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For many years, we have informally used a referee process of anonymous peer review to help select articles for publication and to enhance the content and quality of *APJ*. We would like to recognize the now formally established Board of Reviewers and thank its members for the invaluable service they provide as recognized authors and experts in various fields of aerospace power. Along with our Editorial Board (listed on the inside back cover), the Board of Reviewers is critically important to promoting *APJ* as the premier forum for aerospace power dialogue and debate.

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Medicinal Thoughts

WE USUALLY DON'T think about breathing until we can't. This literally involves one of the most important facets of war—medicine. Just as weaponry, reconnaissance, communications, and myriad other technologies have experienced phenomenal advancements, so too has military medicine progressed in quantum leaps of a revolutionary nature. Far removed from the era of Florence Nightingale during the Crimean War, military medicine now enjoys capabilities that translate into significantly increased comfort and prospects of survival for injured combatants on the battlefield or for innocent civilian victims of terrorist attacks or natural disasters.

Despite its critical importance and the dramatic improvements in practices, military medicine has remained an obscure topic in most professional military journals, including this one. In fact, a cursory glance at the history of *Aerospace Power Journal* (as well as that of its predecessor, *Airpower Journal)* reveals a paucity of attention afforded to aerospace medicine—until now. We are focusing on this important topic with several interesting pieces that suggest a new perspective on military medicine for most readers. Similar to aerospace superiority (another thing, like breathing, not to be taken for granted), military medicine is not only essential to mission success but can be the mission itself. Military medicine finds itself more closely linked to the very essence of our national policy in terms of engaging globally with humanitarian and disaster assistance and connecting with force protection—of paramount importance to military involvement worldwide.

As military medicine becomes increasingly involved with the total force, jointness, and coalition efforts with other nations and various organizations, it experiences the growing pains of new wineskins. Global engagement has tremendous implications for the Air Force Medical Service, and just as airmen—from fighter pilots to joint force air component commanders—have to accommodate the demands of timely decision making, so does the medical service find itself in an observe-orient-decide-act (OODA) loop in its worldwide challenges. Basically, the challenge calls for doing more things faster with a lighter, leaner medical force. The argument presented by Dr. Tom Hughes in one of our articles—that quicker may not always be better—has a perplexing application to military medicine, in which one measures the difference between life and death in seconds and heartbeats.

Threats to national security, vital national interests, and international stability are becoming increasingly complex and unpredictable. Similarly, military medicine is facing far more complicated challenges. But as some of the articles in this issue point out, Air Force medicine is up to the task. The piece by Lt Gen Paul Carlton Jr. highlights the current shift in emphasis on patient care to quicker, leaner, lighter, and essential-only systems that can react appropriately in support of the expeditionary Air Force. Brig Gen Bruce Green explores the same theme by looking at the history and current state of aeromedical evacuation—not just some peripheral issue but a "line of the Air Force" concern. In another article, Col James Dougherty points out the unique nature and "special" challenges of providing medical support to special operations forces. Finally, the Vortices opinion piece by Lt Col Stephen Howard attacks the rationale behind the drug-war efforts in

South America, a topic with important medical considerations for today's environment.

Air Force medicine is moving from the realm of the supporting to that of the supported—from the shaft to the tip of the spear. As such, it is increasing in its capability to respond and decreasing in size and response time. Integral to the overall effort is medical situation awareness on the part of the entire Air Force, including this journal. Hopefully, readers will understand this as they take their next breath and read on. □

Ricochets and Replies

We encourage your comments via letters to the editor or comment cards. All correspondence should be addressed to the Editor, Aerospace Power Journal, *401 Chennault Circle, Maxwell AFB AL 36112-6428. You can also send your comments by E-mail to apj@maxwell.af.mil. We reserve the right to edit the material for overall length.*

MYTHS? OR TRUTHS WITH ASTERISKS?

Lt Col Martin Wojtysiak is to be commended for taking the time to write his article "Another View of the Myths of the Gulf War" (Fall 2001), in which he rebuts my earlier article "Myths of the Gulf War: Some 'Lessons' Not to Learn" (Fall 1998). I set out to be purposely provocative and feared that I may have failed in provoking a response. Apparently, I did not.

Rather than rebut his views point by point, which seems overly academic, let me make some general comments about his remarks. First, the bulk of my article was a presentation given to the chief of staff of the Air Force's Airpower Symposium, a gathering of general officers and major-command participants held at Maxwell Air Force Base in the fall of 1992, well before most of the works Colonel Wojtysiak cites as making some of the same arguments that I make. I just didn't get around to publishing it outside the professional military education environment for some time. But these arguments have been made and reiterated within the Air Force, by me and others, for some time. The overselling of the capability of airpower is a problem for airmen too, not merely "Western politicians."

Second, if he prefers to call these statements of mine "truths with asterisks" instead of myths, that is fine. In doing so, he accepts the point of the exercise in saying that we ought not be overwhelmed with the military triumph without examining some of the questions about it. It is like making claims about the best team in baseball in 1994. That was the strike season—the division winners are listed as of August, when the strike occurred, but there were no play-offs, no pennant winners for the year, and no World Series. It is "truth with an asterisk." That is, one needs some extra explanation to put the listing of accomplishments in proper perspective.

Third, a "militarily intact Iraq" does not control Kuwait. While that is a truly good outcome of the Gulf War, it is not the whole story. Iraq is largely militarily intact, and Saddam is stronger in many ways—with less domestic opposition (from Kurds or Marsh Arabs), even after the destruction in the war and despite the sanctions, the no-fly zones, the inspections by the United Nations Special Commission, and so forth—than was the case before the war. Iraq's weapons of mass destruction have not been destroyed, the Republican Guard has been largely reequipped, the sanctions leak like a sieve, and regularly scheduled Iraqi airliners fly routinely in the supposed "no-fly zones," as do helicopters. And more than a decade after the Gulf War,

Iraq represents a threat to the region and the US forces stationed there. I suspect that many people expected more from a "victory."

Fourth, Colonel Wojtysiak points to the *Gulf War Air Power Survey (GWAPS)* and the Department of Defense's (DOD) *Report on the Conduct of the Gulf War* as sources of information on the Air Force's performance in the Gulf War. The DOD report, a major public-relations effort, is at variance with several other analyses, including RAND studies and Government Accounting Office reports, also commissioned by the US government. The *GWAPS* report—designed as an equivalent to the *United States Strategic Bombing Survey*—has an interesting history. Originally, there were to be some 3,000 unclassified copies printed. But some senior Air Force officers and civilian officials wished to suppress it because it was more objective and critical than they wished. Ultimately, the print run was changed to only 500 copies on a carefully controlled distribution list. That does not promote truth and trust in the Air Force.

Fifth, and most importantly from my perspective, is the fact that Colonel Wojtysiak fails to answer the main question of the piece. Gen Carl A. "Tooey" Spaatz made a set of summative assessments about the effectiveness of airpower in World War II that were largely "rediscovered" in the Gulf War. I asked, "Why did airmen not understand what we had achieved over 50 years ago? How did they let these insights disappear from their understanding of war and the application of airpower?" I think the late Carl Builder included a major part of the answer in his book *The Icarus Syndrome*. We should not presume airpower's capabilities or success and should be mindful of its limitations. That's a healthy attitude, not an unjust criticism. Promise only what we can deliver, and deliver all we can promise.

Last, I eagerly await Colonel Wojtysiak's reply to my more recent article "Myths of the Air War over Serbia: Some 'Lessons' Not to Learn" (Winter 2000). It reviews the same myths—plus one—and suggests that we still have not placed things in perspective or realized the harm that may occur from being overly boastful. I do this not to demean the contributions of the Air Force or its airmen. They are exceptionally well trained, dedicated, and capable men and women who are achieving remarkable operational prowess in their service. And the Air Force's accomplishments in the Gulf War and Kosovo were considerable—but not without fault. I don't want us to lose sight of airpower's limitations amid the euphoria of limited military triumphs.

My fear is that we will try to use airpower to cure all foreign ills and ask it—continually—to do things it may not be able to do because it is misunderstood, ill funded, or misapplied. No degree of operational prowess can substitute for a failed strategy. As I stated in the more recent article cited above, "Airpower is a precious asset. Merely because it *can* be used does not necessarily mean it *should* be used." In our euphoria over the public demonstration of airpower's considerable abilities and accomplishments, we should not oversell it or lose sight of its limitations. That said, I welcome the larger debate and the contributions of Colonel Wojtysiak.

Dr. Grant T. Hammond
Maxwell AFB, Alabama

LEADERSHIP BY WALKING AROUND

Your Summer 2001 issue contained some excellent articles about leading airmen. However, I failed to find a single article on the human aspect of "leading" airmen. It seems to me that Air Force leaders, especially those in the midlevel noncommissioned officer (NCO) and officer ranks, have no concept of what I will call "Leading by Walking Around" (LBWA), an adaptation of a term borrowed from management experts—"Management by Walking Around." By LBWA, I mean showing genuine concern for the lives and families of the people being led. More importantly, a leader needs to communicate genuine appre-

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New Millennium, New Mind-Set

The Air Force Medical Service in the Air Expeditionary Era

LT GEN PAUL K. CARLTON JR., USAF, MC, CFS*

Editorial Abstract: Diverse threats to our nation's security, both at home and abroad, challenge the Air Force's medical personnel to develop innovative solutions to provide medical support for a wide range of military operations. By using highly portable medical teams and modularizing deployable assets, commanders can tailor medical response to fit the unique features of each situation. Partnering with sister-service and coalition medical services achieves synergistic effectiveness.

AS COLD WAR scenarios fade from memory and dozens of small-scale contingencies around the world challenge deployed military medics, military medical services are rethinking their readiness philosophies to fit a new paradigm. Each service must prepare for a spectrum of operations much broader than the traditional wartime role. What are the diverse missions faced by the military medics who must support these operations? What are the readiness roles in these uncertain times?

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*I wish to recognize the coauthors of this article: Col Richard Hersack, USAF, MC, CFS; Col Kerrie Lindberg, USAF, NC; Col Stephen Waller, USAF, MC, FS; Col Joan C. Winters, USAFR, BSC; and Capt Melissa Ulitzsch, USAF, NC.

The *National Military Strategy of the United States, Joint Vision 2020,* and *Air Force Vision 2020* all point to continued global, proactive engagement by Air Force people. Because this cannot happen without effective medical support, the Air Force Medical Service (AFMS) is transforming itself in order to develop the necessary expeditionary culture.

My "vision" for the AFMS emphasizes that Air Force medical personnel must be able to support the Air Force mission throughout the full continuum of military operations in which airpower may be employed, as described in Air Force Doctrine Document 2, *Organization and Employment of Aerospace Power,* 17 February 2000. To do this, medics must be able to provide support across three broad categories of deployment scenarios: humanitarian and civic assistance (HCA), medical response to disasters, and support of traditional wartime operations. These scenarios also directly support *Air Force Vision 2020*. For example, HCA missions demonstrate *vigilance* by promoting democracy, peaceful relationships (military-to-military and military-to-civilian), and economic vitality—a sort of "preventive medicine" against war. We demonstrate *reach* by responding promptly and appropriately to disasters when invited by an allied country and when called upon to augment disaster response by civil authorities at home. Both HCA and disaster-response missions create opportunities for our medical personnel to gain valuable experience during deployments that carry over to support wartime operations. Thus, they support *power,* our traditional readiness mission.

Medics face diverse and frightening challenges as our military increases its participation in nontraditional roles. Potential scenarios could involve weapons of mass destruction, natural disasters, and complex technological/political/natural crises. A regional or worldwide epidemic, such as the outbreak of influenza in l918, could have enormous impact on all medical personnel. None of us need to be reminded of the recent tragic consequences of terrorism that put medical response to a severe test. Controlling such events can avert worldwide economic catastrophe and subsequent potential conflict.

Since each situation is unique, lessons learned from previous disasters will not solve all the problems of a new crisis. But one can learn general lessons and apply them to the development of generic plans for responding to different types of disasters. On the one hand, earthquakes, for example, can result in major surgical casualties, particularly in the first three days after the event. The need for intensive care and renal dialysis may overwhelm the civilian medical system's capability. On the other hand, a flood or hurricane may cause few surgical casualties but increase demand for emergency-room and public-health services as well as ongoing basic health-care needs, such as refilling prescriptions.

Medics face diverse and frightening challenges as our military increases its participation in nontraditional roles.

This scenario, combined with the potential loss of medical infrastructure, may overwhelm the local civilian medical system, as recently demonstrated when floods struck Houston, Texas, during Tropical Storm Allison. The Air Force deployed a 25-bed field hospital within 24 hours of receiving urgent requests from Texas and the Federal Emergency Management Agency. In such cases, the rapid insertion of lightweight, rapidly deployable, well-equipped surgical teams and field hospitals may prove critical to saving as many victims as possible while decompressing the civilian health-care system enough to give it a chance to recover. Most disasters create chronic needs for the local population that require long-term development work for full recovery. As the civilian health-care sector's ability to respond to sudden increases in casualties declines, senior government officials and citizens more than likely will expect military medics to assist quickly.

Medical-response missions could occur either just outside a domestic military base or overseas. Requests for domestic civil support would originate from local and state governments to appropriate federal agencies, which would then route the requests to the Defense Department. Overseas, these types of requests would come through the State Department, as they did after Hurricane Mitch struck Nicaragua in l998 and floods swept through Mozambique.

Responding appropriately and rapidly—a new paradigm for the military's medical personnel—requires the efficient use of limited airlift so that critical medical supplies and assistance reach the people who need it most. Since moving large field hospitals may not satisfy this requirement, the answer lies in light, lean, and mobile medical teams with a small footprint that can make modular, "tiered and tailored" responses.

This way, one can literally custom-build medical support for each mission. By creating small, multifunctional teams, the medical service can provide the on-scene commander with a flexible response tailored for the specific contingency. These "medical building blocks" permit problem-specific treatment—analogous to the flexibility available from the modern practice of using blood components rather than the traditional whole-blood treatments of the World War II era. Small, portable medical teams extend limited resources and maximize options for commanders, public-health officials, or host-nation governments. No longer is it necessary to task eight C-130s to haul a large air-transportable hospital when a five-person, backpack-portable surgical team can provide the needed care. After hurricanes or floods, for example, one may have a great need for public-health and preventive-medicine assessment. Deploying a two-person aerospace-medicine/public-health team or several such teams may be the ideal response, as was the case after Hurricane Mitch. The first tier of disaster response comes from local and host-nation sources, followed by additional tiers of teams, as needed. The availability of modular teams allows host nations to request specific, focused medical teams tailored to the unique disaster scenario at hand.

Such modular-response teams take full advantage of revolutionary medical electronic equipment. Instruments formerly too large to move are now carried in one hand. Patient monitoring, once confined to an intensive-care unit, can now be done under field conditions. These improvements and careful logistics allow a small team with backpacks to provide impressive medical care quickly in any corner of the world. Personnel can even travel with the 70-pound packs as normal luggage on a commercial airliner if military airlift is not available. Historically, relief workers have experienced inevitable delays before they could reach the site of a disaster. Yet, a team of military medics with man-portable medical equipment will be able to meet the initial disaster-response needs of the community and then pass control on to other, larger relief agencies or sister-service medical units when they are able to respond.

Expeditionary medical support (EMEDS) consists of numerous modular teams ranging in size from just two personnel with equipment in backpacks to components of the modular Air Force theater hospitals (AFTH). Specifically, the two-person preventive medicine/aerospace medicine (PAM) team can provide initial medical assessment of disasters, public health/preventive medicine, and emergency/flight/primary-care medicine. Ground critical-care teams (GCCT), three-person intensive-care units based on critical-care air-transport teams (CCATT), have performed critical care and patient transport in hundreds of real-world missions. The five-person mobile field surgical team (MFST) provides emergency general and orthopedic surgery to 10 patients. Together, these teams—PAM, GCCT, and MFST—make up the 10-person small portable expeditionary aeromedical rapid-response (SPEARR) team, a disaster-response "force package" that travels with backpacks only (no pallet space) or with a small trailer (one pallet–equivalent) that can be loaded by a sling. It does not require a forklift, and one can pull it with a standard pickup truck or airlift it by

helicopter. The team provides a broad scope of care and has intrinsic communication capability for aeromedical coordination, consultation, or resupply. The SPEARR team has completed its development process, including successful field-validation tests in both San Antonio, Texas, and Alaska, and has exercised side by side with the international medical and surgical response team, a volunteer unit from Massachusetts General Hospital tasked with responding to medical emergencies overseas. Finally, the AFTH consists of additional modules of personnel with palletized equipment. Building around the SPEARR, EMEDS-Basic adds two pallets with a holding capacity of four beds. Beyond that, AFTH+10 and AFTH+25 boast 10 and 25 beds, respectively. Indeed, the EMEDS system is designed to build incrementally up to AFTH+500.

One must understand that these medical teams provide essential rather than definitive care in the field. In high-paced scenarios, the military finds it more efficient to evacuate and replace personnel who cannot be returned to duty in a reasonable period of time. Providing definitive care at a forward location in order to avoid evacuation requires vast amounts of logistical support and, thus, more airlift than is realistically available when the military must meet other operational needs. Hence, the Aeromedical Evacuation System (AES) is shifting patient-care doctrine and reducing the holding capability in the AFTHs. This action has two implications: (1) the AES must be able to transport critically ill or injured patients and (2) to maintain proper patient flow, it must undergo modularization to build incrementally, as do the EMEDS modular teams. Thus, the AES has modularized the components of the basic mobile aeromedical staging facility (MASF) into rapidly deployable and, in some cases, man-portable teams.

Shifting from definitive to essential care permits the evacuation of more patients in "stabilized" rather than "stable" condition. In other words, the fact that they may require much more than basic nursing care during evacuation drives a requirement to provide a critical-care-capable patient-evacuation system. The AES now has CCATTs that literally convert any airframe into a flying intensive-care unit.

