
Editor
Col Anthony C. Cain

Senior Editor
Lt Col Malcolm D. Grimes

Associate Editor
Maj Donald R. Ferguson

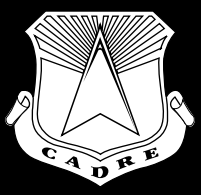
Professional Staff
Marvin W. Bassett, *Contributing Editor*
Larry Carter, *Contributing Editor*
Mary J. Moore, *Editorial Assistant*
Steven C. Garst, *Director of Art and Production*
Daniel M. Armstrong, *Illustrator*
L. Susan Fair, *Illustrator*
Ann Bailey, *Prepress Production Manager*

Air and Space Power Chronicles
Luetwinder T. Eaves, *Managing Editor*

http://www.af.mil

http://www.aetc.randolph.af.mil

http://www.au.af.mil



http://www.cadre.maxwell.af.mil

Visit *Air and Space Power Journal* on-line at http://www.airpower.maxwell.af.mil or E-mail to aspj@maxwell.af.mil

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
2003		**00-00-2003 to 00-00-2003**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Air & Space Power Journal. Volume 17, Number 2, Summer 2003	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Air and Space Power Journal,155 N. Twining St,Maxwell AFB,AL,36112-6026**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**130**	

Prelaunch Notes 5

Flight Lines

The Transformation of Air and Space Power in Operation Iraqi Freedom 6

Vortices

Direct Attack—A Counterland Mission 9
Lt Col Phil M. Haun, USAF

Neglected Air Force Combat Missions 17
Maj Collin Ireton, USAF

PIREP

Transformation from the War Fighter's Perspective 31
Col Kurt "Two-Lips" Dittmer, USAF

Features

US National Security Strategy and the Imperative of "Geopresence" 35
Gen Gregory S. Martin, USAF

Task Force Concepts of Operations: Transforming the USAF 49
Lt Col Larry Weaver, USAF, Retired
Col Anthony C. Cain, USAF

Training: The Foundation for Air and Space Power Transformation 57
Lt Col John M. Fawcett Jr., USAF, Retired

Transforming Homeland Security: Intelligence Indications and Warning 69
Lt Col Kenneth A. Luikart, Georgia ANG

Military OR Ethics 79
Dr. James H. Toner

"Reining in" the Center of Gravity Concept 87
Lt Col Antulio J. Echevarria II, USA

Learning as a Weapon System 97
Lt Col Richard R. Baskin, USAF
Dr. Dean L. Schneider

Net Assessment

The Military History of Tsarist Russia 106
Frederick W. Kagan and Robin Higham, eds.
Reviewer: Lt Col Robert B. Kane, USAF

Warfare in the Western World, 1882–1975 107
Jeremy Black
Reviewer: Col Eric Ash, USAF

Victory in Vietnam: The Official History of the People's Army of Vietnam, 1954–1975 108
Military History Institute of Vietnam, Merle L. Pribbenow, trans.
Reviewer: Col Darrel Whitcomb, USAFR, Retired

Ploesti: The Great Ground-Air Battle of 1 August 1943 110
James Dugan and Carroll Stewart
Reviewer: Dr. Frank P. Donnini

Luftwaffe Aces of the Western Front 110
Robert Michulec
Reviewer: Lt Col Robert F. Tate, USAFR

European Warfare, 1815–2000 111
Jeremy Black, ed.
Reviewer: Dr. Stephen A. Bourque

Enlarging NATO: The National Debates 112
Gale A. Mattox and Arthur R. Rachwald, eds.
Reviewer: John H. Barnhill

Exploring the Unknown, vol. 5, ***Exploring the Cosmos*** 113
John M. Logsdon with Amy Paige Snyder, Roger D. Launius, Stephen J. Garber, and Regan Anne Newport, eds.
Reviewer: Col Jonathan W. Campbell, PhD, USAFR, Retired

Mao's Generals Remember Korea 114
Xiaobing Li, Allan R. Millett, and Bin Yu, eds. and trans.
Reviewer: Col Anthony C. Cain, USAF

Clash of Arms: How the Allies Won in Normandy 115
Russell A. Hart
Reviewer: Maj James P. Gates, USAF

The Fallacies of Cold War Deterrence and a New Direction 117
Keith B. Payne
Reviewer: Maj John E. Shaw, USAF

Night Fighters over Korea 118
G. G. O'Rourke with E. T. Wooldridge
Reviewer: Lt Col Merrick E. Krause, USAF

Tailspin: The Strange Case of Major Call 119
Bernard F. Conners
Reviewer: Maj David Van Veldhuizen, USAF

Third Reich Victorious: Alternate Decisions of World War II 119
Peter G. Tsouras, ed.
Reviewer: Maj Paul G. Niesen, USAF

The* Pueblo *Incident: A Spy Ship and the Failure of American Foreign Policy 120
Mitchell B. Lerner
Reviewer: Capt Gilles Van Nederveen, USAF, Retired

The Military History of the Soviet Union 121
Robin Higham and Frederick W. Kagan, eds.
Reviewer: Dr. Matthew R. Schwonek

Mission Debrief 126

Air and Space Power Journal Board of Reviewers

Prelaunch Notes

COL ANTHONY C. CAIN, EDITOR

THE *AIR AND SPACE POWER JOURNAL (ASPJ)* staff joins the Air University community in welcoming Col Joseph A. Panza Jr., USAF, retired, as the executive director of the Air University Foundation. Colonel Panza takes over from Col Don Karle, USAF, retired, who served the foundation well for several years. The Air University Foundation provides support for education and research related to air and space power, including *ASPJ*'s annual Ira C. Eaker Award and the *Alas de las Américas/Alas das Américas* (Wings of the Americas) Awards for the Spanish and Portuguese *ASPJ* editions. These awards recognize the best articles published in our journal. Welcome, Colonel Panza!

Book reviews are one of the best—but least used—tools available for acquiring knowledge. Good reviews expose us to one reader's opinion before we invest our time, effort, and money reading the book ourselves. As professionals, our time is valuable, so we cannot afford to waste it reading something that is poorly written or otherwise flawed. Thus, book reviews help busy professionals decide how to spend the time they set aside for personal development. *ASPJ*'s "Net Assessment" and "Touch and Go" sections feature reviews of significant books and programs related to air and space power. The former offers longer reviews (1,000–1,500 words), which summarize the latest air and space power scholarship and include a critical assessment of the author's efforts. The latter usually consists of shorter critiques (200 words) of both aviation-related printed works, designed to provide the widest range of material for our readers, and computer-based products (e.g., CDs, wargame software, etc.). Readers who wish to contribute a review should consult the list of available books and guidelines on our Web site: http://www.airpower.au.af.mil/airchronicles/bookmain.html. We provide the book free of charge to the reviewer.

As always, the *ASPJ* editorial staff looks forward to reading and publishing *the best in air and space power thought*. Refer to our publication guidelines in the "Mission Debrief" section, or check the submission instructions on our Web site at http://www.airpower.au.af.mil/airchronicles/howto.html. We seek quality articles that explore emerging air and space power technologies; the relationship between regional security and air and space power; and the history, doctrine, and strategy of air and space power. □

A well-planned, well-organized, and well-flown air force attack will constitute an offensive that cannot be stopped.

—Brig Gen Kenneth N. Walker

The Transformation of Air and Space Power in Operation Iraqi Freedom

HOW CAN WE know that a transformation is occurring or has occurred? The realization does not always come crashing down on the observer like a 2,000-pound precision munition. Sometimes transformational effects subtly erode accepted practices, just as sandpaper smoothes rough surfaces on wood to reveal a true masterpiece. When transformation occurs, there may be a moment when commentators cannot process what they witness. But when the moment passes, they recognize the new effects as "normal." It's as if they had always known such things were possible but had never decided to try them. Unfolding events in Operations Enduring Freedom and Iraqi Freedom bear witness to a transformation in air and space power that is simultaneously dramatic and subtle. If we don't take time to reflect on the nature of this transformation, we might miss its significance.

First, operations *did not* begin with the decapitating strikes, nor with the much-touted "shock and awe" bombing campaign, nor with the multipronged thrust into Iraq by British, Australian, and US ground and special operations forces. The foundation for every success that the coalition has enjoyed to date stems from an intense information-gathering campaign that relied on air and space power, human intelligence, and intelligence-gathering efforts by special operations personnel. The precision strikes against strategic and operational targets during Iraqi Freedom stand as evidence of *predictive battlespace awareness* (PBA). This unprecedented capability to fuse intelligence data from various sources and make it useful to combatant commanders is one of the cornerstones of the transformation of air and space power.

Because of investments in technology and, more importantly, in doctrine and forward-thinking operational concepts, coalition planners are able to develop a strategic assessment of the enemy's plans, force structure, and capabilities that is unprecedented in its accuracy and timeliness. This predictive awareness is such a pervasive capability for US forces that we now have changed our perceptions about the precision and flexibility that have always characterized air and space power. As a result of this transformational capability, we can now speak about the effectiveness of air and space power with greater authority and certainty. After Operation Desert Storm, analysts described the closing of the gap between air and space power's technological limits and its potential. In the operations in Afghanistan and Iraq, we have witnessed a conceptual and organizational transformation that redefines how we think about employing air and space power to achieve national strategic and operational goals. Using air and space power's PBA capabilities, we can alter the character, pace, depth, and scope of operations to suit our timing and objectives.

Second, operations in Iraq reveal a *seamless* integration of air and space power's capabilities with those of other components. In the past,

we thought of joint operations as cobbling together a tactically—or even an operationally—effective force from various service components. In Iraqi Freedom, the interservice conflicts that accompanied former joint efforts have not occurred. Air and space power doctrine, organization, and employment now occur within the context of mature joint structures and operating concepts. The result is a complex, integrated, and synchronized campaign that allows coalition commanders to outthink *and* outfight enemy commanders and their forces. The difference between the capabilities displayed by coalition forces and those of the Iraqi military is comparable to the difference that would occur if a US Civil War–era force suddenly found itself confronted by the Allied forces in Europe near the end of World War II. The Iraqi military's inability to compete against the coalition's seamless operational and tactical integration renders it tragically clumsy and impotent.

Finally, air and space power will ensure that the stunning effectiveness that characterizes combat operations will carry over into war-winning, post-hostilities operations. The humanitarian crisis that many analysts expected has not occurred, largely because the precision-strike capability inherent in air and space power has limited the destruction that normally accompanies large-scale combat operations. To be sure, the destruction inflicted upon Iraqi armed forces from all coalition components exceeds the power brought to bear in previous conflicts. What is different—and transformational—about this campaign is that coalition leaders have unflinchingly taken the war "downtown" without fear that civilian populations would suffer equally alongside enemy combatants. This decision sends a clear message to the Iraqi people: "We make war against an immoral regime, not against you." The same precision, timeliness, and reach that allow us to deliver stunningly accurate bombs on targets also allow us to deliver humanitarian supplies to people who would otherwise starve or die of thirst and disease.

During the buildup toward war, we often heard that the outcome was not in doubt. The transformation of air and space power, in part, guarantees that outcome. We could no more imagine fighting this war, or any future war, in the same way that we approached Desert Storm than we could apply the same organizations and methods used in Vietnam or World War II. Whether we realize it or not, a decade of intense thought, organizational change, combat experience, and preparation has placed us in the midst of a true air and space power transformation. The task now is to look around us to understand how the results of that transformation will affect future capabilities and operations. More importantly, we must ask ourselves how to prepare air and space capabilities to generate the next transformational wave. □

I just feel that the surest way to prevent war—and that is my goal, and I feel very strongly about it—is to have overwhelming strength so that it is ridiculous for anybody to even think of attacking the United States.

—Gen Thomas S. Power

Airpower in Operation Desert Storm

COL MATTHEW B. CAFFREY JR., USAFR

On 16 January 1991, coalition air forces launched the campaign to liberate Kuwait and eliminate Iraq's ability to threaten its neighbors. Smart strategies, smart weapons, and smart airmen characterized the campaign. Campaign planners analyzed the enemy as a system, orchestrated attacks to degrade enemy capabilities in the air, and degraded the regime's political control of the state. This strategy was made more feasible by the first widespread use of precision-guided munitions. Still, smart aircrews were often the key to success, as was the case when F-111F pilots noticed that enemy tanks retained heat longer than the surrounding sand and initiated "tank plinking" operations.

Yet, friction and a thinking enemy prolonged the campaign. The weather was the worst on record, degrading both bombing and bomb damage assessment. The political consequence of Iraqi Scud surface-to-surface missile attacks diverted coalition airpower to protect Saudi territory and to preserve the coalition. Finally, Iraq invaded Saudi Arabia in an apparent attempt to force an attrition ground battle that would end the one-sided campaign in the air. The resulting battle for Khafji demonstrated both the potency and limitations of airpower. Our having too few forward air controllers reduced the effectiveness of direct air support to friendly ground forces, yet air rendered reinforcing Iraqi units combat ineffective *before* they contacted friendly ground forces. In the aftermath of the battle for Khafji, airpower destroyed retreating Iraqi formations as they returned north to Kuwait.

Overcautious joint command and control procedures and an insufficient number of forward air controllers limited the effectiveness of airpower when coalition ground forces launched the long-awaited offensive to liberate Kuwait. As Iraqi forces surrendered or retreated, ground commanders insisted on extending the fire support coordination line (FSCL) far in front of their rapidly advancing troops. Many Republican Guard forces escaped the tightening noose because aircraft could strike targets inside the FSCL only under the direction of a forward air controller. Coalition air forces had too few controllers positioned with land formations to regulate the amount of airpower flowing into the battle area. More Republican Guard forces escaped when coalition leaders halted operations after liberating Kuwait. The surviving Republican Guard crushed the revolt by the Iraqi people after the coalition's self-imposed cease-fire, thus tainting the apparent victory and setting the stage for a decade-long standoff between coalition and Iraqi forces.

Time has added perspective to many assumptions made shortly after the Gulf War. Many analysts believed that we would never again encounter a situation that would allow airpower to be so effective. Experiences in Bosnia, Kosovo, and Afghanistan have proven otherwise. Still, it now appears that ground forces could have been more effective in the first Gulf War if they had been given a few more hours to surround the Republican Guard. Perhaps the most valuable lesson available from the Desert Storm experience is that the effectiveness of air *and* ground power depends on the wisdom with which both are employed.

To Learn More . . .

Campen, Alan D., contributing ed. *The First Information War: The Story of Communications, Computers, and Intelligence Systems in the Persian Gulf War*. Fairfax, Va.: AFCEA International Press, 1992.

Khaled bin Sultan, with Patrick Seale. *Desert Warrior: A Personal View of the Gulf War by the Joint Forces Commander*. New York: HarperCollins, 1995.

Matthews, James K., and Cora J. Holt. *So Many, So Much, So Far, So Fast: United States Transportation Command and Strategic Deployment for Operation Desert Shield/Desert Storm*. Washington, D.C.: Research Center, United States Transportation Command and Joint History Office, Office of the Chairman of the Joint Chiefs of Staff, 1996.

Winnefeld, James A., Preston Niblack, and Dana J. Johnson. *A League of Airmen: U.S. Air Power in the Gulf War*. Santa Monica, Calif.: RAND, 1994.

To maintain an effective deterrent, the posture of the strategic force must be updated continuously. At the same time, we must have the capability to meet requirements for conflicts of lesser magnitude than general war.

—Gen Curtis E. LeMay

Direct Attack—A Counterland Mission

LT COL PHIL M. HAUN, USAF*

A B-52 CIRCLING OVER Afghanistan is loaded with Joint Direct Attack Munitions (JDAM). Its crew receives the coordinates of Taliban military positions from an Air Force controller operating on the ground as part of a special operations forces (SOF) team. The B-52 releases the precision-guided bombs that hit with pinpoint accuracy and decimate—one by one—the Taliban positions. This impressive display of airpower demonstrates the flexibility and all-weather capability of Global Positioning System (GPS) munitions—a capability that has justifiably captured the imagination of airpower enthusiasts. Still, a gnawing question remains: What mission is the B-52 performing? This attack on enemy fielded forces is best termed *direct attack* and does not fit neatly into the description of either the *close air support* (CAS) mission or the *air interdiction* (AI) mission as defined by current Air Force *counterland* doctrine.[1]

*Lieutenant Colonel Haun is the director of operations in the 355th Fighter Squadron, Eielson AFB, Alaska.

In the recent air operations in Kosovo and Afghanistan, US airpower has been employed against enemy armies independent of friendly ground operations. Yet the Air Force doctrinal description of how it fights does not reflect this reality of modern combat. Traditional thinking holds steadfast to the supporting role of airpower in counterland operations. Until the Air Force acknowledges the direct attack of fielded forces as a counterland mission and assumes the responsibilities of this role, it will continue to have difficulty in organizing, training, and equipping for the task.

The relevance of counterland operations should be addressed before examining specific air operations against fielded forces. Some USAF strategic airpower theorists argue that the targeting of fielded forces is of marginal importance.[2] These theorists note that since World War II, most of the Air Force force structure and doctrine had been developed to counter the modern, industrialized nations of the Warsaw Pact. Yet they fail to recognize that US airpower has been primarily employed against underdeveloped, authoritarian states. Such states have been controlled by leaders reliant on the backing of the military as their primary source of power and as an instrument of their ambition. The United States has enjoyed the advantage of air superiority over these small states, which have not been able to afford and train a modern and sophisticated air force.[3] They turn instead to their conventional armies, ranging from large armored divisions to small groups of lightly armed militia, to provide both internal and external security. Airpower's ability to attack such armies is a significant contribution to the defeat of these states.

Combat operations in Kuwait, Kosovo, and Afghanistan have highlighted the importance of direct attack. Yet Air Force counterland doctrine has not adequately addressed these operations. The doctrine's fundamental flaw continues to be the assumption of simultaneous air and land operations. Today, counterland airpower operations are classified as either CAS or AI missions.[4] While CAS deals specifically with air operations in the close proximity of friendly ground troops and requires detailed coordination, AI engages the enemy before it reaches the battlefield. According to Air Force doctrine, AI is employed "to destroy, disrupt, divert, or delay the enemy's surface military potential before it can be used effectively against friendly forces."[5] Both the CAS and AI definitions assume that friendly ground forces exist and are involved on the battlefield.

History does not support the underlying assumption of simultaneous air and land operations. From Normandy to Afghanistan, airpower has typically been used prior to the introduction of ground forces. The routine choice to employ airpower first could be explained by its greater mobility, the result of political considerations, or simply sound military planning. Early Air Corps doctrine advocated a period of time, prior to the engagement of ground troops, in which airpower would attack various targets, including enemy ground forces.[6] Current Air Force doctrine, however, does not adequately address the use of airpower to attack enemy

ground forces in the absence of friendly land forces. When required to do so, the Air Force finds itself ill prepared and must take an ad hoc approach to such key tasks as overall command and control of the *battlespace*[7] and target identification and prioritization.

Airpower's Historical Support of Counterland Operations

This article has discussed the current counterland doctrine of AI and CAS, and will now look at how airpower has actually been employed. The objective is to reveal shortcomings in current Air Force thinking and doctrine and to recommend changes to improve the employment of airpower in the direct attack of a fielded army.

World Wars I and II

The support of ground operations has been a primary role of airpower since its inception. In World War I, Royal Air Force (RAF) bombers inadvertently introduced aerial interdiction. They had been unable to locate their primary targets and instead attacked German railheads in France; in so doing, they disrupted the flow of equipment and supplies to the German front.[8] In the three months leading to D day in World War II, the RAF and Eighth Air Force redirected their energies from strategic bombing to a sustained air interdiction operation against the German transportation system in France.[9] Gen George S. Patton and his Third Army relied heavily on CAS sorties from the fighter-bombers of the Ninth Air Force to punch their way across France. Patton placed experienced pilots in his lead tanks, using radios to control strikes. Likewise, in the Pacific, CAS proved to be a key element in the amphibious operations of the island-hopping campaign. In fact, the air attacks at Rabaul were so effective that it was deemed unnecessary to launch ground operations at all.

Korea

The post–World War II reduction in military forces and the early focus on strategic bombardment had reduced the Air Force's counterland capabilities by the time of the outbreak of the Korean War. Although short of airfields and tactical aircraft, US airmen neutralized the Korean rail network, forcing the North Koreans to move supplies by convoy across already overextended supply lines. During the day, USAF F-80s and F-51s were successfully employed against truck convoys. Their success limited the North Koreans to nighttime movement.[10] Further, airborne forward air controllers (FAC) flew propeller-driven aircraft (such as the T-6 Texan) in visual-reconnaissance and strike-control missions and greatly enhanced the effectiveness of CAS operations.

Above: *An F-51 of the 18th Fighter Bomber Wing taxis up to a loading point where napalm tanks will be added to its rockets to complete its combat load.* Below: *An F-80 loaded with 1,000-pound bombs launches to attack targets in North Korea.*

Vietnam

March 1965 marked the beginning of the Rolling Thunder air campaign, which was designed to interdict the flow of men and supplies to the Vietcong in the South and convince the North Vietnamese to withdraw support. However, by July of that year, President Johnson had concluded that a victory in Vietnam would require a protracted campaign with emphasis on military action in South Vietnam.[11] These ground operations relied heavily on CAS.[12] For the next seven years, the Air Force mastered the execution of CAS and fully integrated it into its doctrine. This included the maturation of the Tactical Air Control System (TACS) network and the widespread integration of airborne FACs. By the end of

the Vietnam War, most of the airmen in Tactical Air Command and many in Strategic Air Command were well versed in CAS.

Central Europe and the Cold War

Even during the Korean and the Vietnam wars, the primary focus of the US military remained on Europe and the threat of an invasion by the Soviet Union. During the late ’70s and ’80s, the US Army and Air Force worked to develop the AirLand Battle doctrine, a joint vision for integrating air and land operations. CAS and AI were essential elements of AirLand Battle. Also, *battlefield air interdiction* (BAI), a NATO term, was expanded to include *follow-on forces attack* (FOFA), the interdiction of enemy second-echelon ground forces moving toward, but not yet engaged with, friendly ground forces.[13]

The fall of the Berlin Wall in November of 1989 and the subsequent breakup of the Soviet Union left the United States victorious but lacking a threat—similar to that provided by the Soviets during the Cold War—on which to base its military force structure and AirLand Battle doctrine. As the United States began to reduce its overall force structure, dismantle its forces in Europe, and help establish a new world order, interest abruptly shifted to Southwest Asia on 2 August 1990 when Iraq invaded Kuwait.

Kuwait

Operation Desert Storm provided the opportunity to test AirLand Battle against the large Iraqi army. Airpower writers have generally focused on the Instant Thunder portion of the air campaign, which introduced the American public to the effective use of stealth and precision munitions.[14] However, Desert Storm was primarily a counterland operation with over 75 percent of all strike missions directed against the Iraqi army.[15] Only a small portion of these missions were flown as traditional CAS.

CAS sorties were limited for three reasons. First, CAS was only flown during the four days of coalition ground operations while the majority of strikes were conducted during the 38 days prior to those operations. Second, the US Army did not require much CAS, as it already had sufficient organic firepower (artillery, rotary-wing aviation, and M1A1 tanks) to handle the Iraqi army. Finally, the fast-paced nature of the ground invasion increased the risk of fratricide. It proved difficult for ground commanders to know the precise location of their *forward line of own troops* (FLOT). Further, it was challenging for pilots to navigate precisely and be certain of the FLOT location in the featureless Kuwaiti desert. Instead of flying CAS missions, strikers were typically pushed forward to conduct armed reconnaissance against deeper Iraqi units who were not yet engaged by the Army.

While traditional CAS had a limited impact in the war, direct attack sorties against Iraqi units proved to be very effective and the most widely employed method of attack. The best example is the Battle of Khafji, in which the battle for control of the Saudi Arabian border town was decided

not by the small ground skirmishes within the village but by the devastating air strikes against massed Iraqi armor after its assembly and movement was detected.

Kosovo

Operation Allied Force (OAF), the 1999 air war over Serbia, was conducted without the deployment of friendly ground forces. The counterland missions against the Serbian Third Army deployed in Kosovo were conducted as an independent air operation. Traditional CAS was not flown during that 78-day campaign. Instead, the majority of counterland strikes were flown with A-10 FACs assigned to locate and control direct attack strikes on the Serbian army in either of the two kill boxes in which Kosovo had been divided. [16]

An A-10 taxiing for launch

These direct attack missions were clearly different from traditional CAS and AI. Following OAF, the Air Force moved to fill this void in its counterland doctrine. Air Force Doctrine Document 2-1.3, *Counterland*, expanded the scope of AI to read as follows: "Air interdiction, to include both lethal and nonlethal systems, is employed to destroy, disrupt, divert, or delay the enemy's surface military potential before it can effectively engage friendly forces, *or otherwise achieve its objectives*" (emphasis added).[17]

The phrase "or otherwise achieve its objectives" acknowledged that airpower, as demonstrated over Kosovo, could be used to directly attack an army without the presence—or foreseeable presence—of friendly ground forces. However, this Band-Aid approach to redefine air interdiction doctrine to include direct attack did little to influence how the Air Force trained and equipped for the counterland missions it would later encounter in Afghanistan.

Afghanistan

In Afghanistan, the United States again relied heavily on the direct attack of enemy forces to gain victory. The Taliban crumbled once their military forces were targeted along the front with the help of the Northern Alliance. These air strikes could not be described as traditional AI or CAS missions. Airpower was not supporting a friendly ground force; rather the Northern Alliance supported US airpower by providing intelligence,

assisting in targeting, and then occupying the ground vacated by the Taliban following US strikes.

Implications

Historically, the airpower role in counterland has proven critical, and the direct attack of enemy forces has been, and continues to be, an important part of that airpower mission. Unfortunately, the Air Force has not yet embraced direct attack as a separate counterland mission, and continues to only acknowledge the traditional missions of AI and CAS in its doctrine. The USAF would improve its direct attack and, therefore, its counterland capabilities if it would adopt the following recommendations.

Training and Tactics

It should adjust training and tactics to effectively prepare airmen to attack armies. An Air Force that does not train or develop such tactics will not have the requisite skills when confronted with those circumstances in combat. The old adage "fight the way you train" is true from two perspectives. First, it makes sense to develop and take into combat well-considered tactics and techniques that have been honed during peacetime. A second, more subtle, implication is that military force is generally employed in come-as-you-are conflicts and airmen have no other option but to fight the way they have trained. It is training that develops the tactical skills and the mind-set that define and refine a combat force's capabilities. Two steps should be taken immediately: incorporating the direct attack of fielded forces into major USAF exercises, and rewriting Air Force Tactics, Techniques, and Procedures (AFTTP) 3-series manuals to include the direct attack mission.

- *Major exercises such as Red Flag, Air Warrior, and Cope Thunder should incorporate the direct attack of fielded forces as a primary mission.* The Combat Air Forces (CAF) must require continuous peacetime exposure to the direct attack mission to become familiar with the challenges and acquire the requisite skills.
- *The Air Force should develop a separate AFTTP volume on the direct attack of fielded forces, focusing on the integration of US and coalition intelligence, surveillance, reconnaissance, command and control, FAC, and strike assets.* It should develop and share the best practices used in attacking fielded forces through the AFTTP 3-1 series process to address most of the current limitations. Currently, the tactics that have been developed are found only in the specialized aircraft volumes.

Doctrinal Issues

Current Air Force doctrine contains the underlying assumption that air strikes against fielded forces are always flown in support of land

operations. Joint and Air Force doctrine must adjust to the reality of how US airpower is now sometimes employed and reclassify counterland to include direct attack as a separate mission.

Conclusion

This article's purpose has been to show that direct attack of enemy ground forces is a primary airpower mission, distinct from AI and CAS, and can be conducted independently of, or supported by, friendly ground forces. The Air Force should acknowledge direct attack in its doctrine, and then it should appropriately man, train, and equip itself to better conduct counterland operations. □

Eielson AFB, Alaska

Notes

1. Air Force Doctrine Document (AFDD) 2-1.3, *Counterland,* 27 August 1999. Current Air Force doctrine limits the definition of *counterland* missions to *air interdiction* and *close air support,* and these missions are directly related to friendly ground forces.

2. Col John A. Warden III, "The Enemy as a System," *Airpower Journal* 9, no. 1 (spring 1995): 52.

3. These enemy states, however, have had sophisticated air defense weapons and integrated air defense systems (IADS).

4. AFDD 2-1.3, v.

5. AFDD 1, *Air Force Basic Doctrine,* September 1997, 50.

6. US Army Air Corps, Field Manual 1-5, *Employment of Aviation of the Army,* 1940.

7. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms,* 12 April 2001, amended 7 May 2002, 51. *Battlespace* is a doctrine term that refers to the environment, factors, and conditions that must be understood to successfully apply combat power, protect the force, or complete the mission. This includes the air, land, sea, space, and the included enemy and friendly forces; facilities; weather; terrain; the electromagnetic spectrum; and the information environment within the operational areas and areas of interest.

8. John Buckley, *Air Power in the Age of Total War* (Bloomington, Ind.: Indiana University Press, 1999), 60.

9. William Momyer, *Air Power in Three Wars: World War II, Korea, and Vietnam* (1978; reprint, Washington, D.C.: Office of Air Force History, 1985), 164.

10. Eduard Mark, *Aerial Interdiction: Air Power and the Land Battle in Three American Wars* (Washington, D.C.: Office of Air Force History, 1994), 271–72.

11. Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (New York: Free Press, 1989), 60, 71. President Lyndon Johnson accepted Secretary of Defense Robert McNamara's proposals, following a McNamara fact-finding trip in July 1965.

12. John Schlight, *The War in South Vietnam: The Years of the Offensive, 1965–1968* (Washington, D.C.: Office of Air Force History, 1988), 42.

13. Lt Gen Merrill A. McPeak, "TACAIR Missions and the Fire Support Coordination Line," *Air University Review* 36, no. 6 (September–October 1985): 70.

14. The F-117 stealth fighter was first flown operationally in Operation Just Cause, the December 1989 invasion of Panama. Precision-guided munitions likewise had been first used at the end of the Vietnam War. However, neither received much public appreciation until Desert Storm.

15. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, D.C.: US Government Printing Office, 1993), 65.

16. F-16CJ, F-14, and Marine F/A-18D FACs were also used.

17. AFDD 2-1.3, 23.

Neglected Air Force Combat Missions

MAJ COLLIN IRETON, USAF*

IN OPERATION DESERT STORM, the US Air Force showed the world how to kick down the front door of a Soviet-designed and -equipped advanced integrated air defense system (IADS). Stealth technology and tactics neutralized command and control (C^2) centers, early warning radars, and ground control intercept (GCI) sites, blinding the Iraqis and forcing uncoordinated operations. Effective use of air superiority fighters led to a complete rout of Iraq's fixed-wing air force. The IADS broke down, leaving only an air defense effort with neither systematic approach nor integration and allowing the effective use of suppression of enemy air defense (SEAD) operations by F-4G and F-16C aircraft against the remaining pockets of activity.[1] With the destruction of C^2 nodes and the Iraqi air force, as well as the moderately successful suppression of ground-to-air defenses, a high-threat arena became a medium-threat arena. These actions opened the way for the destruction of large numbers of strategic and tactical targets through interdiction and close air support (CAS), as well as other required missions such as combat search and rescue (CSAR).

Perhaps such success as this partially justifies the tremendous fiscal outlays for a "kick down the door" force. The acquisition of specialized aircraft such as the B-1, F-117, B-2, and F-15E, although costly, ensures our ability to penetrate and destroy both C^2 centers and a host of other strategic targets. The new joint family of inertially aided munitions (IAM) gives these aircraft the tools to do the mission, day or night, in almost any type of weather. Surely this ability to destroy fixed targets represents one of the Air Force's greatest strengths.

Another strength, although it is slowly eroding, lies in our counterair capability. Development of the AIM-9X and Joint Helmet Mounted Cueing System; incorporation of the advanced identification, friend or foe (IFF) in the F-16; and continued superb performance of the AIM-120 will slow the erosion of our lead. The F-22 will reverse the trend and clearly define air dominance over hostile aircraft as another Air Force strength (at about $92 million a copy, it should).[2]

The ability to destroy or suppress the plethora of ground-to-air threats constitutes another strength. Since the Vietnam War, the concept behind the F-100 Wild Weasel has evolved considerably. Today's F-16C, equipped with the high-speed antiradiation missile (HARM) Targeting System and a family of joint weapons, increases our ability to destroy and suppress

*Major Ireton is the A-10 chief pilot and A-10/F-16 developmental test pilot with the 40th Flight Test Squadron, Eglin Air Force Base, Florida.

ground-to-air threats. Acquisition of the unmanned combat aerial vehicle ensures the Air Force's ability to kick down the door of any advanced IADS.

We are spending sizeable amounts of money and devoting much effort to forcibly enter an enemy's territory and then gain and maintain air dominance. But what resources are being outlaid to do what we came to do: step through the door and systematically destroy the enemy's centers of gravity? The Air Force tends to take the assets that enabled entry and use them to deliver body blows. The B-2 is great at what it was designed for; but it cannot hit moving targets, roll into a CAS line, or go down below the clouds and find, identify, and kill Scud missiles. Neither F-117s nor AC-130s fly around during the day looking for artillery tubes that are pounding friendly ground troops. If an F-15E attempts to provide CAS, more than likely it will be doing as ineffective a job as it did at Robert's Ridge in Afghanistan.[3] An F-16 might do these things, but almost as soon as it begins killing, it has to leave for more weapons and fuel—and the same will hold true for the F-35 Joint Strike Fighter.

The money the Air Force is spending on support roles such as counterair and SEAD is out of proportion to the money it invests in the ability to find, identify, and destroy large numbers of tactical (mobile and fixed) and strategic targets at a tempo the enemy cannot withstand. Our service must continue to support its commitment to US ground forces by providing ample and decisive CAS; it must also support CSAR operations with a suitable platform. The lack of fiscal planning to these ends threatens the Air Force's future ability to dominate the battlefield. Air superiority and SEAD do not, by themselves, bend an enemy to our will. They are only support roles; the ability to put bombs on target impels the enemy to see things our way.

Close Air Support

Because CAS directly supports our ground troops in contact with the enemy, it is extremely important. Conducting CAS without inflicting casualties with friendly fire requires a high degree of teamwork between the ground forward air controllers (FAC) and the CAS aircrews—a skill that takes aircrews years to perfect and that requires constant honing. A typical fighter swinging to a CAS role may do a passable job when the enemy is several miles from friendlies. But a troops-in-contact situation requires professional CAS providers. One need only consider the recent situation in Afghanistan in which the force attempting to rescue Navy SEAL Neil Roberts found itself in need of CAS. After an hour's wait (apparently no CAS assets were in orbit or on ground alert, standing by for just such an occasion), F-15E Strike Eagles arrived. Not designed for CAS and flown by aircrews not trained for troops-in-contact CAS, the F-15Es made only ineffective strafing runs.[4] Our troops deserve better.

As long as the United States possesses the initiative, can choose the time and place of the conflict, and decide whether or not it will commit ground troops, CAS may seem a secondary concern. But when we cannot predict the time and place of combat or do not have the luxury of months of setup before committing troops, CAS becomes critical. More than likely, the next conflict will not be like the last, so we must be prepared to fight without the initiative.

In the Korean conflict, we quickly learned that slow, propeller-driven aircraft performed CAS better than the fast, jet-driven aircraft. For this reason, ground forces valued Marine F4Us above F-80s and F-84s. The success of the Douglas series of A-1/AD Skyraiders in Vietnam made it obvious that a heavily armed, survivable, long-range, high-loiter-time, slow aircraft was ideally suited for CAS. Today's F-16s and tomorrow's F-35s are akin to the F-80s and F-84s of yesteryear.

Combat Search and Rescue

The Air Force has a long history of keeping the faith with downed aviators. Aircrews take comfort in knowing that the Air Force will do what it takes to rescue them. It's also comforting for the civilian leadership as it denies aircrew exploitation—and for the public, who takes no joy in seeing its finest dragged through the streets of an enemy capital.

Traditionally, a good CAS asset has proven a good asset for CSAR, which involves escorting helicopters moderate distances at slow speed, finding the aircrew, and loitering while the choppers attempt the rescue. It may require large amounts of well-placed, timely ordnance. Again the slow, long-range, high-loiter-time, large-payload Skyraiders of the Vietnam era were the weapons of choice to fly "Sandy" missions.

CSAR keeps aviator morale high. The rescue of Capt Scott O'Grady from Bosnia in 1995 lifted the spirits of his comrades as well as those of the nation. It also kept him from being exploited by the enemy, which could have had serious political implications. The abuse of a US serviceman's remains by hostile Somalis certainly played a role in demoralizing the American public and pushing political objectives aside. Like CAS, CSAR is a critical Air Force mission that requires teamwork and skill; coordination, complexity, and flexibility on par with those for CAS; and a dedicated cadre of aircraft and crews.

Heavy Interdiction and the Arsenal Aircraft

An arsenal aircraft would prove useful in any low- to medium-threat theater with numerous mobile and fixed tactical or strategic targets. Such an aircraft would act as a force multiplier by freeing up more dedicated and expensive platforms for specialized missions and would use a large, varied payload and increased staying power to pound numerous targets. It

would also act as a “dollar multiplier” by performing the jobs of several more expensive aircraft, carrying perhaps three or four times the payload of a traditional fighter.

Bridging the gap between fighter and bomber, an arsenal aircraft, like a bomber, would exceed the traditional fighter’s firepower, range, and loiter time, thus reducing dependence on tankers. It would employ ordnance in the manner of a fighter through level or diving bomb, cannon, and missile attacks. The aircraft’s robustness would allow it to operate from forward operating bases and roam extensive areas to locate, identify (sort decoys from real targets), and destroy fixed and mobile tactical targets as well as strategic targets, using the correct weapon for each one. It could acquire targets visually with a targeting pod or through handoff from a Rivet Joint aircraft. An arsenal aircraft also would have the maneuverability and survivability to operate either day or night in a medium-threat environment.

Such an aircraft could take off, release a partial payload on fixed targets, and then enter a kill box to look for movers or report to a FAC for a CAS mission. Ideally, it would have great range and loiter time to perform a variety of somewhat unspecialized ordnance-delivery missions; it would not perform SEAD or employ extreme standoff precision weapons. It would carry many weapons, allowing it to attack 12 to 15 targets, yet be maneuverable enough to survive all but the high-threat arenas. In this way, an arsenal aircraft could fulfill the mission of several traditional fighters that have sacrificed payload and loiter time for stealth and supersonic capability.

The A-10A

The only US fixed-wing aircraft stationed in Afghanistan and ready to provide responsive CAS is the Fairchild A-10A Warthog. Its minimal runway requirements and robust systems made it the ideal choice for deployment to Bagram Air Base (AB), a forward operating location. In Afghanistan’s extensive and scattered battlefield, the “Hogs” have shown their worth against an enemy without traditional centers of gravity. For example, on 20 September 2002 the enemy attacked Bagram AB with rocket fire. The US response included mortar and small-arms fire, together with two A-10s on CAS alert. The Hog pilots located the rocket position, destroying it quickly and decisively.[5]

The Hog’s extensive arsenal of weapons allows it to fix and destroy large numbers of targets. During Desert Storm’s ground offensive, a two-ship formation of A-10s performing CAS destroyed 23 tanks and damaged another 10 over three sorties in a single day, often while under nearly continuous antiaircraft artillery (AAA) fire.[6] Because of the A-10’s extensive loiter time and weapons capacity, the air leadership tasked the aircraft with the problematic mission of roaming the desert to find, identify, and destroy Iraqi Scud launchers. Hogs destroyed several Scuds and launchers, but in the absence of secondary explosions (often the case

The A-10's heavy armor, redundant backup systems, and arsenal of weapons make it a formidable ground-attack aircraft, capable of finding and destroying large numbers of targets.

when launchers did not have missiles), their pilots found it difficult to determine whether they had hit a decoy or the real weapon.[7] Visual searches and battle damage assessments often proved inadequate.

If properly upgraded, the A-10 has the potential to provide hard-hitting CAS and effective CSAR. It is also poised to provide the Air Force an extensive ability to survey the battlefield and then identify and destroy both mobile and fixed targets in quantity as an arsenal aircraft. Although the Hog has been scraping by on the skill of its pilots in these roles, it is now staring obsolescence and ineffectiveness in the face.

The strengths of the A-10, specifically designed as a CAS platform, include loiter time, payload, ability to destroy large numbers of targets per weapons load, speed range compatible with that of escorted helicopters, and ability to search for and find targets at low altitudes. Since the aircraft costs only about $9.8 million, leaders envisioned it as a cheap way to counter the immense deficit in tanks we faced in the German theater.[8] As an inexpensive, low-tech aircraft in a high-tech Air Force, the A-10 found itself at the end of the line for improvement programs and first in line for phaseout. Since its inception, the Hog has received only one major improvement—low-altitude safety and targeting enhancement (LASTE). Sold to the Air Force in the early 1990s as a safety improvement, LASTE gives the A-10 a continuously computed impact-point capability, thus dragging its weapon-delivery system from the World War II era to the Vietnam era.

The A-10's greatest traditionally perceived weakness is its lack of speed. Fighter pilots equate speed with life: the faster they can go, the more survivable they are. Many commentators suspected that the plodding A-10 would be driven from the skies over Iraq during the medium threat

representative of Desert Storm. Three A-10s were shot down in enemy territory during the war, and another was damaged beyond repair. Evidently, infrared (IR) surface-to-air missiles (SAM) downed them, often during diving-attack recoveries. The loss rate of 0.5 aircraft per 1,000 sorties[9] (not including OA-10 data) is far better than the coalition average of 0.9 losses per 1,000 sorties.[10] Damage to 13 other A-10s yielded a damage rate of 1.6 per 1,000 sorties.[11] Compared to the loss rates of 2.6 to 3.0 aircraft per 1,000 sorties during intense air operations such as 1972's Linebacker III and 1967's Route Package 6 in Vietnam, these are excellent numbers and more than likely represent the wisdom of conducting a medium-altitude war.[12] Still, a large discrepancy remains between the A-10's loss and damage rate and that of its nemesis, the F-16C, which—in keeping with the mission creep that has characterized its existence—has assumed many of the A-10's roles, such as CAS, FAC(A), and even CSAR.

The loss and damage rates for F-16s during Desert Storm were 0.2 and 0.3, respectively—far lower than those of the A-10.[13] However, a more telling statistic would be loss and damage rate per 1,000 weapons passes. Although we have no figures detailing how many passes each aircraft made, we can estimate the number. Of the nine weapon stations on the F-16, four are for air-to-air missiles only; two are occupied by external wing tanks; and another hosts an electronic countermeasures pod for combat missions. The remaining two stations are for air-to-ground weapons. Typically, the aircraft carried two Mk-84s or six Mk-82s on triple ejector racks, or two to four cluster bombs of various types during Desert Storm. These munitions were usually expended in one pass. Undoubtedly, the F-16s performed multiple passes a number of times, but the vast majority delivered their munitions in a single delivery. An average of 1.5 weapons passes per sortie is probably generous for the F-16.

The A-10 Thunderbolt II has a Night Vision Imaging System (NVIS), a goggle-compatible single-seat cockpit forward of its wings, and a large bubble canopy that provides the pilot all-around vision. Titanium armor protects both the pilot and parts of the flight-control system.

By way of comparison, the A-10 has 11 weapon stations and a cannon designed for air-to-ground attack. One station typically carries air-to-air missiles, another an electronic countermeasures pod, and another station is not usable when the adjacent stations are occupied. Thus, eight stations can carry air-to-ground ordnance. Firsthand accounts indicate that a typical combat load consisted of two AGM-65s (A, B, D, and G models); six Mk-82s; and 1,150 rounds of 30 mm

cannon ammunition consisting of a combat mix of five armor-piercing incendiary (API) rounds to one high-explosive incendiary (HEI) round. One pilot describes how he shot two AGM-65 Maverick missiles in two passes at GCI and troposcatter radar sites, dropped six Mk-82s on support buildings during another pass, and then began multiple strafing passes firing 900 rounds for a total of eight weapon-delivery passes (allowing five passes to fire the 900 rounds).[14] An estimate of four weapons passes per sortie is probably on the conservative side for the A-10. These averages generate loss and damage rates of 0.125 and 0.4 per 1,000 weapons passes for the A-10 and 0.133 and 0.2 for the F-16. Therefore, in all probability, the A-10's loss rate per 1,000 weapons passes was no different than that of the F-16.

One may account for the fact that the A-10's damage rate is higher than the F-16's by pointing out that, because reattacks forfeit the element of surprise, the attacking aircraft is more likely to suffer combat damage. For example, consider an account of the shootdown of a wingman and flight lead after three and five weapons passes, respectively. The flight elected to attack an area that had already launched several IR SAMs at them, and both attacking aircraft were shot down by IR SAMs in the ensuing melee.[15] Another account tells of an A-10 shot down while recovering from what was apparently its fifth weapons pass.[16] Most such instances of damage to A-10s show them being hit on their third or fourth pass. All shootdowns and damage occurred after the Hogs dropped ordnance and often during the recovery to medium altitude. Evidently, all were hit by IR SAMs, suspected man-portable air defense systems (MANPADS), and SA-13s.[17] In summary, the A-10 is just as survivable as the faster aircraft that one finds in medium- and low-threat environments, but it is susceptible to hits by IR missiles.

Upgrades

Today the A-10 is on the verge of receiving its second major improvement—Suite 2, a hardware and software upgrade that will incorporate a passive method of determining target altitude (previously, the pilot had to input estimated target altitude), a searchable database of steer points, and modern aiming symbologies. When Suite 2 is implemented, the A-10 will attain the capabilities of other Air Force aircraft of the late 1980s.

Furthermore, a small alteration in the GAU-8 cannon's symbology promises great changes in its employment. Typically, the cannon's combat mix has consisted of five API rounds to one HEI round. Because each round has slightly different ballistics, HEI shot from high slant ranges, such as four or five nautical miles (NM), would hit short of the API-tuned sight. Suite 2 provides a ballistic solution for HEI as well as API so that pilots have two sights when combat mix is loaded, and they can choose to put either the API or the HEI on target when shooting from high slant ranges. The HEI will explode and throw significant amounts of shrapnel even when fired from a

5 NM slant range, thus giving A-10 pilots 1,150 grenades that they can deliver with precision—extremely effective on small bodies of enemy troops.

A third planned update, Suite 3, will incorporate two multifunction displays, improved hands on throttle and stick (HOTAS) controls, data-link capability, the ability to use IAMs, and an IR/charge-coupled device (CCD) laser designator (targeting pod). Although the A-10 has always had the ability to employ precision-guided munitions such as the AGM-65 Maverick and its 30 mm cannon, these improvements will allow it to engage a greater variety of targets with precision and near-precision weapons. The AGM-65 and GAU-8 are quite capable of destroying most tactical targets but are limited in their ability to engage many strategic targets. Having the flexibility to choose between AGM-65s, the cannon, IAMs, or Paveway-series laser-guided weapons will allow the A-10 to destroy any tactical and most strategic targets.

The IR/CCD laser-designator capability is especially important. The pilot can slave this device to a point of interest on the ground—usually by referencing target coordinates—and magnify it, as if by a telephoto lens. Because this can occur in either the IR or visual spectrum, allowing day, night, or diurnal crossover usage, the pilot can identify many targets at standoff ranges or altitudes. Something that looks like a truck to the naked eye from 15,000 feet will clearly be seen as a mobile launcher for a missile such as a Scud. The IR targeting pod would also allow identification of an inflatable decoy since it does not have the same black-body radiation characteristics as a metal target. Incorporating this targeting pod on the A-10 is key to successful target identification from survivable ranges and altitudes.

The A-10 Thunderbolt II's 30 mm GAU-8/A Gatling gun, which fires 3,900 rounds a minute, can defeat an array of ground targets, including tanks. Some of its other equipment includes an inertial navigation system, electronic countermeasures, target-penetration aids, self-protection systems, and AGM-65 Maverick and AIM-9 Sidewinder missiles.

Laser-guided Paveway weapons are uniquely suited for CAS. The GBU-12, a 500-pound weapon with excellent accuracy, reliability, and maneuverability, can be dropped like a conventional Mk-82 and hit fairly close to the ballistic Mk-82 solution. This capability is

The A-10/OA-10 Thunderbolt II is the first Air Force aircraft especially designed for close air support of ground forces. This simple, effective, and survivable twin-engine jet aircraft can be used against all ground targets, including tanks and other armored vehicles.

important in the event the kit fails to seek the laser or the laser fails with the bomb in flight. In this case, the weapon does not glide or go "haywire" and will hit close to, if not on, the intended target. Typically, after the bomb is dropped and falls toward the target for 10 or 20 seconds, the laser fires for the last 10 seconds of flight, guiding the bomb directly into the target. It is capable of destroying tanks, armored personnel carriers (APC), light bridges, small buildings, and troops—both sheltered and in the open since the fuse can be set for slight delays. Another feature of this relatively light weapon is its maneuverability. It can easily be "moved" about 500 feet from its ballistic solution with the laser.[18] The A-10 can drop the bomb on poor target coordinates or on a mobile target. The lasing aircraft (not necessarily the dropping aircraft) turns its laser on and either moves the bomb from the poor ballistic solution to the target or follows the moving target. The bomb adjusts its ballistic profile and flies into the target—something an IAM cannot do.

The data-link capability will enhance the Hog driver's situational awareness. Ground and air threats, targets, and positions of friendly troops will display on one of two large, multifunctional color displays. A significant advantage of the data link is its compatibility with US Army systems and the fact that it can provide a tactical air control party (TACP) with the relative location of the A-10's aiming point. If the A-10 is at 20,000 feet and out of sight of the troops providing positive control, the jet can data-link the position of its pipper (point of intended weapon impact) to the FAC or TACP with respect to the location of the friendly troops. This allows the TACPs to exercise positive control by always knowing the Hog's axis of attack and where it is aiming.

The Problem

The problem, simply stated, is that the Hog is a pig. Each TF-34 motor has only 8,900 pounds of thrust. Even at production, people thought the engines were inadequate, and now that they have aged and been detuned, they are unsatisfactory, keeping the A-10 in the threat envelope for unreasonable amounts of time. Weapon-delivery passes take the A-10 from the relatively safe 15–20,000-feet arena down into the AAA and MANPADS arena. After delivering ordnance, the jet turns skyward and begins clawing for altitude. It is quite alarming to see how long it takes the A-10 to climb out of the threat envelope. On recovery from a 2 NM slant-range gunshot, pulling through the horizon at 7,000 feet at 400 knots with the throttles in maximum power, the aircraft can take four minutes and 45 seconds to reach 20,000 feet—out of most IR SAM threat envelopes.[19] One should note that all A-10s lost in Desert Storm were assessed to have been taken by IR SAMs. Such poor performance will certainly decrease the A-10's survivability in the next conflict. The poor motors also compel Hogs in hot-weather locations to take off with partial fuel loads, thus reducing range, loiter time, and war-fighting effectiveness if the aircraft does not go to a tanker to top off. Also, it is difficult to scramble and provide timely CAS if the jet has to tank first.

The Competition

The Air Force has begun acquiring the F-35 Joint Strike Fighter as a replacement for the F-16C and intends to replace the A-10 with it as well.[20] The answer for long-term CAS, CSAR, and arsenal aircraft does not lie with the F-35. Neither its speed range nor weapons load is compatible with CAS and CSAR missions. The F-35 will allow carriage of two air-to-ground weapons routinely, and its single-barrel 25 mm cannon will hardly prove capable in the air-to-ground role. If push comes to shove, seven air-to-ground weapon stations (with no stealth capability) could be made available, which still does not match the A-10's 10 stations and GAU-8 Avenger. Although it is certainly a suitable replacement for the F-16C, at almost three times the cost of the A-10 and with less weapons capability, the F-35 is no bargain.[21] Upgrading the A-10, however, *is* a bargain.

What We Need

The Air Force must outlay funding for CAS and CSAR commensurate with its spending on air dominance and SEAD. Any aircraft that meets the requirements of an excellent CAS or CSAR platform can fulfill the heavy-interdiction mission of the arsenal aircraft. The A-10 appears suitable for these tasks today. However, at the rate high-technology weapons are proliferating and at the rate the venerable Hog is deteriorating, attrition will become unacceptable in the near future, leaving no aircraft in the Air

Force inventory designed for CAS—one of our most important missions. This failure, which represents a break in faith with our ground forces, must be remedied. To make the A-10 minimally acceptable for combat operations in the near to mid future, the Air Force must take action.

Continue to Fund Suite 3

This improvement includes a pod that will enable target identification and effective weapon employment at standoff altitudes and ranges. Furthermore, it will allow the A-10 to communicate effectively in the positive-control CAS environment and will permit the use of IAMs for flexibility in striking both tactical and strategic targets.

Upgrade the A-10's Engines

Without such an upgrade, the excessive time to climb to safe altitudes will continue to plague the A-10. The increase in payload resulting from the variety of weapons allowed by Suite 3, coupled with current engine deterioration and the increasing use of the aircraft in hot-weather environments, makes the current power plant unsatisfactory. More powerful engines will allow more efficient and quicker deployments, higher standoff altitudes, greater payloads, acceptable hot-weather operations, and—most importantly—increased survivability. To cite one example, General Electric's proposed TF34-GE-100B engine for the A-10 would provide 15 percent more sea-level thrust and about 30 percent more thrust at altitude with improved thrust-specific fuel consumption. Cost for the fleet of about 370 A-10s with flight-testing would come to about $1 billion—the equivalent of 12 F-22s or 33 F-35s.

Add a Missile Warning System

Short-range IR missiles such as MANPADS, SA-9s, and -13s have extremely short fly-out times, are difficult to pick up visually, trigger no radar-warning receivers, and are lethal. As mentioned previously, A-10s have a history of trouble with IR SAMs. A missile warning system can detect the plume of an inbound missile and trigger the aircraft to begin dispensing flares while telling the pilot to maneuver. Such a system would greatly enhance A-10 survivability. The Hog's susceptibility to tail shots by IR missiles and its small IR signature from the front calls for a system that would cover only the six-o'clock area of the aircraft—perhaps a 60–90 degree cone around the longitudinal axis. Such a limited system would be relatively cheap and greatly increase the A-10's chances in the next war.

Add a Towed Decoy

A towed decoy trails the aircraft and is designed to attract radar-guided weapons, thus affording some measure of protection. Such systems are widely fielded—but not on the A-10. The Hog's dual-rail adapter, which

carries two AIM-9 air-to-air missiles, could accommodate such a system, allowing use of the AIM-9s at the same time that the towed decoys are either stored in a housing in the adapter or deployed and working. This configuration would have the double advantage of retaining the weapon station and increasing survivability.

Develop a New API Round and HEI Heavy Combat Mix

The extremely useful GAU-8 30 mm cannon is flexible enough to defeat a main battle tank and strafe enemy troops. The Hog driver can make more than 10 lethal passes to expend the weapon's 1,150 rounds. Currently, A-10s carry either combat mixes (one HEI round to five API rounds) or loads of all-HEI rounds. But political and environmental issues associated with depleted-uranium API may not allow employment of this round in all arenas, perhaps limiting A-10s to all-HEI loads.

We need to acquire new API rounds. Less penetration is an acceptable consequence of being allowed to use the weapon in all theaters. On the one hand, in a theater where main battle tanks are expected in large numbers, A-10s could use depleted-uranium API rounds. On the other hand, targets such as trucks, troops, APCs, and the occasional tank call for a more useful general-purpose load of two HEI rounds to one environmentally friendly API round, giving Hog drivers great flexibility. If the target is soft, they can shoot from 5 NM slant range and 18,000 feet above the ground into as close as they like, use the HEI pipper, and expect excellent results. If the target is a truck, they can do the same and expect good incendiary effects and penetration. An APC or a tank, however, would require a Maverick, laser-guided bomb, or a closer-range shot. In situations encountered in Afghanistan, where targets often consisted of small groups of men, this surgical tool would shine. The HEI heavy load would be especially effective against troops, laying down a grouping of hand-grenade-like munitions. With a five-mil radian dispersion, a 2 NM shot would produce a 30-foot-radius impact area (assuming a vertical projection). Skilled pipper placement and the localized effects of the HEI would allow the strafing of targets to within perhaps 150 feet of a parallel line of "hunkered down" friendly troops. The gun would provide an excellent range of destructive ability against a variety of targets with an improved HEI heavy load.

Acquire a Helmet-Mounted Display for Air-to-Ground Operations

A helmet-mounted display (HMD), which projects information onto the pilot's helmet visor, would allow the pilot to look at a visually acquired target, overlay a designation point displayed on the HMD, command the system to derive approximate coordinates and elevation via HOTAS, and slave the IR/CCD laser designator to the target—all in a matter of seconds. Immediate attack with precision weapons could follow, or, if the Hog is acting as a FAC, the pilot could catalog the point for a later CAS

strike. Moderate testing of the Viper IV helmet and associated helmet-tracking system confirms their usability in such a role.[22] An HMD would allow for quick and efficient collection of target data and subsequent target destruction.

Conclusion

With these improvements, the A-10 would become a viable CAS, CSAR, and heavy-interdiction arsenal aircraft until the end of its predicted service life in 2028 or until it is replaced by what the Air Force really needs—the next-generation attack aircraft. In the meantime, improvements to the Hog would dramatically increase the Air Force's firepower at relatively low cost and with little financial risk. The arsenal aircraft would become both a force multiplier and a dollar multiplier, producing significantly more "bang for the buck" than the F-35 in this role. For these reasons, the Air Force should expend resources for CAS, CSAR, and heavy-interdiction arsenal aircraft commensurate with those for its other programs. □

Eglin AFB, Florida

Notes

1. Norman Friedman, *Desert Victory: The War for Kuwait* (Annapolis: Naval Institute Press, 1991), 148–53.
2. Federation of American Scientists, "F-22 Raptor," 25 April 2000, on-line, Internet, 26 December 2002, available from http://www.fas.org/man/dod-101/sys/ac/f-22.htm.
3. David L. Grange et al., "The Close-Air-Support Imperative," *Armed Forces Journal*, December 2002, 14.
4. Ibid.
5. *CNN. com*, "U.S. Base Attacked in Afghanistan," 20 September 2002, on-line, Internet, 20 September 2002, available from http://www.cnn.com/2002/WORLD/asiapcf/central/09/20/afghan.raid.
6. William L. Smallwood, *Warthog: Flying the A-10 in the Gulf War* (Washington, D.C.: Brassey's, 1993), 195–96.
7. Ibid., 94.
8. "A-10/OA-10 Thunderbolt II," USAF Fact Sheet, June 2000, on-line, Internet, 15 December 2002, available from http://www.af.mil/news/factsheets/A_10_OA_10_Thunderbolt_II.html.
9. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, vol. 5, *A Statistical Compendium and Chronology* (Washington, D.C.: Government Printing Office, 1993), 641.
10. Friedman, 166–67.
11. Keaney and Cohen, 651.
12. Friedman, 166–67.
13. Keaney and Cohen, 641, 651.
14. Smallwood, 84.
15. Ibid., 177–78.
16. Ibid., 140.
17. Ibid., 84–190.
18. Personal observation by the author.
19. Ibid.
20. Jeff Rhodes, "JSF System Development and Demonstration," *Code One*, second quarter 2002, 5, on-line, Internet, 26 February 2003, available from http://www.codeonemagazine.com/archives/2002/articles/arp_02/jsf/index.html.
21. The Web site of the Federation of American Scientists quotes the price for the Air Force variant of the F-35 at $28 million. See "F-35 Joint Strike Fighter (JSF)," 20 December 2001, on-line, Internet, 10 December 2002, available from http://www.fas.org/man/dod-101/sys/ac/f-35.htm.
22. Kevin Gibbons et al., "Flight Test Evaluation of the Non-Distributed Flight Reference Off-Boresight Helmet-Mounted Display Symbology," *X Cockpit*, April–June 2002, 16–18.

Regensburg/Schweinfurt
The Last Unescorted Raids of World War II in Europe

DR. DANIEL R. MORTENSEN

The strategic bombing missions conducted in August and October 1943 against Regensburg and Schweinfurt, Germany, were the greatest American air battles of World War II by any measure—including numbers of aircraft lost. The combined loss of 120 bombers and their crews to German antiaircraft and fighter action, coupled with 60 additional aircraft out of commission from battle damage, threatened Eighth Bomber Command's operational coherency and forced the command to stand down temporarily. This tactical failure presented a serious challenge to the Army Air Forces' (AAF) reliance on strategic bombing theory and its primary emphasis on gaining air superiority. The raids yielded little effect on German aircraft and armaments production, ultimately leading AAF leaders to modify their approach from precision daylight bombing to area attacks against German cities and industrial areas.

Through the remainder of 1943, following the disastrous raids, Gen Henry H. "Hap" Arnold, AAF chief, made wholesale changes in command, leadership, and tactics. Gen Carl Spaatz, Gen Jimmy Doolittle, and Gen William Kepner came to England to provide fresh insight on bombing and gaining air superiority. They pushed hard to develop effective fighter-escort tactics that foreshadowed success in 1944. By the spring, the P-51, equipped with drop tanks and expanded internal fuel cells, arrived to revitalize the strategic bombing campaign.

In 1944 the bombers began to penetrate German defenses with acceptable losses. The new air-to-air warfare favored American fighter tactics. The destruction of German industry and transportation continued apace, and the Luftwaffe, subjected to attack with new ferocity, saw its elite fighter-pilot force destroyed in a vicious attrition campaign that it could not win. Despite the tactical successes enjoyed by American crews, insufficient evidence

prevented any meaningful measurement of bombing effectiveness. Germany's dispersal and concealment of much of its industry further complicated the targeting and assessment problem for American airmen. Consequently, bomber crews found themselves striking targets multiple times to ensure that the Germans did not reconstitute their industrial capabilities.

Although they were a tactical failure, the raids on Regensburg and Schweinfurt represented a key turning point in both the war and the history of American military aviation. Airpower leaders pressed to the limit their doctrine of conducting high-altitude precision bombing during daytime without escort but found it wanting in the face of sophisticated and determined enemy opposition. Thousands of airmen lost their lives pressing home the attack against densely defended target complexes. Air leaders realized they needed to alter their assumptions about aerial combat—and they did so. The twin disasters of Regensburg and Schweinfurt thus represented a painful but necessary step in the maturation of American airpower theory, doctrine, and operational effectiveness.

To Learn More . . .

Biddle, Tami Davis. *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914–1945.* Princeton, N.J.: Princeton University Press, 2002.

Bowman, Martin W. *Four Miles High: The US 8th Air Force 1st, 2nd and 3rd Air Divisions in World War 2.* Sparkford, England: Patrick Stephens, 1992.

Craven, Wesley Frank, and James Lea Cate, eds. *The Army Air Forces in World War II.* Vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943.* 1949. New imprint, Washington, D.C.: Office of Air Force History, 1983.

McFarland, Stephen Lee, and Wesley Phillips Newton. *To Command the Sky: The Battle for Air Superiority over Germany, 1942–1944.* Washington, D.C.: Smithsonian Institution Press, 1991.

Perret, Geoffrey. *Winged Victory: The Army Air Forces in World War II.* New York: Random House, 1993.

Editor's Note: PIREP *is aviation shorthand for* pilot report. *It's a means for one pilot to pass on current, potentially useful information to other pilots. In the same fashion, we intend to use this department to let readers know about air and space power items of interest.*

Transformation from the War Fighter's Perspective

COL KURT "TWO-LIPS" DITTMER, USAF*

FOR PEOPLE WHO place themselves in harm's way, it is easy to recognize a "transformational" capability. If you are going to fly a combat sortie into Country X, you analyze everything this adversary can throw at you and assess whether you can/will survive. If he has a lethal capability, like an SA-20, you have to ask, "What system (capability) do I need in order to survive and be combat effective?" If the answers aren't satisfactory from a system perspective for either survival or combat effectiveness, you can then assess your concept of operations to see if there is any way you can increase your odds or effectiveness. If it *still* looks bad, you start checking for a sinus block or a maintenance nondelivery, or begin the process of groveling to the commander to cancel the mission because failure is imminent!

Fortunately, in our recent history, we've not had to grovel to our leaders to beg out of combat sorties, and US systems have proven combat effective. So let's change perspectives and evaluate the United States from an *adversary's* viewpoint. Our adversaries have had to make some difficult choices over the last century when they assessed whether to attack the United States or invade their neighbor (a US ally) and risk US retaliation. So what questions might they ask?

"What capability/system do I need to face the US armed forces and its [fill in the weapon system]?" In the last century, Soviet leaders constantly asked that question of themselves. The North Atlantic Treaty Organization (NATO) probably never matched the overall combat power of the Soviet Union's forces available for a war in Central Europe. Yet NATO did field conventional capabilities to deny the Soviets the potential for an easy victory in a conventional battle. Innovative weapons and concepts, such as precision-guided munitions, antitank guided missiles, superior frontline fighters, and stealth weighed heavily in the Soviets' assessments for success of either their systems or their operational concepts.

Concerning the risks they could encounter, our current adversaries might ask themselves, "What capability/system do I need to face the US armed forces and their F-15s or F-16s?" Adversaries are beginning to find viable answers to this question and are starting to field aircraft that are better than ours. Those without the resources to train pilots to beat US pilots can invest in Integrated Air Defense Systems with double-digit surface-to-air missiles

*Colonel Dittmer is chief of Combat Forces Capability Requirements, Headquarters USAF, Pentagon, Washington, D.C.

A USAF F-16 fires an AIM-120 in the photo above. The photo below is a closeup of an AIM-120 advanced medium-range air-to-air missile (AMRAAM).

(SAM) that effectively counter current US aircraft. However, neutralizing US F-15, F-16, and F/A-18 fighter aircraft does not guarantee air dominance because the United States may be able to field either transformational defensive systems that neutralize adversary SAMs for survivability or transformational weapons that allow standoff precision engagement of critical target sets. Another strategy adversaries might choose involves reestablishing dominance over potential foes. Here too, superior training or concepts of operations can continue to give US pilots the edge. If the United States does not continue to retain the technological lead and field new capabilities, at some point in time, we may see adversaries who determine that they can challenge us in a conventional war and will make engagement decisions based on that assessment.

So what do we do? We can field a standoff weapon for the fleet like the Joint Air to Surface Standoff Missile (JASSM) or JASSM-ER (extended range), thus forcing our adversaries to go back into their decision cycle because these weapons may be transformational. If they can't afford the investment necessary to shoot down a JASSM or the launching aircraft or if no technological solution enables this engagement, then they must assess the risk that JASSM presents. "Can it penetrate my hard and deeply buried targets that I hold dear?" "Has the United States bought enough of them?" If the answers to these questions come up in favor of the United States, then they may think twice about invading their neighbor and facing the full brunt of US combat capability.

Let's try this new analysis on a new and somewhat controversial system—the F/A-22. I recently spent quite a bit of time helping put together a study on this aircraft directed by Defense Planning Guidance, so I can reasonably assess its capabilities. If I represented Country X and were contemplating going to war against F/A-22s, this would be my take: "What capability/system do I need to face the US armed forces and their F/A-22s?" I would turn to my air force commander

A USAF F-22 fires an AIM-9.

and get the "Air Staff salute" because no aircraft produced in any country, now or for the foreseeable future, can match the aerodynamic performance of that airplane. Furthermore, the fact that it has integrated avionics, an Active Electronically Scanned Array radar, and eight air-to-air missiles means that your pilots will face the most lethal weapon system ever built. Therefore, an adversary who wants to counter the F/A-22 in the air will have to make significant investments requiring research and development and lots of time (unless another hot spot in the world is occupying our entire F/A-22 fleet because we didn't buy enough of them).

I would ask my ground force, air defense commander to assess what capability he or she has that measures up to the capabilities the F/A-22 will bring to the fight, and again I'll get the Air Staff salute. The commander can't answer the question because no one knows what the first engagement will even look like.

Instead of equipment, I decide I have to invade my neighbor now or never and ask my commanders to look at tactics, training, and procedures to counter the F/A-22's capabilities. I tell them to start a training program to prepare for imminent combat, which would look something like this: "Today you SAM operators will need to practice against a weapon system that has the radar cross section of a golf ball. It will be flying above 40,000 feet at Mach 1.5. Okay, got that picture? Good! Now, these F/A-22s will be throwing Joint Direct Attack Munitions or small-diameter bombs at you outside your shot range! Now, in order to practice this profile, I would provide you something that can fly this profile, but we don't have anything even remotely close, so . . . any questions?"

A JASSM launches from an F-16.

Similarly, for the pilots: "Today, your adversary will be a two-ship formation of Raptors. To simulate what you will be seeing, I want you to take your four-ship out and place your radars on 10-mile scope, turn your radar-warning receivers off, and plan to start your defensive maneuvers outside your maximum weapons envelope. Plan on 'kill removal' eliminating a couple of members of your flight prior to the merge. For those who do merge, you will be facing AIM-9X and AIM-120 missiles from the most maneuverable fighter ever built. If you elect to run, a valid separation must exceed Mach 2.0. Any questions?"

"Sir, I think my sinuses. . . ."

Do I think the Raptor is transformational? Yes. Do I think an adversary will need to think twice about invading his neighbor? You bet. In fact, what systems would Country X need to develop in order to counter this transformational weapon system, and how much would this cost? Can *any* adversary afford to bankrupt his country to facilitate an invasion of his neighbor? Or does he wait? Hmmm.

With such a compelling case for a transformational capability on a weapon system, I am amazed that we have to fight for the Raptor's very existence. Unfortunately, when I've been asked about the aircraft's transformational capabilities, it is usually to compare them with an equally transformational F-35! Why? Because the office with the aviation expertise analyzes aviation while the office that looks at directed energy or land forces looks at directed energy or land forces—it's what they know best, and it's what their analysis tools are optimized for.

Can someone in the Defense Department assess weapon systems from the adversary's perspective? It's probably not fair for the services to take on that task, so we can only write papers or editorials and rhetorically ask the question. However, since we taxpayers want to get the best investment for our hard-earned tax dollars, I have to ask the hard questions. How is something like the unmanned combat air vehicle (UCAV) considered transformational because it doesn't have a human in it? From the adversary's perspective, I will ask, "What capability/system do I need to face the US armed forces and their UCAVs?" It may very well be transformational because the United States is willing to fly UCAVs aggressively into harm's way because no US pilots will be at risk. Or, if I can figure out the control-mechanism frequency and can force the entire fleet to crash without firing a shot, then maybe it isn't transformational. The adversary will assess the UCAV's range, payload, and survivability to determine whether his centers of gravity are placed at risk by this "transformational" weapon system, and *he* will determine whether or not the UCAV is transformational.

All that being said, which transformational system is going to change the way an enemy will fight his next war or perhaps deter him from ever crossing the border in anger? Space-based missile defense? The Airborne Laser? The Crusader? The CV-22? The answer is an important one. I just hope someone is asking the question. A RAND analyst captured one of my greatest concerns when he said, "Cost matters, of course, but too often the most 'cost-effective' system is the one that will allow our forces to lose the war at least cost."[1] We have limited resources and must use them wisely to ensure that every dollar spent brings the greatest return. A gun that shoots an extra two miles may be transformational when compared with other shorter-range guns, but will that extra two miles change the investment and engagement decisions of our potential adversaries? If we can get our arms around that analysis, then perhaps we will be on the path towards getting the best bang for the buck. A truly transformational weapon system for our war fighters would be one that instills so much fear in our enemies that we can win the next war without ever firing a shot. If we use that logic, perhaps the F/A-22 is truly transformational. □

Note

1. David Ochmanek, "The Debate over Transformation: Toward a More Productive Discourse," draft, n.d., 4.

US National Security Strategy and the Imperative of "Geopresence"

GEN GREGORY S. MARTIN, USAF

THE LAST TWO years have brought a number of unforeseen developments to the world stage, and with them have come major challenges for American foreign policy—even aside from the terrorist attacks in New York and Washington, D.C., on 11 September 2001. In Europe alone, the scope of political and military changes taking place may be the largest since World War II. For example, in 2002 alone we have witnessed substantial government shifts in both Western and Central Europe, unparalleled expansion and integration by the European Union, unprecedented enlargement and restructuring of the North Atlantic Treaty Organization (NATO), and new patterns of inter-

national cooperation and relationships resulting from the US-led global war on terrorism (GWOT).

These historic events, transitions, and circumstances obviously have contributed to the way we now think about national defense and foreign policy, and their impact is clearly present in President George W. Bush's new *National Security Strategy of the United States of America (NSS),* unveiled last September.[1] The past 18 months in particular have served to solidify the new defense perspectives and themes evident in this new strategy. If nothing else, we now recognize that the world is inherently a much more dangerous place than we had imagined after the Cold War, and with that realization the Bush administration's national security and defense strategy is significantly different than the interim strategies we pursued for more than a decade.

At the heart of this strategy is the new awareness described so well by President Bush: "The gravest danger to freedom [now] lies at the crossroads of radicalism and technology."[2] This crossroads highlights the new challenges before us in a much less certain world, where we face both state and nonstate adversaries and where our military operations increasingly cross multiple theaters and unified commands, occurring both in and out of alliance areas. If nothing else, the attacks of 11 September awakened us to the fact that no longer are our country and global interests threatened only by nation-states with organized militaries and the advanced technologies of war. Now there exists a much more fleeting and dangerous set of international actors bent on radical change, who may possess the means to effect that change. This new enemy is a supranational entity—one without borders, postured in a network of execution nodes that hide in a global array of shadows, and able to conduct operations on a global scale.

This new understanding, in turn, has helped create a defense posture that clearly has moved from the traditional *threat-based model* that guided strategic planning for over half a century to a new *capabilities-based model* that concentrates on identifying and arranging the required means to meet the new security challenges. During the Cold War years, we developed a very refined process by which we analyzed the enemy's force structure; his operational, strategic, and geographic laydowns; and his operation of forces and weapon systems in a tactical environment. We then built, positioned, equipped, and trained our forces to fight that known enemy forward with both operational and strategic reserves based in the United States. This threat-based approach served us well in our preparations to conduct war-fighting operations against the Soviet Union and other similarly equipped forces (e.g., Iraq during Operation Desert Storm), but it did not prepare us as well for conducting operations in so-called low-intensity conflicts (e.g., Lebanon and Somalia).

As we departed the Cold War era and entered what seemed to be a period of "simmering peace," we increased our attention on being able to conduct military operations other than war. In many cases, this required developing special capabilities that we had previously assumed were lesser abilities residing within our threat-based force structure. More so than ever before, our military today must be able to conduct operations across the full spectrum—from nuclear deterrence and high-end conventional warfare to lower-end, yet potentially volatile, peacekeeping, humanitarian, and noncombatant-evacuation operations—and it must have the capability to execute those operations rapidly, anywhere in the world.

The challenge we face in building a capabilities-based force structure lies in deciding how much of any given capability the United States requires and how best to position it to provide appropriate global response. Although this article does not presume to design the size of the capabilities-based force structure, the methodology for doing so would be based on the following considerations: (1) the interests of the United States and its allies and friends that would justify the use of military forces; (2) the types of threats and areas of the world that would most likely require the use of military forces; (3) the contributions of

allies and friends for use in concert with the application of US military forces; and (4) the number of simultaneous contingencies in which US forces would likely be employed. On the other hand, this article *does* discuss the imperatives for carefully designing and executing an appropriate strategy of overseas presence in order to provide our nation's leadership, as well as that of our allies and friends, with the most effective military options during any crisis response.

Our experiences in Operation Enduring Freedom and other ongoing missions in the GWOT clearly illustrate the importance of developing strong geostrategic relationships with all of those national and international players with whom we must interact in pursuit of our foreign policy and defense goals. Most importantly, the lessons of these recent experiences also have greatly contributed to our current strategic thinking. During these operations, it became very evident that those fundamental geopolitical relationships that we needed to conduct combat operations, training, and contingencies in various regions of the world were made possible by past and ongoing US forward military presence or relationships in Europe, Asia, and the Middle East. During the fall of 2001 in particular, we quickly understood how this presence translated into those necessary political and diplomatic capabilities that enabled American armed forces and their coalition partners to operate over many countries and areas for which they had not planned—and on a geographic scale and scope larger than anything seen since 1945.

In other words, it is clearer now than ever before that we must foster and maintain sufficient overseas presence and international relationships in order to conduct future training as well as contingency or combat operations. In essence, this is *"geopresence"*—a multifaceted presence that allows the US military to operate in any region of the world, promoted by conscious diplomatic, economic, military, and political involvement in the necessary regions and with the necessary countries. More specifically, geopresence helps us access various regions of importance, engender cooperation, achieve effective interoperability, and ultimately influence the outcomes of events wherever it seems appropriate and beneficial.

Consequently, the new *NSS* supports this view of the importance of geopresence throughout. Its call for strengthening alliances and enhancing cooperation, preventing enemies from using weapons of mass destruction (WMD) to threaten friends and allies, and transforming the military in order to define the battle space on our own terms underscores the importance of geopresence in support of our new defense policies. In the words of the *NSS*, "the presence of American forces overseas is one of the most profound symbols of the U.S. commitment to allies and friends. . . . The United States will require bases and stations . . . as well as temporary access arrangements for the long-distance deployment of U.S. Forces."[3]

In short, our recent experiences in this new, dynamic environment emphasize the need not only to develop new force and technological capabilities, but also to conduct a sophisticated, proactive approach to prepare the geopolitical and diplomatic battle space. The president's new *NSS* codifies this perspective.

A New Strategy for a Changed World

Although the *NSS* has important diplomatic, economic, legal, and philosophical aspects, I would like to concentrate on the major themes that apply directly to the US military in underpinning the new strategy.[4] The US military must execute the president's *NSS* by focusing its efforts on five major strategic goals delineated in that strategy. They are not mutually exclusive since significant areas of overlap exist.

1. Defend the United States, the American people, and our interests at home and abroad by identifying and destroying the threat before it reaches our borders.

2. Prevent enemies from threatening friends and allies with WMDs.

3. Transform the instruments of national defense to allow us to define the battle space on our own terms.
4. Strengthen alliances and work with other nations to defeat global terrorists and defuse regional conflicts.
5. Enhance agendas for cooperative action with other great powers.

Defend the United States, the American People, and Our Interests at Home and Abroad by Identifying and Destroying the Threat Before It Reaches Our Borders

The first and most important mission of the US military is to provide the president with the capabilities he needs to defend the United States, its people, and its interests around the world. The concept of "identifying and destroying the threat before it reaches our borders" is very important. It requires that we have the ability to understand the nature of the external threats we face—their locations, capabilities, methods, and intentions—and that we have the means to deal with them before they cause harm to our nation, people, or interests abroad. In order to meet these expectations, we must have the appropriate intelligence and military forces, as well as established and appropriate geostrategic relationships with other nations in the form of either a bilateral, multinational coalition or alliance agreements to provide for cooperative effort in the application of the right instrument of power at the right time.

Prevent Enemies from Threatening Friends and Allies with WMDs

From the start, the new *NSS* outlines the predominant enemies we face in the post–11 September world—especially the dangers of their acquiring WMDs. In that regard, the president makes it very clear that, in addition to traditional threats from organized states or armies with which we have always had to contend, America now faces a whole spectrum of new threats—most of which are tied to terrorism in some way, shape, or form: "The enemy is terrorism—premeditated, politically motivated violence perpetrated against innocents. . . . We make no distinction between terrorists and those who knowingly harbor or provide aid to them."[5] Therefore, these new enemies include both terrorists and the various states and nonstate organizations that support them. They represent entities with global reach that may not conform to the same "views of rationality" or respect for recognized international rules or norms of behavior that most democratic societies share.

Importantly, the *NSS* also makes it clear that we in the United States currently believe that this international situation is one in which we are in fact waging a war against those who threaten our very values and way of life. What is more, to defend ourselves successfully, we will act against imminent danger of attack, and—above all—we will do so to prevent the use of vastly destructive weapons by those who have no qualms about directing them against us or our friends and allies.

The president's strategy outlines a variety of responses and capabilities to meet this challenge. These include focusing more on innovation and improvement in the areas of foreign diplomacy, technology, military forces, and intelligence gathering. Perhaps most importantly, it also calls for a drastic change in how we view the traditional concept of deterrence with which we have lived for over 50 years. No longer will we predominantly rely on *deterring* state actors from undertaking dangerous and irrational military actions, but now we will focus more on actively *defending* against all dangers and attacks that, for the most part, we expect to occur. Deterrence remains a part of our strategy, but instead of simply concentrating on deterring particular threats with the overwhelming power of weapons, we must also prepare to defend ourselves against any danger from a much broader array of actors for whom the concept of deterrence may hold no meaning. This new focus on defense also dictates that we maintain the capability to project forces of all kinds anywhere in the world.

Transform the Instruments of National Defense to Allow Us to Define the Battle Space on Our Own Terms

Another major theme of our new strategic vision builds on the need to move from addressing the traditional threats of the last few decades to putting in place the things we need to meet both traditional and nontraditional enemies in a changed world. This calls for a transformation of US national security institutions to (1) *assure* our allies and friends; (2) *dissuade* future military competition and adversaries; (3) *deter* threats against the United States, together with its interests or allies and friends; and (4) decisively *defeat* any adversary if deterrence fails.[6] For the military in particular, this transformation encompasses the new capabilities-based aspects of the strategy and recognizes the need for new developments in intelligence, standoff and precision weapons, a reorganized focus on homeland defense, information operations, protection of space assets, and—most relevant to this article—the ability to "ensure access to distant theaters."[7] This means developing new concepts of basing, forward presence, and overseas access that enable any level of long-distance deployment of US and coalition forces.

Simply put, transformation encompasses new technologies, organizations, and infrastructures that will enable us to define the battle space on our own terms, anywhere in the world.[8] We must concentrate on bringing the capabilities together to do that—just as the terrorists seem to have done not only on 11 September, but also on many occasions over the last 20 years, when they clearly defined the battle space on their terms.

Strengthen Alliances and Work with Other Nations to Defeat Global Terrorists and Defuse Regional Conflicts

In order to defend effectively against new international threats to our security, we need international cooperation. Our new strategy, therefore, outlines building new avenues of interdependence and interaction with regional friends and powers—both states and nonstate organizations—in order to fight terrorism.

At the same time, we must revamp, expand, or create more effective international structures and organizations to deal adequately with the new circumstances we face. Whether law-enforcement organizations, financial institutions, or military structures, the United States will enlist international support and build the necessary relationships to effectively prevent acts of terrorism, visibly remove support for terrorism, and delegitimize its acceptance in any form. The new strategy clearly defines international cooperation as one of the most effective tools in doing so.

Enhance Agendas for Cooperative Action with Other Great Powers

Similarly, as we build international cooperation, we also must concentrate on organizing and/or strengthening broad coalitions of those states most capable of helping us in the defense of our country, friends, and allies. Obviously, this suggests enhancing many aspects of our most important alliance—NATO. Expanding its membership, increasing military contributions from all members, creating more effective planning and command structures, improving technological capabilities, and increasing interoperability among all its militaries will, in the words of the *NSS*, "sustain a common perspective on the threats to our societies and improve our ability to take common action in defense of our nations and their interests."[9] We have moved a long way along this line with the latest NATO summit in Prague, Czech Republic, in November 2002, during which the alliance offered new memberships to seven nations and agreed to revamp its command structures to the greatest extent in perhaps 40 years.

Our new strategy also calls for reenergizing our other existing alliances, especially in Asia, as we build our growing relationships with Russia, India, and China. All of these views of increasing cooperative action with other powerful nations obviously include bolstering our capabilities to maintain a viable overseas diplomatic and military presence. After all, relationships with key international states are the foundations upon which we build access to all regions for military cooperation, training, and current and future operations.

Clearly, the last two major themes are interrelated and together highlight the importance of international cooperation and engagement in general—from regional, global, and great-power perspectives. This means strengthening alliances, building international coalitions and cooperation, working with other global powers, and taking advantage of existing international structures and institutions. Indeed, this common perspective about the importance of international-security cooperation on a global scale threads its way throughout the *NSS* and clearly prescribes that the United States must maintain and intensify all aspects of its foreign relationships in order to meet whatever dangers and situations that may arise anywhere on the globe. The military plays a substantial role in this effort, whether in peacetime or war, and its presence overseas ensures success in strengthening those relationships.

Foundations of the New Security Paradigm: From Containment to Embracement

To understand our new defense vision, we can view it in terms of how it compares to what came before; clearly, it differs from our former strategies. Primarily, our *NSS* during the Cold War was based on containing the expansion of Soviet and Chinese communism. Our primary strategic goals entailed stopping the spread of communism through a network of alliances and the forward basing of a significant number of our forces to deter any aggressions by our adversaries, all underpinned by the potential use of nuclear weapons. When necessary, however, we did use conventional military force, as in Korea and Vietnam, in an effort to contain communist expansion without upsetting the critical balance of nuclear deterrence, which remained the cornerstone for all our policies in pursuing overall containment of the communist threat.

Deterrence was based not only upon nuclear capability and huge, modern arsenals, but also upon the determination by American leaders to remain overseas politically and militarily. We resolved to draw the line against these looming threats, and a large, permanent forward deployment was the most logical means to deter military action and contain communist influence. Although we periodically tailored our forces and doctrine over the five decades of the Cold War, we always did so in response to the perceived nature of the threat from communist states and their surrogates, basing our actions on deterring rational state actors from crossing the thresholds of war. This truly was a strategy based upon a "stability of fear" understood by both sides in the conflict. Therefore, deterrence was the primary concept around which we pursued containment up through the 1990s, and vestiges of this strategy remained even until 11 September.

The end of the Cold War did not automatically bring changes to our view of how best to protect America's homeland, friends and allies, and interests abroad. US foreign policy quickly moved in new directions, especially in its relations with old allies and former adversaries and as a result of world events. We fought the Gulf War in 1990–91 and have remained involved in the region. Also, in 1991 Germany officially reunified as a single nation-state. The Conventional Forces in Europe Treaty became final in 1992, negotiated between two alliances—NATO and the Warsaw Pact—but implemented multilaterally among numerous nations on the Continent. Yugoslavia quickly disintegrated throughout the early 1990s, ultimately requiring US and NATO intervention for peacekeeping in 1995—and since then.

However, perhaps one of the most important developments in response to the global events of the first half of the 1990s occurred in 1994, when NATO created the Partnership for Peace (PfP) program, which included 27 participants, many of whom represented states and republics formerly controlled by the Soviet Union. This event was important because it refocused NATO, both to take on a more stabilizing role for all of Europe and to redefine itself as a more political institution in its quest for a new raison d'être. The United States led this effort. As I discuss later, PfP also played

an unforeseen but vital role in our operations in Enduring Freedom.

All of these developments right after the Cold War illustrate that international events and exigencies forced the United States to reexamine the world in which it found itself, as well as its changing roles in it—an experience very similar to the one we had just after World War II. Anybody even remotely interested in foreign policy soon recognized the apparent mismatch between the old threat-based defense policies and the new, rapid changes going on in the world. In that context, numerous scholars, policy makers, journalists, and others struggled with the debate over what the US defense policy after the Cold War should be, and what forces we really needed.

Consequently, by the mid-1990s in the United States, several panels, committees, and studies had dedicated themselves to framing a new US strategic concept. A very evident leap forward on a new strategy began with the *Report of the Quadrennial Defense Review* (*QDR*) of 1997[10] and its subsequent appraisal by the National Defense Panel (NDP), chaired by Phil Odeen.[11] Both of these efforts introduced important concepts into post–Cold War strategy by trying to address the new reality of more numerous contingencies in the face of force reductions, along with the tremendous ongoing revolution in military affairs. Both studies recognized the need for a "strategic concept for shaping the geostrategic environment, responding to the full spectrum of conflict, and preparing for future challenges."[12] Everyone also agreed that we now faced the prospect of more asymmetric warfare, which would result in increasing numbers of smaller-scale contingencies.

The NDP in particular introduced several themes echoed by the new Bush strategy, but especially the importance of maintaining and increasing "access to and use of forward basing facilities,"[13] as well as initiating greater coalition capability and interoperability. At the same time, several scholars outside of government also reached similar conclusions, recognizing that national security challenges were now very different and encompassed a whole spectrum of potential regional situations and dangers not necessarily tied to predictable, monolithic threats (as had been the case during the Cold War). For example, according to Richard Kugler,

> the great drama of the 20th century was democracy's struggle against totalitarianism; the defining issue of the 21st century will be whether the democratic community can control chaotic strategic affairs in the vast, troubled regions outside its borders. . . . It will face the challenge of fostering greater strategic stability at key places outside them, not only to protect its own interests and values but also to help progress take hold there. This challenge . . . will especially fall on the United States.[14]

Clearly, the Bush administration's current strategy builds upon these earlier efforts, embracing many of their concepts and recommendations; it is bolstered by some of the contemporary academic studies as well. The effort continued over the first few months of the new presidency as Secretary of Defense Donald Rumsfeld directed at least 19 panels, commissions, and studies to further the strategic thought initiated by the NDP specifically.[15]

The major outcome of all of these studies was the new capabilities-based strategy outlined in the new *QDR*, released in the fall of 2001 and then further refined in the *NSS* of 2002. Both documents also call for the readiness to operate anywhere in the world at any time. Again, overseas presence and coalition capabilities are fundamental. But as I mentioned earlier, the method by which we determine the size of the forces and the way we position them globally to be able to identify and destroy the threat before it reaches our borders call for a different approach than the Cold War strategy of containment undergirded by a threat-based analysis of what it would take to deter a rational adversary.

Interestingly, terrorist organizations and those states that support them have unwittingly provided allies and former adversaries of the Cold War the motivation to bury the hatchet and embrace one another in a common effort to destroy the growing, global network of terrorist nodes. The opportunity to

pursue a policy of embracement, coupled with a responsible analysis of the capabilities required to ferret out terrorist nodes and their state sponsors and to act preemptively on behalf of free peoples, is a new and important vector for the United States and its friends. It is high time that we pursue this new opportunity, given the potentially devastating consequences facing the free world as these terrorist elements gain the potential to use WMDs.

So, in contrast to the Cold War policy of building our forces on threat-based models designed to deter our adversaries for the purpose of containing their growth, we need to move to a strategy based on embracing freedom-seeking nations that will build a cooperative network of capabilities designed to preempt the gravest danger facing our world—"the crossroads of radicalism and technology." Indeed, this new vector provides an overarching template for enabling the five major strategic goals discussed earlier.

Understanding Geopresence

Since the Cold War, the military has been used more than ever as a tool for global stability and a defense against the new enemies we face in the twenty-first century. Clearly, the presence of US forces overseas, along with international cooperation, is fundamental to the ability of the United States to carry out its strategy. During the decade of the 1990s alone, the men and women assigned to United States Air Forces in Europe (USAFE) witnessed a sevenfold increase in their employment taskings to support US objectives in contingencies and combat operations throughout Europe, Africa, Central Asia, and the Middle East.[16] Further, one should note that in most of its responses to emerging crises or natural disasters, the United States participated with other nations in a coalition. This points out that, as US strategy has evolved over the last decade, so has the realization that continued regional presence and engagement are crucial to our ability to gain necessary access and garner coalition support to conduct operations. Certainly, our foreign military presence and ongoing military relationships were absolutely vital to our quick successes in the aftermath of the World Trade Center attacks during Enduring Freedom.

One must also understand that, when the United States projects and sustains forces on a global basis, its airpower will require access to air bases or international airports spaced about every 2,500–3,500 miles. These bases allow our airlift aircraft to land, refuel, change crews, and relaunch—or allow our air-to-air refueling aircraft to position themselves in such a way that they can refuel the airlifters and extend the mission distance. For maritime forces, that translates into needing access to ports or bases positioned throughout the world to replenish surface ships with fuel, food, munitions, or other supplies.

In the past, these capabilities generally were sustained by a fairly permanent overseas system of ports and bases that, although reduced dramatically over the last decade, maintained enough permanent US presence in key locations to support global-projection requirements. Moreover, while preserving that long-term presence, we not only sustained important relationships with our host nations, but also participated in other bilateral and regional training exercises—or other cooperative security efforts—that promoted relationships with many nations. This in turn enabled other less permanent "footprints" in a variety of regions and areas. It is this combination of both permanent and temporary overseas military basing that contributes to the vital US posture of geopresence, which enables us to maintain these essential locations and arrange for new ones as the need arises.

What is geopresence exactly? It is a multidimensional strategy designed to provide *access to all regions*—a capability that comes from carefully selecting and engaging in the right locations politically and geographically, and putting in place those military structures that can present the appropriate balance of permanent and rotational forces able to meet all potential diplomatic and military requirements. This entails a broad spectrum of regional cooperation, military-to-military engagement,

and a certain level of force presence oriented towards ensuring that we have the right force at the right place at the right time in order to accomplish the strategic goals of the *NSS*.

Geopresence is also dynamic. Governments, regional relationships, and situations constantly change around the globe, forcing us continually to review the calculus on location, size, and methods we consider for stationing and deploying our forces abroad. At the same time, however, the concept of geopresence itself is immutable and provides us with a static framework by which we can maintain the flexibility and options to meet our objectives. Therefore, geopresence is a key to any future operation, especially within the context of the new *NSS*. The multidimensional access and broad flexibility that come from conscious geopresence equate to increased capabilities that enable the assure-dissuade-deter-defeat formula of the new strategy.