Modularity and global engagement are having a dramatic international impact. Other nations have modeled their own modular disaster-response capability after that of the AFMS teams.

These teams have successfully conducted missions, including transoceanic flights lasting several hours, that have evacuated hundreds of critically ill and injured patients.

In support of *Air Force Vision 2020*, the AFMS is also focusing on *global engagement*. Specifically, it has developed the international health specialist (IHS), a new career track and specialty code modeled after the US Army's foreign area officers (FAO) program. IHS team members, handpicked from all corps and ranks for their expertise (language, culture, politics, military, economics, medicine, and regional issues) in the area of responsibility (AOR), are interwoven with medical-readiness shops and platforms through-out each commander in chief's (CINC) AOR. Teams are specifically tasked to support the CINC's theater engagement plan, create partnerships with medical colleagues from nations within their region, facilitate military-to-military and military-to-civilian interactions, and support medical-planning operations and deployment execution within their AOR.

The first group of 26 IHSes is receiving new duties within the AOR and getting up to speed on responsibilities. Team members will be called upon to act as advisors and advanced-echelon personnel or to facilitate HCA, humanitarian medical relief operations (HMRO), or other missions into the region of their expertise. IHS personnel will maintain individual clinical competency and provide regional medical expertise throughout their careers.

This career track will become a key credential for a successful Air Force medical career in future years as the international role continues to expand.

In essence, the AFMS has created an exportable commodity that potentially could lead to the development of a worldwide, regionally focused, coalition-based medical disaster-response system.

Modularity and global engagement are having a dramatic international impact. Other nations have modeled their own modular disaster-response capability after that of the AFMS teams. For example, the Chilean air force has created an interoperable team, the *Escuadrilla de Redespliegue Sanitario Modular*, a 25-person complete hospital in two pallets, which can respond to disasters in Chile and neighboring countries.

In addition, US Air Force medics taught regional disaster-response and trauma-systems courses, sponsored by the Expanded International Military Education and Training Program of the Defense Security Cooperation Agency, to nearly 700 students in Ecuador, El Salvador, the Czech Republic, and South Africa. Furthermore, military and civilian medics from adjacent countries have attended and participated in the discussion and laboratory exercises. The courses emphasize regional (multinational) involvement, disaster response, trauma care, leadership, civilian-military collaboration, resource management, and "train-the-trainers" skills. In El Salvador, host-nation graduates of the first course, held in 1999, taught over 100 colleagues and completely redesigned the emergency department of their Central Military Hospital to handle trauma patients more efficiently. When earthquakes devastated that country in January and February of 2001, medics and hospitals were ready, and graduates of the Air Force course from adjacent countries returned to San Salvador to help with medical care and save lives. Clearly, this type of partnership and training can benefit all nations and create regional political stability and economic prosperity, thus reducing the likelihood of future conflict.

In essence, the AFMS has created an exportable commodity that potentially could lead to the development of a worldwide, regionally focused, coalition-based medical disaster-response system. Providing the modular concept as well as the training and education necessary to facilitate casualty care and management will help ensure that deployed personnel receive high-quality medical care if and when they need it, no matter where they are or which nation responds with teams.

Military medics have now become the "tip of the spear." For example, an Air Force HCA deployment in Nicaragua in June l996 represented the first US military presence in that country in 17 years! Two more HCA teams followed in 1997 and 1998, and during recovery efforts following Hurricane Mitch, the Nicaraguans reported that military medical teams had created a climate of trust that benefited US military civil-engineering teams. Thus, the HCA missions provided the basis for a mutually beneficial liaison with a new partner nation.

As Air Force medics continue to fulfill the global-engagement mission, we will need other international partnerships. Acting in my capacity as the Air Force surgeon general at last summer's meeting of the International Committee of Military Medicine (ICMM), I proposed creating regional disaster-response networks among the membership and reporting the results of this effort at the next meeting in 2002. The membership's developing nations, particularly those devastated by disasters in recent years, strongly supported this proposal. In fact, national representatives voted unanimously to adopt the plan, opening a new era of regional and worldwide cooperation among military medical services.

The upcoming ICMM meeting in South Africa in 2002 will focus upon regional-response networks and some of the principles

for success, such as establishing and building international coalition partnerships; building international medical "bridges" of friendship and cooperation; facilitating disaster preparedness among partner nations; and developing regional-response systems, whose value has been proven through mutual exercises and responses to regional disasters. Following these principles allows successful networks among neighboring nations' military medical services to support the political and economic goals of member governments.

These successes, along with many others, are impressive and hold great hope for the future. After the recent earthquake in Turkey, both Egypt and Israel responded promptly with portable medical teams; this effort not only saved lives but also provided military medical personnel with valuable readiness training. Quick response requires good preparation, planning, and execution, including the establishment of diplomatic agreements and the efficient packing of critically needed supplies and equipment.

Optimal medical readiness also demands rapid deployment of appropriate technology. Military medics must capitalize on advancements in computers and surveillance equipment to ensure real-time, state-of-the-art surveillance and monitoring for biological pathogens or chemical toxins. Medics must involve themselves in scientific inquiry to meet the needs of citizens, governments, and military commanders/war-fighting CINCs. The Air Force's medical-readiness officers have embraced this tasking as part of the mission.

To promote the process, the Developmental Center for Operational Medicine at Brooks Air Force Base in San Antonio, Texas, is charged with inserting innovative technology into readiness platforms. It also serves as a liaison with civilian disaster-response agencies, seeking to improve the capabilities and interoperability of both civil and military medical teams.

Finally, to optimize disaster response, AFMS must avoid redundancy with agencies of the United Nations, private volunteer groups, and nongovernmental disaster-relief organizations by offering "what we do best" to regional coalitions. By building on each member's strengths, the regional disaster-response network achieves synergy. Using the proper chain of command and government channels, the AFMS must communicate with other organizations before, during, and after each disaster response so that neighbors can benefit from each other's successes and failures. This includes training together in realistic exercises so that military medics of coalition nations can learn to work efficiently with new technologies and procedures shared by medical experts from various organizations and nations. This effort should result in a better worldwide medical system.

It goes without saying that full implementation of the AFMS vision for expeditionary medical support and global engagement requires involvement of the Total Force. The AFMS's fundamental concern entails developing the capability to complete the mission, regardless of where modular teams are assigned. In other words, whether a SPEARR, EMEDS-Basic, AFTH+10, MASF, or some other modular component is assigned to Guard, Reserve, or active duty units, it must be able to fulfill its role according to the concept of operations. Even though a particular concept of operations may seem to make certain modular teams especially well suited for Guard and Reserve units, the emphasis must remain on providing an overall, integrated capability for medical support. This philosophy will ensure the AFMS's overall success in the Air Force vision for global engagement.

Readiness remains the fundamental core competency of Air Force medics. Building reliable regional coalitions through partnerships and training as well as developing interchangeable medical teams that can respond by invitation to assist each other in emergencies are tasks that we can accomplish now. By utilizing new tools, we can fulfill our diverse readiness missions and engage the full spectrum of operations in the new millennium. □

Challenges of Aeromedical Evacuation in the Post-Cold-War Era

BRIG GEN BRUCE GREEN, USAF*

Editorial Abstract: Arguably, aeromedical evacuation (AE) is the most important and visible aspect of aerospace medicine. In this article, General Green recounts the 80-year history of AE and discusses current and future challenges that face this community. In order to support our war-fighting expeditionary forces in both peace and war, aerospace medical professionals are adopting a strategy of mainstreaming AE and employing the full spectrum of lift to support its mission.

AIR FORCE AEROMEDICAL evacuation, the transportation of patients under the supervision of AE crew members on fixed-wing aircraft, enjoys a proud heritage that spans more than 80 years. The AE system has been instrumental in saving the lives of thousands of America's soldiers, sailors, airmen, and marines throughout every contingency in which our country has engaged since World War I. In addition, during both war and peace, AE has moved thousands of family members who required medical care beyond that available in their local communities. The AE system is made up of AE crews; command and control (C^2) elements; mobile/fixed patient-staging facilities; and a multitude of communications, logistics, and support components. Today, the AE system

*I wish to recognize the coauthors of this article: Col Sheila A. W. Millette, USAF; Col Bob Brannon, USAF, retired; and CMSgt Pamela Trammell, USAF, retired.

faces new and demanding challenges. In order to ensure the effective and efficient operation of AE in the new millennium, a major transformation of AE, led by Air Mobility Command (AMC), is now under way. A brief history of AE will set the stage for that transformation.

An Illustrious History

The concept of moving the wounded by air began almost simultaneously with the concept of fixed-wing aircraft flight.[1] Shortly after the Wright brothers successfully flew their first airplane, two US Army medical officers, Capt George H. R. Gosman and Lt A. L. Rhodes, designed an airplane to transport patients. Using their own money, they built and flew the world's first air ambulance at Fort Barrancas, Florida, in 1910. Unfortunately, on its first test flight, it flew only 500 yards at an altitude of 100 feet before crashing. This flight, followed by Captain Gosman's unsuccessful attempt to obtain official backing for the project, proved to be only the beginning of many challenges for the new concept.

World War I Era

Air evacuation was very limited during World War I; however, it was remembered most as the time during which air-ambulance design made significant progress by trial and error. A French medical officer, Dr. Eugene Chassaing, first adapted French military planes for use as air ambulances by inserting two patients side by side into the fuselage behind the pilot's cockpit. The first actual evacuation of wounded in airplanes specifically equipped for patient movement occurred in Flanders in April 1918, using a modified Dorand II aircraft.

The United States began to use airplanes for evacuating the injured from the battlefield in World War I but found it difficult to use planes not designed for patient airlift. Specifically, the fuselages were too small to accommodate stretchers, and the open cockpits exposed patients to the elements. As a result, the US Army Medical Corps used airplanes primarily to transport flight surgeons to the site of airplane accidents to assist in the ground transportation of casualties.

By war's end, the US Army realized the need to transport the wounded by air. In 1918 Maj Nelson E. Driver and Capt William C. Ocker converted a Curtiss JN-4 Jenny biplane into an airplane ambulance by modifying the rear cockpit to accommodate a standard Army stretcher carrying an injured person in a semireclined seat. The modification allowed the US Army to transport patients by airplane for the first time. This success led to an order directing all military airfields to have an air ambulance.

Between the World Wars

The success of the Jenny air ambulances during World War I paved the way for the further development of air evacuation, with several other types of aircraft converted successfully for this purpose. In 1920 the DeHavilland DH-4 aircraft modification allowed it to carry a medical attendant and two side-by-side patients in the fuselage. Shortly thereafter, the Cox-Klemmin aircraft became the first plane built specifically as an air ambulance, carrying two patients and a medical attendant enclosed within the fuselage. The building of the Curtiss Eagle in 1921 allowed the transport of four patients on litters and six ambulatory patients. Unfortunately, in its first year of service, an Eagle crashed during an electrical storm, killing seven people.

Despite the crash setback, aeromedical transportation continued to progress. In 1922 the US Army converted the largest single-engine airplane built at the time, the Fokker F-IV, into an air ambulance designated the A-2. In the same year, a US Army physician, Col Albert E. Truby, listed the potential uses of the airplane ambulances as follows:

- Transportation of medical officers to the site of crashes and evacuation of casualties from the crash back to hospitals.
- Transportation of patients from isolated stations to larger hospitals, where they could receive better treatment.

- In time of war, transportation of the seriously wounded from the front to hospitals in the rear.
- Transportation of medical supplies in emergencies.

Before long, others began to recognize the need for air transportation of patients and the special training that would be required for medical attendants. Mary Beard, registered nurse (RN) and director of the American Red Cross Nursing Service in 1930, stated, "No one of our nursing organizations, no leading school of nursing, nor any other professional group, has taken up this subject seriously and definitely tried to promote the organization of a group of nurses who understand conditions surrounding patients when they are traveling by air." After a 15-year crusade, visionary Lauretta M. Schimmoler, RN, succeeded in establishing the Aerial Nurse Corps of America.

World War II

At the beginning of World War II, the common belief was that air evacuation of the sick and wounded was dangerous, medically unsound, and militarily impossible. The Army Medical Department did not believe that the airplane was a substitute for field ambulances, even when it was necessary to evacuate casualties over long distances. The surgeon for the Army Air Forces (AAF) Combat Command, Maj I. B. March, was concerned that field ambulances would not be sufficient to cover the aerial paths of the air forces. In response, the surgeon general of Third Air Force, Lt Col Malcolm C. Grow, stated that the "chief stumbling block in the way of [air] ambulances has been the lack of interest on the part of the [Army] Surgeon General. Until he accepts the airplane as a vehicle [for casualty transportation], I doubt if very much can be done about it."

The war soon demonstrated the necessity of air evacuation. The Burma Hump airlift operation saw what was probably the first use of helicopters for combat rescue, often the first step in the air-evacuation process. In one instance, TSgt Ed Hladovcak of the 1st Air Commandos, piloting an L-1 with three wounded British passengers, was forced down over 100 miles behind Japanese lines. Deep in the jungle where an airplane could not land, unable to move because of the injured Brits, and ground-rescue forces days away, the downed men hid from nearby enemy soldiers. The only option was to dispatch a YR-4 helicopter with its 175-horsepower engine to try a rescue. The YR-4 could carry only one passenger at a time, straining its engine past the redline just to lift off. Despite these difficulties, four trips were made in and out to a sandbar, where the men could safely transfer to an L-5. The mission was a great success. Successful combat rescues and air evacuations were to continue throughout the Hump operation.

The need to transport large numbers of casualties back from distant theaters of war was apparent, but designated air-evacuation aircraft did not exist. AAF policy was to use transport planes for air-evacuation flights as their secondary mission. Transport aircraft were reconfigured for air evacuation, using removable litter supports. In this way, aircraft that transported men and supplies to the theaters of operation were utilized as air-evacuation aircraft on their return trip. By January 1942, AAF C-47 Skytrain aircraft had transported more than 10,000 casualties from Burma, New Guinea, and Guadalcanal.

As air evacuation evolved, it became clear that specially trained personnel were needed to optimize casualty care during air transport. Because there were not enough physicians to put on every flight, Brig Gen David Grant, AAF air surgeon, proposed establishing a flight-nurse corps. Despite opposition from the Army surgeon general, the designation "flight nurse" was created for specially trained members of the Army Nurse Corps assigned to the AAF Evacuation Service. In February 1943, the first class of flight nurses graduated from Bowman Field, Kentucky. The four-week course taught aeromedical physiology, aircraft-loading procedures, and survival skills. This specialized training was the beginning of trained medical personnel providing in-flight care—the catalyst for the current AE system.

Before long, regular AE routes were established, and hospitals were built along airstrips to care for the wounded who needed to remain overnight along the route. In early 1943, AE aircraft began transatlantic flights from Prestwick, Scotland, to the United States. By the end of the same year, transpacific AE flights were returning patients to the continental United States (CONUS) via Hawaii. In 1944 a southern Atlantic route to the United States, originating in North Africa with stopovers in the Azores and Bermuda, began serving passengers. Aircraft used for AE during the war included the C-46 Commando, C-54 Skymaster, C-64 Norseman, C-87 Liberator Express, and the aforementioned C-47. In addition, bombers and tankers moved patients from forward battle zones during tactical AE.

The sheer number of patients transported during World War II reflects the great importance of AE. At its peak, the AAF evacuated the sick and wounded at a rate of almost 100,000 per month. A one-day record of 4,704 AE patients evacuated was set in 1945. In his statement on 18 June 1945, Gen of the Army Dwight D. Eisenhower said, "We evacuated almost every one of our forward hospitals by air, and it has unquestionably saved hundreds of lives—thousands of lives." General Eisenhower placed AE in a class with sulfa drugs, penicillin, blood plasma, and whole blood as a chief factor in cutting the fatality rate of battle casualties.

The risk of evacuating patients by air had been a concern since the beginning of the war. However, as AE crews gained experience, the risk of death during AE dropped to six patients in 100,000 by 1943. At the end of the war, the risk was down to one and one-half patients in 100,000, thus proving that AE was one of the most important medical advances in decreasing the mortality rate associated with warfare.

Postwar Period and a New Service

The postwar drawdown changed the face of the US military's AE system. By 1946 the system consisted of 12 aircraft at the School of Aviation Medicine and one C-47 at each of the 12 regional US hospitals. In 1947 the US Air Force (USAF) was established, receiving orders in 1949 to provide AE for the entire US military.

In May 1949, the Joint Chiefs of Staff (JCS) directed the Air Force to establish "evacuation systems" for both the Army and Air Force. On 7 September 1947, Secretary of Defense Louis E. Johnson made a policy announcement directing that the transportation of patients of the armed services would be accomplished by aircraft when air transportation was available, when conditions were suitable for air evacuation, and when there was no medical contraindication to air transport.

The Military Air Transport Service (MATS) had researched aircraft development in the AE role before its formal organization. The C-47 and C-54 were the mainstays of early CONUS AE. MATS provided regularly scheduled AE missions and transported 12,369 patients within the CONUS from June through December 1948. During this same period, 5,151 patients were moved from locations outside the continental United States (OCONUS) (i.e., overseas) to the CONUS. Intertheater AE from Europe began on 11 October 1949, with the C-121 Constellation (Connie). The C-121 provided a higher service ceiling, pressurized cabin, and smoother transatlantic crossings than the C-54. Eventually, the C-121 replaced the C-54 on the twice-weekly "Benefactor" AE missions from Rhein-Main, Germany, to Westover Air Force Base (AFB) Massachusetts. During this same period, C-54 aircraft serviced the Pacific theater. On 1 June 1950, the new MATS C-97A Stratofreighter was introduced into the AE role. With its larger carrying capacity and pressurized cabin, the weekly C-97A flight replaced the four trips per week flown by the C-54.

The Korean War

Whereas World War II had proved the value of AE, the Korean War established it as the preferred method of evacuation for US casualties. Although bad weather, mountains, and enemy fire hampered AE in the Korean War, Air Force rescue helicopters (C-47/C-54) still managed to evacuate most of the war's casualties.