But how does the concept of geopresence guide us in determining the nature of our future overseas presence? Although no guaranteed formulas exist for computing the optimum geopresence laydown, one should consider some important rules of thumb when contemplating changes to the current overseas footprint. First, it is useful to understand four capabilities that our overseas presence should achieve: access, cooperation, interoperability, and influence. Both from a power-projection perspective and from an ability to conduct appropriate response, contingency, and—if necessary—combat operations, it is crucial to have selected countries and areas where we are most likely to need access to carry out our tasked missions. The willingness of a nation to cooperate with the United States and the extent to which it does so are functions of its familiarity and compatibility with our goals, its trust in the character of our relationship, and the reliability of our forces to conduct themselves in accordance with prescribed agreements. The more we participate in training and exercise events with our different partner nations, the more likely we are to have interoperable equipment, procedures, techniques, and operating standards. Last, the more often we work with one another, understand each other's cultures, and deal with similar challenges together, the more likely we will be able to influence events and situations as they arise.

Second, as already stated, we must take into account the distance requirements associated with our ability to project forces on a global basis; but we must also consider the need for flexibility in that base or airport construct to account for disagreements that might occur between the United States and other nations with regard to a specific response plan. In general, for every base needed, the United States probably should cultivate relationships with about three nations. Further, the United States will need two to three bases in the region to support contingencies that involve humanitarian relief or noncombatant evacuations. Additionally, if the objective area for relief or evacuation is greater than 2,500–3,500 miles away, we will require two or three en route support bases to enable an "air bridge" operation. On the other hand, in order to deploy and then sustain major combat forces to participate in a conflict similar to Desert Storm, the United States will require five to six en route bases.

Third, in order for the United States to conduct a major campaign, airpower will need between 15 and 20 air bases within a major region, and, once again, it is best not to plan on having all of them in any one nation. To enhance redundancy and flexibility, we should cultivate the number of relationships to allow only three or four bases each.

Armed with these rules of thumb, US planners can then begin to develop an appropriate geopresence structure based on the number and location of nations or regions in which we are likely to be asked to provide support for various contingency operations—both now and in our planning future. That structure will include both en route support during deployment and sustainment operations and employment bases for conducting the actual operations themselves.

Once that structure has been developed, we then must begin to make appropriate assess-

ments about whether our presence should be permanent or temporary. If the former, we must determine whether it should be robust or more of a caretaker nature; if the latter, we must consider how often, how large, and for how long. It should go without saying that we must conduct such an analysis with respect to our current overseas presence before we initiate any changes to that structure in the near future.

USAFE's basing infrastructure is a good example of an appropriate geopresence laydown. Although we may tailor the footprint somewhat in the future, our current structure remains generally appropriate for the challenges we now face, primarily because a considerable amount of that basing infrastructure supports our essential mission of acting as a strategic-mobility hub for forces flowing into US European Command's (EUCOM) area of responsibility (AOR) or moving on to US Central Command's (CENTCOM) AOR. This capability consists of robust bases with substantial ramp space that also allow us to operate further forward when needed.

Our strategic mobility to and from the European theater is grounded in a "six lose one" strategy. That is, we have six en route bases that have the flexibility to accomplish our mission should we lose our most capable base for any reason. Thus, our European en route infrastructure (EERI) system is focused inside a so-called lens represented by an array of bases that lie in a band between 2,500 nautical miles (NM) and 3,500 NM from hubs in the continental United States such as Dover AFB, Delaware, or McGuire AFB, New Jersey. Our EERI bases also happen to be between 2,500 and 3,500 miles from theater aerial ports of debarkation in Southwest Asia. The area inside this lens represents the optimum range of a C-17, where the en route system is most efficient.[17]

Five USAFE bases—Mildenhall and Fairford, England; Ramstein and Rhein-Main (to be replaced by Spangdahlem in 2005), Germany; and Moron, Spain—are approved to support the EERI system, and Naval Station Rota, Spain, is the sixth EERI base. All are considered to be of an enduring nature, based upon their high level of capability and fixed-infrastructure investment.

With regard to the African continent, our ability to project airpower is supported by a network of intermediate staging bases—less robust than those in Europe but of critical importance as preplanned refueling stops as we continue to conduct periodic humanitarian, noncombatant-evacuation or crisis-relief operations into sub-Saharan Africa from our bases in USAFE. These missions will continue well into the foreseeable future, given the ongoing political, economic, demographic, and climatic instability in the region. Consequently, just as we maintain an east-west strategic-airlift lens for movement from the United States through Europe, so do we maintain a north-south lens to operate into Africa from our main air bases in EUCOM.

Geopresence, therefore, is not theoretical but exists in what we are doing today, and the flexibility and advantages it provides are very real. As the following shows, it has proved vital to our successes in our latest military operations in the GWOT and will continue to be so as we constantly develop and adjust the locations, relationships, and access requirements necessary to execute our *NSS*.

Geopresence in Action: Operation Enduring Freedom

Military operations and planning after 11 September accentuated the importance of geopresence. Our military around the globe depended upon the numerous relationships that we had built in order to open up new avenues of access to the regions in which we needed to operate against terrorists. Immediately following the terrorist attacks on New York and Washington, D.C., we realized that our forces would be involved quickly in operations—probably in the Afghanistan region. Consequently, as we found ourselves increasing our force-protection posture and initiating sustained 24-hour operations, we also began to gather and consolidate our knowledge of the Central Asian region and other regions

surrounding it, concentrating on the nature of the political, cultural, and geographical challenges. After all, since we generally did not operate in many of these areas, we needed to understand them more fully. Part of that understanding also involved calculating the true extent of the military-to-military relationships we had recently built with many of these nations.

Central Asia also fell squarely on the seam between two combatant commands—EUCOM and CENTCOM. Although CENTCOM prepared to conduct the major combat operations, EUCOM was designated as a supporting command and tasked to set up and manage the humanitarian airlift of food for the thousands of Afghan refugees and others in the region who already faced starvation—or who could be even further displaced by pending operations beyond those already caused by the Taliban. We also prepared to provide airlift support for special operations and medical-evacuation missions, in addition to ongoing airlift for delivering troops and other supplies throughout the theater. Over a period of only four weeks, we expended tremendous efforts to prepare for all of these missions, quickly accomplishing the detailed planning required to organize, load, and execute combat, resupply, and humanitarian missions. Bases throughout Europe and the Middle East witnessed a massive increase in air traffic as planes moved people and cargo forward.

Importantly, right after 11 September, we also immediately began to ascertain the status of diplomatic relations and permissions to fly over, base forces in, or transit countries from the Balkans to the Caucasus and Caspian Sea areas—and on to the Central Asian region. We discovered that, in many cases, the fundamental foundations we needed, such as the necessary diplomatic agreements, mechanisms, or clearances to fly over and into these nation-states, did not exist. Personnel throughout all military combatant and component commands worked diligently to identify requirements and pass through channels to the State Department in order to start this vital process. Again, the scope of effort in preparing and obtaining the number of diplomatic permissions from so many countries across separate unified commands had not occurred since World War II.

By 29 September, when the first C-17 arrived at Ramstein Air Base, at least 26 countries had granted basing or overflight for the GWOT. By 9 October, American airlift aircraft were flying directly from Germany through Central Europe; over the Black Sea, the Transcaucasian region, and the Caspian Sea; and on into Central Asia and Afghanistan. In other areas as well, aircraft transited the Mediterranean and flew from the Pacific regions into the theater of operations. By November we also had set up for the first time tanker operations in Bulgaria. This allowed refueling of aircraft over the Black Sea, reducing the transit time for our tanker crews on their way to refueling points, and increased the amount of fuel available for the C-17s.

In addition, the US military also needed to set up new bases in Central Asia for ongoing operations. Most of the governments in this region were very supportive, and we quickly negotiated for basing in Uzbekistan and Kyrgyzstan that allowed US and coalition aircraft to begin operating directly into Afghanistan. In all, the US military created or reinforced 12 bases in the Central Asian and Middle Eastern regions during this time.

Taken together, these operations represented an important feat of diplomacy and coalition building with friends and partners in a new region of operations, accomplished in only a few weeks. One of the most important factors that allowed us to arrange and conduct our operations to such an extent so quickly was our ongoing security-cooperation programs in which we already had established military-to-military relationships with most of the countries of the former Soviet Union through several venues—but especially NATO's PfP program.

Ongoing proximity to these countries within an already robust security-cooperation regime enabled this significant military-to-military engagement. For example, during the year prior to the attack on the World Trade Center,

EUCOM devoted over 84,000 man-days; 4,500 sorties; and 11,000 personnel to important interaction with foreign militaries within the AOR.[18] The relationships produced by this level of cooperation formed the essential foundations we needed to conduct Enduring Freedom in and over these new regions.

One important example of this level of cooperation became very evident in May 2001, when Gen Tommy Franks, commander of CENTCOM, and USAFE's Warrior Preparation Center hosted a major, high-level PfP exercise with many of the chiefs of defense from those countries (including Turkmenistan, Uzbekistan, Azerbaijan, Kyrgyzstan, and Tajikistan) that would become so crucial a few months later in Enduring Freedom. The personal relationships fostered in this exercise alone provided vital avenues of interaction necessary to work many of the diplomatic and political agreements we needed to conduct missions in Central Asia—missions that continue today. We also must not underestimate the roles that our NATO allies and other long-term partners played in this effort. As of the summer of 2002, over 69 nations were supporting our war on terrorism, including over 16,000 troops (from 20 countries) deployed into CENTCOM's region of responsibility—7,000 in Afghanistan alone.[19]

Clearly, our overseas presence and NATO participation were major factors in why this level of coalition support occurred, and they are the primary reasons we were so successful in Afghanistan as well as other areas involved in the GWOT. We could not have done it without the forward presence of our military in these areas—from the perspective of both geographic necessity and the relationships that presence had fostered. Without this geopresence, any comparable degree of success would have come at a much higher price.

In sum, what we have learned from our ongoing operations in the GWOT highlights the significance of our forward basing and ongoing security cooperation. The capabilities provided by this geopresence are invaluable for any future regional challenges or humanitarian operations we may have to conduct. We benefit beyond measure from the flexibility and different levels of access that geopresence affords, and that is what our new *NSS* is all about.

Conclusion

An important realization from our recent military operations is that they have validated the wisdom (and vision) of our past political and military leaders who set up the overseas infrastructure we have today. The bases we already had in place and the relationships they engendered with other nations ultimately enabled success in an area of the world where no other single power or coalition has really dominated for centuries. The primary reason for this success is American geopresence, which is—and will continue to be—an essential capability in our military operations.

As I have attempted to show in this article, geopresence provides the necessary access that enables US forces to train, stage, and employ successfully; it also gives US forces the ability to access any region of the world as they respond to a multitude of contingencies. Further, it presents important and natural opportunities to enhance interoperability and cooperation with our partners and allies—even as we take the necessary steps to transform and modernize our own forces.

From all of this, in turn, we gain a measure of influence in the regions where we are present and involved. This influence affects all aspects of our dealings with other countries, whether diplomatic, economic, societal, or military. It fosters useful, indeed vital, channels of interaction that enable our government to garner the staunch support needed for our policies and programs, not the least of which is the ability to operate in and through any required regions and countries.[20] At the same time, this influence helps us to put in place the complex political and diplomatic foundations needed for any future military operation in those regions. Perhaps most vital in this regard are the personal and organizational relationships between the US military and foreign defense personnel.

Consequently, the *NSS* and, from that, any emerging basing strategy call for some level of overseas geopresence from which access, cooperation, interoperability, and influence can be developed, maintained, or improved. With that in mind, we need to consider how best to posture ourselves to take full advantage of these four primary capabilities that geopresence provides.

Although no set "stationing template" exists for every region, we can logically determine both the locations and proper mix of permanent, rotational, and training force structures we need to meet today's challenges. A viable geopresence provides both the opportunities and flexibility to implement whatever decisions we undertake as we determine where we want to station forces, as well as the reasons and the means for doing so. Therefore, whether we decide that we need overseas presence for strategic airlift, alliance commitments, humanitarian operations, training, or combat contingencies, geopresence gives us a greater range of choice for both the levels of access we require and the type of access we want.

We can then pursue a conscientious basing, exercise, and security-cooperation strategy that, I am convinced, will prove much more capable of attaining the five strategic goals of our new *NSS*. This geopresence strategy will make it possible to meet the varied dangers threatening the American homeland as well as our vital interests abroad. It will enable a rapid response to or even prevent those individuals who would use WMDs to threaten, blackmail, or harm the United States or its allies and friends. It will help us transform our national defense at home and overseas in a way that will let us define the future battle space on our terms—and ours alone. A geopresence strategy is the fundamental foundation for building, strengthening, and enhancing all of our relationships with individual nations, including both regional and global powers.

In that regard, geopresence also provides us the opportunity to embrace those societies throughout the world who truly are interested in pursuing freedom, democracy, and free enterprise. In particular, it ensures the existence of potential staging areas to help nations in their struggle against various forces that deny or threaten their freedom. As President Bush points out in the foreword to the *NSS*, "Freedom is the non-negotiable demand of human dignity; the birthright of every person—in every civilization."[21] The president reiterated this statement in his latest State of the Union Address, when he stressed that "we will not permit the triumph of violence in the affairs of men—free people will set the course of history."[22] Freedom, therefore, is also a primary goal of our *NSS*.

This commitment to an overseas basing strategy of geopresence is not cheap in the short term but will yield great potential in the long term, just as Enduring Freedom and the overall GWOT continue to show. On the other hand, failure to build and maintain American geopresence could be catastrophic to our foreign and defense policies—and, I believe, to our future national security. As recent events have so clearly shown, even the staunchest of our allies can at times disagree with us on issues of vital importance. However, our geopresence has helped us work through these issues and provides multiple solutions and avenues of cooperation on all fronts—not just from the military perspective.

Although in times of political and international conflict or crisis, it is tempting to think about withdrawing to America and relying upon new technologies to meet our security needs, we must sustain a well-planned and adaptable overseas presence. We must be there physically to do all of those things I have described here. I believe that Gen Jim Jones, our new supreme allied commander, Europe, accurately and succinctly expressed this requirement recently when he said, "Virtual presence really equals actual absence."[23] In short, no nation can do it all alone. In the end, continued geopresence is the means by which we maintain the necessary capabilities that are so critical if we are to weave a net of interconnected nations to fight and win this global war on terrorism. □

Notes

1. *The National Security Strategy of the United States of America* (Washington, D.C.: President of the United States, September 2002), on-line, Internet, 17 March 2003, available from http://www.whitehouse.gov/nsc/nss.html. Hereafter referred to as *NSS*.
2. Ibid., 2.
3. Ibid., 29.
4. The strategy outlines separate aspects in eight different sections within the document.
5. *NSS*, 5.
6. Ibid., 29.
7. Ibid., 30.
8. President Bush introduced this way of understanding transformation by stating the need to "revolutionize the battlefield of the future and to keep the peace by defining war on our terms." Speech on the occasion of signing the Department of Defense Appropriations Act for fiscal year 2003, Pentagon, Washington, D.C., 10 January 2002.
9. *NSS*, 26.
10. See William S. Cohen, *Report of the Quadrennial Defense Review* (Washington, D.C.: Department of Defense, May 1997).
11. See National Defense Panel, "National Security in the 21st Century: The Challenge of Transformation," *Joint Forces Quarterly*, summer 1997, 15–19; and idem, "NDP Assessment of the QDR," on-line, Internet, 17 March 2003, available from http://www.defenselink.mil/topstory/ndp_assess.html.
12. "NDP Assessment of the QDR," 1.
13. Ibid., 4.
14. Richard L. Kugler, "Controlling Chaos: New Axial Strategic Principles," in *The Global Century: Globalization and National Security*, ed. Richard L. Kugler and Ellen L. Frost (Washington, D.C.: National Defense University Press, 2001), 75.
15. John A. Tirpak, "The QDR Goes to War," *Air Force Magazine*, December 2001, 4, on-line, Internet, 17 March 2003, available from http://www.afa.org/magazine/Dec2001/1201qdr.html.
16. During the decade of the 1990s, USAFE participated in over 67 major contingencies and other operations in EUCOM's AOR.
17. Headquarters Air Mobility Command, Plans and Programs, En Route Strategic Plan, n.d.
18. Office of Plans and Programs, United States Air Forces in Europe.
19. Department of Defense Office of Public Affairs, fact sheet, 7 June 2002, 1.
20. Headquarters United States Air Forces in Europe, "USAFE Security Cooperation Strategic Concept for FY 2002–2003," draft, version 4, 30 May 2002.
21. President's foreword, *NSS*.
22. President George W. Bush, *State of the Union Address*, 28 January 2003, on-line, Internet, 17 March 2003, available from http://www.whitehouse.gov/news/releases/2003/01/20030128-19.html.
23. Statement at the 2002 Marine/Air Force Warfighter Talks, Miramar, Calif., July 2002.

"Chronicles Articles"

Our "Chronicles Articles" section takes a different turn with our latest article "Mentoring Makes a Difference" by Lt Col Penny H. Bailey. What is mentoring? Why should the Air Force have a mentoring program? Who should be responsible for mentoring? When, where, and how should we mentor someone? Lieutenant Colonel Bailey answers these questions and takes some of the mystique out of mentoring by reviewing the basics of the process in relation to the Air Force.

In "Allied Airpower Comes of Age: The Roles and Contributions of Airpower to the Italian Campaign," Maj Robert A. Renner analyzes the fight for air superiority during Operation Husky (the invasion of Sicily) and the subsequent contribution of Allied airpower to the land offensive. He examines Allied interdiction operations in 1943–44, including airpower's efforts to interdict the Germans' evacuation of Sicily, delay their counterattacks during Operations Avalanche (the invasion of Salerno) and Shingle (the invasion of Anzio), and deny their freedom to maneuver during Operations Strangle and Diadem. The article then evaluates innovations in close air support developed by the Allies in Italy and addresses the strategic-bombing effort launched from the Italian mainland.

We also recently posted to our site Maj Jeffrey W. Decker's article "Logistics and Patton's Third Army: Lessons for Today's Logisticians," which summarizes Patton's career and describes his exposure to the importance of logistics in modern war. Major Decker illustrates Patton's logistical experience before he assumed command of Third Army in 1944 and examines how logistics successfully contributed to that unit's campaigns in 1944–45. The article also considers the influence of logistics on the general's actions in North Africa, Sicily, France, and Germany, including examples of how his troops adapted logistically during these campaigns. Major Decker concludes by identifying lessons that today's joint logistician can learn from Patton's experience.

These articles and others are available on-line at http://www.airpower.maxwell.af.mil/airchronicles/cc.html. To obtain information about being published in "Chronicles Articles," E-mail us at aspj@maxwell.af.mil.

AIR & SPACE POWER CHRONICLES

Luetwinder T. Eaves
Managing Editor
Air and Space Power Chronicles

Task Force Concepts of Operations

Transforming the USAF

LT COL LARRY WEAVER, USAF, RETIRED
COL ANTHONY C. CAIN, USAF

Editorial Abstract: Lieutenant Colonel Weaver and Colonel Cain provide an insightful description of the seven operating concepts for transformation—the Air Force approach that complements the Department of Defense initiatives. The concepts work well in the new strategic environment, help codify the expeditionary mind-set, and provide a methodology by which leaders can determine capability requirements and assess shortfalls and risks. The authors also explain why change was needed, the implication of that change, and its progress.

IN FEBRUARY 2001, the United States Air Force began to develop a new operating philosophy to complement Department of Defense (DOD) transformation initiatives. Originally couched under the rubric "Task Force Concepts of Operations (CONOPS)," the philosophy continues its evolution under the slightly revised heading "Operating Concepts."[1] Seven organizing components impart structure to the transformational approach that will ultimately guide Air Force capability-based procurement and operations. Information about the philosophy and its components is slow to filter to service members because of what one staff officer termed the "preexperience and predoctrinal" nature of the concepts. However, after two years of thought and development, outlines of the philosophy are becoming clear enough to merit discussion and explanation among Air Force members.

Rationale for Transformation

Operating concepts appear at this moment because senior Air Force leaders realized that traditional planning and programming methods were inadequate for Secretary of Defense Donald H. Rumsfeld's transformation emphasis. Before the 11 September 2001 attacks that brought American security policy into sharp focus, the services struggled to understand

why they should transform what was arguably the most effective and capable military in the world. The secretary of defense's Office of Net Assessment led the effort to devise the transformation road map until the debate within DOD—about the need for transformation, the scope of transformation initiatives, and the direction that transformation should take—erected an impassable roadblock.

After 11 September 2001, Air Force leaders realized that the conflict spectrum included tasks that their service was ill prepared to accomplish without new procurement practices and force presentation models. Ironically, as the Air Force got on the transformation bandwagon, it found itself engaged in a global war on terrorism, historically unprecedented homeland-defense efforts, and the potential for major contingencies in the Middle East and Northeast Asia. Thus, airmen should rightfully expect that any official statement regarding transformation should reflect the initial reluctance to tamper with an effective and successful combat formula, the urgency of defending a formerly invulnerable homeland, and the anticipation of the most significant and challenging combat mission to come our way in more than a decade.

One compelling imperative for transformation stems from the continually evolving strategic environment's uncertain character. Strategists maintained for nearly a decade that no peer competitor would emerge to challenge US regional or global hegemony until at least 2025—if then. Analysts first suggested that Russia's strategic power-projection capabilities could be revitalized and challenge US interests in Europe, the Middle East, and Asia. As Russia continued its decline, however, the likelihood of that possibility became less and less plausible. Gradually theories about a potential clash with an emergent China replaced fears of a revitalized Russia. China's vast territory, equally vast population, and unrealized economic and military potential appealed to those in search of an enemy. A more thorough look at China, however, reveals the distance that country must travel to achieve peer-competitor status in any strategically significant dimension. The next closest candidates for peer competitor status are the democracies of India (with a growing population and a high-tech economic base) and the European Community (with its dramatic economic surge). However, planners are almost required to employ the science-fiction realm to devise a credible scenario that leads to military conflict between either of these candidates and the United States.

Just when consensus seemed to congeal around the realization that American dominance—"reluctant hegemony" as some characterize it—appears set to prevail for the long haul, a host of challenges and a dramatic change in strategic focus emerged. The global war on terrorism seemed to violate deeply held beliefs among US military professionals about how to employ military power. Throughout the 1990s, experience appeared to confirm that short, decisive campaigns, overwhelming military power, and unwavering public support worked together in an almost algebraic way—certainly in an axiomatic way—to produce battlefield success. The war against terrorism violates nearly all of these principles. First, national leaders agree that this conflict has no clearly defined end state or end time. We have no obvious metric for strategic success against enemies with a mesmerizing message that convinces followers from all economic classes to abandon family, money, country, and even life to strike at US ideals and substance. Second, the front lines of the war on terror involve combating ideologies; and ideologies are notoriously immune to the core competencies that soldiers, sailors, marines, and airmen so proudly nurture. Special operations forces (SOF) most effectively occupy the front lines of counterterrorist campaigns to the extent that they are subject to military force at all. Third, public support for such campaigns is notoriously fickle, and may fade if no more terrorist attacks reach American soil. American notions of justice and fair play can drain the energy from a SOF-centric campaign if the public perceives that tactics used to achieve tactical or operational goals—no matter how worthy

those goals may be—threaten to tarnish our ideals of justice and honor.

Just as Air Force leaders began to discern outlines of the campaign they faced, the White House introduced one of the most significant national security strategy (NSS) changes in recent memory. The new NSS places greater emphasis on the utility of military power as an instrument of national power. Now military planners must shift their focus from a strategic framework in which the military is a tool of last resort (subordinate to diplomatic, economic, and informational instruments) to one in which military power could play a dominant role—a preemptive role—in US foreign-policy initiatives. In this new role, DOD and service leaders had to shift their attention to providing more expeditionary capabilities than they anticipated as the Cold War faded into history.

Air Force transformation efforts, therefore, needed to confront at least four characteristics of the new security environment. First, a peer competitor will probably not emerge for at least the next 10–15 years. Barring the advent of a competitor's technological leap that fundamentally changes warfare, this leaves the United States and the Air Force in a dominant technological position that discourages a search for radical new operating concepts and technologies. Second, DOD and the services were not satisfied with earlier attempts to revolutionize institutions and technologies presented by the end of the Cold War. Now the proliferation of overseas threats and the urgency of the threat to the homeland dictate a conservative and evolutionary development strategy. Third, because the Air Force experienced nearly a decade of relatively stable but underfunded combat and combat-support force structures, it is not optimized for the expeditionary demands placed on it by the emerging security environment. Fourth, the reality and urgency of present-day threats exert pressure on service leaders to emphasize and nurture contemporary capabilities. The Air Force finds itself mired in an expanding deployment and employment cycle that favors current systems and infrastructure. In other words, the system is under great pressure to perform, which means less emphasis and concern for embarking on a path that aims to produce fundamental technological, institutional, or operational change.

Status—Task Force CONOPS

The Air Force transformation focus produced seven conceptual operating concepts to cope with pressures radiating from the emerging strategic environment discussed above. Operating concepts and CONOPS monikers proved confusing both within and outside the service. *The USAF Transformation Flight Plan* provided the most complete description of how the operating concepts would lead to transformation.[2] This document linked Air Force transformation initiatives to larger plans under the auspices of the *Defense Planning Guidance (DPG)* and the *Quadrennial Defense Review (QDR)*. *The USAF Transformation Flight Plan* first outlined a clear transformation definition: "A process by which the military achieves and maintains asymmetric advantage through changes in operational concepts, organizational structure, and/or technologies that significantly improve war-fighting capabilities or ability to meet the demands of a changing security environment."[3] This broad definition afforded planners enough guidance and ample maneuver room to respond to midcourse corrections as senior leaders refined specific goals in response to shifting security demands.

No matter what the details of the specific security concern may be, the transformation approach concentrates on providing a menu of air and space power capabilities to joint force commanders (JFC) as they design operational campaigns. Formerly, the service concentrated on procuring systems to meet a defined threat. According to the emerging philosophy, threat-based planning produced a very capable but inflexible force structure that ultimately struggled to adapt when confronting enemies that did not conform to the characteristics portrayed in the threat assessment. The new approach attempts to match actual

and desired capabilities to a risk-assessment process that will assist program decision making. If the Air Force lacks a capability in a certain area, Air Staff CONOPS "champions" and major command (MAJCOM) "flight lead planners" will determine if the continued lack of capability presents significant risk. If the champions and flight leads perceive that the risk is unacceptable, they will recommend that the Air Staff direct the MAJCOM to fund programs to provide the capability. Capability-based planners argue that the approach moves service procurement functions out of a judgment-based, linear mind-set into an analytical-based system that better matches resources to required functions. Additionally, leaders will now be better equipped to defend service procurement decisions within the joint community and before Congress. The operating concepts provide structure for the capability-based analysis designed to transform how Air Force personnel think about purchasing, deploying, and employing air and space power.

The Air and Space Expeditionary Task Force (AETF) Operating Concept forms the basis for providing complete and tailored air and space capabilities to JFC through the remaining six operating concepts. AETF provides an analytical framework for programming decisions that provide operational capabilities to address national security challenges. AETF "prime" functional areas represent a force-in-being that provides the foundation for the deployable air and space expeditionary force (AEF). When Air Force leaders match prime assets to designated AEFs, they represent "core" deployable capabilities. In effect, the AEF core matches air and space weapon systems with available manpower to provide expeditionary forces to JFCs. When a JFC assigns AEF resources to mission taskings, the "mobility" function becomes an essential capability that provides combat and combat-support power to allow the AEF to exert global air and space dominance. Finally, "foundation" capabilities serve as long-term force multipliers to the AEF through education and training, logistics, acquisition, infrastructure, and health care. As all four components (prime, core, mobility, and foundation) come together to respond to security challenges, they form air and space expeditionary task forces that function as integral parts of joint task forces.

The Space and Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (Space and C4ISR) Operating Concept provides capabilities for real-time information collection and manipulation that reaches across the tactical, operational, and strategic force-employment spectrum. Existing infrastructure remains tied to threat-based information demands. To achieve the expeditionary vision inherent in Air Force transformation philosophy, the Space and C4ISR CONOPS will require significant investments to move from a CONUS-based approach to a lighter, deployable expeditionary approach. As Space and C4ISR capabilities transition from day-to-day deterrence and dissuasion tasks to providing support for more focused war-fighting activities, the emphasis will shift to tailoring capabilities to enhance predictive battle space awareness (PBA) for joint forces that are engaged. The pace and scope of Air Force transformation relies on integrating timely and accurate information and command and control architectures with combat and combat-support capabilities, thus making the Space and C4ISR Operating Concept a critical component of service transformation initiatives.

The Global Strike (GS) Operating Concept received the most attention during its development because of the erroneous assumption that Air Force leaders were creating a mission for the F/A-22. In reality, planners understand that shrinking overseas basing and support infrastructure combined with the proliferation of sophisticated antiaccess systems will constrain the effectiveness of existing capabilities. Thus, GS will involve a full range of capabilities designed to allow joint forces to gain access to the battle space, neutralize antiaccess systems, and affect any adversary's high-value capabilities. Integrating the elements contained in the Space and C4ISR Operating Concept will obviously serve as a key enabling

part of GS, as will mobility and sustainment operations. Essential GS capability will center on finding, fixing, tracking, targeting, engaging, and assessing (F2T2EA) adversary antiaccess capabilities, thus allowing follow-on joint and AETF forces to employ combat power across the full range of the theater.

Expeditionary forces capable of rapid, small footprint deployment into areas of strategic and operational interest represent the most significant transformation from the Cold War force in the operating-concept structure. In this area, the Global Response (GR) Operating Concept promises to offer the most important shift in procurement emphasis as service leaders implement the transformation flight plan. GR will present JFCs with rapidly deployable, precise, and decisive capabilities to defend US interests across the globe. GR capabilities most closely resemble those resident in today's SOF, but unlike today's SOF, the GR Operating Concept will integrate strike and support capabilities to provide persistent capabilities ranging from raids to small-scale contingency operations. The defining requirement for GR capabilities centers on rapidly attacking "fleeting or emergent, high-value and high-risk targets by surgically applying air and space power during a narrow window of opportunity."[4] Thus, GR capabilities will provide commanders with an invaluable tool with which to counter terrorists; rogue states; and chemical, biological, radiological, and nuclear challenges to national security.

Since 1947, Air Force capabilities and operating concepts have focused on fighting enemies far from our borders. That focus changed on 11 September 2001. The Homeland Security (HLS) Operating Concept contributes to the interagency HLS effort by preventing attacks, protecting critical infrastructure, and responding to physical or cyber attacks that threaten our security and our way of life. This operating concept is perhaps the most difficult to define and implement because air and space capabilities that advance US security and interests against overseas adversaries do not necessarily function in the same ways in the domestic arena. Legal constraints against using military and intelligence-gathering capabilities to support law-enforcement and civil-defense authorities impart a significantly different character to Air Force capabilities and operating concepts as specific scenarios that threaten homeland security emerge.

The Global Mobility (GM) Operating Concept provides the capabilities for global power projection. Future force-application scenarios will require a more responsive mobility presence that relies less on established infrastructure and more on tailoring the deployment footprint to effectively meet mission requirements. GM will integrate traditional airlift/air-refueling capabilities with enhanced command, control, ISR, space-based, and sustainment capabilities. The benchmark for GM operations will center on how effectively Air Force forces deploy, base, sustain, redeploy, and shift Air Force and joint forces to meet rapidly emerging threats.

The Nuclear Response (NR) Operating Concept affords the deterrent umbrella under which the other six operating concepts will function. Details of this operating concept remain classified, but the emphasis rests on providing capable, safe, and secure nuclear deterrent forces that can rapidly shift to meet mission requirements defined by national leaders, should deterrence fail.

The structure that the operating concepts provide allows program managers to examine capability requirements under the Capability Review and Risk Assessment (CRRA) process. The CRRA review board advises senior leaders on potential shortfalls in Air Force force structure using capabilities defined by CONOPS champions. Armed with knowledge of the shortfalls and the risk associated with not correcting them, service leaders can choose where to apply scarce resources and funding allocations. Advocates of operating concepts insist that this process will yield a more quantifiable defense of force capabilities than traditional threat-based planning systems while simultaneously affording JFCs with a wider range of capabilities. Advocates argue that from an acquisition management perspective, the new philosophy should protect major sys-

tems from gradually deteriorating funds that plague the program objective memorandum (POM) cycle over the life of a weapon system.

Implications for Achieving Transformation

One of the clearest and most compelling reasons for pursuing defense reorganization and change stems from shifts in, and the characteristics of, the new strategic environment. There are clear tensions within the system that require close monitoring and energetic diplomacy, but there are few aggressors who will present overt challenges to the system's status quo. The threat posed by such aggressive states imposes a degree of caution that encourages maintaining current conventional forces and capabilities while gradually fielding new technologies that preserve those forces and capabilities. At a lower level, nonstate threats may erode the deterrent value of those forces, thus providing justification for gradually enhancing flexible combat power in a time of relative peace and stability.

A willingness on the part of US leaders and the public to pursue preemptive and even unilateral military action to guarantee domestic security appears tied to the uncertain character of the international environment. The twin threats posed by conventional and nonconventional actors dictate a cautious and evolutionary approach to military procurement and operational philosophy that simultaneously guarantees dominance and flexibility. To the degree that this assessment matches the realities of the global system, it is a reasonable—even prudent—approach to meeting challenges that emanate from that environment.

The operating concepts provide a degree of focus for Air Force programming and procurement as the service confronts an uncertain and complex strategic environment. Rather than diverting attention and resources to pursuing ill-defined goals or risking institutional stability and identity in organizational reengineering efforts, the new philosophy allows planners to assess risk, identify program shortfalls, and shape programming policies to guarantee that air and space power provides a clearly defined set of capabilities to policy makers and war fighters. Compared to the enthusiasm and outlandish projections of those who push for revolutionary and entrepreneurial change strategies, this approach appears evolutionary and conservative. After nearly a decade of pursuing radical change with little tangible result, however, the service may be justified in adopting a more measured approach designed to enhance service capabilities gradually while preserving an overwhelming advantage in a wide range of combat and combat-support functions.

If the service intends to achieve the vision inherent in the operating concepts, what can airmen expect in the coming months and years? First, we should witness an aggressive campaign to codify the expeditionary mindset in doctrine and Air Force culture. Like any other doctrinal evolution, this should involve attempts to control the scope and tenor of the debate regarding the state of the art in air and space power theory. Second, since the philosophy focuses much of its energy on the procurement system, reasonable observers should see a new emphasis on promoting and protecting capabilities that reinforce Air Force roles in projecting power in the event of a major war while advertising the utility of the same capabilities in smaller contingencies. Third, related to the degree of emphasis on the procurement system, Air Force members should see a degree of predictability in the POM cycle matched with increasing service leverage with the shrinking base of defense contractors. Fourth, for the next 10 to 15 years we should see an international system that resembles the one we have today in which US air and space power in conjunction with the other components of the joint force dominates the conventional military arena. To the degree that the philosophy accomplishes these outcomes and contributes to maintaining US dominance over the international system, the operating concepts will be judged successful.

Supporting the Transformation Vision

These seven CONOPS are a significant step forward in fulfilling the transformation vision. They focus the drive to reduce procurement cycles and create a new expeditionary mind-set in the Air Force. They also focus efforts to develop and exploit technological advantages because they provide a method of measuring new technology's value. They also provide an important bridge between the old Air Force core competencies and the concept of transformation. They follow the logical conceptual evolution of ideas over the last decade in which discussions centered first on the *military technical revolution* (MTR), then the *revolution in military affairs* (RMA), and now *transformation*. In fact the CONOPS can be seen as one of the first real attempts to give these somewhat ethereal concepts practical life.

However, there are some very real cautions as we move forward. The emphasis on the POM cycle can create near-term operational-innovation blind spots. Stated another way, there are numerous operational innovations that affect only contemporary problems that could be seen as competitors for more long-term transformational goals. The question becomes, Does an investment that produces a marginal improvement in a current weapon system come at the expense of future and potentially transformational systems that are included in the POM? If it does, are the advantages significant enough to warrant changing the plan? While it is dangerous to focus on the present at the expense of a future vision, it can also be equally dangerous to focus on the distant goal and lose sight of the near-term need.

Additionally, the CONOPS support programmatic and technological change but may not provide enough impetus for institutional and doctrinal change. This is an easy trap to fall into because Americans are a technologically oriented people, and the Air Force is the service that is most comfortable with technological solutions to operational and strategic challenges. However, as the MTR and RMA debates of the 1990s demonstrated, real change takes place when institutions and doctrine change. For example, as we seek to support the AETF Operating Concept we must ask ourselves, Is our current structure, from the command level to the individual airman, suited for the new expeditionary mind-set? On the other hand, Does that institutional structure constrain transformation because it reflects a bygone strategic environment? What are the doctrinal implications of supporting GS or GM concepts? And what lessons have we already learned from Operation Enduring Freedom? The operating concepts do not directly drive changes in either of these arenas.

Effects of the Evolving Security Environment

The post–Cold War security environment drives planners to favor capability—rather than threat-based planning—as part of a transformational strategy. However, the environment presents some significant obstacles. For example, current operations increase the stress on military institutions at the same time that DOD and service leaders demand significant reform. The historical record of reform under pressure is mixed and demands significant leadership attention. There is also a danger in deciding that simply making things happen faster (tightening the observation, orientation, decision, and action [OODA] loop cycle) will lead to success. This OODA loop focus is very much in keeping with the American mind-set; however, there are examples of opponents who achieved equally dramatic successes by protracting or slowing the operational tempo. The evolving situation on the Korean peninsula serves as an example. North Korea's rapidly developing nuclear program dramatically affects our conventional forces' decision cycle by posing an asymmetric threat. The potential use of such weapons serves as a conventional deterrent. It changes the political balance and the military equation.

There is also a danger that the transformation-vision-and-operating-concept process could create an asymmetric vulnerability. The obvious emphasis on technology and decision cycles opens the way for threats from less technologically sophisticated sources or decision processes that do not depend on speed. The solution to this potential problem rests with institutional and doctrinal change that will lead to unconventional thinking on how best to use the technological advantages that transformation offers. As the technology gap grows, opponents will seek to neutralize that advantage through nontechnical means. History offers numerous examples of devastating success in this area. Rome in the first century A.D. lost three legions in the forests of Germany to an opponent that was organizationally and technologically inferior. Roman advantages in engineering and organized mass warfare proved poorly suited along narrow forest trails that led to the annihilation of an army. The effect of that loss had repercussions throughout the empire and offers a useful lesson for the world power of the twenty-first century.

The question remains: What organizational and doctrinal changes are needed to support the operating concepts? While answers to this question will require a great deal of work, an outline of the possibilities is emerging. For example, the idea of training the way we fight has been a long-standing Air Force tenet. Now may be the time to consider organizing the way we fight as well. After the end of the Cold War, the Air Force took the lead in an internal command reorganization that better met global strategic challenges. That revolution may now need to be expanded even further to include a reexamination of wing, group, and squadron structures, for example. In the doctrine arena the direction is less clear. The requirement is to create a doctrine that can take into account the unexpected, the asymmetrical, the required institutional change, and transformation. Historical support for such doctrine will need to be drawn from more distant parallel times such as the first five centuries A.D., the Age of Empire, or the period between world wars in the twentieth century. In any case, operating concepts allow us at least to sketch outlines of supporting institutional and doctrinal change.

Conclusions

Operating concepts are a real attempt to transfer ideas to practice. The long-standing discussion and sometimes-vociferous war over systems is being translated into action that matches the transformation visions of the secretary of defense and the secretary of the Air Force. They will codify processes, procedures, and force procurement plans already under way while beginning the process of educating and indoctrinating the Air Force community into the new expeditionary philosophy. Furthermore, if we are successful, external audiences such as the joint community will recognize airpower as a tool of choice. However, the seven operating concepts are not sufficient to achieve Air Force transformation. They must be accompanied by changes in structure and doctrine that will allow us to make major leaps forward—progress that has been shaped by the air and space power debate over the last decade. □

Notes

1. As we went to press, service leaders had not yet decided on "Task Force Concepts of Operations [CONOPS]," or "Operating Concepts" as the official name for the transformation architecture. We introduced both terms in this article, which illustrates the dynamic character of Air Force transformation initiatives and adds a degree of justification for providing a "snapshot" of where Air Force transformation efforts stand. For the purposes of this article, "Operating Concepts" and "Task Force CONOPS" are synonymous. However, the trend seems to favor using "Operating Concepts" as a clearer, more descriptive name for the initiatives.

2. Headquarters USAF Transformation Division (HQ USAF/XPXT), *The USAF Transformation Flight Plan; FY 03-07*, n.d., on-line, Internet, 28 March 2003, available from http://www.oft.osd.mil/library/usaf_transformation_Pub_Release.pdf.

3. Ibid., iv.

4. Air Combat Command (ACC/XPS), *Global Response Task Force CONOPS* (ver. 3.0), 25 September 2002, 4.

Training

The Foundation for Air and Space Power Transformation

LT COL JOHN M. FAWCETT JR., USAF, RETIRED

Editorial Abstract: Lieutenant Colonel Fawcett urges readers to develop a lifetime-learning ethos as he challenges the Air Force to change its training processes, institutions, and personnel-management systems to better meet the demands of the air and space expeditionary force. He provides a vision of how the Air Force can transition to a fully integrated training program that provides combat-ready air and space leaders and forces to combatant commanders.

The idea that any but a trained soldier can conduct war is absurd.

—Capt George S. Patton Jr., US Army Cavalry
Letter to his wife, 1917

The focus of Training Transformation is to better enable joint operations in the future, where "joint" has a broader context than the traditional military definition of the term. "Training," in the context of this plan, includes training, education, and job-performance aiding.

—*Strategic Plan for Transforming DOD Training*
1 March 2002

AFTER THE DIFFICULTIES encountered in the air war over Vietnam, USAF leaders went to work on creative solutions to enhance aircrew training. Rigorous and standardized initial qualification training (IQT), mission qualification training (MQT), and continuation training (CT); the inclusion of dissimilar air-combat training (DACT); the formation of aggressor squadrons; and the creation of Red

Flag characterized these innovations. That tactical foundation has stood the USAF in good stead as demonstrated by combat effectiveness in the Gulf War and the Balkans. However, the USAF must now expand that foundation to meet rapidly changing operational, informational, and technological challenges. This article proposes changes to USAF training institutions, personnel management, training processes, and technologies, allowing the service to meet the demands of the air and space expeditionary force (AEF).

Military training serves three interrelated purposes: to provide essential skills necessary for mission performance, to socialize members of the organization, and to improve performance of commanders and their staffs. The ultimate measure of military training effectiveness is readiness for combat, which now implies mastering a range of tasks, including traditional force-application missions and support for peacekeeping and humanitarian-relief operations. US forces place a high premium on training, especially since the inception of the all-volunteer force with its role as an invaluable force multiplier. Identifiable goals that are consistent with assigned missions and the corporate culture should form the cornerstone of any comprehensive training system to preserve the combat edge that the service derives from training investments.

Purists argue about the distinction between education and training. Absent definitions in either the *Air Force Glossary* or the *Department of Defense Dictionary of Military and Associated Terms*, we rely on Webster to clarify the relationship:

> *educate*. 1.a. To provide with training or knowledge, esp. via formal schooling: TEACH. b. To provide with training for a specific purpose, as a vocation. 2. To provide with information: INFORM. 3. To stimulate or develop the mental or moral growth of.[1]

> *train*. 1. To coach in or accustom to a mode of behavior or performance. 2. To make proficient with special instruction and practice. 3. To prepare physically, as with a regimen.[2]

Airmen should minimize these pedagogical debates in recognition that both approaches are complementary and necessary to allow programs to move across a spectrum from education through training as required by instructional goals. In fact, we should stop talking about "education" and "training" and instead develop a "lifetime learning" ethos that favors advantages derived from both pedagogical categories.

While education, specifically professional military education (PME), will continue to be an important aspect of lifetime learning, the remainder of this article focuses on a transformation in Air Force training. This new approach aims to create a rational flow for functional integration and professional growth that aligns training institutions, processes, and technologies with war-fighter requirements, Air Force capabilities, and the career paths of the individuals involved.

A New Institutional Framework for Expeditionary Air and Space Forces

Before embarking on a detailed discussion of the training system, this article will consider the following proposal for reorganizing how the USAF conducts cradle-to-grave training. Any organizational scheme must meet the mandates of Title 10, "Armed Forces," of the *United States Code* and provide theater commanders with trained USAF teams to be part of joint and coalition task forces. Under a proposed new major command structure, all three commands would execute the Air Force's organizing, training, and equipping responsibilities. The following diagrams illustrate how such a structural reorganization will facilitate providing trained expeditionary forces for theater combatant commanders (fig. 1).

General Headquarters Air and Space Forces (GHQ AF) will provide forces to combatant commanders and meet Title 10 responsibilities through the numbered air forces (NAF). Air and Space Materiel Command (ASMC) will manage all materiel acquisition required to support the full spectrum of air and space operations. This includes

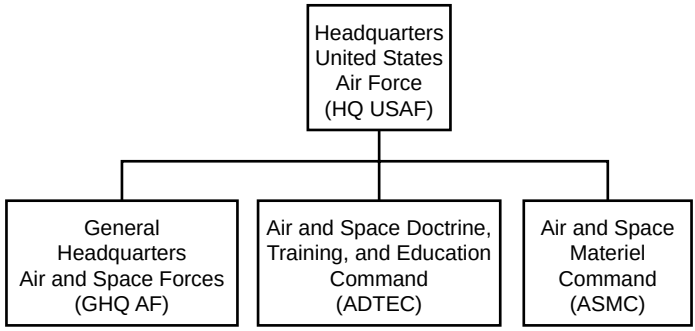


Figure 1. Proposed USAF Organization with Three Major Commands

large scale, long-range programs such as aircraft or satellite acquisition as well as the rapid turnover of software and hardware associated with command and control (C2) systems.[3] Air and Space Doctrine, Training, and Education Command (ADTEC) will contain the Air and Space Warfare Center (AWFC), Nellis AFB (fig. 2).

The AWFC will be responsible for the USAF battlelab, the tactical center of excellence wing (57th Wing, Nellis AFB), the operational art center of excellence wing (53d Wing, Eglin AFB), functional wings for space (Schriever AFB), air mobility (Fort Dix), information warfare (Kelly AFB), and the Air Force Experimentation Office (AFEO) (fig. 3). The battlelab will be a central organizing structure that will establish temporary detachments as needed to support experimentation. This concept would replace the multitude of independent battlelabs in today's construct. Because of the need for experienced personnel with career maturity, the rank structure of the AWFC units may be more "top heavy" than equivalent operational and training wings. But, AWFC will also have the flexibility to look for officers of relatively junior rank, with good ideas and leadership skills to offer them an opportunity to create innovative war-fighting operational concepts.

AWFC is the link between the war fighters in the NAFs of GHQ AF and ASMC and the acquisition process. The NAFs are advocates to both their theater combatant commanders and, through AWFC and GHQ AF, to the USAF. AWFC also becomes a crucial part of the feedback loop necessary for rapid acquisition. AWFC will evaluate the constantly shifting desires of the NAFs, look across the network, and provide balanced requirements to ASMC.

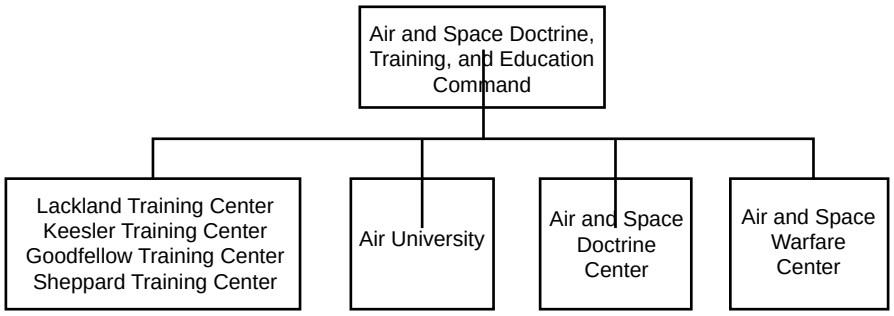


Figure 2. Proposed Air and Space Doctrine, Training, and Education Command Structure

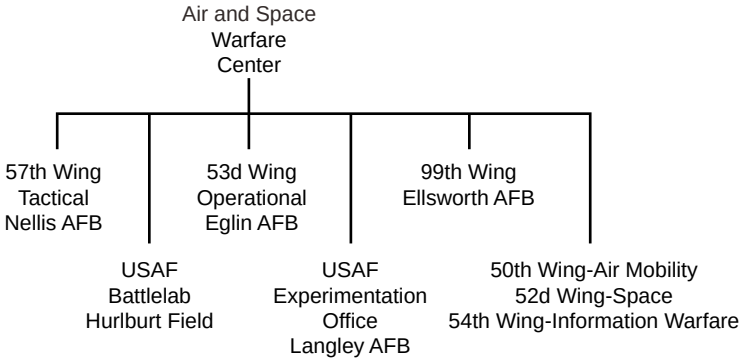


Figure 3. Proposed Air and Space Warfare Center

The organization of ADTEC presented in figure 2 unifies training and education responsibilities under a single commander. ADTEC would serve as a feedback conduit between the acquisition and war-fighting communities to help identify and validate operational and training requirements. Incorporating all the basic missions into one command will bring the same focus to training missions and activities that centralized command brings to war-fighting missions.

People, Process, and Technology

The Air Force has long worshipped at the altar of technology—the benefactor of winged flight for man. The airplane has, from its inception, been an expression of the miracles of technology. The very knowledge of how to fly came from technical devices and experiments, and fliers have been the major instigators and beneficiaries of technological advances in everything from structural material to microelectronics.

—Carl H. Builder
The Icarus Syndrome

We trained hard, but it seemed that every time we were beginning to form up into teams, we would be reorganized. I was to learn later in life that we tend to meet any new situation by reorganizing; and a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency and demoralization.

—Petronius Arbiter (210 B.C.)

The interaction of people, process, and technology sets the stage for effective air and space power employment. If the institution fails to integrate these functions, it may find itself uninformed, ill prepared, subject to inflexible dogma, and—as Carl Builder noted in the quote above—caught up in the religion of technology as savior. When addressed in an integrated manner this triumvirate creates a trained team that is equipped with flexible, relevant doctrine and able to launch innovative solutions from standard processes with whatever technology is available—this is the essence of a capability-based force.

People must encounter a challenging training environment that is relevant to the war-fighting missions they will execute. In the broadest sense, military training is pervasive and includes training activities within operational units. “Good leaders are good trainers” is a motto the military can live with. USAF training will not only provide the essential tools for completing assigned tasks, but will infuse all members of the force with a unifying ethos—a common vision of airmanship. In the proposed reorganization, a direct relationship between each NAF and its assigned combatant commander will allow ADTEC to be responsible for accession training (table 1). The

Table 1

Theater Commands and Proposed Air Components under GHQ AF

Air Force	MAJCOM
First AF	NORTHCOM/NORAD*
Second AF	TRANSCOM
Third AF	SOCOM
Fourth AF	SOUTHCOM
Fifth AF	PACOM
Sixth AF	SPACECOM
Seventh AF	USFK
Eighth AF	EUCOM
Ninth AF	CENTCOM
Tenth AF	JFCOM
Eleventh AF	STRATCOM

*NORAD is a special case of a standing alliance with a defined command and control structure

war fighters and the NAFs will identify USAF training priorities that result from mission-oriented dialog between operational and training functional managers. This vision is essential when contemplating a training mission that not only supports the war-fighting commanders, but also encourages innovation and experimentation.

A leadership career path defines individual and team skills at each level of warfare. Progress through all levels is required before nomination for a joint command. Career progress is marked by a demonstrated ability to perform—not just to fill a square. Just surviving a command tour also is not enough to justify promotion or selection for future command. The leadership evaluation metrics must be capable of recognizing when a unit is changed (either in organization or process) without any motive other than to demonstrate change. Such change, as noted above by the ancient Petronius Arbiter, is not only a waste of time, but also potentially dangerous.

Recruitment starts the training journey. The ability to attract qualified enlisted accessions and officer candidates will be ADTEC's first challenge. Shaping candidate expectations is one of the most important institutional functions at this critical training stage. Contrary to popular mythology, not every graduate of the Air Force Academy has a chance to become chief of staff of the Air Force. A reasonable system affords all entering candidates an environment that will give them an opportunity for growth and fulfillment. The military's best marketing tool is not money; the dual opportunity to serve one's country and excel at a challenging profession appeals to the better recruits and serves to increase their retention. In an era when military television ads appeal to self-focus—what's in it for the individual—there is a missed opportunity that ties enlistment to selflessness—what's in it for society. Living up to recruit expectations should not be a hardship; it should be the norm.

ADTEC will be the bridge between the civilian and military communities and must continually adjust its assumptions about entering recruits. For example, can computer literacy be assumed for all categories of entering candidates? If the USAF decides to migrate to more computer-based training systems, this becomes a critical assumption. The military makes these assumptions on a regular basis. We assume candidates know how to use a telephone, indoor plumbing, and an electrical switch; yet for the majority of American society, each of these has been a modification of culture in the last century.

Embedded in the ADTEC role is the vision of what it is to be an airman. This is a unifying theme that is consistent throughout all USAF training and is the bedrock of the lifetime-learning construct. The Air and Space Doctrine Center is the keeper of this flame, and it is manifested in the mundane yet essential answer to the question of what it is to be an airman. By way of illustration, walk up to a marine and say: "Every marine is a _____." The marine you are addressing will most likely automatically respond, "rifleman." That

is the ethos of the corps, and it transcends generations of marines. It is independent of technology and holds meaning for veterans of World War II and the newest recruits at Parris Island. The USAF must develop and communicate the same essential professional ethic to its members. It is a bond that sustains service members through crisis and combat. It is neither dogma (resulting in the brainless automatons so popular in media and entertainment caricatures of military members, especially career officers and NCOs) nor the next advertising slogan for a 60-second television spot. Instead, it is a vital, professional identity that produces an esprit de corps and force-multiplier effect.

Understanding basic processes enables airmen to adapt to the situation and the tools at hand. At a basic level, an *air tasking order* (ATO) is no more than a rational attempt to organize the application of air and space power. Sometimes the construct involves the equivalent of a flying schedule for a wing; sometimes it involves thousands of sorties provided by many nations. In any case, standardized processes must exist to facilitate training and preparation, thus building the framework on which necessary modifications can then be made to respond agilely to situations encountered in combat. A desirable process is a flexible, rational map of interrelated activities. When the task or environment changes, the process may also need to change to remain relevant to tactical and operational circumstances.

Future wars may include such complex technology that the complexity itself creates vulnerabilities that an enemy can exploit. Therefore, airmen should embrace technological advances with a clear appreciation of their potential risk. To do less invites the asymmetric warfare described in the book *Unrestricted Warfare,* written by Colonels Qiao Liang and Wang Xiangsui of the People's Liberation Army, and in Tom Clancy's novels.[4] It is essential to employ technology within the appropriate context. Sometimes the best computer is a human with a pencil and a piece of paper, and the best solution is a bayonet to the throat. Advances in technology do not wipe out all previous military concepts; they add to the war fighter's toolkit.

For example, a tool that could transparently automate *course of action* (COA) development would enhance resource-allocation discussions and decision making. Using such a tool, planners could develop COAs that clearly reflect resources required to support effects-based operations. Armed with such insight, planners could propose shifting assets from one theater to another based on a commonly understood rational approach. This illustrates the importance of well-trained people understanding processes and integrating technology to enhance combat readiness. The question remains, however, when do we introduce new technology, modify processes, and look for new people? Our future capabilities will depend, in part, on how we approach that answer.

Pulling It All Together

The Red Flag staff used the same building block approach established by the Fighter Weapons School to lay out the mission. The first few Red Flag sorties were flown as four-ships, the basic fighting unit, to targets that were not difficult to find. Only one or two Aggressors defended the targets, and they were limited in the attacks they could make on the Blue forces. During the second week, though, the missions started to build in intensity. Larger attack packages thundered westward into Red territory, escorted by fighters looking to kill the Aggressors. Tacticians integrated aircraft capable of jamming the Red radars into the strike force. By the end of the second week, it was all-out war with the Blue force throwing everything they could at the targets while the Red force defended in full strength.

—C. R. Anderegg
Sierra Hotel

The Red Flag program provides a historical model for matching training-system elements to operational-mission requirements to achieve greater tactical and operational effec-

tiveness. Parts of a robust capability already exist and now must be harnessed to support Air Force, joint, and coalition forces. The goal of training is preparation for employment across the tactical, operational, and strategic spectrum. The critical issue becomes how to link training activities to operational force employment. With the advent of the expeditionary concept, the AEF rotation schedule can and must be integrated with air and space expeditionary task force (ASETF) employment.

Air Force training must continue to have a firm air and space power doctrinal foundation. This is not the wild-eyed fanaticism of some airpower zealots; it is the rational explanation of air and space power's legitimate force-employment role as a full and equal member of the joint task force operational team. Sound, well-articulated air and space power doctrine must be the common thread that unites all USAF education and training, providing the intellectual path for operational effectiveness and professional leadership development.

Individual training provides the basis for tactical-level mission effectiveness. It starts with Air Force specialty code (AFSC) training. The existing enlisted AFSC training architecture is designed to work through various skill levels and schools and offer a clear development scheme within which airmen can move from entry-level technical skills to the rank of supervisor, and which finally will prepare them for senior enlisted leadership roles. Officers graduate from accession programs into a very structured initial training environment regardless of tactical or technical specialty. Using the model for F-16 pilots, officer graduates of undergraduate pilot training progress through a clearly defined pipeline that leads first through a formal training unit (FTU) where they receive syllabus-defined training in flying the aircraft and acquire the appropriate tactical skills necessary for the mission. They then move to an operational unit where they get a local checkout in the specifics of the mission and environment and generally become mission capable (MC) as wingmen. Here the pilots gain experience and began to move through various training programs to become qualified as F-16 flight leads, multiship flight leads, and instructor pilots.

Even at the tactical level, a transition is beginning to occur for our notional pilots. Leadership demands the integration of various weapon systems in a strike package to achieve a greater overall capability. The challenges to do that are often daunting and are not well defined. The desire to integrate is a philosophy that helps develop the ability to use a tool in more than one way. Twenty-first-century airmen cannot allow their contributions in this integration process to stagnate because of a dogmatic mind-set or too much comfort with current operating procedures. These self-imposed constraints lessen the warrior, cause him or her to be predictable, and make life easy for an opponent who only has to anticipate one well-defined set of tactics. Integrating multiple capabilities within tactical-level mission tasks offers airmen a transformational tool that bridges the tactical and operational levels of war.

Operational Training and the Air and Space Expeditionary Task Force

The first quality that must be sustained is the mental capability for flexibility; CENTAF personnel possessed the ability to solve unexpected situations quickly because they were trained to do so. The tough, realistic training accomplished at exercises such as Red Flag nurtured mental flexibility.

—Lt Col William F. Andrews, USAF
Airpower against an Army

Operational art lies in the ill-defined terrain between tactics and strategy and is under constant review. Training at the operational level of warfare requires the practitioner to move to a philosophical level of warfare where the integration of the full spectrum of functional specialties is required to effectively plan and execute the mission.[5] The following paragraphs reflect the post–Cold War reality

where an ASETF may have units distributed over a wide geographic area. In this environment, the traditional continental United States (CONUS)-based wing commander becomes a force provider rather than a combat leader.

Air Force doctrine directs the creation of an ASETF as the air component of a JTF.[6] The size, structure, and capability of an ASETF is based on mission tasking and requirements. A key notion of this approach is that the ingarrison wing is the force provider tied to an AEF cycle. With 10 AEFs on a 15-month cycle, every wing provides forces with appropriate capabilities, as described by their unit type code (UTC), to help create each AEF. The AEF training cycle evolves from a focus on unit training to a focus on integration and must include not only the AEF employment force but also the C2 capability of the Air Force forces (AFFOR). The NAFs will be able to provide the C2 capability with a NAF restructure aligned with the regional and functional combatant commanders as shown in table 1.[7]

Consider the 4th Fighter Wing (FW) at Seymour-Johnson AFB. If the wing were to be restructured with five operational squadrons of 12 aircraft, then each squadron could be aligned with one of five AEFs. In the AEF rotational cycle, the squadrons are aligned with AEFs 2, 4, 6, 8, and 10 (fig. 4). The 4th FW is the lead wing for AEF 8. The wing commander is responsible for all of his or her wing's squadrons in the *recovery* and *individual and unit training* phases. During the *deployment preparation* and *deployment ready* phases, the operational control of those squadrons changes from the wing commander to the AEF commander. The AEF commander will be one of five brigadier generals collocated with a small staff at the AEF Center at Langley AFB under the GHQ AF. The AEF Center will have tasking authority across the USAF. Each of the five brigadier generals will be responsible for two of the 10 AEFs. The generals will monitor their designated units during recovery and individual and unit training phases, and when the units have completed all requirements, the generals will accept the operational control of these units for the final two phases—deployment preparation and deployment ready.

The AEF commander will ensure, during deployment preparation, that integration training and readiness certification of the appropriate UTC personnel are accomplished. That includes the people who will man the expeditionary operations center (EOC) and the proposed AEF C2 capability, which will provide the deployed integration and connectivity between the operational and tactical levels. The commander of the Air Expeditionary Group (AEG), or Air Expeditionary Wing (AEW), will require an EOC in order to fight the group or wing and link to the AOC—the ASETF's C2 center. The ASETF commander is responsible to the joint force commander (JFC) for all air and space issues and for the interface at the operational level of warfare. ASETF command will be provided by the NAF assigned to the engaged region or function. Regional and functional commanders have both supported and supporting roles. Let there be no mistake about roles and missions; the ASETF commander is the commander of Air Force forces (COMAFFOR) and, if so designated, the joint force air component commander (JFACC). The opera-

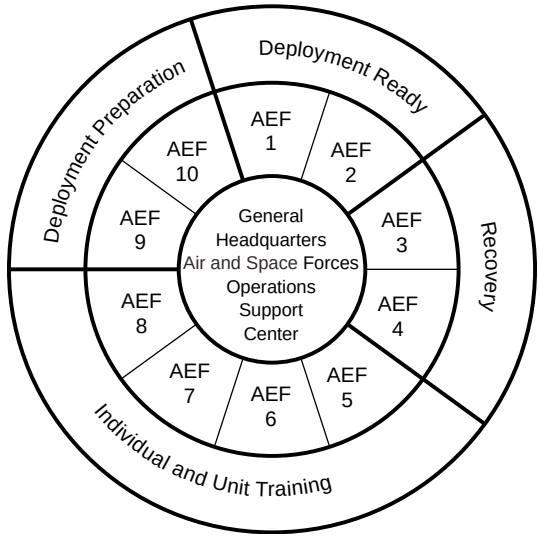
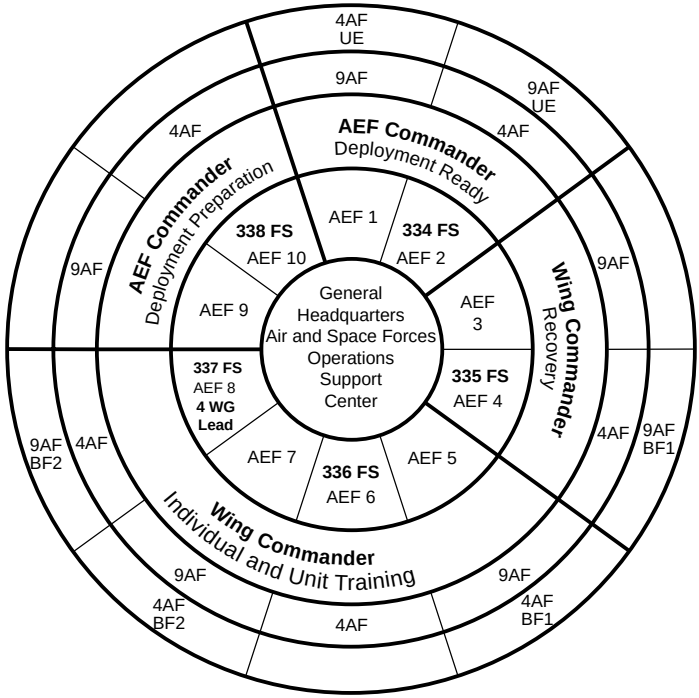


Figure 4. Air and Space Expeditionary Force Rotation

tional control of AEWs and AEGs is transferred to the COMAFFOR, and that is why the AEF cycle will source the component command from a NAF headquarters and the combat capability from contributing wings.

The 4th Fighter Wing commander has lead-wing responsibilities for this example's AEF 8 as it approaches the deployment preparation phase (fig. 5). His or her contribution of forces, with the appropriate UTCs, is more significant. The AEF 8 EOC will be built around the 4th Operational Support Squadron (OSS). With the 4th FW commander as lead for AEF 8, his or her role is no longer as a fighter wing commander; however, he or she may be called on to command an AEW or AEG of mixed forces.

So far this article has attempted to tie the organization and employment structure together, albeit based on some proposed assumptions; it now turns to the nature of the deployment-preparation training. The centerpiece of the AEF training will be AEF Flag, a modified version of Red Flag. The goal of this new exercise will be to build on years of tactical experience while pursuing a dramatic increase in the exercise's operational fidelity. During the deployment preparation phase, most designated AEF units will deploy to Nellis AFB. This will bring all the component pieces of the AEF together. The AEF commander will have to execute the Red Flag–type missions as he or she simultaneously creates a base infrastructure from training equipment stored at Nellis. The AEF's assigned mission will also require that the lead wing commander establish communications and logistics links and create an architecture to provide ISR data flow. The AEF commander will exercise the time-phased force and deployment data (TPFDD) and the time-phased



BF 1 - Training Blue Flag
BF 2 - Free-Play Blue Flag
UE - Unified Endeavor

4th WG Unit Rotation with lead for AEF 8
AEF on 15-month cycle
NAF on 18-month cycle

Figure 5. Integration of AEF Command and Training Relationships

force and deployment list (TPFDL) flows of his or her assigned forces.[8] In the case of units that don't deploy or deploy to a geographically separated location, the commander will also have to establish connectivity and processes for executing assigned missions. These are the tasks the AEF would be expected to accomplish if employed as an AEG or AEW. Individual crews would see few changes other than residence in a tent city.

Logistics play and organic command and control of deployed forces are weaknesses in current Red Flag exercises. Likewise, large-scale training efforts afford little experience with the Joint Operation Planning and Execution System (JOPES) and the importance of TPFDD flow. Ad hoc solutions to organizational, logistical, and execution problems have been characteristic of every deployment and operation since the Gulf War and should not be mistaken for a demonstration of competence.

Logistics and C2 expansion alone will not complete the ASETF structure. Fourth and Ninth Air Forces, because of their deployment posture, will participate initially in the ASETF training cycle and provide the operational level of warfare interface.[9] First Air Force will participate as the air component of USNORTHCOM. Fifth Air Force will be added once a robust telecommunications network is established. Seventh and Eighth Air Forces will leverage existing modeling and simulation centers and in-theater forces for training events. Scenarios for the NAFs will incorporate training for the AEF Flag from home-station facilities. This is a logical option, since the COMAFFOR's headquarters will not necessarily be collocated with the AEG or AEW. AEF Flag provides a forum for air mobility integration by including the tanker-airlift control element (TALCE) and airfield-management aspects of TPFDL flow. Air mobility involvement will integrate the Phoenix Readiness Training program.[10] A full-spectrum exercise will expose USAF personnel at the wing and unit levels to the language and processes of mobilization, deployment, operations, and redeployment in a controlled, bare-base environment. With this basic knowledge, personnel should be able to make the adjustments that are always necessary in real-world operations.

AEF Flag will provide the NAF with only limited training because tactical goals and objectives will dominate the exercise. NAFs that are deployable from the CONUS must participate in two Blue Flag scenarios and one Unified Endeavor, in sequence, every 15 months.

The first Blue Flag will be very structured, built around the guidance of the NAF commander and his or her staff to reflect their training goals and objectives. The exercise control cell will drive events to meet the training goals and objectives. There will be an increase in logistics play over the existing Blue Flag exercises. TPFDD and TPFDL flow and discipline were a problem in the Gulf War and have continued to be a problem in every crisis since. Shipping things twice to get them to the theater once, usually without en route visibility, may provide a veneer of competence, but it is not a very pretty reality. A second Blue Flag will involve a neutral scenario without a direct relationship to existing plans. This second exercise will be akin to the Silver Flag concept proposed by Col Bobby Wilkes in his *Aerospace Power Journal* article of the same name.[11] Opposing forces (OPFOR) will not be scripted and are expected to employ creative challenges in a "free play" exercise environment. This will help lay the foundation for a Red Force concept of operations, ultimately available for crisis-action planning and course-of-action development.[12] Goals and objectives will be broad and not under the control of the NAF commander. Externally imposed rigor at this level is unusual, but essential, if commanding generals are to have a clear picture of both the demands that will be placed on them and the capabilities of their staffs.

The final phase of training will integrate the JFC, the AFFOR team, and the other components in the Unified Endeavor series of exercises. At this point the AFFOR team will come to fully develop their relationship with the JFC. Service or functional exercises tend to reinforce tribal perspectives, not necessarily bad or good as long as exercise objectives

provide productive training, but a good joint exercise will transcend the tribal perspectives.

Conclusion

Of course, the basic idea of using training objectives was nothing new to experienced educators, but it was at the Fighter Weapons School. Jumper, who wrote the Building Block Approach article, also tied the training objectives to specific, measurable criteria in a new way that appealed to everyone. For example, during a bombing attack, the specific objective was not only the score, but also the tracking time the pilot used before he released the bomb. If the pilot could not drop an accurate bomb using only five seconds of tracking time, then he could not progress to the next level.

—C. R. Anderegg
Sierra Hotel

That which is currently happening is not impossible.

—McAdams's Second Law

Professor McAdams had a rather abrasive way of reminding graduate students to first assess the obvious. In the era after Vietnam, innovations in training and processes at the tactical level of warfare, coupled with new technology, led to a dramatic increase in combat capability. That foundation provides the vision of how the USAF can make a transition to a fully integrated training program that provides combat-ready air and space forces to combatant commanders. All the capabilities addressed in this article are in place or can be fielded at low cost and with minimal modifications. This is one path to creating a transformational training structure that provides the USAF with leaders and an ASETF team prepared to command and support joint or coalition task forces. □

Notes

1. *Webster's II New Riverside University Dictionary* (Boston, Mass.: Riverside Publishing Company,1994), 418.

2. Ibid., 1225.

3. For the purposes of this paper, C2 will include the C2 of intelligence, surveillance, and reconnaissance assets.

4. Qiao Liang and Wang Xiangsui, *Unrestricted Warfare* (Beijing: PLA Literature and Arts Publishing House, February 1999), on-line, Internet, 25 March 2003, available from http://www.terrorism.com/documents/unrestricted.pdf.

5. The full spectrum of functional specialties is described by a unit type code (UTC), which is a Joint Chiefs of Staff–developed and –assigned code that consists of five characters that uniquely identify a unit's capabilities.

6. Air Force Doctrine Document (AFDD) 2, *Organization and Employment of Aerospace Power*, 17 February 2000, 33.

7. Lt Col John M. Fawcett Jr., USAF, retired, "Leadership and Reorganization: A New Model for the Air Force," *Aerospace Power Journal* 15, no. 2 (summer 2001): 65–77.

8. Time-phased force and deployment data (TPFDD) is the Joint Operation Planning and Execution System (JOPES) database portion of an operation plan. It contains time-phased force data, non-unit-related cargo and personnel data, and movement data for the operation plan to include: (a) in-place units; (b) units to be deployed to support the operation plan with a priority indicating the desired sequence for their arrival at the port of debarkation; (c) routing of forces to be deployed; (d) movement data associated with deploying forces; (e) estimates of non-unit-related cargo and personnel movements to be conducted concurrently with the deployment of forces; and (f) estimate of transportation requirements that must be fulfilled by common-user lift resources as well as those requirements that can be fulfilled by assigned or attached transportation resources, also called TPFDD.

The Time-Phased Force and Deployment List (TPFDL) is a JOPES database located at Appendix 1 to Annex A of deliberate plans. It identifies types and/or actual units required to support the operation plan and indicates origin and ports of debarkation or ocean area. This listing is to include both in-place units and units to be deployed to support the deliberate plan.

9. Fawcett.

10. Lt Col Michael E. Dickey, commander of the 421st Ground Combat Readiness Squadron, interviewd by author. The Phoenix Readiness (PR) program at the USAF Air Mobility Warfare Center (AMWC) is the USAF's premier program for expeditionary combat support training. It is the only program—DOD wide—which assembles personnel representing virtually all the AF specialty codes necessary to provide expeditionary combat support, trains them for a week, and then exercises them for five days in a challenging field environment. The PR program is an effective and relatively inexpensive training venue, which is overseen by functional representatives of the Air Mobility Command staff and has Air Force–wide applicability. The PR focus is on specialty and functional areas and the integration of combat support and combat service support at the tactical level of warfare. Its objective is to train and educate today's total Air Force through integrated and joint training for tomorrow's contingencies.

11. Col Bobby J. Wilkes, "Silver Flag: A Concept for Operational Warfare," *Aerospace Power Journal* 15, no. 4 (winter 2001): 47–56.

12. Col Timothy G. Malone and Maj Reagan E. Schaupp, "The 'Red Team': Forging a Well-Conceived Contingency Plan," *Aerospace Power Journal* 16, no. 2 (summer 2002): 22–33.

The WASPs

CHARLES TUSTIN KAMPS

An organization known as the Women's Airforce Service Pilots (WASP) was formed in August 1943 as an amalgamation of the Women's Auxiliary Ferrying Squadron, started by Air Transport Command employee Nancy Love in September 1942, and the Women's Flying Training Detachment, founded in November 1942 by Jacqueline Cochran. Both women were accomplished pilots, and their chance to contribute came in the dark, early period of World War II, when the United States Army Air Forces (USAAF) desperately needed pilots. Cochran was given command of the WASPs, while Love became the WASP executive member on the Ferrying Division Staff of Air Transport Command.

Some 25,000 women applied for the WASPs, but only 1,830 were accepted for training. Of these, 1,074 graduated to active status. The program's entrance requirements were tougher than those for male aviators. Applicants at first had to have prior experience, including at least 100 hours of flying time—a number later reduced to 35. Graduate WASPs wore uniforms and had officer privileges but were civilians, for all practical purposes. They received no benefits, and their pay was less than that of a second lieutenant.

Forbidden by Congress to fly outside the continental United States, WASPs undertook a formidable array of flying duties nevertheless. These included assignments as pilot instructors, pilots for navigator and bombardier student flights, target-tug pilots, glider tow pilots, weather-reconnaissance pilots, engineering test pilots, instrument

instructors, transport pilots and—perhaps their best known role—ferry pilots. WASPs flew nearly every airplane in the USAAF inventory, including attack aircraft such as the A-24; bombers such as the B-17, B-24, B-25, B-26, and B-29; and fighters such as the P-38, P-39, and P-63, to name a few. They also flew various training and cargo planes, from the AT-6 and AT-11 to the L-5 and C-47. It was not unusual for a WASP ferry pilot to have flown over 50 different aircraft types during the war.

The program was officially deactivated on 20 December 1944, as the USAAF began to draw down its training establishment. By that time, the WASPs had logged over 30 million flying miles, and 38 of their members had paid the ultimate price in operational accidents. Not until the late 1970s were the WASPs finally accorded the status of World War II veterans. These air pioneers can justly claim to have blazed the trail for today's female pilots of the US Air Force.

To Learn More . . .

Carl, Ann B. *A WASP among Eagles: A Woman Military Test Pilot in World War II*. Washington, D.C.: Smithsonian Institution Press, 1999.

Granger, Byrd Howell. *On Final Approach: The Women Airforce Service Pilots of W.W.II.* Scottsdale, Ariz.: Falconer Pub. Co., 1991.

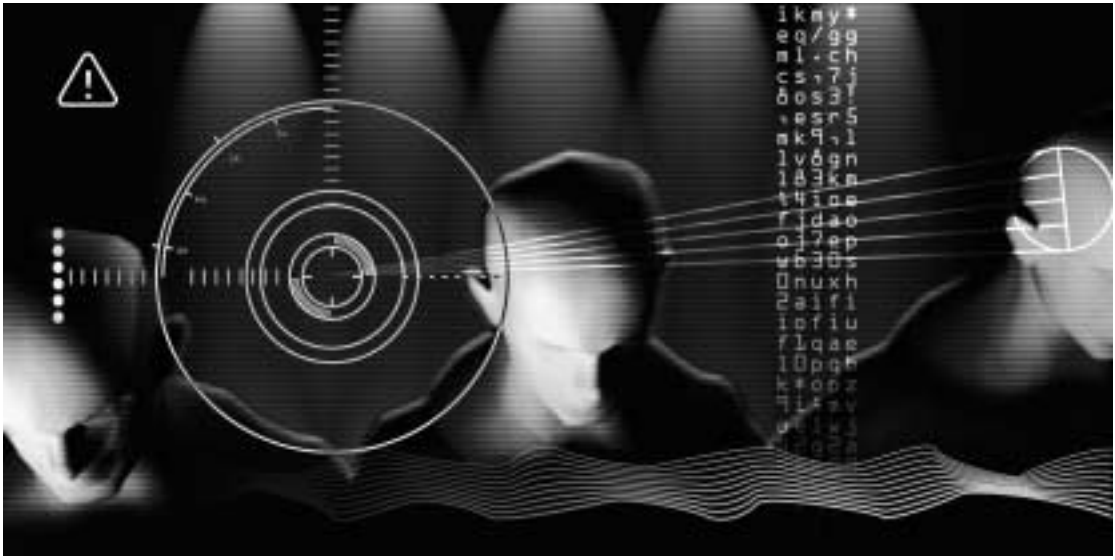
Williams, Vera S. *WASPs: Women Airforce Service Pilots in World War II*. Osceola, Wis.: Motorbooks International, 1994.

Transforming Homeland Security

Intelligence Indications and Warning

LT COL KENNETH A. LUIKART
GEORGIA ANG

Editorial Abstract: With the demise of the Soviet Union, many people believed that threats to the United States would diminish, but this has not necessarily been the case. Lieutenant Colonel Luikart proposes an indications-and-warning cell to support intelligence requirements related to homeland-security missions. The cell would provide more accurate information to senior decision makers.



THE TERRORIST ATTACKS of 11 September 2001 demonstrated that our national intelligence organizations continue to conduct business in the shadow of the Cold War. The failure to disseminate threat information to decision makers, lack of shared information between law-enforcement and national intelligence agencies, and ambiguity inherent in attempting to assess hostile intent and the adversary's operational plans contributed to missed opportunities for thwarting the attacks on the World Trade Center and Pentagon. Despite the urgency of improving our intelligence collection, assessment, and reporting processes, no significant changes in intelligence architecture have occurred to protect the homeland or correct significant intelligence shortcomings since the advent of the Cold War.

Today's problem with intelligence support to the president and policy makers began with the downfall of the Soviet Union in the late 1980s. Conventional wisdom held that threats to our nation would diminish after the

Communist state crumbled; however, just the opposite occurred. Today's strategic environment is more volatile than the one of two decades ago. With the demise of the Soviet Union, many of the stable intelligence factors used to determine an adversary's courses of action disappeared, and numerous old hatreds resurfaced. Wars in the former Yugoslavia, Somalia, and the Persian Gulf area confirmed that global hostilities are likely to increase rather than decrease.

Moreover, the proliferation of weapons—especially nuclear, biological, chemical, or radiological weapons capable of inflicting mass destruction—affords countries with militarily insignificant conventional forces a greater ability to prey upon their weaker neighbors. The multifaceted nature of today's proliferation threat makes it difficult for states to mount effective defenses against terrorist-launched chemical or biological attacks. Therefore, because of the proliferation problem and associated instability in the international system, we must assume that our nation will have to respond to persistent and ill-defined threats for the foreseeable future. This situation places an even greater burden on both civilian and military intelligence analysts to accurately predict hostile actions against our nation.

These problems will plague the newly formed Department of Homeland Security. In spite of countless attempts to "fix" our intelligence systems, they are lacking in their effectiveness at assessing specific threats to the United States.[1] The last discussion of reorganization, conducted by the Senate Select Committee on Intelligence, occurred in 1992—it is time to renew the conversation about how best to organize intelligence support for national decision makers.

Three things remain broken. First, intelligence and law-enforcement agencies have failed to reach consensus on the specific nature of the threat. Most threat studies focus on foreign armed forces, often providing only cursory analyses of terrorists, drug lords, and rogue nations. This does not mean that strategic and operational intelligence agencies ignore nonstate threats, but such challenges receive less attention than do conventional military systems. Second, intelligence agencies have failed to formulate significant changes in the way they task, collect, analyze, produce, and disseminate intelligence information for decision makers. If this process misidentifies actual threats to our nation, defense efforts may concentrate on adversaries and capabilities less likely to hurt us in the near term while more lethal and subtle dangers operate more or less freely below the visual field of intelligence agencies and decision-making bureaucracies. Lastly, the intelligence architecture necessary to shape debate while incorporating all-source intelligence between national intelligence agencies and law enforcement doesn't exist.[2]

Simply stated, our country's decision makers—the president, National Security Council (NSC), and policy makers—should receive unbiased, nonparochial, all-source intelligence threat estimates based upon the president's essential elements of information (EEI) (that is, what the president needs to know but does not know). Unfortunately, the Federal Bureau of Investigation (FBI), Central Intelligence Agency (CIA), Defense Intelligence Agency (DIA), National Security Agency (NSA), and other intelligence organizations compartmentalize information, making effective synthesis difficult if not impossible. This practice results in poor information sharing, loss of continuity, and inadequate analysis of hostile forces' intentions. Large intelligence institutions often analyze information wrongly or simply do not provide the analysis that policy makers need. Col John Warden, USAF, retired, notes that national-level intelligence agencies have historically missed the mark on long-range intelligence assessments. Poor performance on such assessments results from centralized, compartmentalized decision making and analysis by bureaucracies, study groups, and committees. Analysts, working in small groups or as individuals, have had more success in developing extremely accurate intelligence assessments.[3] Although individual analysts provide their best assessments, we should have a system in place that allows them to

compare notes, debate, and present their cases to other agencies.

Concerning our current NSC and supporting intelligence agencies, Amy Zegart observes that "the Cold War is long over, yet this Cold War organization remains undaunted and largely unaltered. Though American politics has a good handle on domestic-level organization, the field pays almost no attention to foreign policy. It is fair to say that American politics is the study of American domestic politics."[4] Zegart notes the lack of a vibrant intelligence agency prepared to face the new challenges that 11 September brought to our nation, describing the "structural split" between the FBI and CIA as a "yawning communications gap. Why didn't the FBI and CIA compare notes in the summer of 2001? The simplest answer is that they usually don't. These two agencies have never talked to each other as well as they should."[5]

Chastising a "government that was ignorant and apathetic," William J. Lederer characterizes the typical US approach to politics and policy, together with its lack of understanding of world affairs, as "debilitating national ignorance, both official and unofficial."[6] Similarly, Max G. Manwaring, writing about gray-area phenomena (e.g., terrorism, drug trade, etc.), observes that

> [in] this type of conflict the general task for leaders and their staffs is to incorporate the forgotten social dimensions of conflicts—political, economic, psychological/informational, and moral—into a strategy for improving the ability and the will of the governments to deal with the problems and consequences of instability. Despite the pervasiveness of these problems [the gray-area phenomena] and despite the fact that they have been a part of the international security environment for a long time, it appears that opinion makers and decision makers are doing little more than watching, debating, and wrangling about how to deal with these seemingly unknown phenomena.[7]

Finally, former senator David L. Boren (D.-Okla.) sums up the problem of support for the director of Central Intelligence (DCI): "In short, despite all the rhetoric about DCI's role as a leader of the Intelligence Community, I do not see a leader with clear responsibilities: or a leader with significant authorities over the Intelligence Community, either in law or in Executive Order; or a leader with sufficient wherewithal to effectively manage the U.S. Intelligence Community."[8]

What can we do to fix our outdated intelligence system? What is the feasibility of developing an analytical cell that supports the president and the Department of Homeland Security with all-source intelligence analysis? Finally, what type of indications and warning (I&W) system would directly support national decision makers with short- and long-range analyses of intelligence threats?

Defining Intelligence

Most intelligence failures occur when intelligence agencies prove unable to disseminate the right information to the right decision makers at the right time. Defining what we mean by *intelligence* will help us understand how to correct this endemic failure. The term can refer to a profession, a person's ability to think, secretive information, or an organization. This article considers it the analytical "spin" put on information. Analysts and information handlers must understand that this process imparts value to the information they pass on to decision makers. Thus, one cannot overstate the importance of the differences in terminology, methodology, and emphasis that characterize intelligence support for law enforcement, antiterrorism initiatives, and conventional defense-intelligence efforts. These institutional differences erect barriers to synthesizing accurate and timely intelligence estimates from multiple-source intelligence data into accurate, coherent threat assessments. Thus, the proliferation of institutions prevents effective intelligence sharing because the institutional spin acts as both a filter and barrier between analyst and decision maker.

During the last 4,000 years of warfare, intelligence information focused on the physical characteristics, location, and movement of enemy forces. Spies observed the numbers of men marching and their equipment or geo-

graphic location.[9] Intelligence analysis and reporting followed this template from ancient warfare to more modern times. As governments became more sophisticated at sending postal dispatches, organizations could intercept those dispatches in order to gain secretive information, as did the Depot of Military Knowledge, which served the British military throughout the 1800s. When most governments began to correspond by means of military courier, the former practice faded. Newspapers in the 1800s became known as "intelligencers," and "diplomats continued to speak of 'political intelligence.' "[10]

From the Civil War through World War I, intelligence agencies and their customers began to emphasize the collection and analysis of verbal message traffic. The development of radio and tactical field communications during World War I proved a valuable intelligence tool for field commanders, opening up the new field of signals intelligence. After the war, the United States, Britain, and Germany formalized the development of units for gathering signals intelligence.[11]

During the evolution of intelligence tasking and collection, "intelligence face[d] two all-encompassing, never-ending problems. Both are ultimately unsolvable. . . . The first problem is how to foretell what is going to happen. . . . The second problem, as old as mankind, is how to get statesmen and generals to accept information that they do not like."[12] Both problems continue to plague modern intelligence analysts.

Testifying before the Senate Intelligence Committee in 1992, Gen Paul Gorman, USA, retired, explained that "intelligence remains information, no matter how adroitly collected, and no matter how well analyzed, until it is lodged between the ears of a decision maker."[13] He went on to explain that it is the process of disseminating intelligence information that is at fault when either our nation or our commanders in the field suffer a strategic surprise. Poorly analyzed information or the failure of the recipient to heed sound intelligence warnings leads to a loss of credibility among intelligence agencies.[14]

Tasking, collecting, processing, and analyzing information create unique information-handling problems. But the dissemination of information, the manipulation of data, and the type of analytical spin put on information can create serious intelligence-support problems.

Mishandling Information

If analysts and decision makers misunderstand information, they can fail to see real threats that may exploit vulnerabilities or cause catastrophic attacks, such as those carried out by al Qaeda on 11 September. The acceptance of manipulated information as unquestioned fact may lead to threat inflation. A report issued by the Reagan administration in 1982 offers an example of miscalculating the Soviet threat. The report asserted that the Soviets produced more than 6,000 tanks a year, but DIA's figure was only 3,000. Such threat inflation may have resulted from an honest mistake; however, the fact that the report asked the question "Has America become Number Two?" suggests the possible manipulation of intelligence information to guide US arms-procurement strategies in a preconceived direction. This episode illustrates that, although some information may be accepted as fact, the analysis may actually be either skewed or incorrect.[15]

History is filled with examples of commanders who manipulated intelligence to support their own notions of enemy capabilities and operational plans. For instance, prior to World War I's battle of Passchendaele (31 July–12 November 1917), British general Sir Douglas Haig's chief of intelligence, Brig Gen John Charteris, chose only "facts and figures" that supported General Haig's battle plan. Charteris ignored and manipulated pertinent information concerning German morale and reserves. The ensuing battle cost the British 244,897 casualties.[16]

Prior to Operation Market Garden in September 1944, Maj Brian Urquhart, a British intelligence officer, found evidence of enemy tanks parked at British drop zones near Arnhem, the Netherlands. Major Urquhart rushed

his evidence to Gen Frederick Browning, commander of the British Airborne Corps, and presented an argument for reexamining the plan of dropping paratroopers in the intended drop zones. Urquhart almost convinced the general, but Browning's staff argued that the major was too "zealous" and "inclined to be a bit hysterical, no doubt brought on by overwork,"[17] persuading him to ignore the information and place Urquhart on medical leave. In the ensuing operation, airborne forces suffered more than 17,000 casualties, in part because operational commanders and their staffs ignored critical intelligence information.[18]

Melvin A. Goodman, formerly an analyst at the CIA, reported the most damning evidence of information manipulation after conducting a critique of three intelligence-commission reports about the roles and capabilities of the CIA in 1996. He found that in the late 1980s, when the CIA lost its spies in the Soviet Union, the DCI provided the president of the United States information from KGB double agents: "CIA leaders provided phony information to the White House during the final years of the Cold War, when the Soviet Union was coming apart at the seams. When the CIA misleads the president, it is time to start over."[19]

Why is this important to the development of a new homeland-defense I&W intelligence cell? The unique relationship between analysis and raw information is essential to producing useful intelligence. The dissemination or discussion of intelligence between analyst and user lays the groundwork for future operations and policy. Good intelligence, used appropriately by leaders, "shortens the struggle, sparing gold and blood. In peace it reduces uncertainty and so relaxes tensions among states, helping to stabilize the international system. These are the ultimate human goods of intelligence: these are the ways this servant of war brings peace to man."[20]

Redefining the Threat to the United States

During the past decade, policy makers and intelligence analysts struggled to redefine the threat to US national security. Prior to the demise of the Soviet Union, most intelligence agencies focused on that country as a system. Now, however, it is fragmented and, according to Angelo Codevilla, has become "a nuclear armed Lebanon." Codevilla, who describes modern-day Russia as a massive country with 11 time zones and dozens of ethnic groups,[21] argues that intelligence analysts must understand how former Communist countries are coping with their newfound freedom. He cites Eastern Europe, China, East Asia, Mexico, Latin America, and the Middle East as hot spots that need continued intelligence interest.[22]

Despite the need to redefine the threat, a rift exists between policy makers and intelligence analysts. Glenn P. Hastedt comments that the "disagreements over the proper relationship between intelligence and policy" are based on "linking together intelligence as information and policy."[23] He goes on to point out the measurably "different expectations" between analysts and policy makers, the latter expecting information always to be accurate and "threat information as self-interpreting." Intelligence analysts, though, use estimative processes to create some analyses, thus "artificially creat[ing] the future through the selection of starting assumptions and scenario creation."[24] As Walter Laqueur explains, intelligence "does not exist in a vacuum, even if its practitioners sometimes tend to forget this." If the users of the intelligence product—the president and senior policy makers—do not trust the validity of the assessment, then "even excellent intelligence is of little consequence."[25] Policy makers and intelligence analysts must overcome decades of misunderstanding and compartmentalization and then search for common ground in redefining the threat. To further complicate this endeavor, intelligence support to law enforcement, a third party to this cumbersome search for redefining the threat to our national interests, also requires attention.

Robert H. Johnson suggests that the current intelligence-analysis system be changed so that analysts with divergent views or hy-

potheses about threats to national security can "confront" each other and develop a "baseline for policy." This offers an outstanding way to "cross-pollinate" information by comparing notes in an environment that would force analysts to stand behind their work.[26] Furthermore, James Martin suggests that the attacks of 11 September will change the posturing of intelligence from offensive to defensive. He sees the attacks as a "watershed event" that will certainly change our current intelligence organization, perhaps resulting in legislation as important as the National Security Act of 1947.[27]

Major Threats to Our National Security

Proliferation of weapons of mass destruction (WMD) offers militarily weak adversaries a greater ability to prey upon weaker neighbors and strong states alike. The terror threat to the homeland and its accompanying nuclear, biological, chemical, and radiological dimension have alerted the national consciousness to the potential for mass destruction or mass-casualty attacks (table 1). This places a great burden on civilian and military intelligence analysts to produce accurate assessments of potentially hostile actions against our nation.

Table 1

Major Threats to US National Security

1. Threat from Foreign Armed Forces
2. Economic Espionage
3. Weapons of Mass Destruction
   a. Nuclear Devices
   b. Chemical and Biological Weapons
4. Gray-Area Phenomena
   a. Terrorist Organizations
   b. Rogue States
   c. Illicit Drug Trade and Narcoterrorists

A study of the number of intelligence reports compiled during the 1990s clearly shows that the intelligence community places more emphasis on foreign countries' conventional armed forces than on WMD threats or on terrorist organizations with global reach (table 2). Our intelligence agencies are geared for supporting the world as it was in 1947—not today's threat environment.[28]

Table 2

Percentage of Threat Reports Produced in the Early 1990s

35%	=	Defense intelligence, including international arms trade and nuclear proliferation
20%	=	Intelligence on terrorism (spanning foreign and security intelligence)
15%	=	Defense-intelligence surveillance of foreign conflicts and insurgency
10%	=	Intelligence on foreign states' internal politics, general foreign policies, internal economies, and international economic policies
10%	=	Tactical support to diplomacy and other international negotiations of all kinds, including economic
10%	=	Counterintelligence, counterespionage, and residual security-intelligence subjects; other miscellaneous subjects such as narcotics and international crime

Source: Michael Herman, *Intelligence Power in Peace and War* (Cambridge: Cambridge University Press, 1996), 54.