Air Force H-5 rescue helicopters of the 3d Air Rescue Squadron went into action as frontline medical craft. C-47 transports of the 315th Air Division, carrying AE crews, flew into the most forward airstrips under enemy fire, saving thousands of American lives. The Air Force's 801st Medical Air Evacuation Squadron (one of the first units to receive a distinguished unit citation) evacuated more than 4,700 casualties from the Chosin Reservoir in December 1950. This aeromedical support enabled the embattled 1st Marine Division to execute a successful fighting withdrawal to the port of Hungnam on the northeast coast of Korea. The Army soon set up its own helicopter-evacuation service and, by late 1951, combined AE support to enable naval ships in-theater to serve as floating hospitals rather than simply transports for the wounded. Most American patients were airlifted to Japan, Hawaii, and the United States.

MATS used C-46, C-47, C-54, and C-124 aircraft to transport 137,950 patients between stations overseas and from OCONUS to the CONUS during the Korean War. Additionally, MATS provided for the movement of 215,402 patients within the CONUS. In a restatement of the USAF mission in 1953, MATS was charged with "the provision of airlift for patients of the Department of Defense on overseas routes over which MATS operates, from ports of debarkation, and between air facilities serving hospitals within the zone of interior." AE was now a major mission of MATS—no longer a corollary task limited to the forward delivery of cargo or passengers.

Specialized Aircraft for AE

The next major AE development was the introduction of the Convair C-131A Samaritan. This pressurized aircraft, with a specialized interior for AE, offered fast service for the short air routes of Europe and North Africa. The C-131A, which made its debut on 26 March 1954, had a cruising speed of 235 knots; it had room for 37 ambulatory patients or 27 litter patients plus four ambulatory patients, as well as a medical crew of three. The aircraft configuration accommodated specialized medical equipment such as an iron lung, orthopedic bed, artificial kidney machine, or infant incubator. All Samaritans were distinctly marked with a red cross on the tail.

In June 1966, Headquarters USAF directed Air Force Systems Command to submit a proposed source-selection and procurement plan for a new AE aircraft. In July 1966, the Department of Defense agreed to initiate a modernization program, and in January 1967 it approved the expenditure of $34 million to purchase eight aircraft plus spares. Three contractors responded with proposals: McDonnell-Douglas (DC-9A), British Aircraft Corporation (BAC-111), and Boeing (B-737). On 31 August 1967, McDonnell-Douglas received the contract, with the first aircraft delivery scheduled for August 1968, followed by one per month for seven months. The rollout ceremony of the C-9A Nightingale occurred on 17 June 1968. The aircraft was tested and delivered to Scott AFB, Illinois, on 10 August 1968. Eventually, 21 C-9As were purchased between 1967 and 1971.

The Vietnam War

Advances in AE improved medical care during the Vietnam War. Rapid evacuation of the wounded from Vietnam's battlefields by helicopters, followed by jet transports, saved many lives. Pacific Air Forces (PACAF) operated in-country aeromedical service and transoceanic jet service to hospitals at Clark Air Base (AB), Philippines, as well as Yokota AB and Tachikawa AB, Japan. Military Airlift Command (MAC)—the successor to MATS—helped evacuate many casualties from Vietnam, handling all patient movement to the United States. Although the Air Force acquired its first C-9A in August 1968, C-9As did not begin flying missions in Southeast Asia until March 1972. Ordinary transport planes—primarily the C-7 Caribou, C-130 Hercules, and C-141 Starlifter—equipped with litters flew most of the war's aeromedical missions. PACAF's 903d Aeromedical Evacuation Squadron provided the first mobile casualty-staging facility during this war.

Subsequent to Vietnam, AE supported a variety of contingency and humanitarian operations over the next two decades. The more notable ones included Operation Homecoming—the return of US prisoners of war from Vietnam; return of the 52 American hostages held in Iran for over 400 days; evacuation of casualties from the bombing of the US Embassy and Marine Corps barracks in Beirut; and evacuation of 167 casualties from Grenada. Officially designated mobile aeromedical staging facilities (MASF) were in the AE inventory and available when Operation Urgent Fury in Grenada took place in October 1983 but were not used.

Operation Just Cause and the Gulf War

AE proved to be a key factor in the overall success of Operation Just Cause in December 1989. During that short but violent conflict to oust Panamanian dictator Manuel Noriega, wounded American soldiers, sailors, airmen, and marines received care at the joint casualty collection point (JCCP) at Howard AB, Panama. The JCCP, which included both conventional and special-operations assets, combined surgical and mobile aeromedical-staging capability into one element by employing MASFs for the first time. The JCCP treated 276 patients, stabilizing and evacuating 257 to military hospitals in San Antonio, Texas, on nine AE missions (using eight C-141s and one C-130). Four of the nine missions (which evacuated 192 casualties) took place during the extremely intense first 24 hours of the operation. The overall survivability rate for American service members treated at the JCCP during the operation was 99.3 percent (276 total casualties treated; only two died from their wounds). Furthermore, no deaths occurred during AE missions.

The next challenge for AE came in response to Iraq's invasion of Kuwait in August 1990. During the weeks preceding the start of Operation Desert Storm, United States Central Command predicted that as many as 15,000 Americans would be wounded in the early stages of the allied invasion to reclaim Kuwait. With the help of aeromedical elements from the Air Force and medical units from the Army, Navy, and Air Force, a coordinated, multitheater chain of evacuation was created to evacuate potential casualties. The Air Force AE system, totaling over 1,950 personnel, included 19 AE liaison teams, 12 MASFs, 99 tactical AE crews, 46 strategic AE crews, and 22 flight surgeons, as well as a number of C^2 and support elements. The plan was to use medically configured C-130s for dedicated evacuation flights within the Persian Gulf, followed by a combination of dedicated and retrograde C-141s evacuating the most seriously wounded to Europe and the CONUS.

The mobilization and deployment of Air Reserve Component (ARC) forces were essential to the evacuation plan due to extremely high patient-movement planning factors—up to 6,000 per day. ARC accounted for almost 97 percent of the total AE forces, serving in a multitude of AE elements that created an elaborate evacuation chain stretching from Southwest Asia to the CONUS. The planning factors for AE, predicated on a six-week rather than six-day air war were very high. Predictions averaged over 1,000 intratheater patient movements per day, and intertheater AE movements were predicted to average an additional 900 patients per day.

Most Air Force planners did not anticipate that the air and ground fighting during Desert Storm would hardly tax the medical system. Coalition casualties were so light that the staff at Air Force contingency hospitals in Europe, like many of their counterparts in the Arabian Peninsula, practiced very little combat medicine. From August 1990 to March 1991, disease and nonbattle injuries accounted for most of the patients evacuated from Southwest Asia to Europe during Desert Shield/Storm. An aggressive preventive-medicine campaign was implemented, proving very effective in minimizing losses to disease.

During Desert Shield/Storm, several significant issues arose to challenge the AE forces, including the lack of Kevlar protective equipment for many of the Guard/Reserve personnel; the need for contingency training for the

ground AE elements as well as a more streamlined, coordinated process for patient regulating; and review of interface points with the AE system. Nonetheless, the mission involved the largest deployed AE force in history, totaling over 12,632 patients evacuated on 671 AE flights with no in-flight deaths—a complete success.

Change in the Nineties

A new era in airpower history began on 1 June 1992 with the inactivation of MAC, Strategic Air Command, and Tactical Air Command. Two new organizations—Air Combat Command (ACC) and AMC—developed from the elements of the deactivated commands. Shortly afterward, AMC divested itself of infrastructure and forces not directly related to Global Reach. Among the units affected were C-130 airlift squadrons and AE squadrons at Rhein-Main AB, Germany, which transferred to United States Air Forces in Europe (USAFE), and similar squadrons at Yokota AB, Japan, which transferred to PACAF. These transfers—along with the majority of active and ARC C-130 airlift squadrons; the active-duty AE squadron at Pope AFB, North Carolina; and the 19 gained AE squadrons from the ARC—all went to ACC in order to align all theater (combat) support under one command. However, in 1997 these same assets were transferred back to AMC.

In 1996 the Global Patient Movement Requirements Center (GPMRC) was established within US Transportation Command to facilitate and streamline patient validating and regulating. Theater Patient Movement Requirements Centers also stood up in US European Command and US Pacific Command. These centers are responsible for definition and management of patient-movement requirements, patient in-transit visibility, and collaboration with their respective theater or joint-task-force movement-control agency to coordinate bed and lift plans.

Because of lessons learned in Desert Shield/Storm, an Aeromedical Evacuation Contingency Operations Training (AECOT) course was developed and fielded at Sheppard AFB, Texas, in September 1998. The course trains AE personnel in a standardized manner regarding general philosophy, capabilities, organization, operations, C^2, and support required to provide full-spectrum AE capability during contingencies.

In 1999 a Critical Care Air Transport Team (CCATT) course was developed at Brooks AFB, Texas, to prepare teams of physicians, nurses, and technicians to provide structured en route care for critically ill and injured patients whenever and wherever required. The course includes a detailed review of the CCATT mission, equipment, and organization, as well as familiarization training with AE aircraft, orientation to the stresses of flight, and refresher training through a fundamental critical-care support course.

Throughout the nineties, AE units continued to be engaged in a variety of contingency operations covering multiple theaters. AMC and AMC-gained units deployed 60 medical personnel for 90 days in the fall of 1994 to manage an air-transportable hospital in support of Operation Uphold Democracy. Those medical personnel were responsible for treating and aeromedically evacuating, if necessary, all military personnel deployed. In addition, Air Force medics deployed to austere locations throughout Haiti to take part in the humanitarian-assistance program.

Additionally, active duty and ARC AE forces joined to support operations in Kenya, Rwanda, Saudi Arabia, Kuwait, Bosnia, Somalia, and Kosovo. AE evacuated many critically injured Rangers and special operations forces to Ramstein AB, Germany, after the 3 October 1993 "Bloody Sunday" firefights in Mogadishu, Somalia. AE personnel supported Operation Allied Force with crews and mobile aeromedical-staging facilities. Moreover, those same personnel concurrently supported Operation Shining Hope, a humanitarian cause. The first four AE missions flown out of Tirana, Albania, were on C-17 Globemaster IIIs, demonstrating the effective use of opportune airlift. In each operation, the presence of AE forces ensured the prompt and safe aeromedical evacuation of military personnel who needed more care than was avail-

able locally. Finally, throughout the nineties, AE units supported humanitarian civic-action operations in various locations throughout Central and South America. With the adoption of a new casualty-replacement policy and a smaller presence in overseas contingency theaters, AE became even more important as the twentieth century closed.

Time for Change

By the late nineties, AE faced new and daunting challenges. Modern conflict, routinely characterized by rapid, short-duration, high-intensity combat, has resulted in casualty generation with very little lead time. As a result, there is often no opportunity to set up en route contingency hospitals, and critically ill patients frequently have to be evacuated long distances to reach comprehensive medical care. This necessitates the movement of "stabilized" (rather than fully stable) patients, who often require intensive care during evacuation.

In December 1998, during an internal review of current AE posture, AMC identified a number of critical issues with significant potential to affect future AE operations. These included the Air Force's evolution into the expeditionary aerospace force (EAF) concept and air expeditionary force (AEF) structure; implementation of TRICARE; evolving doctrine and command relationships; changing patient-movement requirements; the impending retirement of the core strategic AE aircraft, the C-141, which currently performs the majority of peacetime intertheater AE missions; and the status of the dedicated intratheater AE platform, the aging C-9A, which requires major modifications to meet both global air traffic management and stage III noise-compliance requirements. As evidenced by the above, today's AE system is designed for a world that no longer exists. Today's changing environment demands a new look.

In August 1999, Lt Gen Walter S. Hogle Jr., AMC vice commander, directed a review of the entire AE mission area and established an integrated product team chaired by AMC Plans/Programs (XP) with the support of the AMC command surgeon. In September 1999, a multicommand AE Tiger Team (AETT) was formed to address the following areas: requirements, doctrine, operations, airframes, organization, resourcing, equipment, communications, information management/information technology, education, training, and awareness. This team generated a comprehensive final report—the road map to implement recommendations.

Major Findings and Key Recommendations

Requirements. Wartime casualty projections, including an added 25 percent to account for weapons of mass destruction, were 30–55 percent lower than in 1996.[2] Peacetime patient movement was greatly reduced in the CONUS due to TRICARE, but OCONUS requirements remained fairly constant because TRICARE was not as robust and quality-of-life issues mandated the need for AE.

Doctrine, Operations, and C². Recommendations included the following:

- Insert an AE control team in the air mobility division (AMD) with coequal status to the existing airlift, air refueling, and air mobility control teams.
- Align the patient-movement requirement centers under the appropriate mobility control centers at the unified commands.
- Formally establish AE cells in the air mobility control centers of the component air commands (Tanker Airlift Control Center in AMC and Air Mobility Operations Control Centers in USAFE and PACAF).
- Clarify the chain of command for fielded AE forces, with AE as a line/operations function under the joint force air component commander (JFACC) through the deployed mobility wing commander and the operations group commander.
- Change AE processes to a requirements-based system and optimize the use of limited airframes. Mix patients and

cargo when appropriate; gain visibility, using routine training missions for live missions; and use space required/space available, opportune airlift, or commercial air service.

Airframes. The major recommendations included the following:

- Option One—Pursue a strategic-distance aircraft dedicated to AE.
- Option Two—If the short-term financial constraints (acquisition costs) of such a purchase preclude option one, turn both the peacetime and wartime intratheater AE missions over to the C-130 fleet in a designated role, which would require a slight increase of C-130s in each theater.
- Investigate the concept of modifying KC-135s as an immediate, short-term intertheater fix for the retiring C-141s. This would require AMC funding for electrical modifications to a small number of KC-135s for testing and follow-on funding for additional KC-135s, based on test results. Pursue funds for a roll-on/roll-off litter capability.

Since publication of AETT's report, factors such as fiscal limitations, aircraft tasking and availability, and changing national strategy have prompted a relook at all aircraft recommendations. Further, analysis is ongoing to determine whether a shortfall of organic AE aircraft exists. Another focus is on mainstreaming AE into airlift operations and enhancing operations with the use of seats, pallet spaces, and palletized system concepts.

Organization. The team had begun to reengineer and incrementalize existing AE flying and ground-support unit type codes (UTC) in order to eliminate the need to routinely pare and tailor them to meet operational requirements. For example, the existing 50-bed MASF (which includes 39 personnel and requires seven C-130s to move it) was reengineered and incrementalized. The new MASF consists of a 10-bed basic package that can be augmented with additional 20-bed packages, as needed. This building-block approach provides significantly enhanced mission flexibility and reduces airlift requirements from seven to three C-130s. Another proposal was to form "virtual combination units," which would allow geographically separated units the opportunity to work, train, deploy, and fight together, thereby improving integration and meeting ongoing Air Force Total Force efforts for the future.

Resourcing. The team reinforced the concept that the Defense Health Program (DHP), operated and funded by the Office of the Secretary of Defense/Health Affairs, was responsible for all means of peacetime patient movement. However, Air Force aircraft may accomplish some patient movement by using training missions funded by operations and maintenance (O&M). The program budget decision transferred all funding for active duty C-9A and AE squadron operations from DHP to Air Force O&M on 1 October 2000. The team recommended decentralizing DHP funds to each theater to provide flexibility for patient-movement options. This funding would allow the purchasing of seats or pallet spaces on existing cargo missions, AE channel missions (if required), and civilian air ambulance or commercial airlines (when appropriate).

Equipment, Communications, and Information Management/Information Technology (IM/IT). Recommendations included the following:

- Fund the deployable oxygen-system initiative.
- Exercise Care in the Air (CiA), airborne wideband, and other AE communication and IM/IT initiatives during the joint expeditionary force experiment (JEFX) 2000.
- Finalize a stopgap communication plan to meet fiscal year 2002 joint requirements.
- Complete redistribution of high-frequency communications assets.
- Continue integrating and maintaining computer-based training for the Spitfire (PSC-5) radio.

- Continue pursuing the joint tactical radio system.
- Publish the AE communication concept of operations on the Air Force surgeon general (SG) Web page.
- Update and incrementalize AE communications allowance standards.

Education, Training, and Awareness. Recommendations included the following:

- Create an "Aeromedical Evacuation Center of Excellence" as a one-stop shop for AE education and training.
- Develop a flight-qualification program to standardize initial qualification for AE crew members.
- Train "universal" crew members, eliminating the "tactical/strategic and multiqualified crew" paradigm in use today. Specially qualified AE crew members will be certified in multiple airframes to provide CiA.

Gen Charles T. Robertson Jr., AMC commander, approved the AETT report on 26 September 2000, and Gen Michael E. Ryan, then the Air Force chief of staff, lauded the effort: "Please pass on to your XP and SG folks that they have done a yeoman's job on AE reengineering. General Carlton and I are impressed with the incrementalization/revamping of AE assets to better match the AEF and the Air Force medical system's direction of smaller, leaner, and more capable deployment units."[3]

Accomplishments to Date

By the end of 2000, the AETT had accumulated an impressive list of accomplishments, beginning with the determination of peacetime and wartime AE requirements. In peacetime, with the changeover to TRICARE medical coverage, the need to move patients had declined in the CONUS from approximately 69,700 patient movements in 1995 to 19,500 movements in 1999, with only 1 percent classified as priority or urgent. As mentioned earlier, in the overseas theaters, because of TRICARE's lack of robustness and because of quality-of-life issues, the requirements remained steady. This was also due to the significant closing of OCONUS medical facilities after the Cold War, requiring the movement of patients to CONUS facilities. With regard to wartime requirements, the overall wartime casualty projections were 30–55 percent less than the projections made in 1996. The projections were based on changes in warfighting concepts, evacuation policies, theater medical capabilities, and the smaller numbers of soldiers at risk.[4]

One recommendation, to insert an AE control team into the Air Operations Center, was approved and articulated in Air Force Doctrine Document (AFDD) 2, *Organization and Employment of Aerospace Power*, February 2000. In addition, a decision brief presented in January 2001 defined the roles and responsibilities of the unified/component command. Also, the Tanker Airlift Control Center (TACC) and GPMRC finalized a memorandum of agreement that addressed communication flow and responsibilities. The AE "Tactics, Techniques, and Procedures" was published through the Doctrine Center in June 2001, followed by approval of the AE Doctrine Template by the AMC commander in July 2001. The use of the approved template in updating various joint and allied publications resolved longstanding joint and service doctrinal issues.