Gregory F. Treverton points out that any new intelligence reorganization will have to face a world that has many targets and a vast amount of information, including misinformation from the Internet. Treverton sees special-intelligence agencies such as the NSA, CIA, DIA, and so forth remaining intact. However, a change in the relationship among nations sparks a corresponding change in the face of the nation-state. Our foes will not attack our strength by "confronting American power symmetrically" but will attack us "asymmetrically" using WMDs.[29]

In other words, our greatest enemy today does not have a country, will not come to the bargaining table, and has no government that will sue for peace. We face terrorists who launch attacks because it is their "business,"

rather than some political ideology. In order to protect ourselves from asymmetrical warfare, our intelligence agencies will have to reorganize and flesh out their analytical capabilities.

Development of an Indications and Warning Cell

If a new intelligence I&W cell is created at the executive level of government, what attributes should it contain? Although the following list is not comprehensive, some attributes that could facilitate a more relevant and responsive intelligence analytical architecture seem obvious. First, the I&W cell should have a streamlined organizational structure. Analytical cells do not need top-heavy bureaucracies; instead, they should remain lean and flexible so information can flow efficiently between analysts and decision makers. Additionally, fiscal authority is essential; the organizational boss, a director of National Intelligence (DNI) or a DCI, will be ineffective without full control of the intelligence budget for all agencies. In other words, the DCI or DNI will need real authority to order or direct changes to the budget and management. Without such authority, the DCI or DNI will be powerless to make the changes necessary to meet new and fluid threat challenges. Most importantly, intelligence analysis does not survive numerous layers of bureaucratic meddling, which stymies free thinking and tends to force analysts to look for the "book" answer or the "politically correct" answer, rather than the "right" answer.[30]

Second, the cell should be physically located near the users—close enough to the president, NSC, and policy makers to provide all-source intelligence analysis and short- and long-range threat warnings to decision makers in a timely manner. This is necessary because analysts get their marching orders from the leadership's EEIs. Distance from intelligence customers delays analysis, risks its loss, and ultimately renders it irrelevant. The closer the analyst is, physically, to the user (i.e., the president, NSC, and policy makers), the better the analytical support.[31]

Third, most experts agree that "hot" intelligence is lost during the dissemination process. To fix this problem, we need to establish a clearinghouse for intelligence threat analysis—a forum for analysts from all agencies where they can present their cases before other agencies. We must encourage such analysts to staff and use this facility to test their models and theories of analysis. Results of this process should filter to user agencies as soon as possible. Threat warnings and information should be an ongoing process, free from bureaucratic parochialism and distraction from outside sources. Some testimony hints that the intelligence-community staff could serve in this function. Regardless of whether we utilize those personnel or a new clearinghouse for intelligence, analysts need a means by which a variety of agencies can present their analytical products for comparison and fusion.[32]

Fourth, whether the new I&W agency is designed within the CIA or the National Military Intelligence Center, as Adm Bobby Inman has suggested, "All warnings would be directly reported to the DCI as opposed to the Chairman and the Secretary of Defense,"[33] a procedure that makes a great deal of common sense. The DCI should be the boss. Simply put, in our current 1947-style intelligence agencies, the DCI does not have the authority or the wherewithal to manage the large, bureaucratic intelligence system; controls neither the management of these agencies nor their purse strings; leads without power (a figurehead without authority); and must supervise an old and outdated intelligence bureaucracy without the commensurate tools to do so.

The new I&W organization should integrate with the new Department of Homeland Security. Moreover, law-enforcement agencies will have to learn some new tricks of the trade, such as developing order-of-battle files. They must revamp their internal-intelligence support and increase their analytical manpower to handle the sheer volume of information. In a speech at the Georgia Air and Army National Guard Joint Commanders Conference in 2002, Col Jeff Mathis stated that, in its

struggle to integrate some 40 agencies, the new Department of Homeland Security will establish an "intelligence infusion capability, but must work out details of how to pass information down to the Governors and State Headquarters" but must upgrade its "distribution technology."[34] Furthermore, not only are the intelligence agencies, FBI, and NSC looking at reorganization, but also the "Defense Department itself must re-examine its relationship in support of Homeland Defense."[35]

For instance, there "is no National Guard, or Reserve, representative at the JCS level."[36] And no "combatant commander" exists for homeland security, although North American Aerospace Defense Command's combatant commander exercises authority over the new Northern Command. The biggest problem arises between situational awareness at the federal level as opposed to situational levels of the 50 states—that is, a disconnect exists between the federal and state programs. Many states have an emergency operations center and their own unique statewide intelligence-collection-and-analysis capability. The following issues warrant consideration: how do the states merge that capability with the federal effort? Who brings all of this information together in an all-source intelligence clearinghouse? Would this be a job fit for a new executive-level intelligence support cell? Moreover, what will be the relationship among Northern Command, the governors of the states, and the executive branch of the federal government?[37]

Lastly, many states are reorganizing their emergency operations centers. Georgia, for example, has taken a look at its computer infrastructure and is working hard to tie the Army and Air National Guard Internet systems together, with some success. Georgia also has organized its Homeland Security Task Force and revised its Department of Defense "strategic plan" to include a terrorism focus area.[38] Furthermore, most states accept that homeland defense is one of the National Guard's missions; it is not, however, the only mission.

Conclusion

In retrospect, one can easily identify intelligence failures. Most of them stem from breakdowns in dissemination processes. The best way to fix this problem involves locating the I&W cell next to the user—placing it closer to the president and Congress. Second, the I&W cell should be lean at the top, with no layers of bosses and subbosses between the analyst and the user. Bureaucratic meddling and political correctness will kill good analysis. Third, the I&W cell must redefine order-of-battle files and threats to our national security and national objectives, reflecting the full range of conventional and nonconventional challenges. Law-enforcement agencies will have to change the ways they handle information about hostile threats and, in so doing, may find that they also have to alter their approaches to fighting crime. Changes in threat identification and information sharing will be necessary in organizing a new I&W cell at the executive level.

Every analytical question begins with the leader's EEI. Leaders will always have questions about things for which they have no answers. Although policy makers and intelligence analysts will not always be on the same page, it is important to note that a good analyst can make the job easier by providing policy makers the best guess at what hostile forces threaten our national objectives. The policy maker must understand that the analyst is guessing. Even more importantly, the president, NSC, and policy makers should understand that poor analysis results from bureaucratic pressure, distractions, and manpower shortages. Budget constraints should not become an excuse for not fully manning intelligence-analyst positions. The information explosion requires completely staffed intelligence agencies to handle the volume of data to be analyzed. We need an executive-level forum where analysts can compare notes as well as test and defend intelligence hypotheses. It can be located either inside the intelligence-community staff or in a new clearinghouse.

It is long past time for an overhaul. Our intelligence agencies, born out of the 1947 Na-

tional Security Act, sustained defense efforts during the Cold War. The events of 11 September 2001, however, revealed that the institutions which served national security well during the Cold War need to adjust to an emerging threat environment. The old-style "combat files" and order-of-battle files need expanding, changing, and revising. New threat alignments will force a redefinition of order-of-battle files. What was important in 1989 may not be as important in 2003.

Lastly, change will have to come from the top down. The battle among the president, Congress, and myriad agencies that currently "own" the assessment process will be brutal and bloody. Perhaps the early years of the twenty-first century will go down in history as those during which the United States redefined itself as a great nation. This task will not be easy, and the road to intelligence reform will be long and tedious. But this is the path our nation must be prepared to follow in order to defeat future threats to its national security. □

Notes

1. *Hearings before the Select Committee on Intelligence of the United States Senate*, 102d Cong., 2d sess., 1992, S. 2198 and S. 421, 1–46.
2. Ibid.
3. John Warden, *The Air Campaign: Planning for Combat* (Washington, D.C.: National Defense University Press, 1988), 24–27.
4. Amy B. Zegart, *Flawed by Design: The Evolution of the CIA, JCS, and NSC* (Stanford: Stanford University Press, 1999), 5.
5. Amy B. Zegart, "Spy vs. Spy: Two Agencies, Two Turfs, and No Communications," 26 May 2002, on-line, Internet, 29 May 2002, available from http://www.ebird.dtic.mil/May2002/s20020529spy.htm. According to Zegart,

> In the face of this new terrorist threat, Bush should take a lesson from another president who faced daunting new challenges to this nation's security: Harry Truman. In 1947, at the dawn of the Cold War, Truman created a radically new national security apparatus that included the CIA, the National Security Council and the Department of Defense. The fight was fierce, and the result was far from perfect. But it was a dramatic improvement over what had existed before. Truman's efforts got him no votes and made him no friends in Congress or his own executive branch. He did it anyway: He knew the country needed it.

6. William J. Lederer, *A Nation of Sheep* (New York: W. W. Norton and Company, 1961), 11–15.
7. Max G. Manwaring, *Gray Area Phenomena: Confronting the New World Disorder* (Boulder, Colo.: Westview Press, 1993), 63.
8. David L. Boren, *Hearings before the Permanent Select Committee on Intelligence of the United States Senate*, 102 Cong., 2d sess., 1992, S. 2198 and S. 421, 169.
9. David Khan, "An Historical Theory of Intelligence," *Intelligence and National Security* 16, no. 3 (autumn 2001): 82.
10. Michael Herman, *Intelligence Power in Peace and War* (Cambridge: Cambridge University Press, 1996), 14–15.
11. Khan, 87–88.
12. Ibid.
13. Paul Gorman, USA, retired, *Hearings before the Select Committee on Intelligence of the United States Senate*, 102 Cong., 2d sess., S. 2198 and S. 421, 1992, 262.
14. Ibid.
15. Andrew Cockburn, *The Threat: Inside the Soviet Military Machine* (New York: Random House, 1983), 279.
16. Cornelius Ryan, *A Bridge Too Far* (New York: Simon and Schuster, 1974), 163. In his book *The Battle for Germany* (New York: Scribner, 1969), Hubert Essame writes, "In misappreciation of actual situation at the end of August and the first half of September, Allied intelligence staffs sank to a level only reached by Brigadier John Charteris, Haig's Chief Intelligence Officer at the time of the Passchendaele Battles in 1917. . . . [He] selected only those figures and facts which suited his fancy and then issued hopeful reports accordingly" (13).
17. Ryan, 159–60.
18. Ibid.
19. Melvin A. Goodman, "The Road to Intelligence Reform: Paved with Good Intentions," 1996, on-line, Internet, 15 January 2002, available from http://www.us.net/cip/digest.htm.
20. Khan, 90.
21. Angelo Codevilla, *Informing Statecraft: Intelligence for a New Century* (Toronto: Maxwell Macmillan Canada, 1992), 55–56.
22. Ibid., 63–72.
23. Glenn P. Hastedt, ed., *Controlling Intelligence* (London: Frank Cass, 1991), 10–11.
24. Ibid.
25. Walter Laqueur, *A World of Secrets: The Uses and Limits of Intelligence* (New York: Basic Books, 1985), 71.
26. See Robert H. Johnson's comments in "Discussion by the Intelligence Advisory Board and Invited Experts," 22 April 1996, on-line, Internet, 15 January 2002, available from http://www.us.net/cip/digest.htm.
27. James Martin, "Intelligence in the Interstices," *Military Information Technology* 6, no. 1 (2002): 17.
28. Herman, 54.
29. Gregory F. Treverton, "Intelligence Crisis," *Government Executive*, November 2001, 18–20.
30. Adm Bobby Ray Inman, USN, retired, *Hearings before the Select Committee on Intelligence of the United States Senate*, 102d Cong., 2d sess., S. 2198 and S. 421, 1992, 226–27.
31. Boren, 167–68.
32. "Testimony of Bob Inman: Hearings of the Commission on the Roles and Capabilities of the United States Intelligence Community," 19 January 1996, on-line, Internet, 15 January 2002, available from http://www.fas.org/irp/commission/testinma.htm.
33. Ibid.
34. Col Jeff Mathis, "Homeland Defense," speech to the Georgia Department of Defense Joint Commanders Conference, Macon, Ga., 12 April 2002.
35. Ibid.
36. Ibid.
37. Ibid.
38. Maj Gen David B. Poythress, adjutant general, State of Georgia, speech to the State Department of Defense Joint Commanders Conference, Macon, Georgia, 12 April 2002.

The F-86 Sabre

CHARLES TUSTIN KAMPS

Taking advantage of German research done during World War II, American engineers made the F-86 the US Air Force's first swept-wing jet fighter, with the initial production aircraft flying in May 1948. The F-86A, designed as a day fighter, was 37 feet, six inches long and 14 feet, eight inches high, with a wingspan of 37 feet, one inch. The Sabre weighed in at 13,791 pounds (fully loaded), mounting six .50-caliber machine guns and capable of carrying 2,000 pounds of bombs or eight rockets. Powered by a General Electric J-47 engine that delivered 5,200 pounds of thrust, it cruised at 540 mph with a top speed of 685 mph. The F-86 had a ceiling of 49,000 feet and a range of 1,200 miles. As a fighter, it was a very stable gun platform, and its canopy gave an unobstructed, all-around view. Some 3,854 of the A, E, and F models were produced, as well as many thousands more for other countries.

The F-86 is indelibly linked with the Korean War. In November 1950, Russian MiG-15s in Chinese markings appeared south of the Yalu River. They completely overmatched the US F-80C jets, as well as F-51 and F-82 propeller fighters then in-country. The 4th Fighter Interceptor Wing (FIW), flying F-86As, hurriedly deployed to South Korea and began operations from Kimpo Airfield in December. First contacts showed that the MiGs had better speed and agility at high altitudes but that they were no match for F-86s flown by veteran US pilots.

The Chinese offensive forced the F-86s back to Japan, out of range of "MiG Alley"—the area of northwest Korea south of the Yalu. With the subsequent retreat of the Chinese, the F-86s returned with a vengeance. Capt James Jabara shot down two MiGs on 20 May 1951, becoming the first-ever jet "ace," with a score of six.

In July 1951, the 4th FIW transitioned to F-86Es, and the 51st FIW exchanged its F-80s for F-86Es late that year. By summer of 1952, the F-86F had arrived in-theater, and, with the "six-three" wing-conversion kit, it could match the MiG for high-altitude speed and maneuverability. February 1953 saw the 8th and 18th Fighter Bomber Wings transition to F-86Fs as well.

By the end of the war, in July 1953, Sabres had downed 792 MiGs while losing only 78 of their own. This 10-to-one ratio has enshrined the F-86 as one of America's top fighters.

To Learn More . . .

Curtis, Duncan. *North American F-86 Sabre*. Marlborough, United Kingdom: Crowood Press, Ltd., 2000.
Jackson, Robert. *Air War Korea, 1950–1953*. Osceola, Wis.: Motorbooks International, 1998.
Thompson, Warren. *F-86 Sabres of the 4th Fighter Interceptor Wing*. Oxford, England: Osprey Publishing, 2002.
Y'Blood, William T. *MiG Alley: The Fight for Air Superiority*. Washington, D.C.: Air Force History and Museums Program, 2000.

Military OR Ethics

DR. JAMES H. TONER

Editorial Abstract: Dr. Toner explains that military ethics is about knowing what is true and then doing what is right. He takes an interesting approach to make his points memorable by using three Os (owing, ordering, and oughting), three Rs (rules, results, and realities), and three Ds (discern, declare, and do). He concludes by asking readers to first remember those who have gone before, who have worn the uniform, and have served the nation. He then challenges them to live a life that attempts to earn the sacrifices their predecessors made to ensure the survival and success of liberty.

THE TITLE OF this article is deliberately "cute" or misleading because it suggests exactly what I wish to argue against. I oppose the idea that there is *either* the "military" (by which I mean the profession of arms, the military services, or combat operations) *or* "ethics" (by which I mean morality, concern for righteousness, or principles of goodness). That division between what is military and what is moral is properly referred to as a false dichotomy; that is, we are arbitrarily and unfairly separating what must not be torn asunder.

Having taught military ethics for 12 years at the Air War College, Maxwell AFB, Alabama, I have never had to make the case to my students there that military ethics is necessary, possible, or ordinarily makes plain good sense. That simple fact—that senior officers almost without exception buy into the reality (not just the ideal) of military ethics—is a great compliment to them and their services. It is also something that the severest critics of the United States military too frequently (and willfully?) overlook. Let me say that another way. I do not have to go on an academic cam-

paign with war college students to persuade them that they can be airmen (or soldiers) *and* moral men and women. About that, they already agree—and that is no small matter.

So the title is not meant to argue that airmen must be *either* militarily competent *or* personally decent. From experience and from personal conviction, senior officers whom I have taught for more than a decade know, accept, and teach this to their subordinates by their own words and works. What I do suggest is that military ethics is based upon two letters, *O* and *R*. A sense of ethics compels me to admit that I will sneak in *P* and *D* also, risking alphabetical overkill, but I intend thereby only to make some precepts of moral ethics clearer and perhaps more memorable. If there is one principal thesis in what is to follow, it is this: Military ethics is about *our* learning what is good and true and then having the courage to do and be what and who we ought to. For military ethics is not about *his* or *her* successes or failures; it is not about *their* virtues or vices. Military ethics is about *our* heritage and history, and it is about *our* responsibility to be men and women of character.

The Three *O*s

Military ethics is rooted in three *O*s: owing, ordering, and oughting. (OK, so I am fudging a little on the third one!) About a decade ago, the movie *Saving Private Ryan* appeared. In it, Capt John Miller of the US Army leads a patrol during World War II to save Private Ryan, all of whose brothers have already been killed. Miller and his soldiers, dying in the effort, do manage to save Ryan. Miller has given Ryan "life," and the dying captain wants young Ryan to make his life count and instructs him to "earn this . . . earn it." Many years later, an aging Ryan returns to France to visit the military cemetery where his captain is buried. He "tells" the captain that not a day goes by that he doesn't think of the sacrifice of Miller and his men so that he could live. He turns to his wife, plaintively asking whether he has, in fact, kept the faith. Has he "earned it"? Has he lived up to the charge given him so many years earlier by his dying captain?

Military ethics based upon "me-ism" or "egotism" cannot function. Military ethics is about knowing whom and what we owe. Like Private Ryan and then Mr. Ryan, airmen must understand that they owe a debt of gratitude to their country, families, services, chain of command, and comrades. That is exactly what is meant by "service before self" (in the Air Force), "selfless service" (in the Army), or "commitment" (in the Navy and Marine Corps). Military ethics cannot properly exist without the concept of owing. If we know why we owe what we do, we are able to recognize the obligation, responsibility, and duty which give rise to moral thinking and ethical reasoning. If I think I owe nothing to anyone, then I am a moral psychopath unable to distinguish the basis of honor, which is an understanding of my moral indebtedness to those who have given me life and learning.[1] Indeed, without a sense of owing, I am little more than a self-indulgent child, of whom we say, quite properly, that "he has no sense of responsibility."

Neither can military ethics properly exist without the concept of ordering. By *ordering*, I do not mean telling subordinates what to do. I refer, instead, to moral structuring and ethical priorities. In the movie *A Few Good Men*, a Marine lance corporal tells his lawyers that the "code" is based upon "unit, corps, God, country." He has it, of course, all wrong. In fact, many illegal activities or stupid mistakes in the military services are the result of leaders' failures to order wisely and well.

In the meantime, let us suppose that our Marine lance corporal attended Officer Candidate School and has now risen to the rank of, say, lieutenant colonel. He is about to appear before a congressional committee to testify about a weapons system which still has a kink or two—but one which the Marine Corps may really want. Is it all right for him to withhold crucial information about that weapons system from the committee that might terminate it? Or even to lie to them about it? Of course it is—*if* we put "corps" ahead of "country." Please: I am *not* saying that the Marine

Corps should or would agree to the colonel's deception or lies. But if the colonel's sense of ordering were that anything the corps wants the corps should have because the USMC is more important than the country, we are looking at potential ethical disgrace and disaster. By the way, just to be clear, I have never known a senior Marine Corps officer who thinks that way.

Before getting to the third *O*, let me suggest that the way to think about the *O*s is in the context of three *P*s: *principle* (truth-telling and honor) first; *purpose* (mission accomplishment and duty) second; and *people* (countrymen, airmen, and soldiers) third. We know that military ethics demands that we look out for more than ourselves. An ancient military leadership principle, after all, is "know your troops and look out for their welfare"; but there is much more to it than just that. If military leaders put their people first, then the armed services would be little more than morale, welfare, and recreation operations. The point, though, is that the proper ordering, in my view, is God, Country, Corps (or Air Force), unit.[2] A great deal of ink has been spilled over the question of "purple" officers. I am not trying to argue the case here for or against "jointness," but I am only saying that every leader ought to be able to see on his BDUs that before the name of his or her service come two letters—*US*. That makes my point.

As I mentioned, the third *O* stands for *oughting*, by which I mean an understanding of what airmen or soldiers *should* do or *ought* to do. The three *R*s which follow are the guidelines to oughting, but the key for military ethics is this: What airmen do may not be the same thing as what they ought to do. Sound simple? Yes, but it isn't, for military hierarchies sensibly insist upon obedience to orders and upon prompt, total discipline. Ethics, however, demurs, insisting upon conditional and contextual obedience to orders, which ought to be obeyed if lawful. So there is often, but not always, tension between the demands of military authority (or command) and the demands of ethical judgment (or conscience). So we have here not just what *is* (which is might and power or the man-made or positive law) but also what ought to be (which is right or ethics or the natural or moral law).[3] Some things we cannot deny knowing, for anyone of normal mental and moral development must understand certain things (such as knowing that the slaughter of the innocent is wrong).

> *It is a defense to any offense that the accused was acting pursuant to orders unless the accused knew the orders to be unlawful or a person of ordinary sense and understanding would have known the orders to be unlawful.*
>
> —*Manual for Courts-Martial,* Rule 916

One does not have to become embroiled in theology or philosophy here, for an AF pamphlet titled *International Law—The Conduct of Armed Conflict and Air Operations*, states the matter plainly: "The fact that an act was committed pursuant to military orders is an acceptable defense only if the accused did not know or could not reasonably have been expected to know that the act ordered was unlawful. Members of the armed forces are bound to obey only lawful orders."[4]

In simple English, then, there can be no proper military ethics without a sense, not merely of what we have been ordered to do, but also of what we ought to do. I said that military ethics is necessary, but I did not say that it is simple.

The Three *R*s

So what guidance can we give airmen as they sort out owing, ordering, and oughting? This is where the three Rs come in—not reading, 'riting, and 'rithmetic, but *rules*, *results*, and *realities*. Unless there were rules, we would have to say that we know little or nothing about ethics. (In fact, there are some scholars who—in my view, mistakenly—would say exactly that.) Rules are minicourses in, or compressions of, ethical guidance. Much of what is, or passes for, ethical education amounts to our teaching rules, which are shorthand moral prescriptions, to our children,

our students, or our cadets. The scholarship, jurisprudence, and wisdom of the ages become the theory of *just war*, which, in turn, becomes the *law of war,* which, in turn, becomes *rules of engagement*.

Oughting tells us that some things we must know; correlatively, some things we cannot not know.[5] But let's understand too that we cannot invent clear rules that govern every circumstance. That is not to say that such moral guidance doesn't exist—consider, for example, the ancient rule that we should treat others as we wish to be treated—but the more ground it covers, the "thinner" it must become. Even the Golden Rule, which depends upon good reason, fails if the one doing the thinking is deranged or sadistic. Rules are therefore very important, but we cannot create military ethics on the basis only of rules, however valid or virtuous they may be, for they are not a moral "logic tree" or an ethical calculator.[6]

Over the years of teaching military ethics, I have found that many, if not most, senior officers lean toward utilitarianism. What matters is the outcome, the bottom line, and the consequence—thus the second *R* of *results*. Ethics instruction frequently amounts to little more, really, than this: Choose the greater (or greatest) good.[7] That is a seductive instruction for military professionals who are and—up to a point—should be concerned with results. (Intelligence, in particular, is driven by a bottom-line concern.) The difficulty with this approach to ethics, of course, is that it ignores a *rule*: The ends do not justify the means. Although this rule can be debated, I think most of us will agree that even good ends can't justify *all* means or *any* means. Would you want as a friend—let alone as a senior commander—someone whose view of ethics is that the only thing that matters is getting a good officer performance report, or passing the inspection, or even winning the battle at *any* cost, regardless of the price, suffering, or deaths involved? Cadet codes of honor, for example, rightly teach that lying, stealing, and cheating are wrong—which is to say that certain means (cheating) are wrong even though the end in sight (passing a test) may be good in itself. Many choices in military ethics are defective precisely because airmen or soldiers forget or ignore the idea that, almost without exception, the end does not and cannot justify the means.

> *What is good for us is not just to choose freely but freely to choose what is good.*
>
> —Professor Alfonso Gomez-Lobo
> *Morality and the Human Goods*

But did you notice the weasel words "almost without exception"? Here we meet our third *R—realities.* Lying is wrong. But would you lie to a Nazi if you owned a house in Warsaw in 1939 and he knocked on your door, asking if you had seen two fugitive Jews (whom you were hiding in your basement)? Of course you would, for you recognize the importance of the situation, circumstances, or realities.[8] Some would say that rules are inadequate and that we cannot predict outcomes; therefore, all we have with which to make ethical judgments are the exigencies of the moment. This is known as "situation ethics," a moral view I strongly deny—and one I am not trying to defend here. Circumstances condition our choices, I think, but they do not and should not determine such choices. We do know some things (rules), and we often can reasonably predict outcomes (results); but, of course, we do take into consideration present realities. The Nazi knocking on my door in 1939 is not entitled to the truth, and I will lie to him, knowing that a literal-minded devotion to the idea here of the *rule* "do not lie" will *result* in the *reality* of a gross miscarriage of justice—the likely murder of those two Jewish people. Prudential judgment—not situation ethics, utilitarianism, or even rule-based thinking—informs my conscience here, and I choose to save the Jews by lying.

This is a case of what I have elsewhere called "dueling duties."[9] In the case of lying to the Nazi, I know I owe loyalty to the security of the Jews before I owe loyalty to telling truth to a Nazi who doesn't deserve it, and I order my priorities in that manner, deciding what I ought to do by reasoned moral judgment. I have two duties—one to save the Jews and the

other to tell the truth. The rule of truth telling finds exception or exemption in this instantiation. But that does not release me, in the future, from the moral obligation of telling the truth.

If we know whom and what we owe; if we know how our loyalties should be ordered; and if we know what we ought to be and ought to do—then we must still marshal the courage to be a lady or a gentleman true to our formed consciences. I do not think of the late Frank Sinatra as a great philosopher, but his line from the song "Strangers in the Night"—"dobedobedo"—makes profound ethical sense. For we become what we do and we do what we become (fig. 1). So we fashion for ourselves either a virtuous or a vicious square.

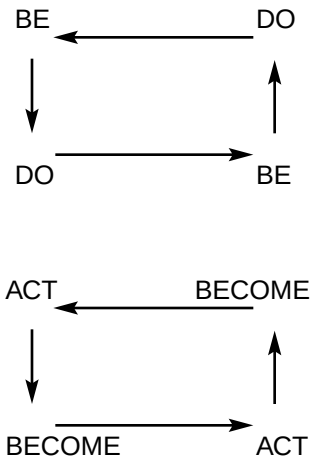


Figure 1. Act—Become—Act—Become

Every time we act, we become what we have done. In a sense, I become what I do, and then I do what I have become. Sensible people do not want to think of themselves as liars even though they may have lied at one time or another. If we think that, by telling a lie, we are becoming liars (not just committing an act), we are much more unlikely to do what we should not do, lest we become what we do not want to be. In this process of moral reasoning, we are, in effect, thinking about owing, ordering, and oughting.

The Three *D*s

The three *O*s work in conjunction with the three *D*s: We must try to *discern* the truth; at appropriate times, we *declare* the truth, as we have discerned it; and then we *do* what we have discerned and declared (fig. 2).

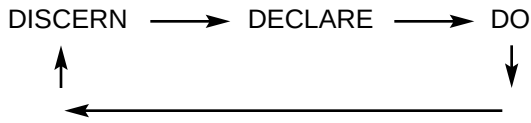


Figure 2. Three *D*s

Consider the name we give to someone who says (declares) one thing but does something different: hypocrite. Although the three *R*s are useful, the best ethical reference I know is a man or woman of noble character. Such people—not paid "ethics industry" consultants or newspaper ethics columnists—should be your moral touchstone, a point Aristotle made 2,300 years ago (and without a Web site, a speaking fee, or a regular column in a periodical or newspaper!).

> *Persons of strong character are the ultimate resource for any military organization, and they are by definition persons of integrity-—individuals whose actions are consistent with their beliefs.*
>
> —Col Anthony E. Hartle, USA
> *Moral Issues in Military Decision Making*

The three *D*s tell us that we have *a moral charge to educate ourselves* as best we can in light of the truth, to speak up for truth, and then to act in truth. One more *D* actually comes into play here, for this is a process of moral *decision*, a word that the dictionary tells us means "the idea of coming to a conclusion after some question, talk, or thinking over." In fact, the word *decide* comes to us from the Latin meaning to "cut off," for we cut ourselves off from alternatives that we reject as unworthy of what we should do or of who we are.

We "cut ourselves off" from deception and distortion, from prejudice and self-promotion, from lies and lunacies, and we seek truth. For we cannot act as we should or be what we ought to unless we are grounded in what is true. Today's world, however, increasingly tells us that "truth is just a name we give to our opinions." As the scholar Felipe Fernandez-Armesto has put it, "Doubt is the truth of our times—the socially constructed, culturally engineered formula which arises from our own historical context—just as, according to relativism, the truth of every group is fashioned by its needs."[10] If that is correct (one can't say "true"!), then it is only a matter of time until the profession of arms itself becomes "self referencing"—that is, the military becomes its own final authority and ultimate standard, "fashioned by its needs," and then there will be no sense of right and wrong, of honor and shame, which transcends the military ethic and by which the deeds of the armed forces can be morally judged. In the Platonic dialogue the *Apology*, Socrates tells us that "the life which is unexamined is not worth living."[11] That assumes, of course, that there are standards and authorities against which one ought to measure his or her life. Without such authorities, one has only the impetus of one's ego as a moral criterion. By the same token, if the armed services have no ultimate standards by which to judge their actions and orders, we court moral and military disaster.

> *If we do not confront the soft relativism that is now disguised as virtue, we will find ourselves morally and intellectually disarmed.*
>
> —William Bennett
> *The Death of Outrage*

In Anton Myrer's novel *Once an Eagle*, the hero—a military officer named Sam Damon—instructs his son in "virtue ethics": "If it comes to a choice between being a good soldier and a good human being, try to be a good human being."[12] Military ethics is about each airman's being a good human being, because an Air Force of competence and character is made up of thousands of "good human beings"—people for whom truth and integrity are not "social constructs" but the very threads of the fabric of their lives. Such airmen know, as Gen John D. Ryan, Air Force chief of staff, put it on 1 November 1972, that "any order to compromise integrity is not a lawful order."[13]

What's It All About, Alfie? A Summary

What's It All About, Alfie? is a movie and the title of a Dionne Warwick song, a line from which is—"Is it just for the moment we live?" In the movie (and song) the question put to Alfie is asked and answered in a way rather unusual for the entertainment industry. I ordinarily refrain, however, from singing Sinatra and Warwick songs when I speak about ethics! Let me put a gloss on the answer given to Alfie.

We have tried to look at military ethics in terms of two—well, all right, three—letters: The *O*s tell us to think hard about whom we *owe*, to *order* those debts properly, and to *ought* ourselves accordingly—to have a "sure sense of *should*." We live at a time and in a society which increasingly tells us that there are no standards and no authorities to help us develop our three *O*s. We are told, instead, to regard as our ultimate standard the image we see every morning in our bathroom mirror. Not only is that morally mistaken, but it is also militarily ruinous, for any armed service which is based upon or rooted in its members' self-love is doomed to failure and disgrace.

So we can highlight two negative adages: *Be leery of loyalty* and *be suspicious of sincerity*. A loyalty *only* to self or *only* to gang or group (or even, by extension, *only* to service) is dangerous. Loyalty must flow from an ordered sense of ultimate obligation: God, country, corps or Air Force, unit (or principle-purpose-people). And, be suspicious of sincerity because the wolf of evil can easily vest itself in the sheep's clothing of sincerity, and good intentions must answer the test question of the ends or purposes served by those intentions. So we *discern* truth diligently; we *declare* our convictions, saying what we will do; and then we

consistently *do* what we say (or discernment-declaration-deed).

Two positive adages also suggest themselves. First, *will wisdom*. Ethics—to include military ethics—is not about prejudice; nor opinion; nor information; nor knowledge; nor even "processed knowledge," which we call "intelligence." Ethics—and all philosophy—are about wisdom, which may be defined as—well, what? How you define that word will determine your idea of owing, ordering, and oughting. But wisdom can be *willed;* it can be sought after; it can be pursued. And good men and women do desire it, seek after it, and pursue it. First, they will wisdom. Not for nothing, after all, does the biblical book of Wisdom tell us that "those who despise wisdom and instruction are miserable. Their hope is vain, their labors are unprofitable, and their works are useless."[14]

Second, good people value virtue, knowing the logic of the ancient proverb that "virtue exalts a nation, but sin is a people's disgrace."[15] Everyone has values, but not everyone has virtue, which is a habitual desire to do what ought to be done and thus to become what one should be (taking us back to dobedobedo!). The four classical, or cardinal, or natural, virtues were wisdom or prudence, justice or truthfulness, moral and physical courage, and self-control or temperance. By understanding the three *R*s (rules to live by, a thoughtful attention to probable consequences or *results*, and situational awareness or *realities*), one forms the habit of detached moral analysis, of circumspect ethical reasoning, and of virtuous deeds. In a word, this is *character*.[16] Character is merely virtue in action.

Character, for example, is the commitment shown by Private Ryan, who properly perceived a debt he had to Captain Miller and the squad which saved him in World War II; he properly ordered his life as a result, reflecting often upon the example set for him; and he acted in the light of that reflection, as he should have. Truly, the good life led by "Private Ryan"—fulfilling and ennobling as it was for him and his family—was the result of his being able to see things *in perspective.* My dictionary defines *perspective* as "a view of things or facts in which they are in the right relation." So, Alfie, I think that is what it's all about! That, in essence, is also what military ethics is all about: Defending the national interest and protecting the innocent with the discrimination and proportionality which flow from seeing things or facts "in which they are in the right relation." And what, exactly, is "right relation"? Here is an Air Force illustration.

A number of years ago at the Air War College, the commandant opened the year with some customary announcements and with the charge to the new students that they were to question and criticize all year long; for that was the reason they had been chosen to read and to study and to think for a year at a senior service institution. The general then added an admonition which I have never forgotten. He told the (mostly) US Air Force students to challenge the speakers, and the readings, and the presented doctrines to their hearts' content, provided that the Air Force officers, in their criticisms, never blamed an ambiguous *them,* instead of *us* (i.e., including the students themselves). For it is *our* Air Force, he said, and not *theirs;* it is about *us,* and not about *them.* That is "right relation."

Military ethics, therefore, is not about *them;* it is about *you*—and about *your* knowing what is true, and doing what is right, and being the man or woman who leads the kind of life you would lead if, every day, you remembered that someone named Captain Miller had saved you from death many years before. And what do we think of all those who served the nation and who wore the uniform before us? Did they not give us a republic, if we can keep it? Did they not tell us about our government "of the people, by the people, for the people"? Did they not tell us to ensure "the survival and the success of liberty"? And did they, in effect, not tell us to "earn [all] this"? Or has our history come to this, that *they* are dead and forgotten, while *we* are alive and forgetting? Can it be that the beginning of military ethics is *to remember?* □

Notes

1. Plato has Socrates make this point in the *Crito*, 360 B.C. A translation by Benjamin Jowett can be found on-line, Internet, 18 March 2003, available from http://classics.mit.edu/Plato/crito.html.

2. Compare Acts 5:29: "We must obey God before men."

3. The concept of the natural or moral law can be found, for example, in Rom. 2:14–15; Ezek. 11:19, 36:26; and Jer. 31:33.

4. Air Force Pamphlet (AFPAM) 110-31, *International Law—The Conduct of Armed Conflict and Air Operations*, 19 November 1976, 15-6.

5. I am indebted to J. Budziszewski for this insight. See J. Budziszewski, *The Revenge of Conscience* (Dallas, Tex.: Spence Publishing Co., 1999), xvi. See also Peter Kreeft, *How to Win the Culture War: A Christian Battle Plan for a Society in Crisis* (Downers Grove, Ill.: InterVarsity, 2002).

6. Rule-based thinking is deontological ethics, associated with Immanuel Kant (1724–1804).

7. Outcome-based thinking is teleological or utilitarian ethics, associated with Jeremy Bentham (1748–1832) and with John Stuart Mill (1806–1873).

8. Sometimes termed *situation ethics* and associated with Joseph Fletcher (1905–1991).

9. James H. Toner, *Morals under the Gun: The Cardinal Virtues, Military Ethics and American Society* (Lexington, Ky.: University Press of Kentucky, 2000), 82–85.

10. Felipe Fernandez-Armesto, *Truth: A History and a Guide for the Perplexed* (New York: St. Martin's Press, 1997), 204, 206. Fernandez-Armesto is simply saying that many today hold that truth is what we call our opinions; he does not agree with that view.

11. Plato, *Apology*, 360 B.C. A translation by Benjamin Jowett can be found on-line, Internet, 18 March 2003, available from http://classics.mit.edu/Plato/apology.html.

12. Anton Myrer, *Once an Eagle* (New York: Holt, Rinehart, and Winston, 1968).

13. Quoted in Malham M. Wakin, ed., *War, Morality, and the Military Profession*, 2d ed. (Boulder, Colo.: Westview Press, 1986), 180.

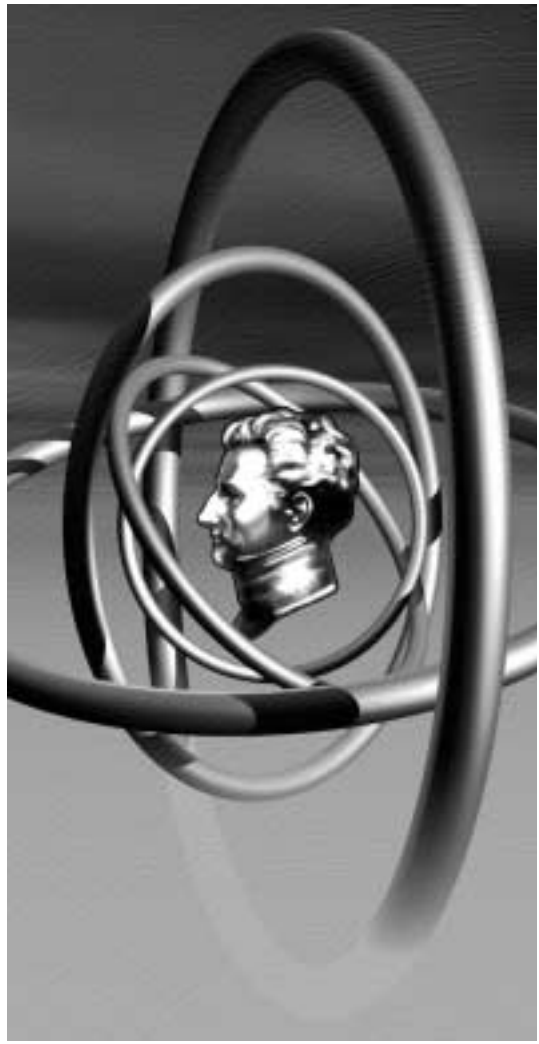
14. Wisd. of Sol. 3:11, New Revised Standard Version. Wisdom, a book of the Old Testament is grouped with other writings referred to as either Deuteroncanonical or Apocryphal; it was included in the original King James Bible of 1611 but is often not included in today's protestant Bibles.

15. Prov., 14:34, New American Bible.

16. I highly recommend James Davison Hunter, *The Death of Character: Moral Education in an Age without Good or Evil* (New York: Basic Books, 2000). I know that a number of ethical consultants, institutes, seminars, and one-day or weekend workshops promise miracle cures for businesses and others willing to pay great chunks of money for these services. There is no royal road to character, however, and it is certainly not developed by "ethics gurus" who are modern sophists and shills for the new national ethics industry. The best ethics consultant I know died nearly 2,000 years ago, and other great ones died more than 2,000 years ago. Their books (e.g., Aristotle's *Ethics*) are available in any good bookstore, and these thinkers do not charge exorbitant speaking and consulting fees!

"Reining in" the Center of Gravity Concept

LT COL ANTULIO J. ECHEVARRIA II, USA



Editorial Abstract: The US military has often debated the true meaning of centers of gravity as developed by Clausewitz. We find our Air Force, Army, Navy, and Marine Corps in varying degrees of conflict, but the debate draws no closer to a resolution. Using a three-step process, Lieutenant Colonel Echevarria provides a detailed explanation of how we can fully comprehend centers of gravity and use them to our benefit.

FOR NEARLY TWO decades, the US military has struggled both to understand the center of gravity (COG) concept as developed by the Prussian military theorist Carl von Clausewitz and to find practical ways to apply it.[1] The volumes of research papers and other studies that fill the shelves of service schools and war colleges testify to both the level of our interest and the intensity of our struggle. Despite all of that, we are not there yet. The vast literature on the COG reflects a variety of individual and service perspectives. The US Marine Corps—a relatively small force designed for expeditionary, ship-to-shore operations—prefers to strike at enemy weaknesses. Accordingly, it tends to equate enemy COGs with key vulnerabilities.[2] In contrast, the US Army, which has the role of fighting large-scale battles and winning major wars, sees the enemy's COG as a "source of strength."[3] It tends to look for a single COG, normally the principal capability—the opponent's land force—that stands in the way of marching on the enemy's capital. Likewise,

charged with the mission of winning maritime wars, the Navy initially had a concept of the COG that resembled the Army's. Navy doctrine defined a COG as "something the enemy must have to continue military operations—a source of his strength, but not necessarily strong or a strength in itself. There can only be one center of gravity."[4]

In keeping with views espoused by some of the early airpower theorists, such as Billy Mitchell and others at the Air Corps Tactical School at Maxwell Field, Alabama, the US Air Force tends to see COGs as "vital centers" located deep in the enemy's heartland.[5] In fact, John Warden, arguably the most well-known modern airpower theorist, has gone so far as to say that COGs exist within each of the five component parts (or rings)—leadership, organic essentials, infrastructure, population, and fielded forces—that describe any strategic entity.[6] Warden defines a COG as "that point where the enemy is most vulnerable and the point where an attack will have the best chance of being decisive."[7] His principal argument is that airpower has the unique capability to strike at such COGs simultaneously through "parallel"—as opposed to sequential or serial—attacks, which can overwhelm and paralyze an opponent and thereby prove decisive. Thus, the theory of parallel attack goes hand in hand with the view that multiple COGs exist. The one tends to reinforce the other. Air Force doctrine followed suit.[8]

Each of the competing definitions of the COG has merit. However, as the Gulf War (1990–91) demonstrated, the lack of a single, coherent definition of a COG can lead to potentially serious problems with regard to joint planning and resource allocation. In the early stages of the conflict, Gen H. Norman Schwarzkopf, combatant commander of US Central Command, had a different notion of the enemy's COG than did Gen Charles A. Horner, his joint air force component commander. Schwarzkopf saw three distinct COGs: Saddam Hussein; the Republican Guard; and Iraq's nuclear, biological, and chemical capabilities. Horner, however, identified 12 "target sets"—ranging from national leadership and command and control to railroads, airfields, and ports—each of which corresponded to a COG.[9] Although the leaders eventually agreed upon three COGs—strategic leadership; military forces (Republican Guard); and the nuclear, biological, and chemical capability—they lost much time in the process.

Unfortunately, joint doctrine has still failed to resolve the differences in these competing views, preferring instead to construct a definition that includes aspects from each of the services' definitions. Joint Publication (Pub) 3-0, *Doctrine for Joint Operations*, for example, defines COGs as those "characteristics, capabilities, or locations from which a military force derives its freedom of action, physical strength, or will to fight."[10] Joint Pub 5-00.1, *Joint Doctrine for Campaign Planning*, based upon Joint Pub 3-0, defines the COG similarly but replaces "locations" with the phrase "sources of strength."[11] It also describes COGs as "those aspects of the adversary's *overall capability* that, theoretically, if attacked and neutralized or destroyed will lead either to the adversary's inevitable defeat or force opponents to abandon aims or change behavior" (emphasis added).[12] Although this definition takes the much-needed step of linking COGs to effects, joint doctrine still fails to address two key issues: (1) determining a combatant's COG, and (2) deciding whether he has one COG or multiple COGs.

Fortunately, by returning to Clausewitz's original concept, we can eliminate much of this uncertainty. As it turns out, both sides of the debate are right—and wrong! In the Clausewitzian sense, COGs are neither strengths nor vulnerabilities per se but focal points where certain forces come together. Moreover, the number of COGs—if, indeed, they exist at all—depends upon the nature (overall unity) of the combatant. COGs do not exist in all cases!

Clausewitz's Center of Gravity

The great Prussian military theorist appears to have derived his idea of the COG after being influenced by a series of lectures presented by German physicist Paul Erman, a professor at both the University of Berlin and

the Prussian *Allgemeine Kriegsschule* (war college).[13] Clausewitz served as director of the war college from 1818 to 1830, and we know that he and Erman had at least a cordial relationship during which they exchanged ideas related to the mechanical sciences.

In modern elementary physics, which was about the state of the mechanical sciences in Clausewitz's day, a COG represents the point where the forces of gravity converge within an object.[14] It is also, generally speaking, the point at which a force applied to an object will move it most efficiently. In other words, we will not waste any of our energy when we move the object. Striking at the COG with enough force can cause the object to lose its balance—or equilibrium—and fall. A COG, therefore, is *not* a source of strength but a factor of balance. A warrior's strength, for example, might derive from his muscles, brains, or weapons—or any combination of these—but they relate to his COG only insofar as he needs to be *balanced* to use them. Also, a COG is not a weakness. A warrior might be physically weak, intellectually challenged, or wanting for weapons, but these conditions have little to do with his equilibrium. Strictly speaking, then, a COG is neither a strength nor a weakness although striking it can compromise a strength or exploit a weakness. If one can direct a blow with enough force against the warrior's COG, he can be laid low, despite the sum of his strengths and weaknesses, because his COG is connected to those things by means of his physical body.