Another key factor in aligning the AE organizational structure took effect 1 October 2000, when the TACC stood up an AE cell designated TACC/XOGA. Major benefits in scheduling, improved response time, and decreased cost were realized almost immediately as the cell implemented various recommendations. The cell began working mixed cargo and AE missions on Atlantic Express C-17s and used air-refueling missions, when appropriate, as well as Patriot Express passenger missions for patient movement. These mixed missions resulted in an overall increase in AE mission reliability. C-141 AE missions continued to be scheduled, but their reliability remained an issue. In the Pacific, mixed missions continued using C-17s and KC-135s

while exploring other options. For example, an August 2000 mission involved a C-17 reconfigured after a repatriation mission from Pyongyang, Korea, in an urgent attempt to save a five-day-old baby girl. The AE crew, made up of active duty and Reserve personnel, flew the 14-hour return leg from Yokota AB, Japan, to the United States, refueling inflight from a KC-10 Extender, which was also carrying an urgent-care patient. In another example, a C-17 cargo mission moved a litter patient from the Pacific to the CONUS. In the past, this would have resulted in the initiation of an AE channel mission costing approximately $81,000. In this case, purchasing space for a cost of $1,415 resulted in a savings of $79,585. These are just two examples of the benefits of TACC and AE cell interface and their efforts to embrace the changing AE process and to continue working with the theaters to meet their patient-movement needs.[5]

The vision represents a shift from the way we do business today and calls for the military community to refocus its view of AE from what was suitable in the past to what is necessary for the future.

Other efforts under way include transitioning AE personnel and functions from AMC/SG to AMC/director of operations (DO) and AMC/XP, reengineering the aeromedical staging facilities, integrating CCATTs, funding war-reserve material, defining a homeland defense mission, and sponsoring a regional Total Force virtual-group pilot study.

A New Vision for AE

In addition to the AETT final report, several other factors—maturing TRICARE regionalization, the imminent C-141 and C-9A retirements, recently validated planning factors increasing the wartime casualty stream by 25 percent, fiscal realities of AE modernization competing with other Air Force modernization programs, and recognition of the inevitable continuing evolution of AE—prompted AMC to redefine basic AE constructs. Brig Gen Jim Roudebush, AMC surgeon, drafted a concept known as "A Vision for Aeromedical Evacuation: Supporting Global Reach, Vigilance and Power into the New Millennium," November 2000, which outlined several precepts for AE in the future.[6] The vision represents a shift from the way we do business today and calls for the military community to refocus its view of AE from what was suitable in the past to what is necessary for the future.

The military has evolved from a strategy of containment to a strategy of engagement. We have moved from a monolithic threat environment with a heavily forward medical infrastructure to the present environment characterized by complex asymmetric threats, a light forward medical presence, and a heavy reliance on AE to transport more critically ill and injured forces and their families.

In May 2001, this vision evolved further during preparation for a briefing at CORONA.[7] The AE system is now in a period of transition from an "outlier" process with separate funding, scheduling, and flying to "mainstreaming" into operational airlift processes. The vision incorporated the AETT analysis and road map and includes the following key precepts necessary to mainstream and modernize AE:

- View AE as a specific medical-airlift mission capable of supporting patients on *any* appropriate airlift platform.
- Adapt AE to fully capitalize on the use of current organic-lift platforms.
  - Develop light, modularized, and independently operable AE equipment.
  - Design an adaptable, multiairframe-capable, palletized litter/seat system.
- Capitalize on contract lift opportunities—Patriot Express, commercial air-

lines, and civilian air ambulance—where the use of these modalities is appropriate and cost-effective.

- Establish AE qualification training designed to support AE on all appropriate platforms.
  - Address the critical interface between the aircraft crew and the AE crew.
  - Focus on two fundamental concepts: *a crew is a crew* and *CiA*.
  - Develop a universal checklist that AE crew members could use on any AE-capable airframe.
- Acknowledge the continued requirement for mobilization of the AE Civil Reserve Air Fleet (CRAF) in wartime.
- Design AE capability into all appropriate future airframes.
  - For example, multirole mobility platforms, KC-X (the future tanker and replacement for the KC-135) mission needs statement (MNS), and C-130J/X upgrades.
- Recognize that as the C-9A and C-141 retire; as AE is assimilated into organic lift, to the extent possible; and as contract-lift modalities are utilized, . . . analysis indicates a residual shortfall in AE lift to meet echelons three and four wartime requirements.
  - The AE MNS identifies AE integral requirements for future mobility airframes and addresses that shortfall between the AE wartime requirement and available lift in the most demanding scenarios.

The strategy for AE of the future was vetted by key stakeholders, including commanders in chief (CINC), Air Staff, major commands, and the Reserve/Guard. Their feedback included many positive and supportive comments, the major concerns centering on assuring availability of lift for the AE mission and training AE crew members for the flexible use of the organic-lift platforms. AMC leadership is committed and fully engaged to support the following:

- Assuring space in the airlift flow for AE requirements.
- Adapting AE to all appropriate airframes.
- Aggressively pursuing the full spectrum of airlift options for AE.
- Standardizing and enhancing training requirements.
- Planning and programming to assure that the AE mission is fully supported.

Consistent with this new vision, as the C-9A nears the end of its distinguished role in the Air Force, it will continue its service in a *designated* versus dedicated capacity. In February 2001, the Air Force chief of staff directed the removal of the red cross markings from the C-9A AE fleet.[8] The C-9A will continue to be a primary AE asset; however, the new decision will permit flexible use of the aircraft in transporting duty and space-available passengers, as well as nonmedical supplies and equipment—without risking violation of domestic or international law. In concert with the decision, AMC/Logistics (LG) designed and acquired a nonpermanent, quick-application red cross for use during times of war, contingency operations, or other instances in which the display of the red cross would be both desirable and appropriate. This capability will allow the quick application of the red cross to *any* aircraft specifically dedicated for AE. This provides protection for patients, while allowing both AMC/TACC and theater air mobility operations control centers (AMOCC) additional flexibility in selecting from all available AE-capable aircraft for such missions.[9] The reengineered AE system will focus on requirements-based scheduled support by purchasing seats and pallet spaces on the most appropriate aircraft rather than paying for entire airplanes. Government-contracted commercial augmentation use, complemented by

scheduled routes based upon CINC-driven theater requirements, form the construct. Within the construct, a variety of aircraft will be available to support AE. Moreover, during contingencies, the staging of AE crew members and en route ground-support UTCs at any airhead where AE requirements may be generated, rather than tying them to specific aircraft beddown locations, will allow increased flexibility.[10]

With the institutionalization of this new AE vision, changes to AE aircrew training and qualification become imperative. Unlike most crew members, AE crews will not be limited by qualification on specific airframes. The new vision will drive the need for a broad-based flight-qualification program, using simulators to train and qualify AE crew members on all potential airframes. In keeping with the flexible and expeditionary approach of the *Line of the Air Force*, AE will be a part of the mission portfolio of all appropriate aircraft, either integrally or by maximizing the use of portable AE equipment suited to all airframes. AE crews will be as flexible as the aircraft they use.

The new vision has taken the initial definitive step to ensure that the AE system is able to support the entire spectrum of AE requirements, from peacetime/steady-state to the full-scale casualty flow of two simultaneous major theater wars. The strategy of *mainstreaming AE* and *employing the full spectrum of lift* to support the AE mission will assure that AE will be capable of supporting our warfighting expeditionary forces in peacetime and war. AE will be here for our forces and families, now and in the future. □

Notes

1. This section draws upon *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift Command, 1941–1991* (Scott AFB, Ill.: Headquarters Military Airlift Command, Command Historical Office, May 1991).

2. This section draws upon "Aeromedical Evacuation Tiger Team Final Report" (U), AMC/Medical Readiness and Aeromedical Evacuation Division (SGX) and AMC/Plans and Programs Studies and Analysis Flight (XPY), September 2000.

3. Message, 181630Z Jul 00, Air Force chief of staff (CSAF), to AMC commander, 18 July 2000.

4. Briefing, Col Sheila A. W. Millette, AMC/SGX, subject: Aeromedical Evacuation (AE) 2000: Supporting Our Expeditionary Forces, 15 November 2000, in "Aeromedical Evacuation Tiger Team Final Report," September 2000.

5. Background paper, subject: Aeromedical Evacuation Tiger Team, AMC/XPY, 25 October 2000; briefing, AE 2000: Supporting Our Expeditionary Forces; and plan, subject: Air Mobility Command Concept of Operations for Aeromedical Evacuation, AMC/SGX, Scott AFB, Ill., 14 July 2000, in "Aeromedical Evacuation Tiger Team Final Report," September 2000.

6. Brig Gen James G. Roudebush, briefing, subject: A Vision for Aeromedical Evacuation: Supporting Global Reach, Vigilance, and Power into the New Millennium, November 2000.

7. Brig Gen James G. Roudebush, AMC, Scott AFB, Ill., talking paper, subject: Aeromedical Evacuation: Supporting Global Reach, Vigilance, and Power into the New Millennium, 21 May 2001.

8. "Emblem Removed on C-9 Aircraft," *Air Force News Service*, February 2001, on-line, Internet, 30 October 2001, available from http://www.af.mil/news/Feb2001/n20010212_0204.shtml.

9. Col Sheila A. W. Millette, AMC, Scott AFB Ill., talking paper, subject: Red-Cross Marked Aircraft, April 2001.

10. For more information on the AE reengineering, integration, and modernization effort, see Air Mobility Command/SG, on-line, Internet, 30 October 2001, available from https://amc.scott.af.mil/sg/sg.cfm.

Treaties are observed as long as they are in harmony with interests.

—Napoléon

Operational Medical Support for the Tip of the Spear

The Heart of Air Force Special Operations Forces (AFSOF) Medicine

COL JAMES J. DOUGHERTY, USAF, MC, CFS, DMO

Editorial Abstract: The war on terrorism has focused the attention of the military establishment on special operations forces (SOF), which will become the "tip of the spear" in this conflict. But how will aerospace medicine support these "light, lean, and lethal" units? Colonel Dougherty explains how SOF's unique operational environment shapes the training and technology required by SOF medical teams and what advances are needed to ensure support. According to Colonel Dougherty, "SOF medicine is *operational medicine."*

THE TERRORIST ATTACKS on 11 September 2001 in New York and Washington, D.C., as well as the crash of the hijacked aircraft in Pennsylvania, reminded Americans of the traumatic necessity of providing medical assistance to the injured, especially in time of war. Prior to the attacks on the World Trade Center and the Pentagon, the fact that the United States had suffered relatively few friendly casualties in recent conflicts (e.g., the Gulf War and Kosovo) may have created the impression that we could fight relatively unscathed. Though understandable, such expectations are extremely naive, especially when one considers the dangerous world of special operations. United States Special Operations Command (USSOCOM), as established by Title 10, section 167 of the *United States Code,* has principal missions, including "combating terrorism" and taking "direct action," that involve inherently dangerous activities. Consequently, as USSOCOM's air component, Air Force Special Operations Command (AFSOC) must ensure effective medical support for its people—a huge

challenge for a force designed to be "light, lean, and lethal."

In the decades prior to 1990, one could not distinguish the Air Force's medical support to special operations forces (SOF) from that provided to conventional forces. The air-transportable clinic provided conventional aviation medical support as well as disease and injury prevention to deployed bases. Designed to support a system of echelons that met theater and strategic-planning models during the Cold War, the clinic proved successful with conventional forces. A squadron medical element, consisting of three personnel (including one physician), could take a single pallet of medical equipment and supplies to a fixed base and provide routine medical care with some limited trauma support for 30 days to a fighter squadron–sized unit of approximately 500 personnel.

But this process could not accommodate SOF. First, medical personnel often found themselves supporting other units; occasionally, the Air Force physician was the only medical officer deployed in support of a joint operation.[1] Flight surgeons faced a scope of responsibility broader than their medical skills could support. Second, they found themselves on unfamiliar ground since most squadron flight physicians were in their first operational assignment, had never worked with SEAL and special forces units, and had no experience with medical issues related to such matters as diving gas mixtures and high-altitude, low-opening jump operations. Third, airlift for medical equipment was almost nonexistent. Organic aircraft had no space for a palletized clinic, and nesting boxes and backpacks became the mode du jour, each medic deciding what to take on any given occasion. Replacements for items left behind were purchased locally with little consideration of suitability and standardization. Thus, over time, each unit accumulated different—sometimes incompatible—medical equipment.

The word *special* in *special operations* does not imply a rejection of conventional Air Force processes in search of independence. Rather, it refers to unique missions driving different tools and training that require unique medical support as well. This raises certain questions: How much "medical" capability is needed and supportable? Why should it be different? What does it need to do? What tools are necessary? What are the desired characteristics of the interface with the rest of the medical system? This article describes efforts to develop operational support for SOF that have taken place during the last decade. In addition, it outlines current initiatives to improve the conduct of that support, including the interface of SOF medicine with conventional theater support and the aeromedical-evacuation system. Finally, it suggests future improvements for SOF medical support. The paramount message for successful medical support is simply that *SOF medicine must be operational medicine*.[2]

The Focus on Operations

SOF medicine must be operational medicine because a preponderance of SOF activities are not associated with fixed-base operations. AFSOC owns only one base, and it has only an outpatient medical facility. All other special operators are in AFSOC tenant units that regularly deploy to fixed-base or beyond-fixed-base locations, where they often are not the lead units and where the logistical tail and links to higher levels of medical care do not exist. In some cases, the presence or absence of higher-level care is irrelevant since, for security reasons, one cannot establish linkage to aeromedical evacuation or deployed military hospitals. In sum, the medical-support plan may assume an isolated capability from the start. If casualty transfer *is* possible, it would probably move rearward to interface with the aeromedical-evacuation system or hospital, using opportunistic airlift and organic medical personnel for en route care.

The constraints of far-forward medical care drive a set of challenging, unique medical requirements for personnel, equipment, and training. As codified by joint doctrine, special operations rely on "adaptability, improvisation, innovation, and self-reliance,"

emphasizing "small size, unique capabilities, and self-sufficiency (for short periods of time)."[3] The challenge has always been to take these characteristics and determine the right mix of medics, medical equipment, and medical training to provide the best possible support to the special operator.

The conundrum is that the demand for flexible capability and self-sufficiency flies in the face of the necessity of remaining small and light. Obviously, all medical-support planning must deal with this dilemma, but not to the extreme that SOF does. For example, in time-critical rescue and disaster-response scenarios, SOF forces must determine what (and how much) needs to go on the first aircraft, the number of Security Forces assets to secure the area against further damage and injury, and the types of medical assets to treat existing casualties. Unfortunately, such decisions are sometimes made during highly vocal, last-minute flight-line discussions.[4]

How Much Organic Medical Capability Does AFSOF Need?

The answer to that question starts with recognizing that special operations are hazardous. According to some sources, SOF accounted for 31 percent (71/228) of total US combat deaths (killed in action) from Desert One through Allied Force.[5] This percentage, disproportionately high for such a small fraction of the total force, argues for a robust medical-support capability that caters to the dangerous missions these units undertake.

Again, the challenge lies in being robust and light/lean at the same time. In the past, operational medics received training in basic lifesaving skills, used basic splints and bandages, and accepted the fact that they could do little for casualties until they arrived at a fixed medical-treatment area. "Acceptable" loss then becomes a planning factor but an abhorrent one, especially when medical science can accomplish so much more if provided immediately (i.e., far forward). An alternative process involves seeking trade-offs, alternatives, and substitutions that maintain a flexible medical capability but reduce the footprint and support tail. A third option calls for maintaining a substantial off-the-shelf capability but modularizing the contents so that their usage depends upon the specifics of the individual mission.

In practice, both the second and third strategies have proved successful. They abjure large power supplies and equipment items for lightweight pieces such as hand-powered water purifiers and suction pumps. Using solar power panels for certain items remains an option, but high cost, inadequate durability, and low charge rates limit their utility. In addition, lightweight materials and minisized devices have been substituted wherever possible, a process not unique to special operations since the Air Force Medical Service as a whole seeks opportunities to reduce size, number, and weight.

Seminal efforts of this service have transformed the traditional echelons (levels) of care into an expeditionary medical-support system more capable of meeting the needs of our expeditionary Air Force. For example, traditional medical-support packages like the air-transportable hospital and the contingency hospital have given way to integrated building blocks that one can use to establish any level of capability, from mere initial response to that provided by a major fixed facility—and to transfer that capability to other medical assets, such as a civilian medical community, host nation, or nongovernmental agency. This approach is very similar to the one taken by special operations.

Keying on the third process of modularization, special operations is focusing on modularizing unit type code (UTC) equipment and personnel packages. For example, AFSOC's rapid-response deployment kit and the consolidated SOF medical element are representative of this strategy. Conceived in 1992–93 and brought on-line the following two years, the new UTCs paralleled similar efforts of the conventional side of the medical service to streamline the medical-support "piece" of operations: in Europe, the United States Air Forces in Europe command surgeon had developed small surgical packages (mobile field-surgical team) and, subsequently at Air Education and

Training Command, critical-care teams for casualty movement (critical-care aeromedical-transport team). That beginning, as well as the cross-fertilization of ideas that occurred between the mobile field-surgical team and the critical-care aeromedical-transport team on the one hand and the rapid-response deployment kit and air-transportable treatment unit on the other, laid the groundwork for development of expeditionary medical support. "Lighter and leaner" began to catch on.