The concept is not without its problems, however. Depending on the circumstances, we might find it much easier to knock a warrior down by sweeping his feet out from under him rather than hitting him in his COG. Similarly, circumstances might not permit us to take up a position from which we can strike a blow at our adversary's COG, in which case we might have to settle for a blow against a vital organ—a head shot for instance. It is misleading, therefore, to think that *only* a blow against an adversary's COG will yield decisive results. Rather, the point is that, if it is strong enough, a blow against the COG will *usually* lay our opponent low.

Most of the US military's definitions of COGs derive from Sir Michael Howard and Peter Paret's English translation of Clausewitz's *On War,* especially book 6 ("Defense") and book 8 ("War Plans"). From these passages, we learn that a COG is "always found where the mass is concentrated most densely"; that it is "*the hub of all power and movement,* on which everything depends"; and that it emerges from the "dominant characteristics of both belligerents" (emphasis added).[15] Unfortunately, this translation, a portion of which is reproduced below, creates the false impression that COGs are akin to sources of strength:

> The first principle is that the ultimate substance of enemy strength must be traced back to the fewest possible *sources,* and ideally to one alone. The attack on these *sources* must be compressed into the fewest possible actions—again, ideally, into one. . . .
>
> The task of reducing the *sources* of enemy strength to a single center of gravity will depend on:
>
> 1. The distribution of the enemy's political power. . . .
>
> 2. The situation in the theater of war where the various armies are operating (emphasis added).[16]

In fact, a closer look at the German text shows that Clausewitz never uses the term *source (Quelle).* Instead, he advises tracing the full weight *(Gewicht)* of the enemy's force *(Macht)* to as few COGs as possible.[17] As in the previous physics example, the COG connects the warrior's various strengths without being a strength itself. A more literal translation of the above passage appears below:

> The first principle is: To trace the full *weight (Gewicht)* of the enemy's *force (Macht)* to as *few centers of gravity* as possible, when feasible, to one; and, at the same time, to reduce the blow against these centers of gravity to as few major actions as possible, when feasible, to one.
>
> Reducing the enemy's *force (Macht)* to one center of gravity depends, first, upon the [enemy's] political connectivity [or unity] itself . . . and,

> second, upon the situation in the theater of war itself, and which of the various enemy armies appear there (emphasis added).[18]

Further examination of Clausewitz's references to the COG throughout the German text of *On War* reveals, first of all, that the concept remains valid only where the enemy possesses sufficient "unity" or "interdependence" *(Zusammenhang)* to act as a single body:

> Just as the center of gravity is always found where the mass is most concentrated, and just as every blow directed against the body's center of gravity yields the greatest effect, and—more to the point—the strongest blow is the one delivered by the center of gravity, the same is true in war. The armed forces of every combatant, whether an individual state or an alliance of states, have a certain *unity* and thus a certain *interdependence* [or *connectivity*] *(Zusammenhang);* and *where such interdependence exists, one can apply the center of gravity concept.* Accordingly, there exist *within* these armed forces certain *centers of gravity which, by their movement and direction, exert a decisive influence over all other points;* and these centers of gravity exist *where* the forces are most concentrated. However, just as in the world of inanimate bodies where the effect on a center of gravity has its proportions and its limits determined by the interdependence of the parts, the same is true in war (emphasis added).[19]

In other words, before applying the concept in war planning, we must ask ourselves whether we can assume the enemy will act as a single entity. If so, we should look for connections among the various parts of an adversary or adversaries in order to determine what holds them together. In 1809, for example, Napoléon had to fight on two fronts—against Anglo-Spanish forces in Spain and Austrians in central Europe. Although they had a common enemy, the Anglo-Spanish and Austrian forces did little to coordinate their efforts. Hence, it would have been correct for Napoléon to look for two COGs—one on each front. As Clausewitz states, the degree of unity formed by military forces and the geographical spaces in which they have to fight can create *more than one COG*. He advocates tracing multiple COGs back to a single one whenever possible. Yet, he allows for the possibility that one specific COG might not exist. The key question we must ask, then, is whether the enemy's forces are *connected* sufficiently so that actions against him in one area will still have a decisive effect on him in other areas.

Second, just as in physics, the COG refers to the thing that holds the enemy's force together or, in a manner of speaking, that serves as a focal point. Indeed, when we reexamine the German text in one of the popular passages from book 8, in which Clausewitz describes the COG as it applies to war planning, we find that emphasis on the COG as a focal point becomes clearer: "What theory can admit to thus far is the following: Everything depends upon keeping the dominant characteristics of both states in mind. From these emerge a certain center of gravity, a *focal point (Zentrum)* of force and movement, upon which the larger whole depends; and, it is against the enemy's center of gravity that the collective blow of all power must be directed" (emphasis added).[20]

To find the COG in any particular situation, then, we must look for the thing that provides a certain *centripetal* or center-seeking force (as opposed to *centrifugal*, which is outward-seeking) for the enemy. Clausewitz points out, for example, that in the February 1814 campaign against France, the allies' COG lay more with Prussia's Field Marshal Gebhard Leberecht von Blücher than with Austria's Prince Karl Philipp von Schwarzenberg, even though the latter had a larger army (140,000) than the former (100,000). "Blücher," Clausewitz explains, "although [numerically] weaker than Schwarzenberg, was nonetheless the more important adversary due to his enterprising spirit; hence, the center of gravity lay more with him and *it* pulled the others in his direction" (emphasis added).[21] In the actual campaign, Napoléon's force (75,000) first defeated Blücher's Prussian army and then turned on Schwarzenberg's Austrians, driving them back. Nonetheless, both Blücher's and Schwarzenberg's armies recovered and defeated Napoléon one month later.[22] Clausewitz criticizes Napoléon's decision, arguing that the French emperor should have fought Blücher—the allies' COG—until the Prussian

force was completely defeated. Such a victory, in Clausewitz's view, would have induced the Austrians to withdraw as well. As in the mechanical sciences, therefore, Clausewitz's military COGs have a centripetal quality; they represent a *focal point*—a location where forces come together.

Clausewitz gives several examples of such focal points. The COGs of Alexander the Great, Gustavus Adolphus, Charles XII of Sweden, and Frederick the Great, for instance, resided in their respective armies. In different circumstances, the personalities of key leaders, a state's capital, or a network of allies and their community of interest might serve as COGs.[23] What all of these various elements have in common is *not* that they are sources of power but that they perform a centripetal or centralizing function that holds power systems together and, in some cases, even gives them purpose and direction. Strictly speaking, an armed force is not a "source" of power. Rather, it serves as a focal point that draws and organizes power from a variety of sources: a population base (recruits), an industrial base (weapons and materiel), and an agricultural base (foodstuffs). The same holds true for the personalities of key leaders, state capitals, or alliance networks: they draw raw power from different sources and organize, refine, and redirect it.

Furthermore, Clausewitz's COG focuses on achieving a specific effect—the total (or strategic) collapse of the enemy. Hence, it is an effects-based approach rather than a capabilities-based one, and it applies only to one level of warfare—the strategic. To be sure, effects and capabilities are linked. Attacking specific capabilities produces certain effects. Achieving certain effects often requires attacking specific capabilities. Indeed, we could say that they represent the proverbial two sides of the same coin. In the capabilities-based approach, the first step is to identify the key enemy strength or capability that could prevent us from achieving our objective. In the effects-based approach, the first step is to identify the effect we want to achieve and then determine what actions we should take to achieve it. Frequently those actions might go well beyond merely neutralizing or destroying specific capabilities. In a manner of speaking, the capabilities-based approach seeks a negative aim—*destruction* of a certain capability. The effects-based approach, on the other hand, pursues a positive aim because it seeks to *create* a certain effect. The US military has gotten into the habit of narrowly focusing on the former approach. It could well benefit from pursuing the latter.

Clausewitz's effects-based COG resembles the emerging concept known as effects-based operations (EBO), which, as Gen Anthony Zinni, USMC, retired, has remarked, forces political and military leaders to determine what specific effects they want military (and nonmilitary) action to achieve.[24] For Clausewitz, the desired effect and the military objective—total collapse of the enemy—are always the same. Like EBO, Clausewitz's COG requires the ability to predict, with some reasonable probability, how to achieve at least first- and second-order effects—and possibly more. That said, it is important to point out that Clausewitz eschews prescriptive formulae and considers the calculation of a COG a matter of "strategic judgment" *(strategische Urteil)* at the highest levels.[25] It is a matter of judgment, and, given Clausewitz's distaste for prescriptive formulae, it is doubtful that he would have approved of some of the current efforts to develop them by means of new kinds of information technology and software. Educating senior leaders to develop their strategic judgment in order to make such determinations, however, was something he certainly would have supported since this theme runs consistently throughout *On War*.

It is worth noting that Clausewitz does not distinguish among tactical, operational, or strategic COGs. As in physics, an individual body can have only one COG at a time. Clausewitz defines the COG by the entire system (or structure) of the enemy—not by a level of war. A local commander might determine a COG for the portion of the enemy's forces arrayed before him, providing those forces are sufficiently removed from the remainder

of the enemy's forces. However, this separate COG would amount to only a *local* rather than a tactical or operational COG. In order for us to speak of an opponent's tactical or operational COG, he would have to have an independent existence at each of those levels of war. Use of the COG concept should have a unifying effect—pulling all tactical and operational efforts toward the strategic end. "Salami-slicing" a COG into tactical, operational, and strategic pieces only stretches the concept to mean everything—and therefore nothing.

In addition, Clausewitz emphasizes that we should look for COGs only in wars designed to defeat the enemy completely. Only the vast amount of energy and other resources that go into wars aimed at achieving decisive victory can cause COGs and their areas of influence to emerge.[26] Perhaps more important, in such wars military and political objectives—the total political and military defeat of the enemy—essentially complement one another. We want to achieve the total collapse of the enemy, so we strike at his COG. In limited wars, on the other hand, COGs tend to compete with the typically more restricted political objective(s). For example, under Clausewitz's concept, determining the Iraqi COG during the Gulf War would have been unnecessary since it was a limited war—not one aimed at regime removal. Simply translating the war's strategic objectives—expulsion of Iraqi forces from Kuwait and reduction of Iraq's offensive capability—into operational and tactical objectives should have given coalition forces all the operational guidance they needed for success.[27] This is not to say that the COG concept can only apply in wars of annihilation but to point out that it is neither appropriate nor necessary in all cases.

In sum, Clausewitz's COG is a *focal point*, not a strength or a weakness—or even a source of strength. Second, COGs are found only where sufficient connectivity exists among the various parts of the enemy to form an overarching system (or structure) that acts with a certain unity, like a physical body. Unless the enemy's parts have sufficient connectivity, he may not necessarily have a COG at all. Third, COGs possess a certain centripetal force that acts to hold an entire system or structure together. A blow to the enemy's COG would throw him off balance or, put differently, cause his entire system (or structure) to collapse. Fourth, the concept necessitates viewing the enemy holistically, as a system. Finally, identifying COGs is not appropriate for all types of wars. It is also important to remember that Clausewitz's COG concept rests on the assumption that an opponent's COG, if it exists, can be identified and is accessible.

Toward a Simple Method

Getting the definition of a COG correct, however, is only half the battle. War planners need a practical method for determining a specific adversary's COG.[28] The method should be simple, in keeping with Clausewitz's dictum that in war even the simplest thing is difficult, yet it should make use of the best intelligence available and accommodate revision as the result of rigorous analysis.

Step 1: Determine Whether Identifying and Attacking a COG Is Appropriate for the Type of War We Are Going to Wage

For example, the campaign against Al Qaeda, though part of the larger global war on terrorism, is essentially a war that, for the United States at least, cannot end without the neutralization or destruction of that group; hence, it is the kind of war in which the identification and pursuit of a COG serves a constructive purpose.

Step 2: Determine Whether the Adversary's Whole Structure or System Is Sufficiently Connected to Be Treated as a Single Body

Al Qaeda has numerous cells operating globally, most of which do not know of the others' existence. At least some of these cells—or certain individuals within them—appear to be linked to the group's leadership by networked electronic communications. Messages and commands are thus passed via the Internet, cellular phones, and other electronic de-

vices. It is also possible that a fair number of cells already have orders—and have had them for some time—that they will attempt to execute at a certain time and place if they receive no other orders to the contrary. Thus, the physical links are only intermittent at best. Successful operations against Al Qaeda cells in Europe will not likely cause those in Singapore to collapse. However, the group's psychological—or ideological—links appear strong. Even if they are not particularly well linked physically, the cells do have fairly strong ideological ties. We might do better, therefore, to seek an ideological COG.

Step 3: Determine What Element Has the Necessary Centripetal Force to Hold the System Together

One ideological element does appear to have sufficient centripetal force to hold Al Qaeda together—its avowed "hatred of apostasy."[29] That hatred, rooted in a radical branch of Islam—rather than Osama bin Laden or another individual leader—probably serves as the group's COG. Admittedly, bin Laden laid much of the groundwork to establish Al Qaeda, but it does not appear that his removal will cause his organization to collapse. Most analysts and intelligence sources claim that if bin Laden were captured or killed, another leader would simply take his place. That leader can only turn out to be either more or less effective than bin Laden. Thus, Al Qaeda's leadership really amounts to a center of *critical capability*—something we want to neutralize but not something, in itself, that will end the war.

Instead, the hatred of apostasy is what draws raw power—recruits, money, and the support of other states—and serves to motivate Al Qaeda's members to wage their particular style of asymmetric warfare. It will likely continue to do so after bin Laden is removed. Decisively defeating Al Qaeda will require neutralizing that COG—that hatred of apostasy. However, doing so will mean employing the diplomatic and informational elements of national power as deliberately, if not more so, as the military one. It is a campaign that will also require the support of moderate branches of Islam.

Recommendations for Air Force Doctrine

If the Air Force is to put its doctrinal definitions of the COG more in line with Clausewitz's idea and thereby bring the concept back under control, Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine;* AFDD 1-2, *Air Force Glossary;* and AFDD 2, *Organization and Employment of Aerospace Power* (as well as Joint Pub 3-0 and Joint Pub 5-00.1, mentioned previously) should redefine the COG to mean a *focal point*. AFDD 1 and AFDD 1-2 mostly reiterate the flawed definition in Joint Pub 3-0, but AFDD 2 comes closer to the true sense of COGs, stating that they are "those centers of power that if defeated or disrupted will have the most decisive result."[30] However, the definition has two problems. First, one can construe centers of power as centers of strength, rather than those things that have enough *centripetal* force to hold everything together and that provide the enemy's raw power with purpose and direction. Second, results are either decisive, or they are not—they include defeat of the enemy and achievement of our objectives, or they do not. In war, a decision is not a matter of degree.

War planners should refrain from applying the concept to every kind of war (or operation) so as to eliminate or reduce the competition that can occur between COGs and political/military objectives. We must ask ourselves whether the total military collapse of the enemy is commensurate with our political objectives and end state.

If it is, then war planners should identify the location of the connections—*and gaps*—in an enemy's entire structure or system before deciding whether a COG actually exists. In short, war planners must then determine whether the enemy (or enemies) has one, several, or no COGs. The COG concept does *not* apply in a situation in which the enemy is *not* connected enough to act with unity.

If a COG does exist, war planners must then determine whether it is accessible—that is, whether it can be attacked. If not, they must decide if another point (or points) exists that, if attacked, will lay the enemy low—the equiva-

lent of a head shot, for example. If the answer is still no, political and military leaders should assess the risks involved before committing to the conflict, if possible. The risk of defeat or failure may be too high unless we can create more favorable circumstances by adding allies and other resources to our cause.

AFDD 2's thought process for developing and attacking a COG (fig. 1) makes the error of deriving the COG from political/military objectives rather than from the nature/character of the opponent(s) and does not include steps for determining whether a COG is desirable or even whether it exists. That process should be modified to reflect the fact that COGs do not exist in all cases (fig. 2). Even when they do, it may not be necessary—or desirable—to attack them in order to achieve our objec-

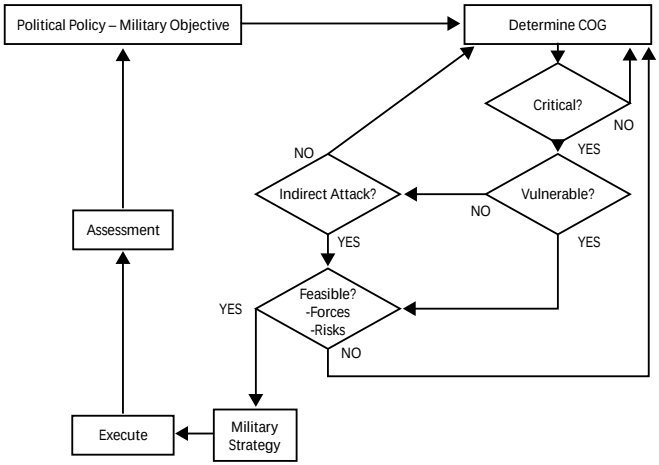


Figure 1. Developing and Attacking a COG (From AFDD 2, *Organization and Employment of Aerospace Power,* 17 February 2000, 91)

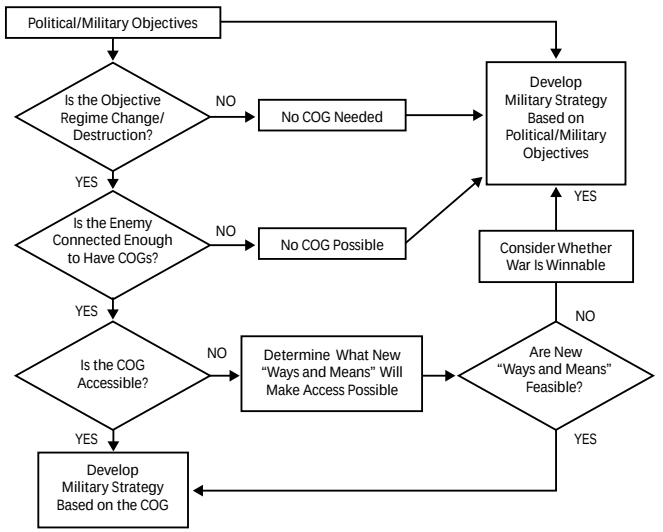


Figure 2. Determining Whether a COG Applies

tives. Furthermore, the thought process should include a reconsideration of the wisdom of prosecuting a war in situations in which our opponent's COG is not accessible.

To be sure, the Air Force is under no obligation to accept a concept developed nearly two centuries ago by a military theorist who was influenced by a distant culture and who had different conceptual tools available to him. Yet, each of the services believes that its definition of a COG derives from Clausewitz's and that this concept has a timeless quality about it. We would do well, therefore, to return to the original idea and build upon that concept to reduce the confusion that it has produced and to give our war-fighting efforts more focus. □

Notes

1. Although Clausewitz's military concept of the COG originated in the 1820s, it only recently became popular in US military circles. Its first significant usage appeared in the 1986 edition of the Army's Field Manual (FM) 100-5, *Operations*, which defines the COG as the "hub of all power and movement" (179–80). At the time, doctrine writers were concerned with continuing the Army's transition from "active defense" to a new war-fighting concept—AirLand Battle—that called for closer ground-air coordination throughout the depth and breadth of the battlefield to defeat Warsaw Pact forces in western Europe. Thus, the strategic context of the Cold War, in conjunction with works by military authors such as Harry Summers *(On Strategy)* and William Lind *(Maneuver Handbook)* in the mid-1980s, prompted the resurrection of the concept. Clausewitz's notion of the COG offered NATO war fighters a conceptual tool for employing their limited resources for maximum effect—namely, to achieve decisive results against overwhelming numbers. However, the concept's introduction into Army doctrine caused a great deal of confusion since the examples used to illustrate COGs—key terrain, army boundaries, and lines of communication—in FM 100-5 essentially equated to Jominian "decisive points." The concept entered airpower theory with the writings of John Warden (see below) in the late 1980s, but here again the examples Warden used to illustrate it tended to equate more with "vital" or critical points than with Clausewitz's actual idea of the COG.

2. Recently, Marine Corps doctrine has distinguished between COGs and critical vulnerabilities, calling them different but complementary concepts. COGs are now "any important sources of strength." Marine Corps Doctrinal Publication 1, *Warfighting*, 20 June 1997, 45–47.

3. FM 100-5, *Operations*, 1993, 6–13. Compare this to the Army's new FM-3, *Operations*, 2001, 5–7, which now uses the joint definition described elsewhere in this article.

4. Naval Doctrine Publication (NDP) 1, *Naval Warfare*, March 1994, 35. Navy and Marine Corps doctrine have recently become more aligned due to the projected need to fight in the littoral; hence, the Navy has now made the linkage between COGs and vulnerabilities more explicit.

5. Lt Col Mark A. Clodfelter, "Molding Airpower Convictions: Development and Legacy of William Mitchell's Strategic Thought," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 79–114; and William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power—Economic and Military* (New York: G. P. Putnam's Sons, 1925), 126–27, 214.

6. Lt Col David S. Fadok, "John Boyd and John Warden: Airpower's Quest for Strategic Paralysis," in *The Paths of Heaven*, 372–73. More a synthesizer of his predecessors' ideas than an original thinker, Warden merged the views of Mitchell and the Air Corps Tactical School into a coherent theory of airpower. As part of that theory, he represents an adversary's component parts as concentric rings, earning himself the unofficial moniker of "Lord of the Rings."

7. John A. Warden III, *The Air Campaign: Planning for Combat* (Washington, D.C.: National Defense University Press, 1988), 9; and idem, "The Enemy as a System," *Airpower Journal* 9, no. 1 (spring 1995): 40–55.

8. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, September 1997, 79, uses the joint definition explained elsewhere in this article.

9. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, vol. 1, *Planning and Command and Control* (Washington, D.C.: Government Printing Office, 1993), 2, 145–47. See also the discussion in Seow Hiang Lee, "Center of Gravity or Center of Confusion: Understanding the Mystique," Wright Flyer Paper no. 10 (Maxwell AFB, Ala.: Air Command and Staff College, 1999), 18–19.

10. Joint Pub 3-0, *Doctrine for Joint Operations*, 1 February 1995, GL-4.

11. Joint Pub 5-00.1, *Joint Doctrine for Campaign Planning*, 25 January 2002, II-6.

12. Joint Pub 5-00.1 also stresses the importance of linking COGs to "critical vulnerabilities" so that one can attack the enemy's COG through weak points in his overall system rather than against his strengths. Ibid., ix.

13. Peter Paret, *Clausewitz and the State* (New York: Oxford University Press, 1976), 310–11.

14. Geoff Jones, Mary Jones, and Phillip Marchington, *Cambridge Coordinated Science: Physics* (Cambridge: Cambridge University Press, 1993), 52–55.

15. Carl von Clausewitz, *On War*, indexed ed., ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1989), 485–86, 595–96. Hereafter, *On War*.

16. Ibid., 617. In fairness to Howard and Paret, they admit that at times their translation was more interpretive than literal. They could not have foreseen the extent to which the US military would embrace the COG concept and adhere to their interpretation literally.

17. See Carl von Clausewitz, *Vom Kriege*, 19th ed. (Regensburg, Germany: Pustet, 1991). Hereafter, *Vom Kriege*.

18. Der erste ist: das Gewicht der feindlichen Macht auf so wenig Schwerpunkte als möglich zurückzuführen, wenn es sein kann, auf einen; wiederum den Stoß gegen diese Schwerpunkte auf so wenig Haupthandlungen als möglich zurückzuführen, wenn es sein kann, auf eine; endlich alle untergeordnete Handlungen so untergeordnet als möglich zu halten. Mit einem Wort, der erste Grundsatz ist: so konzentriert als möglich zu handeln. Der zweite Grundsatz: so schnell als möglich zu handeln,

also keinen Aufenthalt und keinen Umweg ohne hinreichenden Grund. Das Reduzieren der feindlichen Macht auf einen Schwerpunkt hängt ab: Erstens von dem politischen Zusammenhang derselben. . . . Zweitens von der Lage des Kriegstheaters, auf welchem die verschiedenen feindlichen Heere erschienen.

Vom Kriege, 1009–10.

19. So wie sich der Schwerpunkt immer da findet, wo die meiste Masse beisammen ist, und wie jeder Stoß gegen den Schwerpunkt der Last am wirksamsten ist, wie ferner der stärkste Stoß mit dem Schwerpunkt der Kraft erhalten wird, so ist es auch im Kriege. Die Streitkräfte jedes Kriegführenden, sei es ein einzelner Staat oder ein Bündnis von Staaten, haben eine gewisse Einheit und durch diese Zusammenhang; wo aber Zusammenhang ist, da treten die Analogien des Schwerpunktes ein. Es gibt also in diesen Streitkräften gewisse Schwerpunkte, deren Bewegung und Richtung über die anderen Punkte entscheidet, und diese Schwerpunkte finden sich da, wo die meisten Streitkräfte beisammen sind. So wie aber in der toten Körperwelt die Wirkung gegen den Schwerpunkt in dem Zusammenhang der Teile ihr Maß und ihre Grenze hat, so ist es auch im Kriege.

Vom Kriege, 810–11.

20. "Was sich die Theorie hier sagen kann, ist folgendes: Es kommt darauf an, die vorherrschenden Verhältnisse beider Staaten im Auge zu haben. Aus ihnen wird sich ein gewisser Schwerpunkt, ein Zentrum der Kraft und Bewegung bilden, von welchem das Ganze abhängt, und auf diesen Schwerpunkt des Gegners muß der gesammelte Stoß aller Kräfte gerichtet sein." *Vom Kriege*, 976.

21. "Weil Blücher, obgleich schwächer als Schwarzenberg, doch wegen seines Unternehmungsgeistes der Bedeutendere war, daß in ihm also mehr der Schwerpunkt lag, der das Übrige in seiner Richtung mit fortreißt." *Vom Kriege*, 324.

22. David G. Chandler, *The Campaigns of Napoleon* (New York: Macmillan, 1966), 960–76.

23. Alexander, Gustav Adolf, Karl XII, Friedrich der Große hatten ihren Schwerpunkt in ihrem Heer, wäre dies zertrümmert worden, so würden sie ihre Rolle schlecht ausgespielt haben; bei Staaten, die durch innere Parteiungen zerrissen sind, liegt er meistens in der Hauptstadt; bei kleinen Staaten, die sich an mächtige stützen, liegt er im Heer dieser Bundesgenossen; bei Bündnissen liegt er in der Einheit des Interesses; bei Volksbewaffnung in der Person der Hauptführer und in der öffentlichen Meinung. Gegen diese Dinge muß der Stoß gerichtet sein. Hat der Gegner dadurch das Gleichgewicht verloren, so muß ihm keine Zeit gelassen werden, es wieder zu gewinnen; der Stoß muß immer in dieser Richtung fortgesetzt werden, oder mit anderen Worten, der Sieger muß ihn immer ganz und das Ganze nicht gegen einen Teil des Gegners richten.

Vom Kriege, 976–77.

24. Christian Lowe, "In Exercise, U.S. Military Practices Unconventional Warfare," *Defense Week*, 21 May 2001, 2. For a definition of EBO, see US Joint Forces Command, J9 Joint Futures Lab, "Rapid Decisive Operations White Paper," coordinating draft (Norfolk, Va.: US Joint Forces Command, 9 August 2001), A-2, which defines EBO as "a process for obtaining a desired strategic outcome or 'effect' on the enemy, through the application of the full range of military and non-military capabilities at the tactical, operational, and strategic levels. An 'effect' is the physical, functional, or psychological outcome, event, or consequence that results from a specific action or actions." However, the Air Force currently has a vision of EBO that differs from that of the J9. Bruce Rolfsen, " 'Effects-Based Operations' Is New Way to Fight," *Air Force Times*, 7 May 2001, 27.

25. "Diese *Centra gravitatis* in der feindlichen Kriegsmacht zu unterscheiden, ihre Wirkungskreise zu erkennen, ist also ein Hauptakt des strategischen Urteils. Man wird sich nämlich jedesmal fragen müssen, welche Wirkungen das Vorgehen und Zurückgehen des einen Teiles der gegenseitigen Streitkräfte auf die übrigen hervorbringen wird." *Vom Kriege*, 810–11.

26. "Denn nur durch diese Entscheidung werden die Schwerpunkte der gegenseitigen Macht und die von ihnen ausgehenden Kriegstheater *wirksame Dinge*" (emphasis in original). *Vom Kriege*, 813.

27. These strategic objectives are condensed. The objectives for the Gulf War as outlined by President Bush were as follows: (1) withdrawal of Iraqi forces from Kuwait; (2) restoration of legitimate government in Kuwait; (3) assurance of security and stability of the Persian Gulf region; and (4) protection of American lives. Keaney and Cohen, 83–84.

28. Numerous methods, too many to list here, have been devised over the years. The "strategic helix" method, for example, involves attacking all potential COGs until the real one is hit. Put simply, this method amounts to a "recon by destruction" approach and assumes unlimited resources. For a detailed discussion, see Lee, 27–28. Similarly, the "onion method" amounts to little more than eating one's way through the multiple "layers" of the enemy's national power to get at the COG. Maj Collin A. Agee, *Peeling the Onion: The Iraqi Center of Gravity in Desert Storm* (Fort Leavenworth, Kans.: School of Advanced Military Studies, 1992), 26–27. Both of these methods assume that the enemy's COG lies *within* the helix or the onion.

29. Al-Qa'ida (the Base), on-line, Internet, 3 April 2002, available from http://www.ict.org.il/inter_ter.

30. AFDD 2, *Organization and Employment of Aerospace Power*, February 2000, 89.

The bottom line is: space is a place; it is not a mission. We are going to continue to do those things in space that we do in the atmosphere and on the ground and on the seas. WE are not going to go out and do those things in space just because the technology is there. . . . WE are going to do them because we can do them better from space, or we can do them more cost-effectively.

—Maj Gen John H. Storrie

Learning as a Weapon System

LT COL RICHARD R. BASKIN, USAF
DR. DEAN L. SCHNEIDER

Editorial Abstract: Instructional technologies are rapidly approaching a critical mass made up of a multitude of various systems. These technologies help us transform the military-training environment by treating learning as a weapon system. Lieutenant Colonel Baskin and Dr. Schneider take a close look at this learning process, discussing the components involved and the ways they combine to create an effective system.

INSTRUCTIONAL TECHNOLOGIES are rapidly approaching a critical mass made of computer infrastructures, virtual-reality technologies, modeling and simulation technologies, distributed-learning capabilities, and intelligent systems. Taken together, these technologies and capabilities create an opportunity to transform the military-training environment—by treating learning as a weapon system. By acknowledging at the system level that learning is a combination of training, education, and experience—each of which builds upon the others—we can realize many synergies and efficiencies to prepare our personnel. Treating learning as a weapon system recognizes humans as more than a functional component of any weapon system. Although learning is a continuous, lifelong endeavor, it is seldom fully analyzed. The most effective utilization of personnel involves preparing them with the necessary proficiencies at the right time and place. To do this, we must eliminate traditional "stovepipes" that tend to segregate the elements of learning.

The explosive proliferation of information systems created a warfare environment that required personnel to continuously update and/or upgrade procedures, equipment, and systems to meet operational threats. Each of these changes represents a learning burden. The need for just-enough/just-in-time/deployable learning to support the Air Force's

air and space expeditionary force (AEF) vision, along with the explosion of information and learning technologies, provides the opportunity to transform the military training and education environment from an enhancer to a critical enabler. Such transformation can occur only by treating learning from a strategic-visionary perspective instead of using a tactical-requirements approach.

We suggest viewing the continuum of learning from a strategic systems-engineering perspective and establishing an agile yet integrated system-of-systems approach to proactively develop, implement, and manage learning systems across the Air Force. The same revolution that spawned the explosive proliferation of information enables this approach, which will result in better insight and the use of economies of scale in corporate funding, reduced infrastructure barriers, and enhanced personnel management. Some hurdles to overcome include the "if it's not broken, don't fix it" mentality and the organizational changes necessary for properly managing learning as a weapon system.

Learning as a Weapon System: What Does It Mean?

As mentioned previously, learning is a combination of training, education, and experience, each of which builds upon the others. Training develops skills, along with the knowledge needed to utilize them. Education entails the learning of a discipline or subject in order to enable understanding, extrapolation, and application. Experience integrates training and education in an environment that is actual or simulated, controlled or uncontrolled. How does one go about creating an environment that supports learning? "According to the experts . . . [one must] disabuse workers of the notion that corporate learning is simply training, and especially classroom training. 'One of the tenets in the corporate learning organization is that the best training is experience,' says Calhoun Wick, author of *The Learning Edge*. 'Classrooms may be good settings for building basic skills and laying foundations,' observes Wick, 'but experience is where know-how is acquired.'"[1] Proficiencies result from the synthesis of training and education through experience. Some proficiencies require intense, repetitive exposure while other skills are less volatile and can be readily enacted with limited refresher training.[2]

Rapidly evolving threats and technological advances create an operational necessity for a continuous-learning environment. The need for just-enough/just-in-time learning capabilities to support a highly mobile and dispersed air force, combined with expanding information technologies, is driving us away from traditional schoolhouse mentalities. For years, we have used technology to "pave the cow paths" of instructional methodologies, focusing on the creation of marginal efficiencies within an instructional block, a course, or a family/series of courses. As a result, radical and transformational advances have proved elusive.

So what does *learning as a weapon system* really mean? In a nutshell, it means treating the development of Air Force personnel as a weapon system, which is created by using a systems-engineering approach and the best commercial practices. The Department of Defense (DOD) defines systems engineering as the design and management of a total system, which includes hardware and software as well as other life-cycle elements. This process needs to be agile in order to define, develop, and integrate systems, products, and processes simultaneously. The systems-engineering process transforms approved operational needs and requirements into an integrated system-design solution through concurrent consideration of all life-cycle needs. It ensures that the system definition and design reflect the requirements for all system elements (hardware, software, facilities, people, and data), as well as characterize and manage technical risks.[3] Using the best commercial practices will enable systems to evolve to meet a rapidly changing environment. In other words, a weapon system is designed from a strategic perspective.

From such a perspective, one sees how learning resembles a weapon system: based on operational needs and requirements, it contains instructional systems, exercises, experiences, and processes that demand development, integration, and management to efficiently and effectively produce the necessary operational proficiencies in Air Force personnel. At a recent Air Force Association National Symposium, Dr. James G. Roche, secretary of the Air Force, stated that his service wanted a new multimission aircraft that would be useful throughout the battle space.[4] By their very nature, humans are also multimission capable—a characteristic that needs to be harnessed and nurtured. We must reflect upon the operational requirements, select and properly classify new recruits, nurture them so as to bring out strengths and minimize weaknesses by using a continuum of learning, and continuously evaluate them over the course of a career. Doing so requires a corporate strategy and implementation plan focused on entire careers—not a specific assignment or course of instruction.

Remarkable similarities exist between the Air Force's experience with the air and space operations center (AOC) and the treatment of Air Force instructional systems today. Originally, each system within the AOC was built to meet a specific need with unique requirements, in stovepipe fashion. The operational necessity to fuse information across disciplines and the need for standardized and integrated command and control forced the service to begin looking at the AOC as a weapon system rather than a conglomeration of disparate systems. Consequently, the AOC is now defined as "the weapon system . . . through which the Joint Forces Air Component Commander (JFACC) exercises command and control of [air and space] forces. The JFACC employs the AOC to maneuver and mass overwhelming [air and space] power through centralized control and decentralized execution to produce desired operational and strategic effects in support of the Joint Force Commander's (JFC) campaign."[5] Like the AOC experience, learning involves the fusion of information and experience associated with developing proficiencies by Air Force people. Commanders employ personnel and their proficiencies to execute joint and service missions. Due to the proliferation of information technologies, we must integrate and standardize learning across the Air Force to make it effective in today's resource-constrained environment. Both cases (the AOC and learning systems) require dedicated oversight, policy, systems development, and procurement. Because of the explosion of information technologies, our current learning systems find themselves in the same position occupied by the AOC 10 years ago.

The Critical Mass of Learning Technology

Learning technologies have advanced by orders of magnitude over the last decade. One need only note the fact that high-fidelity graphics systems have become a staple at the Interservice/Industry Training Simulation and Education Conferences. The Defense Science Board (DSB) recognized this in its report of January 2001, which discussed how new training technologies, if managed properly, can radically affect the efficiency and effectiveness of training:

> We stand on the verge of a potential training revolution in advanced computer learning, just-in-time/just-right training devices, electronic classrooms, distributed learning environments, advanced embedded training, virtual environments, distributed learning, training administration and resource management (preventing entropy from growing in courseware), automated courseware development, and automated auto-tutor development. The new training can be cheaper, faster and there when needed (avoiding skill decay). New efficiencies (e.g., in training tailored to the individual) will free-up resources for efforts critical to retaining and expanding our training superiority.[6]

Although the DSB focused on military training, its argument is relevant to all learning elements. To harness potential learning synergies, the Air Force must shed its historical

perspectives and, with strategic vision, embrace a new paradigm to transform part of its culture: "We are now operating in a knowledge-centric economy. Information and knowledge have replaced machinery and labor as being the key corporate assets. This has far-reaching implications for many organizations."[7] Strategically, informational technologies are to learning what robotics is to manufacturing. They both provide the ability to define precisely how the final product should be shaped. Informational technologies such as enterprise data systems and metadata tagging permit the managing of detailed configuration control of course content and the maintaining of a person's records of past training, education, and experiences. Using information technologies to precisely target learning enables us to address learning at the strategic versus the tactical level. Coupling data systems with delivery to a highly mobile expeditionary force is our most acute integration challenge: "The value proposition of the most recent generation of collaborative and e-learning technologies is simple and compelling: to empower individuals with technology that allows them to work together more accurately, effectively and appropriately, and to fundamentally expedite knowledge exchange and sharing across physical boundaries."[8] When we do this successfully, we can only imagine what the future of learning could be, as illustrated by the following scenario:

> *Airman Jones is an F-15 engine technician assigned to Boondock Air Force Base. He has received notification that he will deploy as part of an AEF rotation, but he will be assigned as an engine technician on F-16s. Consequently, part of his preparation requires getting checked out on F-16 engines (which happen to be the same as the F-15's in most respects) and the unique requirements of the F-16 airframe. As he travels by airplane to his deployed location, he receives certification training over a secure, wireless connection to his handheld personal digital assistant (PDA). The intelligent system recognizes the skills Airman Jones has already obtained and focuses the instruction on unfamiliar areas—in real time! When Jones lands, he has finished most of his certification but still has a few performance tasks to complete. When he is asked to accomplish a task requiring physical performance—one for which he is not yet certified—his PDA acts as a performance-support system, allowing him to complete and certify the task at the same time.*

This example focuses on using personnel according to their fundamental skills, such as engine maintenance, instead of limiting them to a specific weapon system, as we do today. Current and emerging technology allows us to leverage learning effectively, thus enhancing the flexibility in utilizing our forces and providing for more efficient operations. In other words, learning becomes an enabling force rather than just an enhancing force.

The Way Ahead: A Road Map for Change

To become an enabling force, we must integrate learning elements throughout the Air Force that are now governed by myriad organizations. Our service, like many institutions, has segregated the three elements of learning and has created policies to address them separately. Functional organizations control training requirements, education requirements have been managed as a personnel issue, and experience has principally come under the purview of the major commands (MAJCOM) (e.g., Air Combat Command). In essence, we have taken a tactical- or execution-oriented approach to learning. Instead, we need to develop and maintain a strategic-learning perspective to maximize the synergistic capabilities of the learning elements. In other words, like the development of the US interstate highway system in the 1950s, the Air Force needs to design a strategically placed "interstate" learning system that changes the way people get to their professional-development "destinations"—destinations appropriate to the long-term operational needs of the service. Organizational structures and policies will have

to change to provide the required advocacy, oversight, and direction.

The Air Force can follow the lead of corporations that designate chief learning officers (CLO)—people responsible for the "development and deployment of their organizations' human capital and . . . linking business needs to performance strategies, thus enhancing individual and organizational productivity."[9] In a recent on-line survey by the American Society for Training and Development *Learning Link*, 22 percent of respondents said their organization has someone who functions as the CLO. Great demand also exists for leaders who can provide a strategic vision for workforce development and then execute that vision.[10] "Eric Kugler, CLO at Memorial Hermann Healthcare System in Houston, compares the role of chief learning officer with that of the better-known chief information officer (CIO). 'The reason you have a CIO is that you don't want 20 different databases and 200 software implementations, with each department running wild and fending for itself. You want someone who can look at the big picture. . . . Why not do the same with learning?' "[11]

The Air Force needs to consolidate the management and oversight of its learning activities under a single office and designate a CLO to provide a strategic vision, advocate requirements and scarce resources, and provide consistent and integrated policy. Operational necessity should drive learning (training, education, and experience) requirements. The service also needs an organizational structure that can corporately integrate, prioritize, and address these requirements. As is the case with its command and control, intelligence, surveillance, and reconnaissance (C^2ISR) systems, the Air Force historically has attempted to manage enterprise-wide learning challenges via a loose federation. These systems were based on platformcentric priorities and funding. Like a C^2ISR weapon system, learning requires (1) a CLO to provide centralized operational oversight, integration, and advocacy; (2) the Air Force Research Laboratory and a learning-system product office to research, develop, procure, and integrate the required learning systems; (3) a lead MAJCOM to consolidate Air Force–wide learning requirements; and (4) MAJCOM CLOs to identify learning requirements and provide policy for learning systems and their use (fig. 1). This overall structure would provide the necessary corporate framework to fund learning re-

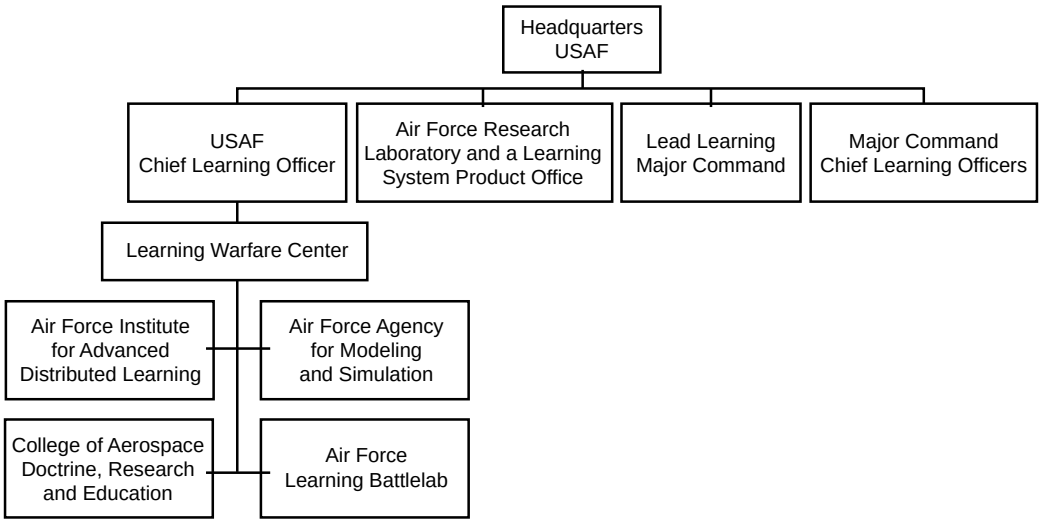


Figure 1. Required Air Force Learning Structure

quirements and oversee execution, as well as offer a systems approach toward transforming Air Force personnel. Additionally, the creation of a learning warfare center (LWC) would provide a war-fighter-centered focus on improving learning across the service, thus enhancing the development of personnel. An LWC could create new synergies by linking agencies such as the Air Force Institute for Advanced Distributed Learning; Air Force Agency for Modeling and Simulation; and College of Aerospace Doctrine, Research and Education. The center should also focus on new technologies, such as distributed mission training, deal with infrastructure issues, and manage the Air Force's combat training centers (CTC). Like other warfare centers, the LWC should include an Air Force Learning Battlelab designed to demonstrate new learning capabilities. Proactive experimentation should become mandatory, and constant experimentation and benchmarking off the other services, allies, industry, and academia would provide proactive thinking about learning as a force multiplier.

The report of the DSB's Task Force on Training Superiority and Training Surprise substantiates our assertion that the Air Force must transform its approach toward learning by using a strategic perspective. This change requires organizational, policy, and procedural alterations to integrate learning across the service. The proposed organizational structure (fig. 1) will enable the Air Force to address some of the findings identified in the DSB's report, which noted that the infrastructure of CTCs was being neglected, that the acquisition and testing process paid little attention to how a weapon system would acquire trained operators and maintainers, and that inadequate and poorly timed training would negate the technical superiority of our hardware.[12] Over 30 years ago, Navy CTCs provided a new approach to training and delivered a dramatic change in air-to-air combat proficiency over Vietnam. In the 1970s and early 1980s, the Air Force and Army adopted their own versions of the CTC, giving trainees experience that developed combat aces and improved combat effectiveness while reducing US combat losses.[13] The task force recommended that the services identify ways to expand CTC training to new warfare areas.[14] Instead of focusing solely on what can be done at the CTCs, the Air Force should also investigate methods for providing virtual CTC capabilities to support an expeditionary air and space force. Another recommendation called for making training a co-equal part of acquisition and testing by insisting that each acquisition program have a defined training subsystem.[15] The report further states that, at the beginning of a program, one must consider how to furnish competent operators *(and maintainers)* throughout the life of the system.[16] Certainly, there should be training subsystems for each system; however, we must develop these training systems within the framework of a strategic Air Force learning vision. Doing so will enable the integration of new training systems with the service's existing systems.

The idea of a continuum of learning becomes a primary source of requirements for training subsystems as well as any other educational or training need. Using the above organization, the Air Force could take the recommendation one step further by treating learning associated with each weapon system (tactical perspective) as part of an Air Force learning system that must be properly acquired and tested (strategic perspective) to ensure that it is properly integrated and meets the overall learning requirements. This organization would also help eliminate inadequate and poorly timed training—another product of decision making with regard to tactical-level learning. The report includes a recommendation to move as much training from the schoolhouse to just-in-time/just-right training in the units, based on evidence that "training must be applied over and over again as the composition of the units and joint forces changes and as skills erode over time."[17] Additionally, it appears that training programs are reactive rather than proactive (i.e., future planning ignores training, tacitly hoping that it will solve itself).[18] In other words, we train forces to use what they are given, rather than choose weapon charac-

teristics based on whether or not we can train people to operate them effectively.[19] The report further states that "technology is emerging that will support this *[the recommendations]* and may save money in the process. Unfortunately, there is no training laboratory, development establishment, or manager with sufficient authority who can foster the second training revolution."[20] Treating learning as a weapon system provides the organizational structures required to address these issues.

In addition to addressing organizational structures, the Air Force needs to integrate the myriad learning policies into a cohesive framework. Learning policy, currently contained within several publication series, should be consolidated into a single series (e.g., no. 39). The service will need to create and revise policy to ensure that it is consistent with both the strategic-learning vision and organizational changes. A separate series would also enable integration of learning policy throughout the Air Force. However, change is difficult, even when the benefits are obvious—and it is especially challenging when existing processes seem to be working effectively.