The rapid-response deployment kit represents one step up from man-portable medical equipment.[6] The kit weighs 790 pounds and consists of four nesting boxes organized along functional lines: cardiac, trauma, environmental, and medical. Three kits fit on a single pallet, and one can mix and match the components to suit mission requirements. The kit can be augmented with a laboratory module, and, in those instances in which airlift limitations are not as critical or the mission is of long duration, other options are available.[7] If all modules are deployed, the assemblage and personnel can provide medical care for a population of 600–800 for up to 30 days. In practice, the smaller configurations are the most useful.

The strength and power of this arrangement lies in modularity—providing lightweight, highly mobile capability for austere environments in a building-block approach and increasing or decreasing this capability as the mission evolves. Medical personnel can either hand-carry or store their medical equipment in containers small enough to add to available space on board an aircraft or ground vehicle. This parallels the core philosophy of expeditionary medical support and supports the Air Force Medical Service's doctrine at an even lighter/leaner level.

In addition, adopting this process helps answer how far and how much medical care one can take into the field. Defining limitations on what one *can* treat allows planners to anticipate situations that will exceed the capability of deployed medical forces. In this context, decisions that recognize supportable medical skill levels and plan to keep losses acceptable can make claim to moral authority. To the extent that the mission commander must balance mission accomplishment with casualty survival in the context of limited medical assets, a strategy that gives that commander information on how much delay he or she can tolerate prior to treatment by different categories of casualties will be of great use.

Toward that end, USSOCOM's Biomedical Initiatives Steering Committee, with component sponsorship, has undertaken a study to establish protocols for commanders in the field that do just that. For instance, one could define the risk of limb loss over time for injuries that disrupt blood supply to the limb. In other words, once this type of casualty occurs, how much more time does a commander have to complete the mission before the risk of permanent disability and death becomes too great? Until we develop this tool, however, mission commanders must develop medical go/no-go plans in consultation with their deployed surgeons, theater medical planners, or Joint Special Operations Task Force surgeons.[8]

What Does It Take to Use That Capability?

The truism that "knowledge has minimal weight and cube" is important in the pursuit of light and lean. The training necessary to provide the best medical care possible continues to grow. Medical technology is not static, and the special operator deserves the same care offered to any service member or citizen. In special operations, whose missions may occur in remote and hostile locations, the level of training must remain as high as one can possibly sustain since medical technicians or physicians, who operate alone and without backup, have correspondingly greater responsibility.

As mentioned above, the SOF medical officer often becomes the consultant for medical aspects of dive, jump, and aerospace operations for which standard flight-surgeon training is inadequate. Second, SOF medical officers and enlisted medics find themselves closer to combat operations than is typical for Air Force medical personnel. Thus, they need training in survival/escape and response to terrorism, as

well as tropical-medicine courses. In addition, one cannot meet the often-encountered challenge of working with host-nation forces or civilian organizations just with enthusiasm and no training. The newly created position of international health specialist can fill this gap.

The enlisted medic in AFSOC frequently operates independently in providing patient care and casualty management, at least in the initial stages. Some casualty-evacuation missions may occur in proximity to ground combat and necessitate the same preparatory training as that received by officers.[9] Doctrinally, the medical training necessary to operate independently in this environment is designated emergency medical technician-paramedic (EMT-P), with Air Force independent-duty medical technician (IDMT) certification. In addition, formal aeromedical-evacuation training is necessary to conduct the casualty-evacuation mission. In total, this formidable and unique level of capability makes the AFSOC medical technician one of the most highly trained medics in the Air Force. Even the pararescueman, also an EMT-P, is not trained or expected to provide nonrescue medical care.

Historically, the AFSOC unit commander's greatest dissatisfaction with medical support is the fact that the unparalleled training (table 1) necessary to bring the SOF medic to mission-ready status takes up to half a tour of duty. Therefore, a training pipeline for AFSOC medics—something the other services have always had—is long overdue. An enterprise philosophy of interchangeable

Table 1

Higher Headquarters Requirements for AFSOC Medical Training

Flight Surgeon		*Enlisted Medic*	
1 week	ISOC	1 week	ISOC
1 week	DIT	1 week	DIT
1 week	ACLS	1 week	ATLS
1 week	ATLS	1 week	Water Survival School
1 week	Water Survival School	1 week	Treatment of Chemical and/or Biological Casualties
1 week	Treatment of Chemical and/or Biological Casualties	2 weeks	Trauma Rotation
2 weeks	Trauma Rotation	12 weeks	IDMT School
2 weeks	Aircraft Mishap Investigation	12 weeks	EMT Paramedic*
2 weeks	C4	6 weeks	Air Evacuation Technical School
2 weeks	Global Medicine		

ISOC Introduction to Special Operations Course
DIT Dynamics of International Terrorism Course
ACLS Advanced Cardiac Life Support
ATLS Advanced Trauma Life Support
C4 Combat Casualty Care Course
* EMT paramedic training time will increase up to a total of 20–24 weeks, based on standard curriculum changes as of January 2002.

Sources: Air Force TTP 3-42.6, *USAF Medical Support for Special Operations Forces (SOF),* 5 September 2001, 28; USSOCOM 40-2, *Medical Services: Organizational and Operational Alignment of Joint Special Operations Medical Training Center,* 6 March 1997, 2, par. i; and AFSOC Instruction 48-101, *Special Operations Aerospace Medical Operations,* 1 August 2000, 10–12, pars. 10–11.

medical personnel among the major commands is the wrong answer for AFSOC.

Dedicated But Nonorganic Capability

Occasionally, AFSOF has medical requirements beyond those of the aviation-support packages discussed so far—an area that still needs work. The air-transportable hospital may have great capability, but it alone is larger than most AFSOC mission packages. Therefore, the answer lies in expeditionary medical support. The fact that its configurations remain pallet-bound suggests the need to graft the modularization idea onto an AFSOC-assigned expeditionary medical-support package that would tailor an already optimized UTC to SOF limitations.

Critical Interface with Conventional Medical Support

The interface between SOF and conventional medical care is fluid, occurring farther forward on some occasions but still avoiding potential exposure to ground combat. SOF medics, on the other hand, must operate in proximity to ground combat, with the potential for direct exposure if dedicated rescue-and-recovery forces are not available.[10] Where should we draw the lines?

As the Air Force Medical Service attempts to bring technology and expertise ever closer to the casualty-causing event, it should think out policy guidelines and make them available to the commander. This won't be easy because it goes against Geneva conventions concerning combat status and involves debates about gender equity and opportunity. In the sister services, the SOF medic is a combat medic, expected to shoulder a weapon as a primary combatant—an asset for "reconstitution" in the event of severe loss of ground-combatant strength. Air Force medical personnel, however, are protected under the Geneva conventions and entitled to use weapons under that category only to defend themselves and their patients against brigandage.

For this reason, conventional aeromedical-evacuation personnel usually have not received sufficient training in combat skills to reasonably ensure survivability on, or in proximity of, the battlefield. Further, they require a fixed location to prepare casualties for further movement, whereas SOF may frequently relocate, making the lifeline for casualty evacuation tenuous. Hence, although ad hoc decision making may have served reasonably well in the past, it is no longer acceptable. We must have doctrinal and procedural adjustments to guide programming and planning for the delivery of operational medical support.

The Future of AFSOF Medicine

AFSOC has accomplished a great deal since it stood up as a major command in 1990. The Air Force Medical Service has transformed a large, static, slow-responding capability into a light and lean force, but today's success has a finite life span. The future of AFSOF medicine calls for visionary thinking and dynamic adaptation along three paths: (1) modernization of equipment, (2) enhancement of diagnostic sensory inputs, and (3) further efforts to modularize and tailor medical equipment to mission requirements.

Modernizing equipment is an ongoing process, not only for the Air Force Medical Service but also for the entire Department of Defense. Medics must advocate improvement in lifesaving, with an emphasis on the operational-support piece of health care and the modernization needed throughout the force. In that endeavor, special operations must become a partner. The Biomedical Initiatives Steering Committee, mentioned above, has a charter that considers only the physiological enhancement, not medical care, of war fighters. Yet, modernization of SOF medical capability, as a treatment and prevention activity in operations, must proceed along service lines.

The second opportunity for the future, diagnostic sensory input, comes from personal observation of treating casualties—on board

an aircraft maneuvering at low level and at night, blacked out on night-vision goggles, and marked by extreme noise and vibration. Much equipment is available to assess and stabilize casualties, if only the environment were more cooperative. But it won't be. Medical skills would dramatically improve if one could perform basic techniques of observation, inspection, palpation, and percussion (not to mention probing, injecting, and the like) reliably under extreme adversity. For instance, a glove-mounted scanner transmitting an image to a heads-up display and using vibration-canceling technology would fit part of the bill. No theoretical impediment to such devices exists. To accurately assess and stabilize a life-threatening, intra-abdominal injury without requiring transport to a secure area would be a boon. But training will have to keep pace with technology if such a capability becomes reality.

Finally, as regards becoming lighter and leaner by modularizing the medical-support package for any given mission, the current test of success is limited to backpacks and nesting boxes. Given state-of-the-art computer systems and automated inventory management, one has no difficulty imagining clinical guidelines for mission scenarios that would link to the types of casualties expected and the medical equipment needed. It should be possible to configure in minutes a medical-equipment package that focuses on the scenario and wastes nothing. Or telemetry may permit the monitoring of an inbound casualty in enough detail to configure a real-time treatment kit ready to use immediately upon arrival. Some of this already occurs through voice communication but with a limited degree of anticipation. In SOF, the need is acute. SOF medical support must seek opportunities to carry *all* that is needed and, at the same time, *only* what is needed to do the job.

The V-22 Osprey can be used for medical evacuation.

In the struggle against terrorism and other threats to national security, the demand for light, lean, and capable medical care will continue since the nation is likely to call upon SOF as the force of choice. This challenge focuses on technology and training to provide the necessary medical support when and where it is needed. □

Notes

1. To progress from intern or first-postgraduate-year trainee to Joint Special Operations Task Force surgeon can overwhelm the abilities of even the most talented physician. Imagine graduating from pilot training and immediately becoming a deployed mission commander.

2. One need not address each principal and collateral special operations mission and define the medical support needed for each type of mission since it matters little to a casualty's future whether a penetrating chest wound, for example, occurred in direct action or special reconnaissance.

3. Joint Publication 3-05, *Doctrine for Joint Special Operations,* 17 April 1998, vii.

4. This happened in response to the Dar Es Salaam and Nairobi Embassy bombings in 1998.

5. Although the total number of combat deaths is small by world-war standards, many people have argued that low casualty rates will become more likely in combat scenarios for the foreseeable future. The data presented were collected from service sources by the Special Operations Warrior Foundation, a nonprofit organization that provides scholarships and counseling to surviving children of SOF personnel killed in the line of duty.

6. Each flight surgeon and medical technician carries a 70-pound vest and backpack SOF medical kit that provides for short-notice, first-responder support.

7. The air-transportable treatment unit—an AFSOC UTC—includes a trailer, tentage, power, and climate control but weighs 6,000 pounds.

8. The theater special operations commanders are authorized an international health specialist on their staffs to conduct medical-planning activities. This new Air Force specialty offers extra utility for SOF.

9. The term *casualty evacuation* describes a mode of movement that occurs prior to *aeromedical evacuation*, a convenient—rather than doctrinal—term.

10. Air Force pararescuemen, though not primarily medics, have paramedic skills. They deploy frequently and sometimes find themselves stretched thin. In their absence, commanders have had to decide whether to send medical personnel on rescue-and-recovery missions in proximity to ground combat.

Linking Resource Allocation to Performance Management and Strategic Planning

An Air Force Challenge

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Editorial Abstract: As a service, the Air Force fights much better than it buys things. In fact, our service—the world's most powerful and capable air force—would probably fail quickly as a business corporation. We must do better, and this article raises some thought-provoking ideas about how to improve.

IN LATE 2000, the service chiefs testified before Congress that the US military required upwards of $100 billion per year of additional spending (a 30 percent increase) to maintain readiness and modernize the force. But the recent tax cut, a slow economy, and spending increases needed for nonmilitary priorities make a 30 percent increase in defense spending unlikely. Without the needed funds, the military will face many difficult decisions concerning allocation of the remaining resources. The question is and always has been, What is the best way to allocate those limited resources?

The approach to allocating resources throughout the Department of Defense (DOD) at the beginning of the twenty-first century has several deficiencies. It doesn't provide a connection among where we are (performance), where we want to go (strategy), and how we get there (resources). In addition, the process identifies shortfalls but not the sources to pay for them. It rewards advocates who are the most adept at articulating increases in spending but sometimes pun-

ishes programs that can produce savings. Even worse, it lacks fundamental measures of value on which to base decisions. Eliminating these deficiencies may not solve the shortfall in resources, but it can ensure that we spend the money we have more wisely.

The key to enabling Air Force leaders to make better resource decisions lies in implementing three major changes in the way we do business. First, we must link resource allocation to performance management and strategic planning. These three management functions must work in unison to ensure consistent direction. Second, we need a process that is simple, transparent, and reproducible. It must be simple enough to be implemented quickly and improved upon; it must be transparent to identify the trade-offs and provide incentives for cost reduction; and it must be reproducible through a structured planning framework that relates capability to cost. Third, we must deliver the best value to the war fighter over time and with the resources available. This requires measuring Air Force capabilities and relating them to resources and operational effectiveness for the near, mid, and long terms.

Such changes are within reach; however, getting there requires a cultural change. The Air Force management processes currently in place provide little incentive to reduce costs and only limited accountability for those costs. Gen Gregory S. Martin, commander of United States Air Forces in Europe (USAFE), recently observed that "the only way we're going to get anywhere in the Air Force today is to develop the tools and performance measures which will allow our people to have control and accountability for their resource and mission performance. And then we can push decisions hard and fast to the lowest level possible. . . . That's the only way we'll really make major progress in the future."[1]

The Air Force has recognized the need for change and is making the transition. Under the leadership of F. Whitten Peters, the former secretary of the Air Force, and Gen Michael E. Ryan, the former chief of staff, Headquarters Air Force created a team to reengineer the Air Force Resource Allocation Process (AFRAP).[2] Led by Maj Gen Danny A. Hogan, the AFRAP team recommended a capabilities-based process for allocating resources.[3] As a result, Headquarters Air Force chose a new approach for building the budget for fiscal year 2003 (FY03) as an initial step to implementing the AFRAP recommendations. Each major command received a topline dollar amount along with the direction to present a balanced, capabilities-based input to the Amended Program Objective Memorandum for FY03.

The USAFE team responded by developing a Resource Allocation Model (RAM) that produced a balanced program and at the same time provided tremendous insight into the command's capabilities. The purpose here is not to wave the USAFE flag but to use its experience as a case study. The USAFE RAM not only works for an operations and maintenance command but also offers promise towards improving resource allocation for the entire Air Force.

We're on a Journey

Throughout history, military spending has been based on available resources that the citizens of a country were willing to spend in peacetime and war. At the macrolevel, we won the Cold War by engaging in a long-term expenditure of resources while maintaining a large standing military. Today, with our vision of Global Vigilance, Reach, and Power, significant technological advantages have changed this equation. Vigilance has progressed from scouts and spies taking days or weeks to provide information, to satellites and unmanned aerial vehicles producing results in minutes. Reach has progressed from the walking pace of horse-drawn wagons to moving millions of ton-miles-per-day (thousands of tons halfway around the world every day). Technological advances in precision and stealth have significantly changed the nature of power in battle from using numerous, large munitions to destroy a target, to using fewer, more precise weapons to achieve desired effects. Beginning with Operation Desert Storm and progressing

further during the air war over Serbia under the leadership of Gen John P. Jumper, then the commander of USAFE, the goal has now become "effects-based" operations.[4] Technology has enabled us to pick and choose which of the enemy's centers of gravity to affect and to strike them with crippling speed.

In the past, military spending drove the pace of technology. Militaries were both technology- and resource-limited. Over time, technology became profitable enough so that the private sector now takes the lead in many areas. As a result, we are faced with more technological choices than we can pursue with our available resources. Being resource-constrained puts a premium on planning that is compounded by a rapid increase in system complexity. Automation and computers have resulted in systems-of-systems interdependent with other systems-of-systems. For example, satellite navigation, radio communications, precision weapons, and aircraft form complex systems-of-systems used to perform many attack missions.

In the late 1950s and early 1960s, Secretary of Defense Robert McNamara and his "whiz kids" responded to the increasing difficulty in allocating resources with the Planning, Programming, and Budgeting System (PPBS).[5] Until that time, each department received fiscal spending limits along with direction on how to spend the resources. Today, the major force programs and associated program elements provide the PPBS framework. Each program element is programmed with funds for five to six years in advance of the current budget. DOD went from little involvement in how the services spent their resources to detailed programmatic insight.

At the time of PPBS development, the military planning system was considered the best ever. But we have since realized that military planning has two broad categories: operational planning and force planning.[6] Although military operational planning and the associated logistical planning have proven extremely capable, force planning has never been highly developed. Even today, the Quadrennial Defense Review is part of an informal process used by DOD to establish force structure.[7]

In 1993 Congress passed the Government Performance and Results Act, which requires government agencies to take responsibility for effectively allocating and expending resources through strategic planning and performance management.[8] It also spawned the National Partnership for Reinventing Government, which, over the last eight years, has fostered numerous studies, experiments, and reforms in government planning and management.[9] In response to the Government Performance and Results Act, DOD published its performance plan and captured its strategic plan through the Quadrennial Defense Review. Until recently, DOD and Air Force reforms have failed to address the key deficiencies in the PPBS process.

In 2000, the AFRAP process reengineering team developed a capabilities-based approach for resource allocation, reviewing PPBS and the related processes in place to establish requirements, make acquisition decisions, manage execution, and perform analysis. The recommendations included significant enhancements to the planning portion of PPBS by combining programming and budgeting and adding execution management.[10]

The fundamental key to implementing AFRAP is development of an Air Force capabilities framework to tie the elements of resource allocation together and serve as a basis for making decisions. Once the capability relationships are established, the AFRAP solution develops numerical capability objectives and projects them over time. These objectives are validated through the rest of the process by planning the capability solutions and associated resources over an 18-year time frame. Finally, accounting and performance-management systems provide feedback directly to the capabilities assessment in order to judge progress.

But We Have Miles to Go

DOD and the Air Force have transformed themselves in many ways recently, but until

AFRAP, neither adequately addressed the overarching issue of affordability. As a result, we still don't really know whether we are spending our resources effectively and efficiently. A recent acquisition-reform effort first identified affordability as the missing link. In 1995 Dr. Paul G. Kaminski, undersecretary of defense for acquisition and technology, created an initiative called "Cost as an Independent Variable."[11] A team, formed with the objective of treating cost as importantly as performance, concluded that the key lay in establishing "affordable cost targets" for acquisition programs.

Since one can define "affordable" only in relation to the total budget, the solution lies not in acquisition reform but in improving the resource-allocation process. Our entire culture focuses on stovepiped portions of resource allocation, producing a system that sometimes encourages self-serving resource-allocation behaviors instead of a cross-functional capabilities approach.

The root cause of this behavior within our process is that we manage by shortfall. Dr. James G. Roche, secretary of the Air Force, said, "Given the demands on the forces, . . . the demands for situational awareness, and a great deal of technology, . . . you can't do the stovepipe game the way you used to."[12] In our current process, we direct the participants to identify their shortfalls and bring them to the table. The result is a process designed to spend more money. Those who are successful in funding their shortfalls are the winners. In addition, since everything we do in the military is very important—life or death issues—cutting back or canceling a program is extremely hard to do. A process of managing by shortfall provides no information on where we can afford to make those cuts. A lack of information increases the impact of opinions. In other words, personalities fill the vacuum.

Management by shortfall also leads to a tremendously inefficient process for resource allocation. Because individual shortfalls tend to differ each year, the majority of the information needed by the process must be generated anew. Also contributing to this busywork is the fact that the relative priority of the shortfalls changes as well. Adding a 30–50 percent turnover in personnel every year to these conditions has the potential for disaster.

Ultimately, we are trying to determine how much of each capability to invest in relation to maintaining readiness of the forces we have. But how can we do this without knowing the relative value of each capability? All the new business practices coming out of for-profit industry could help the Air Force if it weren't for one detail—we don't make a profit! As Secretary Roche has said, "We recognize this is not a business. We don't have a product, as in the open market."[13] All tough business decisions are based on the relative value of the choices. The new process improvements coming from the commercial sector are designed to help industry leaders find a balance between short-term profitability and sustained health of the business. Without profit as a value measure, the military must develop standards of value to improve resource allocation.

Building a Balanced Program

In August 2000, USAFE began creating its RAM in response to the Air Staff's direction to develop a balanced, capabilities-based input to the Amended Program Objective Memorandum for FY03. USAFE's approach entailed dividing the initial top line into groups of capability by assigning each program element to a cross-functional capabilities group. Formation of the groups was based on the relationships between the command's mission-essential tasks and goals, with the scope of responsibility defined by the synergies between the products of these tasks, their relationships to the command's goals, and efforts to minimize the resources that cross group boundaries.

Because USAFE is an operations and maintenance command, management of day-to-day resources drove the definition of capabil-

ity groups. The command created five groups—Information Superiority, Aerospace Operations, Logistics Support and Infrastructure, People, and Medical—tasked with assessing the capability provided by each program element and developing a balanced capability within the assigned top line. Each group also had to provide information for USAFE's leadership to balance resources across the groups.

A simple rating system facilitated comparisons among diverse capabilities. Each program-element monitor was tasked to quantify the capability provided by his or her program element. The maximum usable and minimum acceptable capabilities were defined and assigned scores of 1.00 and 0.70, respectively (fig. 1).[14] Each monitor was also tasked to assign a dollar amount to the maximum and minimum capabilities and define what the resources would purchase. Once the scale was established, the monitor was then tasked to assign a capability rating to the initial top line (fig. 2). Although in many cases data were not available to assign a truly objective rating, each program-element monitor had to defend his or her assessment under the scrutiny of peers and to the group.

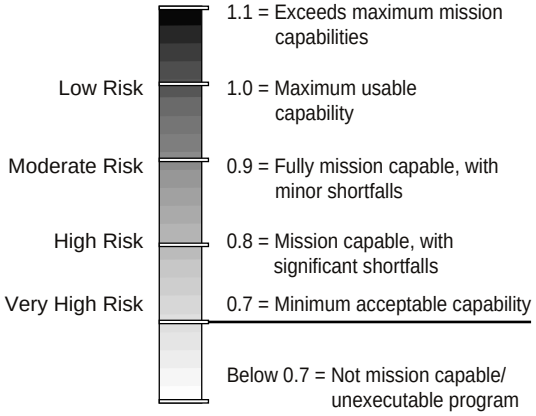

Figure 1. Capability Rating Scale

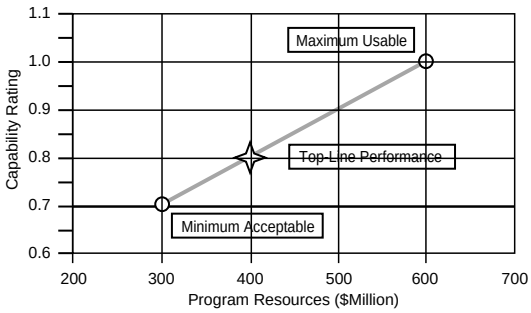

Figure 2. Capability versus Resources

Although the capability ratings provided a means for portraying the health of each program, they did not form the basis for decision making. Balancing resources within a group or between groups is a process of making trades—taking from one program to help another. To facilitate balancing resources, program-element monitors were tasked to identify trade-ups and trade-offs of capability with the associated resources for their programs. In this way, the group could compare the value of a given trade-up for one program with a trade-off for another and develop an understanding of where the balance lay. Each group identified trades that achieved improved balance across its programs and then prioritized trade-ups and trade-offs for the group as a whole. The groups presented this information to the USAFE leadership, who used it to balance capabilities and resources among the groups. Assuming that the overall command is capable of performing its mission beyond the bare minimum, the goal of making trades was to ensure that each element of capability had enough resources to earn a rating greater than 0.70.

This simple methodology resulted in vastly improved understanding of the capabilities and needs within the command. During the trading process, over $50 million moved among programs to correct imbalances. This amount represented only 2 percent of the command's total resources, but the movement represented 65 percent of those resources within USAFE's control, indicating how unbalanced

the program had become without meaningful participation from the major commands.[15] Implementing this process also highlighted several improvements needed within USAFE, along with information the command required from the Air Force to improve the balance further. The command used these lessons learned to make improvements for the next cycle.

Doing It Again—Only Better

One key to successfully implementing a process change is to include continual process improvement in the design. A good example of preplanned improvement comes from software developers as they actually define processes. In the software industry, the incremental approach for continual improvement is called spiral development, whereby a spiral includes the development and fielding of operational code.[16] The first spiral might field 60 percent of the desired functions, with succeeding spirals learning from the previous one and fielding increased functionality. In this light, USAFE's RAM for the Amended Program Objective Memorandum of FY03 is Spiral 1, and the command's approach for the Program Objective Memorandum of FY04 is Spiral 2. The improved RAM/Spiral 2 is the result of lessons learned during the FY03 Amended Program Objective Memorandum and the desire to tie the model to strategic planning and performance management.

One lesson learned was that managing five groups requires too much manpower from headquarters. In addition, several changes to the group structure were needed to align complementary capabilities, resulting in three groups: Command and Control, Aerospace Operations and Logistics, and People and Infrastructure. The realignment added logistics to aerospace operations, where it is needed most. It also put medical and people together with the infrastructure that supports them and operations.

Another lesson was simply that more time, more training, and a more rigorous process were needed to better implement USAFE's RAM. Following the submission of the Amended Program Objective Memorandum for FY03, the process was refined, with detailed work sheets provided to the program-element monitors. They were tasked with defining the capabilities and supporting measures for each of their programs during summer 2001 in advance of the command's effort to balance resources. These definitions were documented and available for continual improvement during each cycle of the process. In addition, USAFE held a capabilities workshop with Air Force Materiel Command personnel who were involved in performance-based budgeting. The workshop also received support from the Air Force Studies and Analysis Agency, which shared techniques for assessing programs and tieing their performance to higher-level capabilities.

A major change implemented for Spiral 2 came from aligning the processes for strategic planning and performance management with USAFE's RAM. During a two-day workshop in March 2001, the command's senior leaders created the integrated-management construct for the USAFE Strategic Vision Process (fig. 3), intended to define where USAFE is through performance management, where it wants to go through strategic planning, and how it is going to get there through resource allocation.

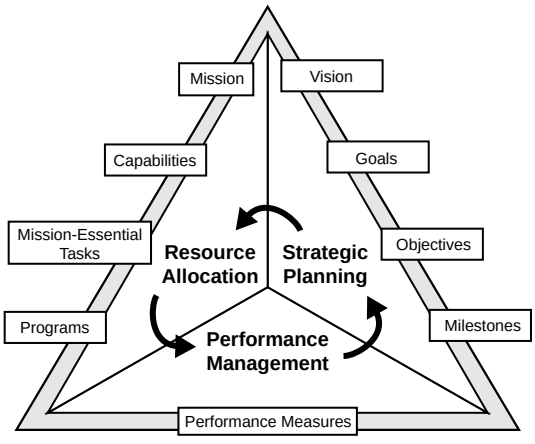

Figure 3. Integrated Management Construct for the USAFE Strategic Vision Process

The integrated-management construct links the three process elements and ties them directly to resources; links capabilities to resources by defining the command's total mission capability within three capability areas; and then breaks those three capabilities into 14 subelements defined as new mission-essential tasks of the command. Assigning each program element to a mission-essential task aligns all command resources with the capabilities. The construct aligns strategic planning and resource allocation by identifying a command goal for each of the three capability areas. One achieves linkage between performance management and resource allocation by aligning the performance measures directly to the mission-essential tasks. The result is a simple framework for aligning strategic planning and performance management with resource allocation.

In addition to aligning resources to take USAFE from where it is to where it wants to go, the new construct will directly improve the resource-allocation process. Dividing the capability groups into 14 mission-essential tasks increases the fidelity for making trades. The new capability groups and their mission-essential tasks used in Spiral 2 align the command's 124 program elements (fig. 4). The approach for the FY04 Program Objective Memorandum involves balancing the resources within each program element, balancing the program elements assigned to each mission-essential task, and then balancing those tasks within each group. The approach is simple, but experience during Spiral 1 proved that establishing capability measures and requirements is challenging. Few programs have useful measures of what is expected from the resources allocated. Comparing the health of each program element and its contribution to total capability requires measures of that capability that cascade down to the program-element level.

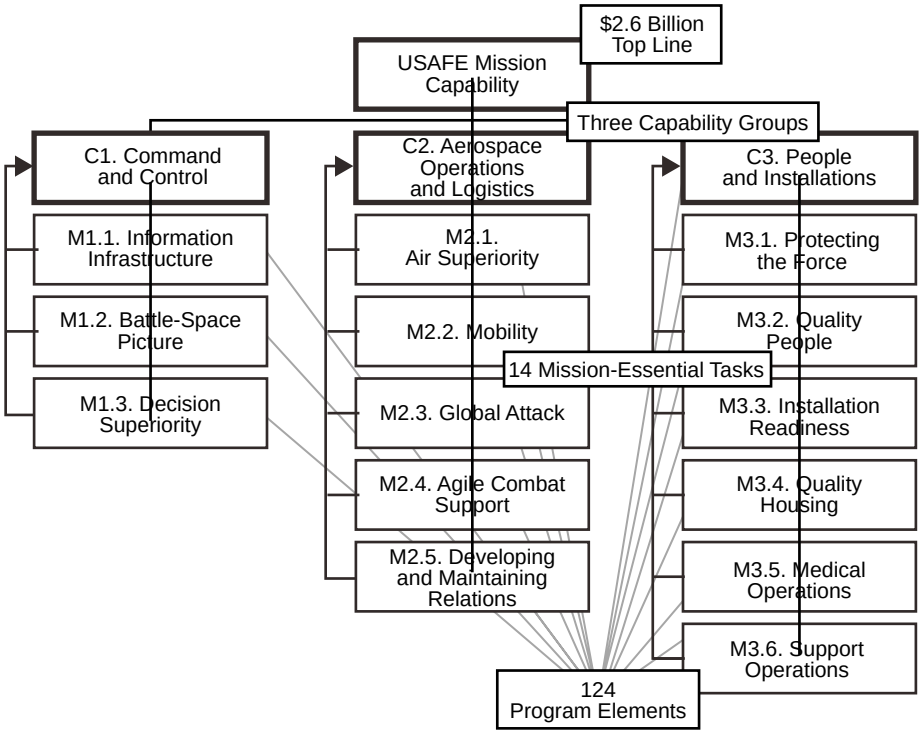

Figure 4. USAFE's RAM

Another significant change during Spiral 2 involves integrating the wings' financial and manpower planning into USAFE's RAM. The wings were tasked to create a capabilities-based financial plan for FY02. The groups reviewed the results of the plan along with manpower assessments to refine their understanding of command capabilities. For FY03, the wings are using Spiral 2 of the RAM to develop an improved capabilities-based financial plan and manpower assessment. Each subsequent spiral will iterate between the wings and command headquarters to develop affordable standards of performance across the command. Those standards will improve USAFE's ability to provide balanced inputs to the Air Force's Program Objective Memorandum.

The biggest change needed for full implementation of USAFE's RAM will not occur until Spiral 3 or beyond and must come from implementation of AFRAP. The required balance among capabilities within the command ultimately depends on having an Air Force definition of the relative value of each capability. As an operations and maintenance command, USAFE receives forces based on higher-level decisions on what capability each weapon system should have, how many systems to purchase, and whether to place them in-theater or deploy them from the continental United States. Implicit in these decisions are value judgements based on each system's contribution to national security. An operations and maintenance command has neither the resources nor the information to make such judgements. For this reason, USAFE is working to define what is required from the Air Force to enable the command's resource allocation.

Application to the Air Force

Development of an Air Force RAM is consistent with the direction being taken by AFRAP and would enable the Air Force to balance its resources, based on capabilities. Building an Air Force RAM requires three crucial steps: dividing the resources among capabilities, determining the value of those capabilities, and implementing a process to balance them over time. Dividing our resources in a meaningful way requires development of a planning framework to categorize capabilities. Setting the values for those capabilities demands analysis coupled with continual process improvement. Balancing our capabilities over time means adding another dimension to the RAM.

Henry Ford taught us that managing anything requires breaking it down into definable pieces. The key lies in making the pieces meaningful and useful for resource allocation. Over the last 20 years, DOD, the Joint Staff, and the Air Force have developed many excellent planning frameworks (table 1). These frameworks were developed for many different purposes but not specifically for resource allocation. Consequently, they don't include all resources, don't adequately address support functions, and don't provide distinct categories meaningful to operations. These characteristics are fairly easy to achieve, but none of the existing planning frameworks has them all.

Table 1

Existing Planning Frameworks

US/DOD/Joint Planning Frameworks

- 13 Title 10 functions
- 2 DOD goals
- 8 tasks in the Universal Joint Task List
- 6 elements in *Joint Vision 2020*
- 12 areas for the Joint War-Fighting Capabilities Assessment
- 8 areas for the Joint Monthly Readiness Review

Air Force Planning Frameworks

- 3 aspects of the vision
- 6 core competencies
- 7 Air Force tasks
- 14 critical future capabilities
- 6 mission areas in *CONOPS 2020*
- 7 elements and 5 capabilities in the strategic concept
- 4 elements in the Expeditionary Aerospace Forces construct
- 7 focus areas in the Vision Force
- 3 Air Force goals

Since the purpose of the framework is to allocate resources, one must include all resources. Existing frameworks for visions or concepts of operations address operational functions, but they leave out the significant peacetime roles assigned by Title 10, *United States Code*. Balancing only a part of the budget will fail to provide the information that decision makers need.

The Air Force's core competencies provide an excellent list of the service's unique functions, but the fact that they are unique keeps them from being complete.

Dividing the whole into manageable pieces is particularly important. Joint and Air Force task lists provide definition for operational tasks but combine all Title 10 functions under a single category. Title 10 breaks "organize, train, and equip" into 13 functions, showing that greater detail is required to describe the roles. However, Title 10 does not address the operational roles of our forces.

Our customers are the joint operations we are tasked to support. Since the customer establishes value, the framework must relate our resources distinctly to operational effects. The Air Force's core competencies provide an excellent list of the service's unique functions, but the fact that they are unique keeps them from being complete. Resources cannot be cleanly divided between precision engagement and global attack. One approach puts weapons under precision engagement and platforms under global attack. But both are usually needed to engage targets, and the operational customer cannot possibly choose between them.

The *Air Force Task List* describes all the activities performed by our service.[17] A thorough review of this list, along with application of the above characteristics, leads to a possible Air Force RAM intended to relate directly to effects-based operations:

- *Global Power* is the key combat capability—the capacity to destroy or disable desired targets.
- *Global Reach* is the capacity to move forces—an enabling capability for engaging targets and a primary capability for humanitarian missions.
- *Global Vigilance* is the capacity to use information—an enabling capability for both Reach and Power and a primary capability for deterrence.

These three areas encompass the capabilities that directly contribute to operational effects.

The proposed RAM also provides coverage of all the Air Force's Title 10 resources in sufficient detail:

- *Agile Combat Support* is the capacity to support forces, whether deployed or not.
- *Quality People* provides a category for all our people programs.
- *Enterprise Management* allows insight into the resources we spend on our immense management task.
- *Innovation and Modernization* groups those capabilities used to transform our force and keep it viable into the future.