The Problem of Institutional Inertia: An Unwillingness to Face the Future?

The idea of *learning as a weapon system* is really hard to swallow for some people who are used to the "old ways" of doing things. However, unlike many senior leaders, new airmen entering the Air Force are increasingly familiar and comfortable with new technologies. Still appropriate is Field Marshal Erwin Rommel's view of the military culture and innovation: "Prejudice against innovation is a typical characteristic of an Officer Corps which has grown up in a well-tried and proven system."[21] Only those senior officials who have readily accepted computers and have adapted their thought processes accordingly are able to visualize the new capabilities enabled by these machines. The basic problem is not necessarily an unwillingness to face the future but an inability to identify with it. This situation, then, leads to questioning the worth of the idea or technology and an unwillingness to expend resources to see if the idea or technology is really useful in its intended application.

The DSB task force identified within the services a "hardware now, training later" mentality, primarily associated with tight money in a low-threat environment.[22] Because warfare is changing, we need a learning revolution that meets future warfare requirements by providing lower-cost approaches to individual and unit development. We need focused investments that will translate into tangible savings, which we can then funnel into additional learning investments. Rapidly evolving technologies hold the potential for significant savings in how we develop, equip, and manage Air Force personnel. However, the task force states that the infrastructure for carrying advanced learning out to the units must be paid for in advance, before savings will accrue in the personnel system. Many unit commanders will view this requirement as shoving the burden of additional training on their units, instead of as a way to keep people in those units, where they will be available for contingencies. We must deliver the money saved in the personnel system to people who can institute and expand distributed learning from the schoolhouses.[23] This effort will require some policy revisions to identify, track, and manage learning-related savings and the associated funding flows among the acquisition, operations, and personnel systems.

The DSB task force also identified the diffuse management of training as a large contributor to existing problems: "Training responsibilities are spread throughout the military and each organization sub-optimizes in its area, ignoring the trades that might save money elsewhere."[24] The task force's report focused on training, a subset of the learning continuum, but the management problem is significantly larger when one considers all of the learning elements. A revised organizational structure, emphasizing learning from a systems perspective, can address many of these problems, but the required changes may en-

counter opposition from organizations that could lose personnel or decision-making influence in the process. The parties involved must set aside their functional allegiances and maintain a corporate Air Force perspective that seeks to use limited resources in the most effective and efficient manner.

Summary

We agree with the DSB task force's statement that "training superiority is ours to lose and for others to gain . . . and a new training revolution is possible that may save money in the process."[25] But training is only a part of a bigger perspective. Learning is the combination of training, education, and experience, each of which builds upon the others. By acknowledging this fact at the secretary of defense and service secretary level, we can realize many synergies and efficiencies in the preparation of our personnel. A requirement exists for just-enough/just-in-time/deployable learning to support the AEF vision. Emerging technologies and new capabilities create an opportunity to transform the military-learning environment by treating learning as a weapon system. Doing so acknowledges that humans are more than just a functional component of any such system. To harness potential learning synergies, the Air Force must shed its historical perspectives and, with true strategic vision, acknowledge that learning is an essential enabler and not simply an enhancer. It must also integrate the management of all learning elements under a CLO and create an organizational structure that will provide a corporate strategic vision and policy, as well as promote the research, development, procurement, and integration of required learning systems. Such actions will enable the Air Force to address the DSB's recommendations on training and provide more effective war-fighting personnel. However, the inability of people to identify with changing operational requirements and learning methodologies, together with the normal institutional resistance associated with functional or tactical perspectives, could derail needed transformational changes. A new paradigm that treats learning as a weapon system will require inspirational integrity and leadership, a true commitment to service before self, and dedication to excellence in all we do. □

Notes

1. Quoted in Larry G. Willets, "The Chief Learning Officer: New Title for New Times," *Reengineering Resource Center*, 1996, on-line, Internet, 10 June 2002, available from http://www.reengineering.com/articles/may96/clo.htm.

2. Dr. Ralph Chatham and Dr. Joe Braddock, *Report of the Defense Science Board Task Force on Training Superiority and Training Surprise* (Washington, D.C.: Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, 2001), 5, on-line, Internet, 20 March 2002, available from http://www.acq.osd.mil/dsb/trainingsuperiority.pdf.

3. See chap. 5, "Program Design," in DOD 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information System (MAIS) Acquisition Programs*, 5 April 2002, on-line, Internet, 7 April 2003, available from http://www.dtic.mil/whs/directives/corres/pdf/50002r_040502/p50002r.pdf.

4. Peter Grier, "The Strength of the Force," *Air Force Magazine* 85, no. 4 (April 2002): 24–25, on-line, Internet, 7 April 2003, available from http://www.afa.org/magazine/April2002/0402Orl.pdf.

5. *Concept of Operations for Aerospace Operations Center* (Langley AFB, Va.: Air Combat Command, Aerospace Command, Control, Intelligence, Surveillance, and Reconnaissance Center, 2001), 9.

6. Chatham and Braddock, 13.

7. Martin Butler, "Learning to Collaborate," *Serverworld*, November 2000, on-line, Internet, 4 June 2002, available from http://www.serverworldmagazine.com/contra/2000/4q/11_collab.shtml.

8. Ibid.

9. Dede Bonner and Stacey Wagner, "Meet the New Chief Learning Officers," *ASTD [American Society for Training and Development]: Virtual Community*, May 2002, on-line, Internet, 4 June 2002, available from http://www.astd.org/CMS/templates/index.html?template_id=1&articleid=27663.

10. Ibid.

11. Amy Sitze, "The Big-Picture People," *Online Learning Magazine*, November 2000, on-line, Internet, 4 June 2002, available from http://209.125.88.134/new/nov00/cover.htm.

12. Chatham and Braddock, 1.

13. Ibid., 7.

14. Ibid., 1.

15. Ibid., 22–23.

16. Ibid., 11.

17. Ibid., 1.

18. Ibid., 12.

19. Ibid., 20.

20. Ibid., 1.

21. Erwin Rommel, *The Rommel Papers*, ed. B. H. Liddell Hart, trans. Paul Findlay (1953; reprint, New York: DaCapo Press, 1988), 203.

22. Chatham and Braddock, 18.

23. Ibid., 17.

24. Ibid., 19.

25. Ibid., 1.

The C-54 Skymaster

CHARLES TUSTIN KAMPS

The C-54 Skymaster was the first transoceanic four-engine transport to see service with the United States Army Air Forces (USAAF). It originated with the prototype of the Douglas DC-4 commercial design of 1939, which was adapted for military use. The plane first flew in February 1942 under the designation C-54, before introduction of the civilian version. Eventually, the USAAF and, later, the United States Air Force (USAF) would take delivery of some 1,164 of these aircraft in seven different variants, produced from 1942 to 1947. The Navy version was called the R5D.

The Skymaster was nearly 94 feet long and just over 27 feet high, with a wingspan of 117 feet, six inches. Powered by four Pratt and Whitney engines of 1,290 to 1,450 horsepower, depending on the model, the C-54 could cruise at about 240 mph with a maximum speed of 275 mph. Ceiling varied from 22,000 to 30,000 feet (in later models). As a long-haul transport, the C-54 had a range of 3,900 miles and a useful carrying capacity of 28,000 pounds of cargo or 49 personnel, in addition to a crew of six—nearly twice the load of the USAAF's primary tactical transport, the C-47.

Although overshadowed in the popular imagination by the more numerous C-47s, the Skymasters did yeoman's service in World War II and Korea. A specially made variant was the first purpose-built presidential airplane, dubbed the *Sacred Cow*. President Franklin Roosevelt made one trip in it, to the Yalta Conference in February 1945. His successor, Harry Truman, used the plane extensively; in fact, Truman was aboard the *Sacred Cow* when he signed the National Defense Act of 1947, which, among other things, authorized the establishment of the USAF as a separate service.

Perhaps the C-54's finest hour occurred during the Berlin airlift. After the Soviets cut off the city from surface means of supply, a massive air-transport effort kept Berlin alive. C-54s first entered the scene in November 1948. Every Skymaster in the USAF inventory was pressed into service, and by January 1949 they had greatly improved the situation by helping to increase the supplies lifted into Berlin from 3,000 to 5,500 tons per day.

The C-54 Skymaster and its civilian counterpart, the DC-4, served as transitional aircraft to the post–World War II standard of four-engine, high-tonnage intercontinental transports.

To Learn More . . .

Holder, Bill, and Scott Vadnais. *The "C" Planes: U.S. Cargo Aircraft, 1925 to the Present*. Atglen, Pa.: Schiffer Publishing, 1996.

Miller, Roger G. *To Save a City: The Berlin Airlift, 1948–1949*. Washington, D.C.: Air Force History and Museums Program, 1998.

Williams, Nicholas M. *Aircraft of the United States' Military Air Transport Service, 1948 to 1966*. Leicester, United Kingdom: Midland Publishing Ltd., 1999.

Net Assessment

In our work to deploy and maintain our nation's space capabilities, we must remember that more than just money or schedules is at stake. Lives and victory hang in the balance. We need to step up the intensity of discipline in our operations and ensure that we do all we can to maximize the effectiveness of our space capabilities to meet national-security needs. The work we are doing now will make a very real difference in the outcome of our war on terrorism.

—Hon. Peter B. Teets
Undersecretary of the Air Force

The Military History of Tsarist Russia edited by Frederick W. Kagan and Robin Higham. Palgrave Macmillan (http://www.palgrave-usa.com), 175 Fifth Avenue, New York, New York 10010, 2002, 272 pages, $59.95 (hardcover).

This book, the first one-volume overall view in English of the development of Russia's armed forces, consists of 13 monographs ranging from the rise of the Muscovite army of the 1400s to the collapse of the tsarist army in 1917. It is the companion to the editors' follow-on volume *The Military History of the Soviet Union*, which covers the period 1918–91. The essays generally review successive periods of the army's development. The collection, however, does include one piece on the tsarist navy, and several others mention significant naval developments. The editors are well qualified to produce this newest addition to the existing works on Russian military history. Frederick Kagan, son of the eminent historian Donald Kagan, is an assistant professor at the US Military Academy at West Point and has authored several books on Russian military history as well as contemporary US defense policy and military readiness. Robin Higham, the co-editor, is professor of military history emeritus at Kansas State University and has served as the editor of the journals *Military Affairs* and *Aerospace Historian*. The authors of the essays are also well qualified in their own right.

The editors provide well-written introductory and summary essays. The former is a general overview of Russian military history during this period. It presents the major factors—geographical vastness, ethnic diversity, natural resources, economic development, social development, and changing relationships with neighbors—that affected the development of Russia's military forces and ensuing historical events. The authors of the subsequent essays then use these factors, to varying degrees, to discuss a particular period of development of the Russian military forces under the tsars (and tsarinas). Collectively, these essays are well written and very informative about Russia's military history in the tsarist era, conveying especially well how political, social, and economic factors affected military development and the conduct of military operations. In the summary essay, the editors review these factors again in light of the preceding essays, noting the generally good conduct and fighting abilities of Russia's army during the eighteenth century and its decline during the late nineteenth and early twentieth centuries. The authors of most of the essays provide areas for future historical research, especially now that Russian archives are more readily accessible to historians.

Throughout these essays, the reader finds two significant themes. First, the editors wish to dispel the view that the Russian army was historically incapable of winning wars, a view that developed from the decline of Russian military capability after 1854. They want the reader to understand clearly that the Russian army did win battles and wars in the late seventeenth and eighteenth centuries against the powers of those times, including Sweden, Turkey, and even Prussia and Napoleonic France. In doing so, Russia's rulers obtained a vast and potentially rich empire, stretching from Eastern Europe to the Far East and from the Arctic to the Middle East and Central Asia. At the same time, the collected essays remind us that the attainment of this vast empire would also be a source of Russia's relative military decline toward the end of the nineteenth century as it faced new, modernizing, and relatively more powerful enemies—Germany in the west and Japan in the east.

The second significant theme that permeates these essays is that a nation's economic and social

development has a significant effect on the development of its military power—armies and navies do not develop solely in the realm of politics. The Russian army scored great victories in the seventeenth and eighteenth centuries because its opponents were similarly armed and organized. The origins of the Russian military's decline, as the essays point out, are found in its delayed social development (serfdom was not abolished until 1867, consequently depriving the army of an adequate source of recruits for a large, adequately trained reserve in the age of mass armies) and economic development. The latter had two aspects. First, inadequate economic development (movement toward capitalism and industrialization, as in the West) meant that Russian rulers after 1854 found themselves increasingly unable to afford military modernization (for example, equipping hundreds of thousands of soldiers with rifled breechloaders) and unable to produce modern weapons (Russia depended upon foreign arms when it went to war in August 1914). Therefore, as the latter essays point out, the Russian army after 1900 was inadequately trained and armed to face the more modern Japanese army in 1904–5 and the German army in 1914–17. However, the Russian army and some of its generals did do well against the Austro-Hungarian army in the early years of World War I.

As a whole, Kagan and Higham's volume on tsarist military history stands as a well-written and easily read work on a very important topic. The emphasis on the social and economic factors that affected Russia's military development is especially noteworthy. Judging from the discussion of the Soviet army found in the introductory and summary essays, as well as occasional references in some of the intervening essays, it appears that Kagan and Higham see similar influences in the creation and development of the Soviet army after 1917. Both the scholar and the general reader will find *The Military History of Tsarist Russia* good reading and good military history.

Lt Col Robert B. Kane, USAF
Maxwell AFB, Alabama

Warfare in the Western World, 1882–1975 by Jeremy Black. Indiana University Press (http://www.indiana.edu/~iupress), 601 N. Morton Street, Bloomington, Indiana 47404, December 2001, 256 pages, $45.00 (hardcover), $19.95 (softcover).

This synopsis of military history, from the British conquest of Egypt in 1882 to American involvement in Vietnam in the 1960s and 1970s, is Jeremy Black's third in a trilogy of studies on war and society. He offers what is in essence a concise primer but one that takes a wider, more systemic swath than the traditional focus on operational military history. Although the principal emphasis is on the Western European experience, the book provides some coverage of other arenas. The primary argument is that contextual awareness is essential when one studies the development and interaction of military forces. National success or failure in war is driven by the complex interplay of cultural and physical geographic elements: politics, demographics, economics, and religion, to name a few. In each of these areas, gains and losses can occur as a result of war, and each can play a significant part in the outcome of war, sometimes independent of technological developments.

It has been postulated—and, indeed, inculcated—in US national-security policy and strategy that democracies are less bellicose than totalitarian regimes. Yet, once engaged in war, they may be much better at fighting and winning—witness their performance in the two world wars. Although totalitarian systems may have the advantage of initially focused agendas to concentrate technological and managerial efforts, they may suffer from less ability to adapt to and anticipate the many proclivities experienced in war that Clausewitz, the master theorist, so effectively articulated. War is a struggle between societies as much as armies.

Therefore, just as societies decisively affect war, so is war a major force for social change. Perhaps in no other period of history than the twentieth century has war been so pervasive in molding gender and racial progressivism, at least in the Western world. Countless social standards, now fundamental to our culture, have direct linkage to wartime necessities.

Despite such military/social ties, Black questions correlations or causality between military developments worldwide. Against the tempting trend to draw threads of continuity, he sees no linear progression, no direct patterns of change, and no osmotic diffusion of development. This stance represents a fairly radical departure from convention, for military historians have traditionally assumed—as has the military itself—a fairly clear developmental chronology based on observation and interaction between belligerents and allies. For example, in electronic warfare the development of electronic countermeasures and countercounter-

measures has for decades involved a back-and-forth series of achievements that has been anything but chaotic or random. Furthermore, one notes countless instances of the effects of espionage, for example, as well as myriad other types of interactions that have resulted in patterns of change. The revolution in airpower and mechanized warfare in general had not only linearity but also geometric progression that spread rapidly to many geographically disparate areas. Consequently, Black's theme is provocative, and its broad historical perspective and contextual focus on the complex interaction of social forces and war provide a valuable contribution to historiography.

Col Eric Ash, USAF
Maxwell AFB, Alabama

Victory in Vietnam: The Official History of the People's Army of Vietnam, 1954–1975 by the Military History Institute of Vietnam, translated by Merle L. Pribbenow. University Press of Kansas (http://www.kansaspress.ku.edu), 2501 West 15th Street, Lawrence, Kansas 66049-3905, 2002, 512 pages, $49.95 (hardcover).

Victory in Vietnam is a translated and updated version of the official history published by the Military History Institute of Vietnam, Ministry of Defense, Hanoi, Vietnam, 1988, and revised in 1994. Merle Pribbenow is well qualified for this task, having served as a Central Intelligence Agency officer and interpreter in Vietnam for five years during the war. Up front, I highly recommend this book to any serious student of the war. At times it is tedious and dry, full of political bombast and outright bragging. But it contains some very revealing information, especially for airmen, and offers a view of American airpower through the eyes of an enemy.

This "official" history of the war assumes the perspective of the People's Army of Vietnam (PAVN), a term used by the North Vietnamese for their army and, by extension, the Vietcong. They claim that, in toto, the two made up the larger army of the Vietnamese people. To buttress this fiction, they declare that the PAVN consisted of three components: the main force, local force, and militia and guerillas. The North Vietnamese revile those who fought against them, referring to all South Vietnamese troops as lackeys or puppet troops of the French and then the United States. The book reveals the skillful use of all three components to carry out the strategy of liberating Vietnam from all "foreign intrusions," unifying it under the control of the Communist Party, and ultimately establishing hegemony over Southeast Asia. The PAVN served as the main tool for achieving these objectives.

Victory in Vietnam describes the various stages of the war as seen from Hanoi, discussing in detail several particularly difficult times during the struggle:

- 1955–59, when South Vietnam almost destroyed the Communist movement in the South.
- 1961–62, when American-supported helicopter assaults and M-113 armored personnel carriers inflicted serious losses on North Vietnamese forces.
- 1966, when US troop strength and airpower increased dramatically, and sustained air strikes against the North began to seriously damage North Vietnam's economy.
- 1969, when Gen Creighton Abrams, the US commander, directly attacked the PAVN and almost destroyed it.
- 1971, when South Vietnamese forces attacked the Ho Chi Minh Trail in Laos.
- 1972, when South Vietnamese ground forces and US airpower killed over 100,000 PAVN troops.

This book, the definitive statement of the Vietnamese Communist point of view, reveals that many of the accepted truths in our own histories of the war are simply wrong. For example, we saw the conflict as the Vietnam War—a self-imposed limitation—and considered the fighting in Laos and Cambodia separate struggles. To the North Vietnamese, though, it was a regional conflict that raged across Cambodia and Laos, involving all of the nations in the area. They did not hesitate to send "volunteers" to Laos or Cambodia to do their "international duty." Such a perspective gave them great flexibility and strategic advantage.

From 1959 on, the North Vietnamese built a great network of roads through the interior of Laos to tie all of the fronts together with the "rear area" (i.e., North Vietnam). They called this complex the Trung Son Road, named for the range of mountains that ran down the western spine of North Vietnam into Laos and the south. We called it the Ho Chi Minh Trail. This book clearly reveals in some detail the tremendous effort the PAVN put into building and defending the trail.

Recognizing the value of this artery, we expended a vast number of men and amount of materiel to shut it down. For almost 10 years, we attacked the trail with endless air strikes, using B-52s, AC-130 gunships, and a host of other weapons systems in the effort. At several points, the narrative reveals the heavy price we extracted from the PAVN:

> Because of our difficulties in obtaining supplies and replacements and because the enemy was conducting ferocious counterattacks against us, after the summer campaign of 1969 a major portion of our main force army was forced to withdraw to our base camps to regroup. . . . By the end of 1969 the enemy had retaken almost all of our liberated zones. . . . Units were forced to begin alternately eating rice for one meal and manioc for the next. Some of our cadre and soldiers became pessimistic and exhibited fear of close combat and remaining in the battle zone. Some deserted their units to flee to rear areas, some even defected to the enemy (p. 246).

At several points, our efforts came close to closing the trail. But the North Vietnamese managed to keep it open. As an airman who flew against the trail in 1972, I was simply amazed to read how the enemy overcame our efforts. We expended almost two million *tons* of bombs, rockets, napalm, and so forth against the trail and lost far too many men. North Vietnamese casualties were heavy, but they realized that the road had to be kept open, whatever the cost. This vital link gave them the strategic mobility necessary to move the PAVN from front to front. Some of the battles fought for the Ho Chi Minh Trail, both on the ground and in the air, determined the outcome of the war—and the PAVN won them.

I found it illuminating to read how the PAVN feared the B-52 and especially the AC-130 (they called it the "thug"), which prowled the roads at night. To counteract these aircraft and airpower in general, starting in 1970, the enemy built an entirely new "secret" road and traveled during daylight. That road was so effective that it enabled them to move several mainline divisions south in 1971–72 for what became the Easter offensive. That movement even included T-54 tanks, which showed up in the battle for An Loc, just 40 miles north of Saigon.

But the most revealing fact about the trail dealt with how the PAVN built a whole new series of roads after our withdrawal in 1973, when it used the entire complex to move massive amounts of supplies and whole divisions of troops south for the battles of 1975:

> The volume of supplies sent down the strategic transportation route from the beginning of 1974 to the end of April, 1975 totaled 823,146 tons, 1.6 times larger than the total volume shipped during the previous 13 years combined. Of this total, 364,542 tons were delivered to the different battlefields, 2.6 times the total for the previous 13 years. . . . These projects, and the motorized force of 6,770 trucks, ensured that our army could conduct large-scale combined-arms combat campaigns. . . . This supply stockpile was sufficient for us to support large forces conducting protracted, continuous combat operations as called for in our strategic combat plan (p. 350).

Not mentioned in this boasting is the fact that their "international brothers" in the Soviet Union and China supplied all of this military largess. *Victory in Vietnam* would have us believe that the factories of North Vietnam produced all of this equipment. At the same time, the United States reduced its support of the forces of South Vietnam, Cambodia, and Laos. Given such a shift in the correlation of forces and the political atmosphere in the United States, the events of March and April 1975 were inevitable.

The book's discussion of US attacks on Hanoi/Haiphong in the winter of 1972 was also riveting. The North Vietnamese take great pride in the fact that they successfully fended us off, disregarding the massive damage we did to their country. They see their "victory" in that battle as a second Dien Bien Phu and claim to have shot down 34 B-52s. Our records put the losses at 17. Indeed, throughout the book, North Vietnamese claims of aircraft downed and enemy (US, Korean, South Vietnamese, and Laotian) forces destroyed appear grossly inflated. But this is their perspective, their military history—and they did prevail. The North Vietnamese did in fact achieve their objective of reunifying the country under their control and driving out "foreign influences."

The PAVN won the war for the North—always, of course, under the control of the Communist Party. But PAVN forces were the instrument of victory. *Victory in Vietnam* makes that point brutally but effectively. This is their history, and they have a right to tell it.

Col Darrel Whitcomb, USAFR, Retired
Fairfax, Virginia

Ploesti: The Great Ground-Air Battle of 1 August 1943, rev. ed., by James Dugan and Carroll Stewart. Brassey's (http://www.brasseysinc.com/index.htm), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2002, 336 pages, $21.95.

Memorable among images of air combat from the Second World War is the photo of a single B-24 Liberator bomber flying a low-level bomb run during the Allied attack on the German-controlled oil refineries in Ploesti, Romania. The US Army Air Forces bomber is so low that it appears to barely miss the tallest smokestacks in the target complex (many of the B-24s flew at 200 feet or lower—sometimes much lower). The remarkable air strike on Ploesti, its excessive cost, and the aftermath for both sides make up the account laid out in *Ploesti: The Great Ground-Air Battle of 1 August 1943*. Largely based on personal interviews, diaries, and letters, this revised edition—which includes a new foreword and more photographs—improves upon its predecessor, published in 1962, despite the passage of time and the fading of memories.

This particular battle invites such revisiting. Controversial even in the planning stages, the bombing effort—dubbed Operation Tidal Wave—involved 178 B-24s in seven bombardment groups; 1,763 volunteer airmen; and a 2,400-mile, 18-hour flight from Benghazi, Libya, in North Africa to central Romania and back. Total time over the target area was only 27 minutes. The oil refineries, which supplied one-third of the needs of the German war machine, were critical to the Nazis. Consequently, the air defenses and fighter-aircraft support around Ploesti were the most concentrated in the European theater. This air raid was definitely not a milk run.

Yet, the stakes were high enough in the middle years of the war to take risks in order to deliver a telling blow to Hitler's "taproot of German might." The price was even higher—the loss of 52 bombers. Of the 88 Liberators that returned to home base in Libya, over 50 showed battle damage, and almost 550 airmen were killed, missing, or shot down, becoming prisoners of war. Despite the expense, the bomb damage to the Romanian oil complex proved not as severe as planned or assessed. Subsequent strategic assaults on Ploesti reduced the refineries' capacity but did not cost as much proportionally in men and planes. The raid of August 1943, however, was an extraordinary drama well worth retelling.

Many of the aircrew members distinguished themselves in battle. Five earned the Medal of Honor, and everyone received the Distinguished Flying Cross. In the postwar years, several reached top levels in the US Air Force. George Brown, who took over the battered 93d Bomb Group at Ploesti, went on to become Air Force chief of staff and chairman of the Joint Chiefs of Staff. Jacob Smart, a key planner, became commander of Pacific Air Forces. Medal of Honor winner Leon Johnson led the 44th Bomb Group during the battle, later assuming command of Continental Air Command. And Rockly Triantafellu, a lead B-24 bombardier, served as the Air Force's chief of intelligence. But the real story is the daring mission itself. The revised edition of *Ploesti: The Great Ground-Air Battle of 1 August 1943* will not disappoint its readers, especially those who have a keen interest in air combat.

Dr. Frank P. Donnini
Newport News, Virginia

Luftwaffe Aces of the Western Front, Luftwaffe at War Series, vol. 19, by Robert Michulec. Stackpole Books (http://www.stackpolebooks.com), 5067 Ritter Road, Mechanicsburg, Pennsylvania 17055-6921, 2002, 72 pages, $14.95.

Stackpole Books, in conjunction with Greenhill Books of London, has added another book to its fine Luftwaffe at War series. Like the other volumes, it offers an excellent and varied photographic history of its subject. The title, however, may be a bit misleading since Michulec, the author of several books and articles on World War II history, includes photographs not only from the Western Front, but also from North Africa and the Mediterranean.

Typical of the series, this entry provides four pages of summary information on Luftwaffe aces and their battles with Allied pilots. Although American flyers indeed won the lion's share of air-to-air victories in Western Europe, I was a bit disappointed that the author seemingly diminishes the contributions of Commonwealth pilots and their efforts in Western Europe, North Africa, and the Mediterranean.

Michulec's extensive and informative descriptions accompany seven color and more than 100 black-and-white photographs, ranging from those of well-known Luftwaffe *Experten* to relatively unknown aces and from squadron images to those highlighting German uniforms and rudder victory marks. Also included are photographic collections of such *Experten* as Werner Moelders, Adolf Galland, Helmut Wick, and Joachim Muencheberg. The subject of German pilots overclaiming their number of kills, always an interesting topic for discus-

sion, is mentioned several times; Michulec also includes photographs of Franz von Werra, whom he calls "the greatest liar of all the *Jagdwaffe* aces."

Luftwaffe Aces of the Western Front is a fine photo collection. If you are interested in this area of Luftwaffe history, the rare and seldom-seen photographs will make this book a great addition to your library. The price tag of $14.95 for a picture book, however, may be a bit steep for readers who do not have an undying passion for this aspect of the Luftwaffe. As long as Stackpole and Greenhill Books continue to publish this series, however, they will make a worthy contribution to the field of Luftwaffe history.

Lt Col Robert F. Tate, USAFR
Maxwell AFB, Alabama

European Warfare, 1815–2000 edited by Jeremy Black. Palgrave Macmillan (http://www.palgrave-usa.com), 175 Fifth Avenue, New York, New York 10010, 2002, 272 pages, $69.95 (hardcover), $22.95 (softcover).

Jeremy Black, a professor of history at the University of Exeter in England, is one the most innovative, respected, and prolific military historians of his generation, with well over 30 books and many articles to his credit. Clearly, any serious discussion of sources of European military history must refer to his impressive body of scholarship. Black's recent works, most notably his *War and the World: Military Power and the Fate of Continents, 1450–2000* (Yale University Press, 1998), aim to steer our understanding of the nature of military history in new directions. He strives to move military history away from an almost xenophobic fascination with large European armies fighting major campaigns to a more balanced examination of what the military experience has actually been.

With his book *European Warfare, 1815–2000,* Professor Black continues his penchant for cutting-edge scholarship, intending this collection of essays to serve both as a summary of trends in the European art of war since the end of the Napoleonic era and as a challenge to our understanding of its written history. His introduction raises serious issues about our approach to evaluating conflicts—issues made weightier by America's current involvement in its war on terror. Although many commentators argue that this conflict is a nontraditional one since the foe is a shadowy extranational organization rather than a nation-state, this author maintains that the definition of the history of modern war does not confine itself to conflict between regular armed forces. Perhaps, as Black asserts, we have become complacent in accepting a "Whiggish" or elitist approach to military history—one that focuses on the grand accounts of nations with organized political forces in conflict with one another. In most cases, the story is about events such as the Napoleonic Wars, the Wars of German Unification, or World War I—a linear approach that emphasizes the progress of military art. Is that approach, however, the correct paradigm for studying military history? Perhaps as, Black argues, it is not. It is one that emphasizes the great dramas and ignores or underrates the events that occur between these conflicts, the role of the military as an internal security force, and conflicts between lesser powers.

Seven prominent military historians join the editor in surveying European military history since 1815 and in attempting to improve our perspective on that subject. Dennis Showalter's lead essay "Europe's Way of War, 1815–1864" sets the tone for this innovative collection. Past president of the Society for Military History and one of our finest scholars, Showalter identifies several "dialectics" that have shaped and characterized European history: internal security versus power projection, quality versus numbers, experience versus theory, technology versus tempo, and Europe versus overseas. Examining Europe's story of conflict in these terms rather than focusing on big battles and chronology proves much more rewarding and is likely to provide new insights into what on the surface is a well-known story.

Black's article "European Warfare, 1864–1914" attempts to steer us away from the traditional concern with the wars of German unification to a more comprehensive view but finds it difficult to escape the scenario that emphasizes the growth of large, Moltkean-inspired armies during this period. As one would expect in a survey of late nineteenth- and twentieth-century military history, we have solid articles on World Wars I and II, by Spencer Tucker and S. P. Mackenzie, respectively. Linking them is a thoughtful essay by Francisco J. Romero Salvado, arguing that the period from 1917 to 1939, in many ways, represented both a European civil war and an unprecedented period of popular upheaval. Essays by Bruce Vandervort and Lawrence Sondhaus provide perspectives on colonial and naval warfare, respectively—the kind of activity that dominated the European military experience throughout this period.

Finally, Warren Chin evaluates European war since 1945 and provides us hints as to the future of war on a European and, perhaps, global scale. Al-

though the previous articles describe almost constant warfare on the European continent since 1815, Chin argues that only one significant regional conflict occurred during this period—the Bosnian wars of 1992–95. Certainly, one can quibble with this interpretation and point to the Soviet suppression of uprisings in Eastern Europe, the Caucasus regions, and the Greek-Turkish conflict over Cyprus, among others. However, the author's essential arguments require serious consideration. More civilians than soldiers have died in these post–Word War II conflicts. He argues that a changing strategic environment exists, especially in Europe, in which national survival is no longer an issue—the international community simply will not tolerate the disappearance of a nation-state. In addition, intervention in smaller conflicts is often driven by the media revolution, which has brought commentary and images into both European and American homes. Furthermore, since wars are not fought over national survival, the population and government have little tolerance of casualties. Wars no longer fit the conventional model of large ground-air-naval forces maneuvering to attain operational and strategic objectives; they are no longer clean (if they ever were) but involve ethnic cleansing and classic guerilla warfare. Finally, the last 50 years have witnessed American military power eclipse that of the Continental powers to a degree unimaginable in 1815.

This thought-provoking collection of essays has its limitations, however. As Professor Black points out, it is about ideas. To benefit from the challenges each essayist presents, the reader needs to be grounded in the basic chronology and issues of the period. Readers of *Air and Space Power Journal* will also be annoyed with the dearth of attention paid to aviation issues. Nevertheless, when used along with a standard text such as *Warfare in the Western World: Military Operations since 1871* (D. C. Heath, 1996) by Robert Doughty and Ira Gruber, *European Warfare, 1815–2000* can serve as an excellent source for alternative interpretations that stimulate discussion and research. It is well worth including in most professional libraries.

Dr. Stephen A. Bourque
California State University, Northridge

Enlarging NATO: The National Debates edited by Gale A. Mattox and Arthur R. Rachwald. Lynne Rienner Publishers, Inc. (http://www.rienner.com), 1800 30th Street, Suite 314, Boulder, Colorado 80301, 2001, 324 pages, $59.95 (hardcover).

When the Soviet Union collapsed, the North Atlantic Treaty Organization (NATO) lost its historical reason for being. The demise of the Communist bloc coincided with Western European debates in the 1990s over the economic union. For the first time in decades, Europe had to redefine itself. No longer did Europe solely constitute the West, with Eastern and Central states on its periphery. As the former Communist states sought new economic, political, and military relationships with the West, NATO could either go away or grow to the east. If it went away, what would replace it? In the absence of a clear alternative, NATO still had a reason for being. The issues became how large it should be, how fast it could grow, and what it could do about the nonmembers—outsiders but no longer enemies. These questions had different answers in different countries as well as within the affected states. The broad decision for NATO enlargement was simple—the devil, as always, was in the details. Interestingly, if not surprisingly, the most common reaction was indifference. Governments and intellectuals dominated the debates. The various publics, having other interests or no inclination toward foreign matters short of war, tended toward apathy.

The editors have assembled a diverse group of scholars—academic and otherwise—each assigned the task of dealing with one of the countries affected by enlargement. The nations fall into three natural categories: old members, new members, and outsiders. The old members include the United States, France, Germany, England, and Italy. The new members are Poland, Hungary, and the Czech Republic. The outsiders include Russia, Ukraine, Romania, and Estonia. Not surprisingly, even within the three groups, the enlargement debate depends upon history, geography, politics, diplomacy, and other aspects of the national individualities. As the leading European power and no longer the gateway for an invasion of the West by the Soviet bloc, Germany responded to the enlargement into Eastern Europe differently than did France, with its wounded pride, or the United States, the distant giant. Britain took NATO for granted and didn't debate significantly; Italy downplayed the issue because the Communists in the governing coalition opposed NATO on any terms.

Naturally, the insiders had different issues than the outsiders. Some of the latter remembered Munich, the Stalin-Hitler nonaggression agreement, and Yalta. Another outsider, Ukraine, still does not

know whether it looks to Russia or to the West. Russia is not exactly sure of its direction without the empire; although not the most trusted of states, it is still a force to be tiptoed around lightly. Every state in Europe had to deal with the question of how an enlarged NATO would affect it.

Other concerns, both foreign and domestic, have taken center stage in the world, but the enlargement debates continue, however quietly. At this writing, NATO is preparing to enlarge again, with nine candidates vying for inclusion and all the advantages it holds. Again, at least in the United States, there doesn't seem to be much interest.

This collection, however limited, provides interesting insights into the many considerations that went into the first phase of post–Cold War growth. The world has changed since, and a gap between the United States and many of the European NATO members is widening. Still, NATO enlargement will occur because it is not a major issue—but it *is* important. We will need an update or a sequel to this work in the not-too-distant future.

The quality of the reports varies, as does the depth and degree of scholarship. Generally, though, the articles are good syntheses, relying mostly on public documents and media articles. *Enlarging NATO* is worth reading, but it will soon be dated and, thus, is probably not deserving of a prominent place on the reader's bookshelf.

John H. Barnhill
Tinker AFB, Oklahoma

Exploring the Unknown, vol. 5, **Exploring the Cosmos** edited by John M. Logsdon with Amy Paige Snyder, Roger D. Launius, Stephen J. Garber, and Regan Anne Newport. US Superintendent of Documents, NASA History Office (http://history.nasa.gov/what.html), Washington, D.C., 1999, 796 pages, $70.00.

One of the most important developments of the twentieth century has been spaceflight—the human movement into space with people and machines. Its elements included people, motivations, organizations, objectives, and technologies; and the managerial, political, economic, and international contexts in which space-age events unfolded. Historians and students conducting research into spaceflight history may find this volume, and the series in general, a useful reference. This is the fifth book in the NASA series that documents key aspects of spaceflight development in the United States. However, it may be of limited value to the general Air Force reader.

Spaceflight has continued to enjoy a near-universal appreciation of its historical significance. Probably no other large-scale human activity has been chronicled as extensively. The result is a body of related material that can be overwhelming and one of the principal challenges faced by scholars and researchers. NASA attempted to ameliorate this problem more than a decade ago when it began the first of what will become an eight-volume series. Each volume includes pivotal documents from diverse sources that detail the evolution of the US space program.

Volume 1, *Organizing for Exploration*, was published in 1995 and covered the antecedents to the US space program and the origins and evolution of NASA and US space policy. Volume 2, *External Relationships*, 1996, dealt with the relationship between the US civilian space program and the space activities of other countries; the relationship between the US civilian, national security, and military space efforts; and satellite communications, remote sensing, and the economics of space applications. Volume 3, *Using Space*, was published in 1998. Volume 4, *Accessing Space*, covered various forms of space transportation and was published in 1999. Future volumes will cover solar and space physics, earth science, and life and microgravity science (volume 6), and human spaceflight (volumes 7 and 8).

Over 110 documents were selected for inclusion in this volume on the US space-science program. They are presented in three major sections, each covering a particular aspect of the program's origins, evolution, and execution. The introductions provide the bibliographical details and background information necessary to show the context of each document's subject to the major events of the space-exploration history.

Chapter 1 deals with the origins, evolution, and organization of the US space-science program. Chapter 2 deals with the solar-system exploration, while chapter 3 deals with NASA's astronomy and astrophysics efforts. Each chapter's introductory essay complements and provides context for its documents. The first chapter's essay includes background information on cosmic-ray science, the balloon program, the upper atmosphere, sputnik, the Space Act, the Space Science Board, NASA's space-science program, and the reorganization of 1959. Chapter 2's essay includes information about NASA's planetary-exploration program, planetary science, the Moon program, the impact of Apollo on planetary exploration, and solar-system explo-

ration today. Chapter 3's essay includes background about space-based astronomy prior to 1958, NASA's subsequent entry into space astronomy, and the associated technical and social challenges. That chapter addresses additional topics: international cooperation; relations with the human space program; the gamma-ray, X-ray, optical, infrared, and radio-astronomy programs; general relativity; the Hubble Space Telescope; the Chandra X-Ray Observatory, formerly known as the Advanced X-Ray Astrophysics Facility (AXAF); the Space Infrared Telescope Facility (SIRTF); the Compton Gamma Ray Observatory (CGRO); and an extrapolation of the future.

Since almost all observatories are making new discoveries daily, the future of space astronomy will continue to be more of the same—except bigger and better. One primary push will be to identify terrestrial-size planets orbiting nearby stars. Identifying these will enable us to focus our search on areas where intelligent life would most likely exist. Another effort will be to continue looking for life in our own solar system—Mars and the moons of Jupiter. In short, volume 5 implies that the future of spaceflight promises to be exciting and filled with new opportunities for exploration and discovery.

Col Jonathan W. Campbell, PhD, USAFR, Retired
Harvest, Alabama

Mao's Generals Remember Korea edited and translated by Xiaobing Li, Allan R. Millett, and Bin Yu. University Press of Kansas (http://www.kansaspress.ku.edu), 2501 West 15th Street, Lawrence, Kansas 66049-3905, 2001, 344 pages, $39.95 (hardcover).

Napoléon wrote, "In war one sees his own troubles and not those of the enemy." Military historians often have trouble analyzing and presenting the plans, actions, and difficulties encountered by both sides in post–World War II conflicts. In some cases, this occurs because of language barriers; it takes years to develop the linguistic skills necessary to detect subtle nuances that often characterize military matters that, by their nature, are jealously guarded by commanders and governments. Obtaining records presents another challenge to those who seek to write about both sides of modern conflicts. Even when authors acquire the language skills and gain access to political and military archives, they may find that participants have carefully shaped their accounts to place their actions in the best light, thereby making historical interpretation difficult. In *Mao's Generals Remember Korea*, three eminent scholars provide one of the best compilations of high-level Chinese recollections of the "Forgotten War."

Two excellent essays, an introduction by the editors, and an essay entitled "What China Learned from Its 'Forgotten War' in Korea" by Bin Yu introduce the generals and place their memoirs in historical context. Chinese leaders celebrate the Korean War as a significant victory against "imperialist" encroachment by the United States and its allies. Despite this attitude toward the war, these leaders intervened reluctantly—only after the Soviet Union refused to provide effective support to Kim Jong Il's North Korean forces and after United Nations (UN) forces advanced toward the Yalu River following the successful Inchon landing in the fall of 1950.

Mao's government attempted to manipulate international opinion against the UN effort by characterizing the conflict as the "War to Resist America and Aid Korea" and by labeling Chinese forces that fought in Korea as "volunteers." The Chinese People's Volunteer Force (CPVF) ultimately grew to include 3 million soldiers, of which more than one-third would become casualties of the war. Chinese strategic objectives focused first on saving Korea and second on preserving Chinese independence (p. 32). Although Mao's forces had defeated the Nationalists, they were ill prepared to fight an expeditionary war against a coalition of modern industrial states. Chinese leaders learned that their army needed to emphasize "professionalism, the role of firepower, [and] improving logistics capability" if it were to compete effectively (p. 24).

The brief memoir of Marshal Peng Dehuai, the top Chinese military leader during the war, reveals the link between Chinese grand strategy and theater operational plans. Peng clearly understood the limits placed on Chinese forces by inferior equipment and inadequate logistical systems. He divides the war into five campaigns that provide the structure for the recollections of the remaining commanders' memoirs. After realizing that pushing UN forces off the peninsula would involve unacceptable materiel and political losses, Peng and his collaborators opted for a protracted war strategy in which actions on the battlefield were designed to influence negotiations. This is the picture of the Korean War after 1951 that haunts most Western accounts of the conflict.

Marshal Nie Rongzhen, who served as chief of the People's Liberation Army General Staff during

the war, focuses on the decision to intervene on the Korean peninsula. Although tinged with Communist dogma, his account reveals the difficulty that the strategic situation created for China: "If the American imperialists' plot had been allowed to succeed in Korea, they would have forced us to have a showdown with them on another battleground [in China]. We could have been pushed into a passive situation. China could never have been what it is today" (p. 43). Thus, rather than being a blot on the national strategic consciousness during the Cold War, Chinese perspectives on the Korean War reflect a nationalistic battle that precluded inevitable aggression from an imperialist foe.

Lt Gen Du Ping, who directed political mobilization during the war, led efforts to place the Korean intervention in proper ideological context for the troops and their commanders. He served as a vital link between political leaders in Beijing and the operational staff that designed the various campaigns. This political effort required troop indoctrination, concern for morale, propaganda aimed at friendly and enemy audiences, and close coordination with official negotiation teams. Initiatives such as a soldier's newspaper, patriotic songs and poems, and memorials to fallen heroes cemented support among the CPVF for seeing the war to a victorious conclusion.

No amount of operational planning or political mobilization could overcome the disadvantage that plagued the CPVF in the area of combat logistics. Gen Hong Xuezhi, responsible for organizing logistics for the CPVF, candidly recalls that he tried to refuse this job because of its daunting challenges. Many CPVF soldiers went into battle with antiquated weapons—or none at all. As Marshal Xu Xiangquian observes, the Soviets were slow in fulfilling their promises of materiel aid; even when such aid was forthcoming, Chinese leaders found themselves saddled with cast-off weapons from World War II rather than the new ones they expected. General Hong contended with poor transportation infrastructure within China, a destroyed road-and-railway network in Korea, and incessant air attacks between the Yalu and frontline Chinese troops. All the memoirs in this book include comments on the effect of UN air superiority on CPVF prospects for sustaining and exploiting offensives. Moreover, as time wore on, coordination between UN air forces and field artillery effectively prevented CPVF and North Korean units from achieving campaign objectives.

The recollections of Gen Yang Dezhi, commander of CPVF's 19th Army Group and later the commander of CPVF itself during the war, provide a unique account of the war from a combatant commander's perspective. General Yang responded to political, ideological, and operational pressures as he attempted to create military conditions for victory. In one amazing section, he accuses UN forces of using bacteriological warfare in the form of "three different kinds of insects. The first kind looked like black flies, the second was a kind of flea, and the third was similar to both ticks and small spiders" (p. 157). To the editors' credit, they allow the memoir to speak for itself on this and other issues, providing a footnote that documents the evidence pertinent to this accusation. Ultimately, this charge was revealed as a Soviet–North Korean hoax intended to discredit UN forces during the war.

In the final chapter, which deals with Maj Gen Chai Chengwen's recollections of the truce talks, readers see the same issues that appear in Western narratives, but from a different viewpoint. General Chai patiently outlines the "reasonable" expectations of the Chinese negotiating team and then shows how inconsiderate and obstructionist behavior by the American-led UN negotiating team unnecessarily extended the truce talks to the detriment of world peace.

The multifaceted nature of the memoirs selected for *Mao's Generals Remember Korea* gives the reader a 360-degree operational view of Chinese efforts to counter UN and US actions in the Korean War. The editors allow the participants' accounts to stand on their own merits but provide excellent footnotes to guide readers to broader interpretations and understanding. Military historians, serving officers, and designers of future military campaigns should read this essential volume carefully because it provides a rare glimpse into the "troubles of the enemy."

Col Anthony C. Cain, USAF
Maxwell AFB, Alabama

Clash of Arms: How the Allies Won in Normandy by Russell A. Hart. Lynne Rienner Publishers, Inc. (http://www.rienner.com), 1800 30th Street, Suite 314, Boulder, Colorado 80301, 2001, 469 pages, $79.95 (hardcover).

Occasionally a book comes along that breaks new ground. Russell Hart has written a masterful account of the effectiveness of the Anglo-Canadian, American, and German forces, not only in Normandy in 1944 but also throughout the interwar and early war periods. His basic premise is that al-

though God is still on the side of the big battalions, sound doctrine, coupled with the ability to adapt, is also key to victory. Airmen should read and study this book.