Each of these four capability areas includes assets that deploy to support operations, along with many used only for Title 10 functions.

All seven of the proposed areas need to have direct costs allocated as much as possible. For example, if hangars are needed for global-attack platforms, the cost of construction and use should be captured under global attack. The costs of acquiring, operating, and maintaining the platforms and associated equipment need to be allocated as well. In addition, manpower and any specialized training attributable to global attack must be accounted for. This is the key to implementing activity-based costing. As Secretary Roche said, "We start really hampered by the fact there's not an activity-based costing system."[18] Accounting for costs of the prod-

ucts we deliver is the only way to assess their value.

Once a planning framework is established, the hard part becomes determining the value of the individual capabilities. To do so, one must define the optimum capability measures and associated requirements, which necessitates defining standardized or generic effects applicable to different operational scenarios. For example, we successfully use the "ton-miles-per-day" unit to help describe our ability to move materiel. Similarly, we need to address the number of meaningful targets-per-day of power. Then we must do the same for vigilance and the other capability areas. Finally, we must apply these effects to a variety of standardized operational scenarios to determine the driving requirements.

Repeated use of capability measures for allocating resources will result in standards of performance, some of which we can adapt from measures already available, such as C-ratings for combat and support systems. We already apply C-ratings to our facilities. Over time, expectations will be generated for other peacetime services as well. As standards are developed and adjusted, the process of allocating resources will become simpler. These standards will flow directly down to the major command and unit levels through the capabilities framework. The three USAFE capability groups in Spiral 2 map onto the proposed Air Force RAM.

The step not yet addressed in USAFE's Spiral 2—which must be addressed for Air Force implementation—is addition of the time dimension. Today's modernization-planning process is easily adaptable to AFRAP planning. After developing capability measures and values, one can then establish near-, mid-, and long-term objectives. Current imbalances, the environment, and the affordability of potential solutions will drive these capability objectives. Capability options will be established, and a robust set of options will be funded to ensure a reasonable level of risk.

Gen Larry D. Welch said, "It's all about balancing modernization, readiness, people, and infrastructure: balancing our readiness today with our readiness tomorrow."[19] Achieving this balance requires implementation of the planning portion of AFRAP. The proposed Air Force RAM enables this implementation by providing the capabilities-based planning framework and the value of those capabilities. Finally, if the Air Force integrates strategic planning, performance management, and resource allocation through a RAM, the result would be a truly "balanced scorecard"[20] approach to management.

The problem we are dealing with in allocating 10s of billions of dollars every year across a nearly infinite series of needs is complex.

Summary and Conclusion

Making the "billion dollar" decisions that we need to operate efficiently and effectively in the twenty-first century requires three key changes in the way the Air Force does business. The first involves linking resource allocation to performance management and strategic planning. We developed the current processes without a unifying construct. Our experience shows that a management construct relating capabilities to mission-essential tasks and to programs provides the needed linkage. The strategic goals align with each capability, and the organizational-performance measures align with each mission-essential task.

The second key change is to create a process that is *simple*, *transparent*, and *reproducible*. The new process must be *simple*—both to implement and to use. The problem we are dealing with in allocating 10s of billions of dollars every year across a nearly infinite series of needs is complex. We can't afford to wait while sophisticated techniques for decision making are developed. We have

to get started by tackling the whole budget, not just shortfalls. To do so, we will need to implement an approach based on continual improvement. Our current promotion system serves as a good example of a simple process that is subject to continual improvement; it is also transparent and reproducible. As with any new process, it was not as good when first introduced as it is today. Over the years, improvements have made it a highly rated and fair promotion process.

"Whoever can manage his own house well can also manage an estate, whoever can keep ten men in order in accordance with conditions may be given a thousand."

To be successful, a resource-allocation process must also be *transparent*. Discussing the new DOD management councils for improving business practices, Secretary Roche said, "We are going to be extraordinarily transparent, and so when monies are saved in one area, those monies will then be . . . applied to another area. . . . This is the incentive that is healthy; it's a win-win for everyone."[21] The process has to reveal the total capability provided by every program and lay the facts on the table for all to see. By defining both the trade-ups and the trade-offs, one can establish the relative value of each choice despite a lack of perfect knowledge. Only then can we agree on what is affordable and reward people for taking cuts for the good of the service.

Reproducibility, the key to the new process's survival, must be based on standards of value that can be established, reused, and improved over time. A single planning framework will help develop the standards, record them as they are established, and clarify the links among programs and their intended operational effects. This framework is actually a categorization scheme. Genghis Khan used a decimal system to manage his armies in groups of 10,000 (called a "tuman"): "Whoever can manage his own house well can also manage an estate, whoever can keep ten men in order in accordance with conditions may be given a thousand and a tuman and he will also keep them in order."[22]

The third key change entails developing capability measures that allow Air Force decision makers to deliver the best value to the war fighter over time. Gregory S. Martin, then a lieutenant general and principal deputy assistant secretary of the Air Force for acquisition, said, "Tying our resources to our capabilities is the single most-important issue facing the Air Force today."[23] We have shown that in order to determine value, capabilities must be related to resources on the one hand and to operational effects on the other. After these relationships are established, we can assess the value of our investments over short-, mid-, and long-term planning horizons. Estimating the value of capabilities and investment options will require analysis, but, in the end, the proposed RAM is a tool for the decision maker—not the analyst.

Our warriors can embrace this particular revolution. It is based on the fundamental principles of establishing teamwork, ensuring capability for the war fighter, and following the money! The improved decision making that results will lead directly to real savings and increased performance by spending the resources where they are most needed. In addition to these direct savings, aligning our efforts will enhance the productivity of the entire Air Force. The biggest obstacle to motivation occurs when people don't know what is expected of them. Sun Tzu said, "He will win whose army is animated by the same spirit throughout all its ranks. . . . But when the army is restless and distrustful, trouble is sure to come."[24] The ultimate improvement in the Air Force will come when our people can be rewarded for providing the war fighter the most "bang for the buck." □

Notes

1. USAFE council meeting, Ramstein Air Base, Germany, 20 April 2001.

2. AFRAP was created in January 2000 under Headquarters Air Force 2002, a major process-reengineering effort led by Lt Gen Joseph H. Wehrle, deputy chief of staff for plans and programs (AF/XP), and guided by Mr. William A. Davidson, administrative assistant to the secretary (SAF/AA).

3. General Hogan was the mobilization assistant to AF/XP (see note 2).

4. Col John A. Warden III, "The Enemy as a System," *Airpower Journal* 9, no. 1 (Spring 1995): 40–55, on-line, Internet, available from http://www.airpower.maxwell.af.mil/airchronicles/apj/warden.html; and James A. Kitfield, "Another Look at the Air War That Was," *Air Force Magazine* 82, no. 10 (October 1999), on-line, Internet, available from http://www.afa.org/magazine/1099eaker. html.

5. Department of Defense Directive (DODD) 7045.14, *The Planning, Programming, and Budgeting System,* 22 May 1984.

6. Joint Publication 5-0, *Doctrine for Planning Joint Operations,* 13 April 1995, I-1.

7. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3100.01A, *Joint Strategic Planning System,* 1 September 1999, E-5.

8. *Government Performance and Results Act of 1993,* Public Law 103-62.

9. "Vice President Gore's National Partnership for Reinventing Government," on-line, Internet, 2 October 2001, available from http://govinfo.library.unt.edu/npr/default.html.

10. The AFRAP process design consisted of four key subprocesses: Determine Capability Objectives, Develop Capability Options, Allocate Resources, and Assess Performance. The entire process was to be supported by end-to-end analysis.

11. Office of the Secretary of Defense (Acquisition and Technology), memorandum, subject: Reducing Life Cycle Costs for New and Fielded Systems, 4 December 1995, attachment 2, Cost as an Independent Variable (CAIV) Working Group Paper.

12. DOD news briefing, Deputy Secretary of Defense Paul Wolfowitz and service secretaries, 18 June 2001, on-line, Internet, available from http://www.defenselink.mil/news/Jun2001/t06182001_t618dsda.html.

13. Ibid.

14. Any scale could have been used, including green-yellow-red or A-B-C. However, allocation of resources favors a numerical system because the next step calls for relating the capability rating to dollars.

15. Dollars moved internally totaled $52 million. Total USAFE resources for the Amended Program Objective Memorandum of FY03 were $2.6 billion. A $76 million trade space was calculated by subtracting the estimated discretionary funds required for minimum acceptable performance ($1,376 million) from the top-line discretionary funding ($1,452 million).

16. George Wilkie, *Object-Oriented Software Engineering: The Professional Developer's Guide* (Reading, Mass.: Addison-Wesley Publishing Co., 1993), 111.

17. Air Force Doctrine Document (AFDD) 1-1, *Air Force Task List,* 12 August 1998.

18. DOD news briefing.

19. Meeting, Headquarters USAFE, Ramstein Air Base, Germany, 2 July 2001.

20. Robert S. Kaplan and David P. Norton, *The Balanced Scorecard: Translating Strategy into Action* (Boston, Mass.: Harvard Business School Press, 1996).

21. DOD news briefing.

22. H. G. Wells, *The Outline of History* (Garden City, N.Y.: Garden City Publishing Co., 1925), 61; and Valentin A. Riasanovsky, *Fundamental Principles of Mongol Law* (Bloomington: Indiana University, 1965), 200.

23. Tiger Team meeting, subject: Future Modernization Priorities and Process, Arlington, Va., September 1999.

24. Lionel Giles, *The Art of War: The Oldest Military Treatise in the World* (Harrisburg, Pa.: Military Service Publishing Co., 1944).

It is better to see and communicate the difficulties and dangers of an enterprise, and to endeavor to overcome them, than to be blind to everything but success till the moment of difficulty comes, and to despond.

—Duke of Wellington

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"Going Boldly—Where? Aerospace Integration, the Space Commission, and the Air Force's Vision for Space"
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Silver Flag
A Concept for Operational Warfare

COL BOBBY J. WILKES, USAF

Editorial Abstract: Wargaming is like deterrence. It has to be credible, believable, and clearly communicated. Red Flag exercises have internalized this concept very well in a training context, but as Colonel Wilkes points out in this article, Air Force wargaming would improve if it incorporated the Red Flag approach. Just as Red Flag exercises the tactical level of war, so would Silver Flag wargaming steer to the operational level. In doing so, our wargaming could rally back to a valuable use of the human dimension of gaming and better organize its processes and infrastructure by capitalizing on available assets.

WITH THE WAR on terrorism and homeland defense in full swing, along with many other national-defense challenges, the urgent but continuing need for effective education and training is enormous. Wargaming can and should play an important role in that process.[1] Red Flag has become a monumental success in "training as we fight" at the tactical level, and we should capture the same visionary approach by using wargaming in education and training at the operational level of war (OPWAR). A Silver Flag, based on an effective use of wargaming, could complement our present Blue Flag exercises to round out an overall systemic approach to OPWAR. For nearly two centuries, wargames have proven vital in teaching military leadership how to think better—how to ask the right questions, how to anticipate, and how to adapt.[2] Wargaming promotes understanding of the "operational art" of war. It provides experience in decision making. It makes book learning and classroom study come alive, reinforcing the lessons of history and illuminat-

ing the theories behind effective planning and execution. These tremendous benefits from wargaming, however, do not come without an investment that starts with recognition of the value of wargaming to professional military education (PME) and training as well as to military operations. This article promotes wargaming as an innovative tool for achieving successful war-fighting strategies. It shows how wargaming is an integral part of the "organize, train, and equip" mission of the service. It argues for a back-to-the-future focus on the human aspects of wargaming to enhance greater effectiveness in how the Air Force approaches wargaming today. Finally, it recognizes the need for improved organizational efficiencies in the service's wargaming infrastructure to better meet current and future national-security needs.[3] Historically and pragmatically, strong reasons exist for refocusing and refining our use of this invaluable tool in order to better plan and execute war.

One should not argue about whether wargaming represents education or training—or whether it is operational or analytical. It is all-inclusive. All tenets are instrumental in producing issues that prepare war fighters and planners to be good decision makers (fig. 1). Along with its supporting tools of modeling and simulation, wargaming teaches people to process issues more effectively in making good decisions. In that sense, the professional application of wargaming can span a broad spectrum of times, scenarios, and circumstances. No doubt, professional war*gaming* is a misnomer in that it reflects a very serious business. Considering it a luxury is foolish. Our military personnel and organizations must be well prepared, and wargaming can make the difference, in terms of decisive training and education, in leaders' competence (or incompetence) in the heat of battle.

One finds many historical examples of wargaming's contribution to successful strategies, operations, or tactics, and it is tempting to try to prove the value of gaming by pointing to direct causality between wargames and success in war. But that ploy, which constitutes an abuse or misuse of history, is not the purpose here.[4] For one thing, historians can only guess as to how frequently and substantially previous wargaming experiences may have influenced wartime commanders' decisions. The unrecorded continuity between wargaming and the thoughts of war-fighting commanders is immense. Nevertheless, one finds value in recognizing that wargaming has had a historically important influence on the operational art of war.

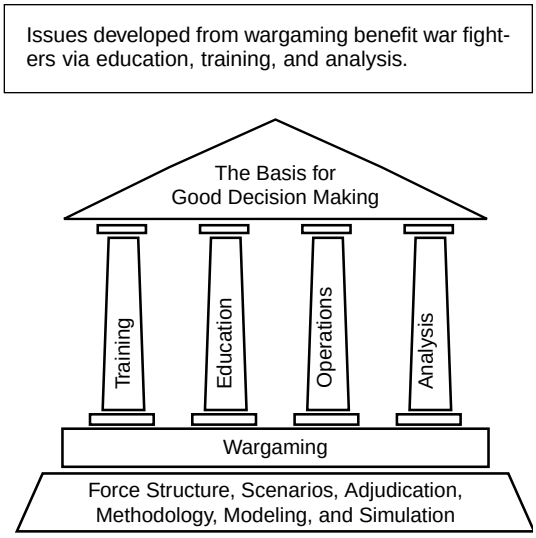

Figure 1. The Foundation of Decision Making

For example, the famous German offensive plan to envelop France at the start of the First World War was a fatally modified version of the so-called Schlieffen Plan, one originally influenced to a great extent by Prussian wargaming under Chief of the General Staff Alfred Graf von Schlieffen.[5] Later in that same war, military-member representatives to the Allied Supreme War Council at Versailles, France, participated in a wargame, trying to anticipate the level of German success. Players representing the enemy (German) side wore their hats backwards as they accurately predicted the timing and location of Germany's final major offensive.[6] These examples were operationally oriented games designed to predict outcomes based on various strategies and force structures.

One may find another example, this one involving wargaming in an educational context, by examining the US Naval War College (NWC), where gaming became part of the school curriculum only three years after the school was founded at Newport, Rhode Island, in 1887. Lt (later Capt) William McCarty Little was the primary initiator of wargames at the NWC, but, for the most part, the institution's leadership also enthusiastically embraced them as valuable educational tools and made them integral to the course of study. In particular, during his second term as college president, from 1918 to 1922, Adm William S. Sims believed that the primary purpose of the NWC was to provide realistic education—more practical than theoretical. The goal was to have students leave with the ability to command at sea—so they needed decision-making experience.[7] Wargames helped provide exactly that. As a result, the college did not conduct just one capstone game a year to reinforce classroom teaching. It did lots of wargaming!

For example, between the First and Second World Wars, the NWC conducted more than 300 games, mostly with scenarios of blue versus orange fleets that usually involved conflict with Japan. Admittedly, people have made too much of the apocryphal remark attributed to Adm Chester Nimitz that no surprises occurred in the Second World War in the Pacific except the kamikazes.[8] Obviously, disastrous "surprises" at Pearl Harbor and the Philippines, for example, did not speak well for the fact that NWC wargaming had indeed explored such contingencies. On the other hand, that same NWC wargaming had not been intended for predictive purposes but to teach decision making. In that respect, a more important point becomes the NWC wargames' direct influence upon the evolution of War Plan Orange, used to defeat Japan during the war. Although much of that influence was indirect and could never be proven historically, it was likely due to the fact that people like Nimitz and Adm Ernest King had played those wargames. In particular, the fleet-exercise experience of "carrier admirals," such as William "Bull" Halsey, Frank Fletcher, and Marc Mitscher most likely had an impact on their ability to fight decisive carrier battles. Not only the admirals but also their staffs learned through human interaction to improve adaptive decision-making abilities. They gained experience, learned to ask the right questions, and learned to anticipate the enemy and fog of war.

Wargaming during the interwar period was not unique to the Navy, of course. At the Air Corps Tactical School (ACTS) at Langley Field, Virginia, and then Maxwell Field, Alabama, faculty members such as Maj Claire L. Chennault and Capt George Kenney developed and conducted games, exercises, and "illustrative problems" to explore tactical and operational uses of airpower for attack, bombardment, pursuit, and observation—often using methods other than those traditionally envisioned by the Navy and Army.[9] No doubt, this activity had enormous subsequent impact on American aviation during the Second World War. But the actual gaming and exercise process at ACTS was less than optimally effective due to arbitrary restrictions and rules to ensure, for example, that bombers would always succeed and that pursuit would always support bombardment in a prescribed manner.[10] By contrast, NWC wargaming had a better approach.

In large part, the reason for NWC wargaming's success lay in its balanced approach to the process of learning itself. In wargames, the learning process is usually more important than the outcome of the gaming battle. Whether one conducts analytical or manual wargames, it is imperative not to "cook" the data to try to "prove" a desired outcome. In other words, one cannot allow the tools to dominate the process.[11] In addition, the more we develop machine-centered analytical tools, the more we must strive to maintain a balanced state of wargaming that continues to recognize the value of human interaction.[12]

Alarmingly, however, the present trend is to move away from that vital characteristic of human involvement in decisions. There is an insatiable appetite for detailed simulations, empowered by the exponential increase in

computational power of the last 20 years, in pursuit of the unattainable—predicting a certain outcome. By reinvigorating the old emphasis on the human dimension of wargaming, we can tap its power to illuminate pertinent issues in the complex national-security environment of the twenty-first century. Wargaming could thus regain its utility as a thought-provoking tool that *leads the way* to military understanding and innovation.