Hart begins by examining the problems each nation faced after World War I, whether it was rapid demobilization, isolationism, or fiscal or treaty constraints. Germany studied its war experiences, developed realistic doctrine, and planned for a quick and decisive war. Britain, almost bankrupt and plagued by class and service parochialism, simply drew a deep sigh of relief and pretended another war could not happen. The US Army studied its war experiences and developed a doctrine that, with few changes, helped it become the most dynamic and effective of all the Western Allies. The basis of American victory was innovation, as two examples illustrate.

First, doctrine prior to D day stressed armor concentration to break through enemy defenses and attack the rear and flanks. However, D day planners failed to anticipate the difficulties of the Normandy bocage. Tanks became easy prey for Germans on the hedgerow-constricted roads. Americans adapted by blasting breaches through hedgerows with demolition charges, allowing armor to move cross-country. Later, several divisions developed near-simultaneous solutions to this problem by welding jagged steel "teeth" to the fronts of tanks. The Shermans could then "bite" into hedgerows, creating breaches and restoring mobility to the battlefield. Moreover, innovations were not confined to individual units. The Army institutionalized its "lessons learned" to examine what worked and what did not and to circulate these lessons throughout its ranks.

Second, the parts of the Army's infantry divisions during World War II were interchangeable—identical to those of every other division—a fact that facilitated training and standardization. Superfluous organizations such as tank and tank-destroyer battalions were not organic but "pooled" at the corps and army levels, to be attached when needed. In theory this approach made sense for industrialized warfare but made little sense in combined-arms warfare. Gen Omar Bradley realized that units which fought together should stick together, so he adopted the policy of permanently attaching these battalions to divisions. Additionally, Hart argues that because Bradley realized that his divisions lacked the firepower to break through the German defenses, he devised a plan (Cobra) to supplement his firepower with airpower to stun, demoralize, and destroy the Germans on a narrow front. His plan exceeded all expectations and brought about the final collapse of German arms in France.

Great Britain either refused to study or drew the wrong conclusions from its World War I experience. Hindered by a regimental system that promoted loyalty above honesty and a class system that viewed change as coming only from the top, coupled with the horrendous bloodletting of Flanders, Great Britain turned its back on intellectual study and developed fundamentally flawed doctrine that stressed massed firepower and attrition. Canada shackled itself to Britain for almost all of its armaments and doctrine. The result was caution, casualty aversion, and lack of initiative and innovation. The Anglo-Canadians adapted much more slowly to combat than did the Americans and never fully solved the problem of overcoming German defenses.

The Germans studied World War I and developed a comprehensive combined-arms doctrine that stressed initiative, speed, and shock. When war broke out in September 1939, Germany was years ahead of its rivals in terms of doctrine. Moreover, Germany looked objectively at its campaigns, discovered what did not work well, and made corrections. Germany's weaknesses existed outside its doctrine—in Nazi ideology and lack of both material resources and logistical support.

Unfortunately, a book of this magnitude usually suffers from a few problems. The maps are very poor, and Hart's style is incredibly repetitious. Many chapters could have done with a complete rewrite because the repetition detracts from the message. Furthermore, the author stumbles when he discusses airpower. Specifically, he attributes the reason for the command overhaul of February 1943 in North Africa, in which all air assets were finally centralized under one air commander, to the American defeat at Kasserine Pass. This is simply not the case. The overhaul decision had been made in January at the Casablanca Conference.

However, for the most part Hart gives good credit to airpower, explaining and understanding that the first prerequisite is air superiority, followed by interdiction and finally close air support. In fact, he believes that airpower directly contributed to victory in Normandy by slowly starving the Germans and was the indirect catalyst for the breakout. Ten days prior to Operation Cobra, aircraft destroyed the Tours bridge, causing major supply disruptions. When the Americans punched through at Saint-Lô, the Germans literally had neither gasoline nor ammunition.

Make no mistake, *Clash of Arms* is a difficult book but a fascinating one for readers interested

in *how* organizations plan to fight and actually fight. One can learn much from it. As Hart states,

> This study demonstrates . . . that militaries whose peacetime doctrines are not fundamentally flawed can adapt effectively, given sufficient combat exposure, as long as they do not suffer decisive defeat. Where an army's basic doctrine is fundamentally flawed, however, not only is effective adaptation unlikely, but defeat may follow. Without correction of fundamental doctrinal flaws, other areas of innovation—organizational and training reforms or better weaponry—can only marginally improve an army's combat capabilities (p. 416).

Airmen should keep this passage in mind as they enter a new kind of warfare, one between states and nonstates. They should substitute *air force* for *army* in the above quotation and then ask, Do we have flawed doctrine? Can we adapt it to changing situations? Are we willing to examine our operations honestly and make changes?

Maj James P. Gates, USAF
Washington, D.C.

The Fallacies of Cold War Deterrence and a New Direction by Keith B. Payne. University Press of Kentucky (http://www.uky.edu/UniversityPress), 663 South Limestone Street, Lexington, Kentucky 40508-4008, 2001, 172 pages, $19.95 (softcover), $35.00 (hardcover).

Since 11 September 2001, discussions about the applications of nuclear deterrence have been relegated to the back burner while our national security focuses more on the threat of nonstate actors and "axis of evil" rogue states than it has on possible peer competitors. Nevertheless, Keith Payne's book, although written before 11 September, is relevant to the national security needs of the moment. The passing of the Antiballistic Missile Treaty, the increasing likelihood that rogue actors may obtain nuclear weapons, and the recent episode of brinkmanship between India and Pakistan all combine to thrust to center stage any questions about the importance and utility of nuclear weapons in the twenty-first century.

Payne is no newcomer to this subject. The chief executive officer and president of the National Institute for Public Policy and the editor in chief of the journal *Comparative Strategy*, he has published numerous books and articles on nuclear deterrence, missile defense, and other strategic issues. In this most recent and relatively short work, his opening salvo sets the tone: because the logical structure of deterrence rests on a tautology, it is flawed. The tautology is as follows: "Rational leaders would be deterred via mutual nuclear threats because, by definition, they would be irrational if they were not so deterred." Payne then proceeds to tick off numerous examples of adversaries in recent history—including Hitler, Castro, and North Vietnam's leadership—who did not behave according to Washington's definition of "rational and reasonable." We have no reason, he continues, to expect that future adversaries will behave and respond in ways we would anticipate or could predict. Payne is so persuasive that readers will cringe, ever after, when they encounter categorical statements such as "the exact same kinds of nuclear deterrence that have always worked will continue to work" (Jan Lodal) or "if we could deter the 'evil' empire for four decades, we can almost certainly deter today's rogue states" (Harvard professor Steve Walt). If ever a clear message existed in the aftermath of the events of 11 September, it is that the threats to our nation have changed drastically from those in the Cold War and that the enemy mind-set is not necessarily one that shares our values or matches our description of "rational and reasonable."

From his basic rejection of all-encompassing deterrence, Payne begins to hint at the implications for missile defense: "In fact, in the post–Cold War era, missile defense in concert with other defensive capabilities may be necessary for the U.S. freedom of action long taken for granted in Washington." Although he fails to elaborate, his point is well taken—the failure of deterrence leaves the United States rather naked and vulnerable to the coercive power and threat of any nation or actor who might develop and field nuclear weapons. Payne makes one particularly haunting observation: during the Cold War, the United States countered the Soviets' conventional superiority in Europe with the implied intent to resort to first use of nuclear weapons to halt a conventional onslaught by the USSR. If the lesson learned is that this approach was successful, it does not bode well for the United States in the twenty-first century since adversaries across the spectrum will likewise seek to use nuclear weapons (or other weapons of mass destruction) to counter the global conventional superiority of the United States.

What, then, is Payne's prescription (the "New Direction" portion of the book's title)? First and foremost, we must not adhere blindly to the old belief that America's nuclear arsenal sufficiently de-

ters any and all threats, and we must accept the fact that in some instances deterrence will simply not work at all. Second, we must develop a more empirical and specialized approach to strategic confrontations, tempered by knowledge of an adversary's particular "beliefs, will, values, and likely cost-benefit calculations under specific conditions," and produce carefully designed declaratory policies and specific responses to an adversary's actions. Such a tailored approach stands in sharp contrast to the "blanket" application of classical deterrence.

The last third of the book is devoted to a case study—a potential future crisis with China over the issue of Taiwanese independence. Payne builds a scenario in which classical deterrence theory simply does not work since the stakes for Chinese leadership are incomparably higher than those for US leadership. The Chinese leader faced with either the outright failure of his state and its philosophy (allowing Taiwan independence) or potential nuclear war with the United States does not have an easy choice. Payne notes that "all alternative courses frequently appear costly or even fatal, and yet a choice still must be made. How leaders will respond to this dilemma hardly is so predictable."

As a whole, *The Fallacies of Cold War Deterrence and a New Direction* is a refreshing examination of the swiftly disappearing classical-deterrence approach to strategic confrontations. However, it also leaves a feeling of incompleteness, having insufficiently explored the roles of missile defenses in such confrontations and having failed to address questions about how the United States should respond to the first use of nuclear weapons by a rogue actor and other queries relevant to our current national security situation. Given Payne's experience in this field of strategic theory, I both hope and suspect that a sequel is in the works.

Maj John E. Shaw, USAF
Washington, D.C.

Night Fighters over Korea by G. G. O'Rourke with E. T. Wooldridge. Naval Institute Press (http://www.usni.org/webstore/shopexd.asp?id=19192), 2062 Generals Highway, Annapolis, Maryland 21401, 1998, 288 pages, $34.95.

Gerald G. O'Rourke led a detachment of naval aviators in a little-known campaign during a frequently overlooked air war—the battle for the night sky during the Korean conflict. This is O'Rourke's autobiographical account of a chapter in the continuing evolution of US night-fighting capabilities. His book provides unique insight into the challenges of flying and fighting a war in poor weather at night while employing untested equipment, emerging technologies, and continually changing doctrine.

O'Rourke, recently deceased, teamed with historian E. T. Wooldridge, a former squadron mate, to produce a description of squadron life and "ole time" flying stories. Their tales are richly woven with the texture of Korean mud, interservice dynamics, and the occasional poignant recollection. O'Rourke had a rich background as a Navy fighter pilot, test pilot, squadron commander, commander of the carrier USS *Independence*, and Navy Department analyst. Likewise, Wooldridge was a naval aviator and test pilot; he also served on the Joint Staff. Woolridge has authored several aviation books and has worked in various capacities at the National Air and Space Museum since 1976.

While the descriptions of night dogfights with MiGs are interesting, it is more valuable for airmen to note the connection between training and the employment of new technology, and the integration of naval and USAF forces during the Korean air war. O'Rourke's descriptions of the demanding conditions inherent in night-flying operations are timeless and well presented. These naval aviators lived and flew with a Marine night-fighter squadron, which served to increase the color and interest of their descriptions about daily life during the Korean conflict.

O'Rourke makes an important observation on the value of multirole fighters: "We now realized what a hindrance it was, in this type of war, to have an airplane built for night fighting only, that would not carry even a single bomb." The contrast between the later years of World War II and the Korean War was large. The former was characterized by a concern for national survival that led to an abundance of operational aircraft and great technical and organizational innovation. The reality of the Korean conflict was that the United States was involved in a war of limited objectives and resources. This resulted in some difficulties integrating new technical developments with established military doctrine. These difficulties, according to O'Rourke, were often worked out at the unit level, where much of the innovation and integration occurred. This solution supports an enduring observation that good ideas often bubble up from the bottom.

The descriptions of the various aircraft and flying operations of the Korean War are interesting, but the personal examples, leadership lessons, and explanations of how the emerging technologies

were integrated into their operations are far more valuable. The history buff should find this book a good selection, due to the abundant detail as well as the sincere and frequently colloquial first-person accounts. Although *Night Fighters over Korea* is enjoyable and easy to read, the analysis of the lessons of experience, leadership, and wartime innovation makes this book worthwhile.

Lt Col Merrick E. Krause, USAF
Springfield, Virginia

Tailspin: The Strange Case of Major Call by Bernard F. Conners. British American Publishing (http://www.britishamericanpublishing.com), 4 British American Boulevard, Latham, New York 12110, 2002, 512 pages, $26.95 (hardcover).

Armchair detectives should enjoy pondering the proposition that Air Force major James Arlon Call was the "bushy-haired man" in the infamous Marilyn Sheppard murder. Her convicted husband, Dr. Sam Sheppard, claimed that a bushy-haired intruder had killed her. That suspect became the one-armed man in *The Fugitive* television series and movie. Whether or not that was truly the case, the book does document Call's extensive "life of crime." That life included a shoot-out in which Call killed a police officer and eluded police during the ensuing 106-day manhunt. The author is a former FBI agent who wrote the book as a dramatized narrative, blending known facts with his own speculations. The last 140-plus pages present the evidence the author uses to implicate Major Call. The truly interested reader can delve deeply into the crime-scene evidence, court exhibits, police reports, and various witness testimonies; others will likely give this part of the book only a cursory glance.

The book details Call's life and actions between 1949 and 1956, illustrating them with several photos of his family and other aspects of his life. Although the book paints him as a "war hero" (he is indeed credited with 17 Korean combat missions), his awards, decorations, and excerpts from his officer-performance reports are not as glowing or impressive as the author implies. As is often the case today, some excerpts from 1949–52 sound very good but say very little! His lifestyle appears to have been less than impeccable. After his wife's untimely death in October 1952 left him with a year-old son, his gambling habit spiraled out of control. In May 1954, he deserts his unit and turns to a full-time life of burglary, robbery, and murder. It's interesting to read how he used his Air Force survival and other general training to avoid apprehension for more than 100 days in the face of a dedicated manhunt.

In accordance with his plea bargain, Call served 13 years in jail for killing the policeman. After his release, he appeared to live a law-abiding life—one perhaps financed by previously ill-gotten gains—and eventually remarried. Call's death in a 1974 auto accident brings a disappointing end to the story and forever leaves unanswered many questions about his role in the Sheppard murder. An interesting read, *Tailspin* will intrigue most Air Force members because it was "one of their own" who committed criminal acts.

Maj David Van Veldhuizen, USAF
Wright-Patterson AFB, Ohio

Third Reich Victorious: Alternate Decisions of World War II edited by Peter G. Tsouras. Greenhill Books/Lionel Leventhal Limited (http://www.greenhillbooks.com), Park House, 1 Russell Gardens, London NW11 9NN, 2002, 256 pages, $34.95.

At times, we ask ourselves "what if?" as we explore alternatives and ponder what could have been. Undoubtedly, luck—good or bad—played as great a role as skill in the outcome of significant events during World War II. In high school during the summer, my friends and I would play historical simulation games that ended with Germany—or even the Soviet Union—winning major battles in World War II. *Third Reich Victorious* takes this stratagem a step further, exploring possible historical outcomes that may have yielded a German victory in key turning points of the war. Tsouras does an excellent job of presenting the difficult topic of alternative courses of action by calling upon several historians and authors to create new scenarios of what might have been. Some readers will consider the contributors' assumptions stretches of the imagination while others will admit that the outcome was simply a stroke of luck—a fortunate roll of the dice for the victor.

Included in this exploration are lessons to learn about the use of combat power, such as the importance of capitalizing on the principles of mass, economy of force, timing, and tempo. Two scenarios are of particular interest to airpower historians and

aficionados. The first is an interesting reading of the alternate history of the Battle of Britain, whereby the Luftwaffe leadership identifies key elements and centers of Britain's air defenses and focuses on eliminating them before conducting the next phase of the air campaign. As we've seen in the most recent US air campaigns waged in Iraq, Kosovo, and Afghanistan, the attainment of air superiority—and, ultimately, air supremacy—depends upon controlling or denying the enemy's ability to maintain or contest the airspace. The fact that the Germans failed to do this in the real Battle of Britain enabled the Royal Air Force to experience its finest hour. But what if the Germans had actually created a solid battle plan and stuck to it? This scenario suggests one possible result.

Another alternative examines the Allied bomber offensive. Starting the historical review in 1943, the scenario explores many variables that actually plagued this offensive—namely, flak and enemy fighters, both of which took a surprisingly heavy toll on US and British bombers. Several times, the Allies were ready to throw in the towel over massive losses on specific raids or segments of a campaign. Similarly, the Germans were ready to give up on their means of countering the bombers. In the (real) end, the Allies triumphed because of decisions and gambles that paid off. But in this scenario, US and British air leadership sticks doggedly to doctrine and tends more often than not either to ignore or belatedly employ advice and advances that would benefit bomber survivability.

Alternate histories aren't for everyone. The authors of these scenarios had to establish some initial, albeit historically rooted, conditions in order to arrive at their conclusions. Some of their assumptions are leaps of faith, random events that didn't come to pass, or in a few cases actual plans or ideas that never saw the light of day. In some instances, these scenarios cause readers to marvel at just how close Germany came to winning a key event in World War II. Although we might not agree with either the assumptions or the outcomes, in most cases the scenarios contain important lessons that we would do well to keep in mind. Indeed, *Third Reich Victorious* has a way of making readers pause to ask themselves, "What *if* history had gone this way?"

Maj Paul G. Niesen, USAF
Maxwell AFB, Alabama

The *Pueblo* Incident: A Spy Ship and the Failure of American Foreign Policy by Mitchell B. Lerner. University Press of Kansas (http://www.kansaspress.ku.edu), 2501 West 15th Street, Lawrence, Kansas 66049-3905, 2002, 408 pages, $34.95.

A long overdue book, *The* Pueblo *Incident* is a detailed examination of the seizure of an American spy ship in 1968 and the failure of American political and national security institutions to deal with armed piracy and hostage taking. It uncovers a serious lack of understanding of North Korean aims and threats; amazingly, in 2002 the United States still finds its Northeast Asian defense policies tied to Pyongyang's whims and manipulations. Equally disturbing is the way the US Navy and National Security Agency went about running these offshore eavesdropping missions. The USS *Liberty* incident had already occurred off the Sinai coast. Israel, a notional ally, bombed and torpedoed the ship and machine-gunned US Navy personnel during the Six-Day War in 1967. The Navy continued to use converted cargo ships for eavesdropping missions and, in order to keep the Cold War from escalating, did not send either Navy combatants or aircraft to protect these very vulnerable vessels. It continued to log these missions as minimal-risk operations until the seizure of the USS *Pueblo*.

The heavy engagement of the United States in the Vietnam War limited President Lyndon Johnson's options. Escalation of tensions on the Korean peninsula was out of the question; as it was, certain US Air Force assets (mostly electronic warfare) had to be redeployed from Vietnam in order to meet needs of proposed Air Force operations on the peninsula. Lerner then takes us with the *Pueblo*'s crew members to North Korean interrogation centers, where they endured brutal beatings and inhumane treatment—a forgotten part of their story. Eighty-two sailors spent a year being treated no better than Americans who fell into the hands of the North Vietnamese in Hanoi. But the crew members received only belated recognition for their sufferings. After returning to the United States, they were considered traitors and interrogated very harshly, as the National Security Agency sought to learn how much of the sensitive cryptological gear and codes had been compromised. None of them received good assignments, and the incident was swept under the carpet. Furthermore, many US Navy officers could not forgive Comdr Pete Bucher for having surrendered his ship without a fight.

The story then switches between the White House and South Korea as President Johnson is forced to walk a tightrope among competing prob-

lems: keeping South Korea in line (Seoul wanted to attack the North), fighting the Vietnam War, and addressing domestic political concerns. Viewing the crisis from a Cold War perspective, one must conclude that it was handled well. But it also left the lasting impression that the United States would take no action to protect intelligence missions. For example, a year later, an EC-121 operated by the US Navy was shot down over the Sea of Japan. Like the *Pueblo,* it had communications problems, operated from Japan, and supported the same Navy security group the *Pueblo* had supported. Indeed, the similarities were eerie. Evidently, the Navy suffered from an inability to learn from its mistakes. Lerner lists other Cold War incidents, leveling the charge that most intelligence losses stemmed from errors within the US intelligence bureaucracy. Seemingly, the US government never was able to grasp the North Korean viewpoint—either in this crisis or in later ones. According to the author, this inability of our makers of foreign policy to see other viewpoints clouds US judgements.

Lerner, who had access to new information and talked to the crew members, breaks new ground in this book. His conclusions, although harsh, may be true—certainly, the facts as recounted in the book support them. The United States will continue to confront this type of event in its war on terrorism, and some of the failings of the national security bureaucracy lend themselves to study lest the country suffer similar misfortunes. *The* Pueblo *Incident,* which has become required reading in new Cold War courses at major academic institutions around the country, makes for spellbinding, provocative reading.

Capt Gilles Van Nederveen, USAF, Retired
Alexandria, Virginia

The Military History of the Soviet Union edited by Robin Higham and Frederick W. Kagan. Palgrave Macmillan (http://www.palgrave-usa.com), 175 Fifth Avenue, New York, New York 10010, 2002, 328 pages, $59.95.

Once a mystery to Western audiences, the military history of the Soviet Union has aroused great attention in recent years. Robin Higham and Frederick W. Kagan, leading experts on the Russian and Soviet armed forces, have taken a crack at synthesizing this new understanding in a handy one-volume military history of the Soviet Union that will delight enthusiasts and assist instructors. Companion to *The Military History of Tsarist Russia,* compiled by the same authors, this collection of 17 essays by leading experts constitutes a comprehensive military history of the Soviet Union—as opposed to a history of the Red Army, national-security policy, or civil-military relations. The authors have cast a broad net, considering politics, strategy, institutions, and campaigns from the military aspects of the Russian Civil War to the immediate post-Soviet period. Coming in for particular attention is the operational art, the subject of some of the book's best chapters. Two penetrating chapters contributed by Kagan effectively survey a burgeoning literature to offer some sensible thoughts on the rise of modern warfare doctrines in the 1920s and the subsequent atrophy of the military art on the eve of the Second World War. A particular theme is the outsized and baleful role of ideology, which significantly figured in the demise of prewar doctrines of maneuver warfare. Despite the terrible lesson of the Second World War, in which the operational art had to be relearned at great cost, the influence of ideology remained important. Scott McMichael cogently argues that political ideology hampered the Red Army in its development of a counterinsurgency doctrine for use in Afghanistan. This debilitating war left the development of Soviet doctrine and forces further crabbed, in that the lessons learned from Afghanistan were not regarded as an advanced course in small wars, but as instruction on dealing with internal threats. Chapters on the Cold War have real relevance for today's world and effectively cast a long shadow over a post-Soviet military already burdened, as widely reported in the press, by aging equipment as well as weak socioeconomic support.

In keeping with its character as a military history of the Soviet Union, the book could have profitably devoted a separate part entirely to the Second World War in addition to those parts dedicated to the formation of the Red Army and Cold War. Many arguments favor singling out this central experience. The monumental nature of the undertaking, the significance of the Red victory, and, not the least of which, the recent outpouring of scholarship on the subject all warrant separate treatment. As it is, one has to be satisfied with two short surveys of operations. As well executed as they may be by the late John Erickson and Kagan, they omit the great battles of 1944 and 1945, when the Red Army fully came into its own. Air Force professionals will appreciate the fact that the book singles out airpower and strategic rocket forces for separate attention, although it gives the Cold War air arm

short shrift in favor of strategic rocket forces. Stephen J. Zaloga's chapter on strategic nuclear forces, mostly a chronology of weapons, is somewhat weak although this might reflect an analogous development to the trend in the United States during the missile age, when nuclear thought and strategy largely migrated to other quarters. (In contrast, the Cold War years saw heated debate over strategy within the upper ranks of the navy overlapping into the Politburo of the Communist Party of the Soviet Union.) One can forgive these lacunas, if only for the superior analysis and uniformly high quality of writing. The editors are to be congratulated for an error-free, genuinely erudite text. Each chapter includes a helpful note on areas for further research as well as a listing of key English sources. Despite its hefty price tag, this book will find its way onto the shelves of many enthusiasts and teachers who seek a single reference volume on the Soviet military experience.

Dr. Matthew R. Schwonek
Maxwell AFB, Alabama

Touch and Go

In this section of "Net Assessment," you will find additional reviews of aviation-related books and CD-ROMs but in a considerably briefer format than our usual offerings. We certainly don't mean to imply that these items are less worthy of your attention. On the contrary, our intention is to give you as many reviews of notable books and electronic publications as possible in a limited amount of space.

Red Wings over the Yalu: China, the Soviet Union, and the Air War in Korea by Xiaoming Zhang. Texas A&M University Press (http://www.tamu.edu/upress), John H. Lindsey Building, Lewis Street, 4354 TAMU, College Station, Texas 77843-4354, 2002, 320 pages, $39.95 (hardcover).

English-language works dealing specifically with Soviet and Chinese participation in the Korean War remain relatively few in number. Dr. Xiaoming Zhang, a member of the faculty at Texas A&M International University, has filled a portion of that gap with a first-rate history of the important role played by the air forces of the two communist giants in that still-unresolved conflict. Zhang draws on a vast array of Chinese, Soviet, and American sources. Readers will find his description of Korean War air operations from the Soviet and Chinese perspective quite illuminating.

Yet, this book is not simply a history of air combat over Korea. It provides a welcome examination of the troubled birth and rapid growth of the Chinese People's Liberation Army Air Force (PLAAF) and its doctrine. It also sheds light on early cooperation between the People's Republic of China and the Soviet Union, as well as on the roots of the Sino-Soviet split. Indeed, many people might dispute Zhang's claim that the "most productive Soviet contribution to the air war in Korea" was the creation of the Chinese air force (p. 142). He demonstrates, however, that Soviet assistance was critical to the PLAAF in securing its own airspace against persistent Nationalist attacks, as well as building and maintaining its strength in the face of American airpower over Korea.

For the PLAAF, the Korean War was a watershed event. Zhang notes that Chinese military writers and historians chronicled the Korean War in heroic terms "so none of the accounts emerged in coherent, coordinated, well-documented form." The resultant "mythology" held that young, inexperienced, and technologically outclassed Chinese pilots "bravely challenged their much more experienced American counterparts and defeated them" (p. 212). Although he spends a fair amount of time trying to bring balance to what he sees as inflated US "kill ratios," Zhang agrees with most Western historians that the communist air forces failed to achieve the air superiority they repeatedly sought over the USAF or even to provide desperately needed protection and close air support to communist ground forces suffering under a furious US and UN air assault. Only now, in the face of

America's post–Gulf War, high-tech air dominance, is China turning its back on its Korean War experience, which, in Zhang's view, shackled it to an outdated and ineffective defensive mind-set.

Readers interested in Cold War politics, the air war over Korea, and the roots of China's airpower will find great value in this well-written and richly researched book.

Mark J. Conversino, PhD
Maxwell AFB, Alabama

A Tribble's Guide to Space: How to Get to Space and What to Do When You Are There by Alan C. Tribble. Princeton University Press (http://www.pupress.princeton.edu), 41 William Street, Princeton, New Jersey 08540-5237, 2000, 224 pages, $35.00 (hardcover), $16.95 (softcover).

A glance at the title of this book suggests that it will be a whimsical look at space—the final frontier—and that some cooing, purring, furry creature will guide readers through 224 information-filled pages of everything they wanted to know about space but were afraid to ask. I don't know what Alan C. Tribble looks like, but I can attest that his *Guide to Space* is indeed a thorough explanation of basic concepts about the physical properties of space, offered up in layman's terms. Moreover, the examples he uses to illustrate these concepts are clear, well thought out, and at times even whimsical. My only rub about the book is that it would have benefited from breaking up the main sections into smaller, more easily digestible pieces—especially those sections that discuss the properties of light, mass, acceleration, and gravity. In sum, *Guide to Space* serves as an excellent primer for nonscientific readers. Although they may have to revisit some of the material in order to grasp it satisfactorily, Tribble's writing style makes this sometimes-necessary part of the journey tolerable.

Maj Paul G. Niesen, USAF
Maxwell AFB, Alabama

Griffon-Powered Spitfires, Warbird Tech Series, vol. 32, by Kev Darling. Specialty Press (http://www.specialtypress.com), 39966 Grand Avenue, North Branch, Minnesota 55056, 2001, 104 pages, $16.95 (softcover).

The Griffon-powered Spitfires and their derivatives were the epitome of grace, representing the cutting edge of air-combat technology. This book, the history of the second-generation Spitfire, covers the full spectrum of the aircraft's evolution, from the first amalgamation of the Griffon engine to the Spitfire platform, to the last manifestation and design from Supermarine—designated the Attacker, it was the first and last jet-powered Spitfire. The design change was driven mainly by the introduction of the Luftwaffe's Focke-Wulf Fw 190, which proved itself more than capable of outflying the earlier Merlin-powered Spitfires. Rolls-Royce developed the Griffon engine to meet the need for a power plant with larger cubic-inch displacement, already having pushed the Merlin to a maximum displacement of 27 liters. Rolls-Royce drew upon its racing-engine experience, extending the "R" class engine to 36.7 liters, thus giving birth to the Griffon.

This meticulous, detailed history with over 170 black-and-white and color photos covers the initial design of the Spitfire in 1931 to its final flight in 1957; it even includes an account of the doomed seagoing version—the Griffon Seafires. Almost every major design enhancement of the airframe is accompanied by a detailed history of multiple tail numbers from that production run as well as a record of each aircraft's entire service tenure and pilot notes on how each design change affected performance. *Griffon-Powered Spitfires* is a must read for Spitfire historians and enthusiasts of World War II aviation.

TSgt Joseph R. Winfield, USAF
Barksdale AFB, Louisiana

Servicemember's Legal Guide, 4th ed., by Lt Col Jonathan P. Tomes, USA, retired. Stackpole Books (http://www.stackpolebooks.com), 5067 Ritter Road, Mechanicsburg, Pennsylvania 17055-6921, 2001, 256 pages, $16.95.

Military members need this book! It contains specific information about what their rights are, how they can avoid problems, and when they need to see an attorney. Even though service people are entitled to free legal assistance, this book is essential reading because it can help them with their planning and steer them away from legal traps. Writing in an understandable style and making good use of examples, Tomes covers laws relating to such topics as finance, property, and civil and criminal matters for both active duty and reserve

personnel. The detailed information in *Servicemember's Legal Guide* makes it an outstanding companion to *Uniformed Services Almanac*, known for its financial and entitlement facts. I heartily recommend both books to all military members and their families.

Herman Reinhold
Yokota Air Base, Japan

The First World War: The Eastern Front, 1914–1918 by Geoffrey Jukes. Osprey Publishing (http://www.ospreypublishing.com), Elms Court, Chapel Way, Botley, Oxford OX2 9LP, 2002, 95 pages, $14.95.

This book, number 13 in Osprey Publishing's Essential Histories series, deals with an area of World War I perhaps least well known to Westerners but one that deserves attention if only for the fact that from the ashes of the eastern front arose the Soviet Union. The author, who spent several years with the United Kingdom's Ministry of Defence, is a specialist in the eastern front during both world wars, having written five books and numerous articles on the subject. Later, he taught at the Australian National University for 26 years. This volume is but one of the publisher's many books on subjects in military history ranging from the Crusades to recent conflicts such as the Iran-Iraq War of the 1980s.

This highly readable work serves as a good introduction to a more in-depth study of the eastern front. Following a useful chronology, one finds chapters on the warring sides, the fighting, and portraits of a soldier and civilian that serve as composites designed to educate readers about the conditions that both experienced. Jukes includes a discussion of the Bolshevik revolution and offers, as do the other volumes of this series, a great many illustrations, photographs, and maps. He also provides a short list of books for further reading.

Is *The First World War: The Eastern Front, 1914–1918* a significant work of history? No, it is not. However, it is a worthwhile book for readers who wish to gain a working, albeit superficial, knowledge of its subject. People curious about the eastern front may want to try this book before jumping into something deeper.

Command Sgt Maj James H. Clifford, USA
Fort Gillem, Georgia

Hitler's Squadron: The Fuehrer's Personal Aircraft and Transport Unit, 1933–1945 by C. G. Sweeting. Brassey's (http://www.brasseysinc.com/index.htm), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2001, 192 pages, $31.95 (hardcover).

Talk about finding a niche and filling it, C. G. Sweeting has done exactly that. His book *Hitler's Squadron* is a detailed look at a relatively unknown aspect of Luftwaffe history. The author, former curator for the Smithsonian Institution's National Air and Space Museum and author of three other books on World War II aviation, has written a fascinating book about the squadron and pilot responsible for flying Hitler during his time as Fuehrer. Likewise, the *Fliegerstaffel des Fuehrers* (F.d.F) was responsible for the air transport of other high-ranking German officials and heads of state from other nations.

In this well-written, extremely informative, and expertly presented book, complete with dozens of rare and previously unpublished photographs, anecdotal stories, and historic sidebars, Sweeting takes the reader into a unique component of the Luftwaffe. In addition to the transport unit itself, the author closely examines the life and career of Hans Baur, Hitler's personal pilot. In February 1933, Hitler chose this Lufthansa captain and veteran of World War I as his personal pilot and commander of the transport unit. Baur, who had complete control in selecting the personnel and equipment for the squadron, was the only pilot (with the exception of one flight in 12 years) with whom Hitler ever flew. An officer in the SS, Baur was an unrepentant Nazi who never renounced either Hitler or National Socialist ideals or even admitted the existence of the Holocaust. For his loyalty to Hitler and the Nazi Party, Baur spent 10 years as a prisoner of war in the Soviet Union, finally released in 1955. Because Baur's achievements as an organizer and pilot are worthy of further exploration, Sweeting's book *Hitler's Personal Pilot: The Life and Times of Hans Baur* may also merit reading.

Overall, *Hitler's Squadron* is an enjoyable book. The excellent technical information and pilot reports on lesser-known German aircraft such as the Ju-52, FW-200 Condor, and Ju-290 of the F.d.F. presented in the appendices make for worthwhile reading by themselves. *Hitler's Squadron* will have a significant impact on Luftwaffe history and will make a great addition to any aviation library.

Lt Col Robert F. Tate, USAFR
Maxwell AFB, Alabama

A Gallant Company: The Men of the Great Escape by Jonathan F. Vance. Pacifica Military History (http://www.pacificamilitary.com), 1149 Grand Teton Drive, Pacifica, California 94044, 2000, 351 pages, $29.95 (hardcover).

A Gallant Company thrusts the reader into the world of Allied prisoners of war (POW) held in Germany during World War II. Jonathan Vance takes us on a remarkable journey into the lives of these prisoners, both before and after their capture. Vance's easy writing style and detailed treatment make this book a thrilling experience. Readers get a real sense of what life was like at Stalag Luft III and the constant struggle between prisoners attempting to escape and guards trying to prevent them. The author covers many early escape attempts, both successful (a "home run" in POW terms) and unsuccessful. He also chronicles the prisoners' numerous methods—some ingenious, some bold, and some just plain crazy. Whether successful or not, the attempts provided invaluable information for later tries. The book culminates with what became known as the Great Escape, which took place on the night of 24–25 March 1944. Vance provides a detailed background of all the prominent individuals involved in the escape effort, known as X Organization, as well as of most of the men who got away. The ambitious plan called for digging three tunnels—Tom, Dick, and Harry—so that even if the guards discovered one or two of them, work could continue on the other(s). The organization selected Harry, 30 feet deep and over 384 feet long, for the nighttime passage of 200 prisoners. Because of problems with cave-ins, an Allied air raid, and myriad other difficulties, only 87 men made it out before the guards discovered the escape the next day. Vance describes how those 87 tried to make their way across Europe to safety and includes an account of the brutal murder of 50 of them by Hitler's Gestapo. I highly recommend *A Gallant Company* for its ease of reading, sheer amount of detail, and interesting story.

Capt Kevin D. Smith, USAF
Winnipeg, Canada

F-86 Sabres of the 4th Fighter Interceptor Wing by Warren Thompson. Osprey Publishing (http://www.ospreypublishing.com), Elms Court, Chapel Way, Botley, Oxford OX2 9LP, United Kingdom, 2002, 128 pages, $19.95 (softcover).

Warren Thompson has produced some fine books and pieces on air warfare during the Korean War. In so doing, he has developed a new genre consisting of pilot interviews woven together by text and prolifically illustrated with heretofore unpublished color photographs from the veterans themselves. *F-86 Sabres* is very similar to the more extensive *MiG Alley: Sabres vs. MiGs over Korea,* which Thompson coauthored with David McLaren. Some of the same pilots appear in both books although their accounts differ slightly. *F-86 Sabres* is smaller, focuses on only one of the two F-86 air-superiority units in the war, and is more of a picture book. Aside from its lower price and different photos, however, I can think of nothing that would recommend it over *MiG Alley*.

Kenneth P. Werrell
Christiansburg, Virginia

It's becoming increasingly apparent to the leadership of this country that while we develop more capable conventional forces, we must concurrently develop the mobility resources to quickly deploy those forces into battle and, once deployed, resupply them.

—Gen Thomas M. Ryan Jr.

Mission Debrief

Air and Space Power Journal is always looking for good articles written by our readers. If you have something to say, send it to us.

The *Journal* focuses on the operational and strategic levels of war. We are interested in articles that will stimulate thought on how warfare is conducted and the impact of leadership, training, and support functions on operations.

We encourage you to supply graphics and photos to support your article, but don't let the lack of those keep you from writing! We are looking for articles from 2,500 to 5,000 words in length—about 15 to 25 pages. Please submit your manuscript via electronic file in either MS Word or Word Perfect format. Otherwise, we need two typed, double-spaced draft copies.

As the professional journal of the Air Force, *ASPJ* strives to expand the horizons and professional knowledge of Air Force personnel. To do this, we seek and encourage thought-provoking articles. Please submit yours to the Editor, *Air and Space Power Journal*, 401 Chennault Circle, Maxwell AFB AL 36112-6428, or electronically to aspj@maxwell.af.mil.

. . . But How Do I Subscribe? EASY . . .

• Just write New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh PA 15250-7954; call (202) 512-1800 (voice) or (202) 512-2250 (fax); or visit http://bookstore.gpo.gov/subscriptions/alphabet.html on the Internet.

• Say that you want to subscribe to AFRP 10-1, *Air and Space Power Journal*, stock number 708-007-00000-5.

• Enclose a check for $32.00 ($44.80 for international mail).

• Spend a year enjoying four quarterly issues mailed to your home or office.

Basis of Issue

AFRP 10-1, *Air and Space Power Journal*, is the professional journal of the Air Force. Requirements for distribution will be based on the following:

One copy for each general officer on active duty with the US Air Force and Air Reserve Forces.

One copy for every five (or fraction thereof) active duty US Air Force officers in the ranks second lieutenant through colonel.

One copy for each US Air Force or Air Reserve Forces office of public affairs.

Three copies for each Air Reserve Forces unit down to squadron level.

Three copies for each air attaché or advisory group function.

One copy for each non–US Air Force, US government organization.

One copy for each US Air Force or US government library.

If your organization is not presently receiving its authorized copies of the *Air and Space Power Journal*, please contact our staff to verify your address. To obtain the latest information or to contact us, visit our Web site at http://www.airpower.maxwell.af.mil.

The Editor

OUR CONTRIBUTORS

Gen Gregory S. Martin (USAFA; MS, Central Michigan University) is commander of United States Air Forces in Europe, commander of Allied Air Forces Northern Europe, and Air Force component commander of United States European Command, Ramstein Air Base, Germany. In addition to flying 161 combat missions in Southeast Asia, he commanded the 67th Tactical Fighter Squadron, the 479th Tactical Training Wing, and the 1st and 33d Fighter Wings. He also served as the Joint Staff's J-8 vice director and the Air Force's director of operational requirements. Before assuming his current position, he was the principal deputy with the Office of the Assistant Secretary of the Air Force for Acquisition. A command pilot and master parachutist with more than 4,100 flying hours in various aircraft, including the AT-38, F-4, F-15, and C-20, General Martin is a graduate of Squadron Officer School, Air Command and Staff College, and National War College.

Col Anthony C. "Chris" Cain (BS, Georgia State University; MAS, Embry-Riddle Aeronautical University; MSS, Air War College; MA, PhD, Ohio State University) is the chief of the Professional Journals Division of the College of Aerospace Doctrine, Research and Education (CADRE). Colonel Cain was recognized as the AETC Educator of the Year while serving as a faculty member of Air Command and Staff College (ACSC). While at ACSC, he directed the Theater Air Campaign and the Airpower Studies Courses. In 2002, the Smithsonian Institution Press published his book, *The Forgotten Air Force: The French Air Force and Air Doctrine in the 1930s*. Colonel Cain's aviation experience includes serving as a B-52 instructor radar navigator and flying 26 missions in Operation Desert Storm. He is a distinguished graduate of ACSC and a graduate of both Squadron Officer School and the Air War College resident program.

Lt Col Larry Weaver, USAF, retired (USAFA; MA, PhD, Indiana University), is a senior analyst for Synergy, a Washington, D.C., based company that supports US military forces around the world. While on active duty, Colonel Weaver served in the Office of the Undersecretary of the Air Force for Strategy and Threat Reduction and as a director of future technologies on the Air Staff. His academic expertise includes serving as a dean at Air Command and Staff College (ACSC) and as an assistant professor of history at the USAFA. His operational experience includes duty as a B-52 pilot. He is a graduate of Squadron Officer School and ACSC.

Dr. James H. Toner (AB, St. Anselm College; AM, College of William and Mary; PhD, University of Notre Dame) is a professor of international relations and military ethics in the Department of Leadership and Ethics at the Air War College. Dr. Toner is on leave from the college until June 2004 to serve as The Ambassador Holland H. Coors Distinguished Visiting Chair of Character Development at the United States Air Force Academy. A graduate of Infantry Officer Candidate School and of the Airborne School, Dr. Toner served as an Army officer on active duty in Germany from 1968 to 1972 and was honorably discharged in 1974. He is widely published and lectures frequently on ethics, character development, and moral issues in national security. His articles, reviews, monographs, essays, and columns have appeared in scores of scholarly journals, popular magazines, and newspapers. Dr. Toner frequently serves as a consultant for religious, military, media, educational, and athletic leaders. In 2001, as a panelist on the Army Professionalism Study, he authored an essay on reconciling Christian ethics with contemporary duty, which was included in *The Future of the Army Profession* (McGraw-Hill, 2002). His books include *The American Military Ethic: A Meditation* (Praeger, 1992), *The Sword and the Cross: Reflections on Command and Conscience* (Praeger, 1993), *True Faith and Allegiance: The Burden of Military Ethics* (University of Kentucky Press, 1995), and *Morals under the Gun: The Cardinal Virtues, Military Ethics, and American Society* (University of Kentucky Press, 2000).

Lt Col John M. "Jay" Fawcett Jr., USAF, retired (USAFA; MBA, Cornell University), is a contractor supporting the commander of the US Air Force Command and Control Training and Innovation Group at Hurlburt Field, Florida. Formerly a division chief with the Joint Forces Air Component Commander Operations Division, 505th Command and Control Evaluation Group, he retired in 1998. His articles have appeared in *Aerospace Power Journal*, *Air Chronicles*, and *Parameters*. Colonel Fawcett is a graduate of Squadron Officer School, Air Command and Staff College, and Air War College.

Lt Col Kenneth A. Luikart, Georgia ANG (BS, Regents College), is director of support and mission-support flight commander for the 165th Airlift Wing (Air Mobility Command), Georgia Air National Guard. He has served as an intelligence specialist, air intelligence officer, air technician detachment air intelligence officer, and senior intelligence officer. He has supported the following operations: Team Spirit in Korea; Badge Torch in Thailand; Coronet Oak and Volent Oak in Panama; Provide Promise, Joint Endeavor, and Joint Forge, flying missions into Bosnia-Herzegovina; and Support Hope, flying humanitarian missions into Rwanda and Zaire. Colonel Luikart is a graduate of Squadron Officer School, Air Command and Staff College, and Air War College.

Lt Col Antulio J. Echevarria II, USA (USMA; MA, PhD, Princeton University; MSS, US Army War College), is currently assigned as the director of National Security Affairs at the Strategic Studies Institute, US Army War College, Carlisle Barracks, Pennsylvania. He has held a variety of command and staff assignments in Germany and the continental United States, and has served as an assistant professor of European history at the US Military Academy; as the Squadron S3 (operations officer) of 3/16 Cavalry; as chief of battalion/task force and brigade doctrine at the US Army Armor Center at Fort Knox, Kentucky; as a researcher in the Army After Next project at Headquarters TRADOC, Fort Monroe, Virginia; and as a speechwriter for the US Army chief of staff. He has published a book, *After Clausewitz: German Military Thinkers before the Great War* (University Press of Kansas, 2001), and articles in a number of scholarly and professional military journals. Colonel Echevarria is a graduate of the US Army's Command and General Staff College and the US Army War College.

Lt Col Richard R. Baskin (BS, Texas A&M University; MBA, University of Colorado at Colorado Springs) is chief of Technology Requirements, Directorate of Plans and Programs, Headquarters Air Education and Training Command, Randolph AFB, Texas. He is responsible for identifying technology applications to improve the effectiveness and efficiency of the command's education and training. His office serves as the command's interface for Air Force battlelab, science and technology, and modeling and simulation activities. He has previously served as commander of a training-support squadron, an operations officer, an instructor, and a standardization and evaluations officer. A master space and missile operator, Colonel Baskin is also a certified acquisition professional, holding a level-three program-management certification.

Dr. Dean L. Schneider (BSEE, Texas A&M University; MSEE, Air Force Institute of Technology; PhD, University of Texas) is a senior research engineer and program manager at the Texas Center for Applied Technology, a component of the Texas Engineering Experiment Station in San Antonio, Texas, where he manages an energy-conservation effort for a Department of Defense facility. He formerly served as chief of the Technology Requirements Branch, Directorate of Plans and Programs, Headquarters Air Education and Training Command, Randolph AFB, Texas. While on active duty in the Air Force, he was director of the Air Force Human Systems Integration Office, a faculty member at the Air Force Institute of Technology, and a reliability and maintainability engineer at an Air Force depot. Dr. Schneider is also a certified acquisition professional.

The *Air and Space Power Journal* (ISSN 0897-0823), Air Force Recurring Publication 10-1, is published quarterly. You may subscribe by writing New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh PA 15250-7954; calling (202) 512-1800 (voice) or (202) 512-2250 (fax); or visiting http://bookstore.gpo.gov/subscriptions/alphabet.html. Annual rates are $32.00 domestic and $44.80 outside the United States. The GPO stock number is 708-007-00000-5. See *Air and Space Power Journal* on-line. Visit *Air and Space Power Chronicles* at http://www.airpower.maxwell.af. mil/.

The *Journal* welcomes unsolicited manuscripts. Address them to Editor, *Air and Space Power Journal,* 401 Chennault Circle, Maxwell AFB AL 36112-6428. E-mail or submit your manuscript via electronic file in either MS Word or WordPerfect format. All submissions will be edited in accordance with the standards set forth in the *Air University Style Guide for Writers and Editors* (available on-line in the *Air and Space Power Journal* section of *Air and Space Power Chronicles* at http://www.au.af.mil/au/oas/aupress/style). *Journal* telephone listings are DSN 493-5322 and commercial (334) 953-5322.