We are no longer in a static national-security environment characterized by well-defined adversaries and expected conflict. Admittedly, in the context of the cold war, in which potentially decisive combat would occur between the large armored and mechanized forces of two superpowers and their allies on the central German plains, precise numbers really did matter. Against an opponent with 10,000 tanks, an attrition rate of 29 percent rather than 30 percent equates to 100 more enemy tanks in the rear area. Thus, wargaming models appropriately clashed large armored forces in areas where terrain was of little consequence and where minor differences in projected attrition rates were more important than human interaction and decision making. With attrition as the key issue, the explosive increase in computational power during the latter half of the twentieth century enabled the development of models and simulations that were highly detailed in their representation of such attrition. But such increased modeling and simulation complexity, addressing ever-increasing force levels and attrition rates, led to large, monolithic events requiring sizable investments in supporting technological infrastructures and extended periods of preparation time.

As a result, the thought processes of operational art degrade while the inflexibility of the models under development increases. This, in turn, leads to the types of doctrinal voids in the Air Force so well articulated in Carl Builder's book *The Icarus Syndrome*.[13] When much of the Air Force initially approached Operation Desert Storm with a doctrinal mind-set of Air-Land Battle, our wargaming correspondingly depicted airpower's principal function as the delivery of "fires" to support the ground scheme of maneuver. Thus, wargaming, which could have been an effective support tool for exploratory campaign planning, was not nearly as significant a contributor to planning for the Gulf War as it could have been. Not much has changed in the last decade to improve the flexibility of databases and models.

In the quest for Jominian prescriptive answers, quantitative mathematical analyses clearly have their advantages. Yet, they have disadvantages as well (fig. 2). Reproducibility can make mathematical simulations very useful from an analytical perspective, but their abstractness, by definition, produces only an approximation of reality. Consequently, they are less than perfect for future leaders trying to grapple with the chaos of war. *But arguing for one type instead of the other misses the point. Wargaming should not be a zero-sum "game" between mutually exclusive types; rather, these types are mutually complementary. Just as we should not discredit the value of analytical simulations, so should we not allow machine-centered analysis to eclipse computer-assisted gaming that takes advantage of human interaction in exploring the complexities of warfare that cannot be precisely modeled mathematically.*

Part of the reason wargaming has ebbed and flowed with inconsistent popularity, waning support, and erratic integration into PME, as well as the nonacademic military environment, lies within the wargaming process itself. It has a flaw that can prove fatal. This flaw, as depicted in figure 2, has to do with convenience, flexibility, and—correspondingly—timeliness. As one of the world's first wargamers, Baron von Reisswitz learned in the early nineteenth century that the king did not appreciate waiting a year for a wargame to be ready.[14] *A dose of reality is that to be effective, wargaming must be timely and flexible enough to accommodate the desired objectives of the game sponsor.* Many wargames have gone the way of the dinosaurs. They lacked organizational commitment, took too long to spin up, did not adapt to changing needs of the sponsor, and failed to produce valuable learning. The Air Force is now expeditionary, light, lean, and lethal—and wargaming must adjust accordingly.

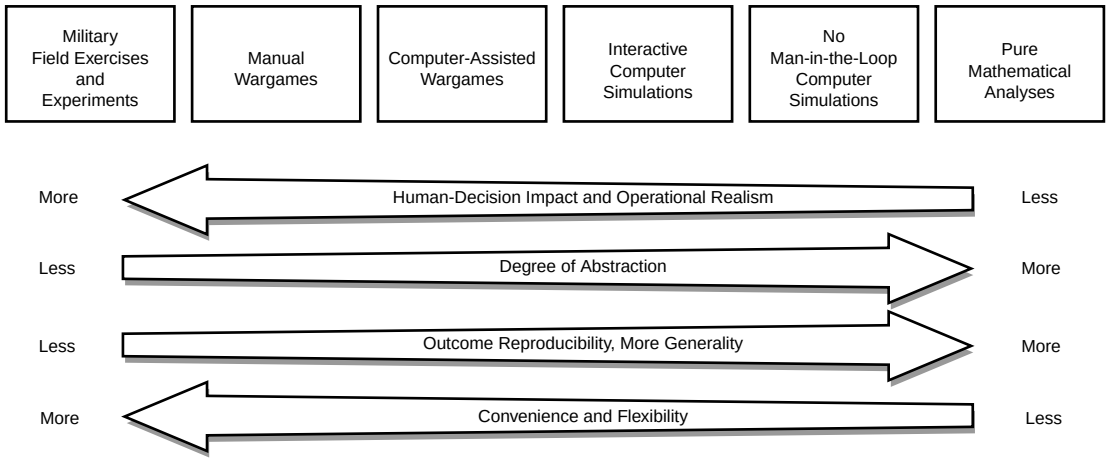

Figure 2. Spectrum of Gaming and Analysis

More specifically, successful wargaming must effectively address key questions involving the interaction of the principal actors in the wargaming process (fig. 3). The sponsor's desires in fulfillment of the intended purpose of the game must drive the overall process to produce a valuable experience for participants and sponsor. This requires good planning; an ad hoc approach will certainly fail.

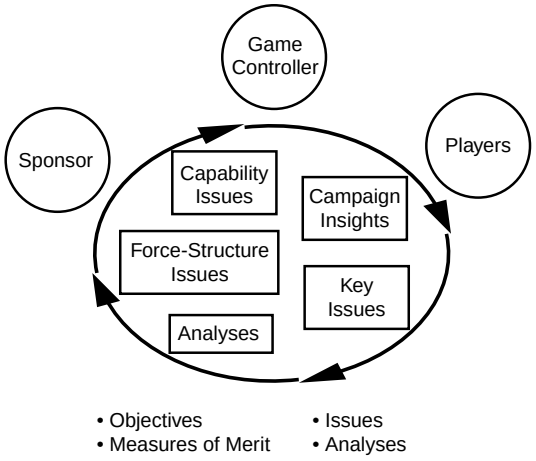

Figure 3. Game Process

With a good plan that drives an adaptable but timely process, the goal of zero disconnects between each acting agency in the design-and-execution loop is achievable.

As the service continues to organize, train, and equip, wargaming can spearhead thought processes. To maximize the benefits of its investment in wargames, the Air Force must integrate efforts with exercises, battle labs, experimentation, and analysis offices (fig. 4). The insights provided by wargaming help drive an "innovation battle space" and can take the form of issues requiring further exploration in different areas: command and control procedures, quantitative system or force-structure trade-offs, or basic system capabilities that appear highly attractive but need a feasibility check from a battle lab or an advanced concept technology demonstration (ACTD) effort.

Getting down to pragmatics, wargaming simply must relate more closely to the fight and become more relevant for war fighters. A mistaken impression exists that educational wargames, in particular, are just for students in PME courses. Not so. All war fighters can and should benefit greatly from experience with wargaming. Currently, however, users complain about the artificiality of wargames. Unfortunately, they are often correct. War-

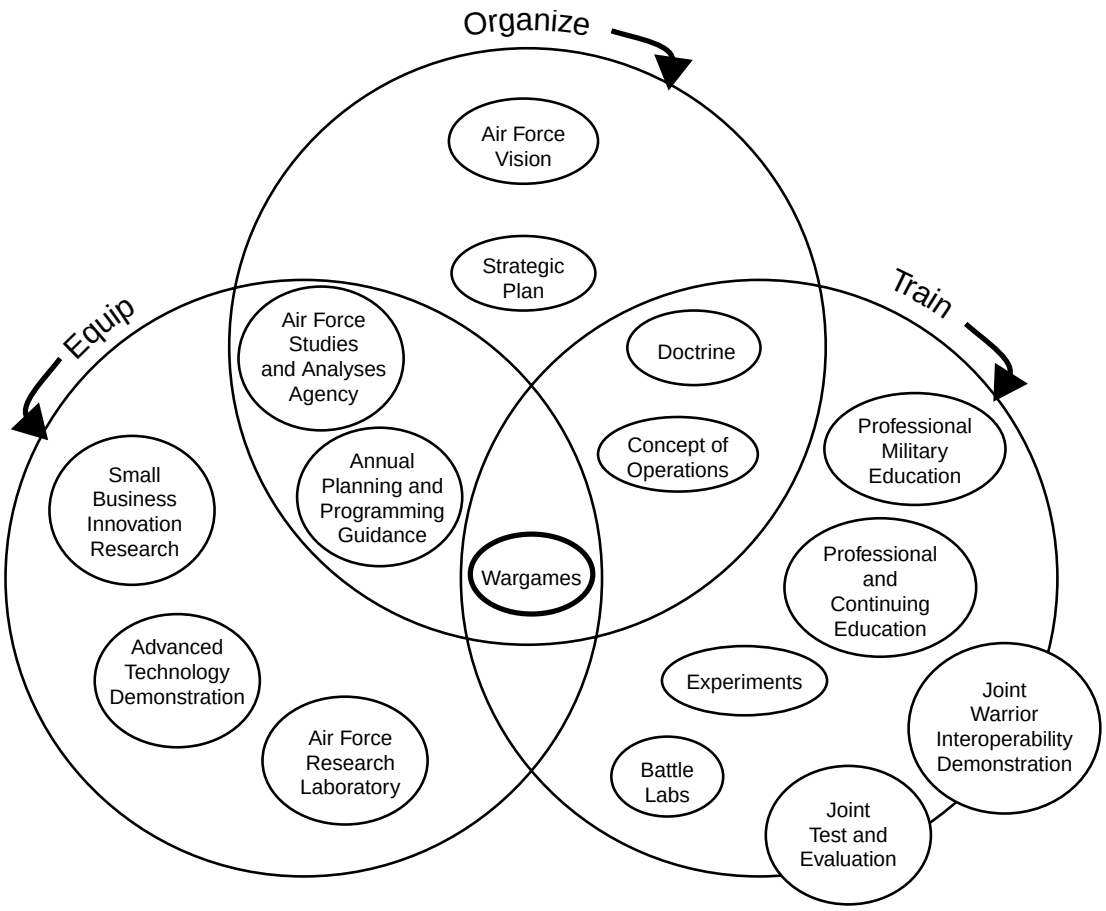

Figure 4. OPWAR/Wargaming Nexus (Adapted from Air Force Policy Directive 10-23, "Innovation Program," draft, 30 August 2001, 2)

games are a waste of time and effort if they don't reflect reality and if they are artificially engineered toward a "desired" outcome. Wargaming students, whether from numbered air forces or PME schools, are no fools—they expect legitimacy. Tremendous potential value lies in the legitimate intellectual exploration of doctrinal issues, new concepts of operations, aspects of information warfare, ways of apportioning and allocating high-demand/low-density assets, and other leading-edge concerns that wargaming can address. However, playing the same tired scenarios, based on outdated attrition algorithms, year after year negates the very utility of wargaming. But the opportunity to address new concerns with new gaming is immense.

For example, the Air Force sees the air operations center (AOC) as a weapon system. As such, it needs capable people there to help plan and execute the air portion of the campaign. Yet, many personnel arrive at AOCs with insufficient knowledge, experience, or decision-making ability. AOC strategy and plans divisions do not have longer-range wargaming efforts. Therefore, gaming centers should work this problem with realistic scenarios and facilities that can accurately depict and

exercise the process from objectives to assessment. Although wargaming is certainly not a weapon system, it can help portray one accurately. Again, the human element is key. The AOC uses machines, but it depends upon people as decision makers.

Critics will still try to argue that this confuses training with education. Certainly, aspects of learning how to operate in an AOC are purely a matter of training. But such training does not have to isolate itself from educational needs. In other words, we must ask such important questions as, What role does wargaming play in the education and training of AOC personnel? Our wargaming centers should then execute the process involved with that answer.

Today, the most notable wargames in the Department of Defense are the services' Title X games, which, unsurprisingly, the Navy initiated in 1981.[15] The Air Force entered this Title X gaming arena when Gen Ronald Fogleman, as chief of staff, recognized the value of the NWC games and the need to establish a level playing field for all the services. The resultant Air Force Title X effort was based upon a game-design concept then in use for the Aerospace Power Symposium's wargame conducted annually at Maxwell Air Force Base, Alabama, which involved corporate and senior civic leaders in an attempt to increase their understanding of the issues facing the military services. General Fogleman, however, changed the audience to senior members of joint war-fighter staffs and refocused their purpose to address near-term, operational-level, war-fighting issues.

The initial game took place in 1996 under the title "Strategic Force '96" and has subsequently evolved into the Global Engagement (GE) series. More recently, the Air Force has added two more games: an Air Force Future Capabilities game, which looks at a more distant time period, and a Space wargame, dedicated to examining future issues related to the military use of space.

Developing these wargames has been a positive step for the Air Force; unfortunately, the wargaming problems identified earlier still haunt the process. Analytic tools focused on attrition require painstaking efforts to refocus them on different geographic areas or force structures.[16] Their inflexibility in addressing present and near-future war-fighting issues in wargames produces large, expensive games that are equally inflexible and require excessively long lead times. In fact, preparation for the various service Title X wargames and capstone games supporting PME schools takes longer than many real-world operations.[17] Even the games' seemingly impressive analytic capability often comes up short in shedding light on important nonattrition, nonkinetic war-fighting issues of the day.

In addition, a review of recent Title X games shows a definite tendency to posit conflict with adversaries committing large force structures to the conflict, oftentimes in less than optimal geographic locations. Clearly, such force levels can be assembled within the next 10–20 years, but that is not the trend in today's national-security environment.

Secretary of Defense Donald Rumsfeld recently stated, "Our current national security environment is dynamic with limited forecasting visibility."[18] In the *Quadrennial Defense Review Report*, he notes that "it is not enough to plan for large conventional wars in distant theaters. Instead, the United States must identify the capabilities required to deter and defeat adversaries who will rely on surprise, deception, and asymmetric warfare to achieve their objectives."[19] Again, the message is clear. Wargaming must have greater agility in addressing smaller-scale scenarios with multiple branches and sequels.

In short, we risk losing the wargaming vision and lesson from Newport. Wargaming must meet the educational and training needs of war fighters and students in terms of timeliness, flexibility, realism, and focus. It is a mistake to demand definitive *answers* to complex issues from a tool best used to raise *questions*. Again, the strength of wargaming lies in exploring alternatives and enhancing insights into likely courses of action, not in providing quantitative results.

For example, one of the most enlightening and helpful wargames in some time was the South Asia game conducted concurrently with the 1999 Global game at Newport. The former provided a forum for exploring the operational aspects involved with the aftermath of a nuclear exchange. It allowed for exploration of US interagency coordination as well as coalition-government cooperation with nongovernment organizations and private volunteer organizations in a military operation other than war. Aside from some ballpark casualty estimates for the detonation of the nuclear weapons, it required no direct model support. This might be the kind of game that is exceedingly relevant and timely, given current national-security concerns of terrorist attacks on the continental United States.

Turning toward suggestions for the future, the services' Title X efforts have identified some important war-fighter issues but not to the depth required. For example, we need more work on coalition relationships—especially exploration of command, control, communications, and computer capabilities required for allies—as well as on technological and doctrinal gaps. After GE IV, although some parties expressed solid support for a game on key coalition issues, budgetary limitations precluded a game focused solely on this critical topic. Other examples of potentially key issues for the Title X series include exploring improved employment concepts for the air expeditionary force; better understanding of escalation-control measures; understanding the trade-offs between air, space, and surface intelligence, surveillance, and reconnaissance (ISR) capabilities; and examining numerous issues regarding both policy and technology of information operations.

The human-centered, qualitative nature of wargaming can and should make great contributions to furthering our understanding of operational art, specifically in the emerging areas of information operations, homeland defense, and effects-based operations. In addition, we can improve in the area of gaming economic and political realities of military force application. To make this happen, however, assessors must be able to adjudicate applicable factors with effective support materials. Otherwise, they have to rely exclusively on personal judgment—both for attrition and nonattrition phenomena—which does not meet the mark. Some of the hypothetical campaigns developed during recent games suggest a singular inability to understand the complex interaction of these factors.

Representation of the protagonist is another area that requires examination. Have we consciously decided that having a professional red team is not a good investment? Effective wargames cannot constrain the opposition to the extent that the moves do not reflect the adversary's operational art. Similarly, we can improve our common treatment of logistics, whose critical limiting factors are frequently overlooked to prevent them from interfering with the unfolding of the operational plan.

A deliberate effort to refine investment in Air Force wargaming could dramatically improve synergistic effects across all aspects of the innovation battlefield. Without getting too much into the weeds, this funneled effort could lead the way to a more efficient study of OPWAR (table 1) and could produce results for OPWAR similar to those produced by Red Flag for the tactical level of war.

Table 1

Potential Initiatives for a Silver Flag OPWAR

- "Train as we fight" at the OPWAR—*a Silver Flag.*
- Link the fields of doctrine, concepts of operations, research, education, and gaming—*synergy through wargaming.*
- Better address the key issues for which games are sponsored, going beyond surface concepts—*detailed analysis.*
- Improve assessment methodology, exploring a "building block" approach by using in-depth, pregame analysis of a range of likely interactions selected and

assembled during game execution—*building blocks*.

- Shift the emphasis from the large, culminating event to multiple, intensely focused events—*smaller games*.
- Dramatically shorten wargame development time—*improved models*.
- Design game-assessment methodologies that better reflect the shift from attrition warfare to effects-based warfare—*better modeling and simulation*.
- Develop a campaign-planning-level wargaming capability that can be brought to war fighters; tailored to their scenarios, areas of responsibility, and issues of interest; and integrated into home-station staff education and training—*a suitcase wargame*.
- Develop a cadre of experts equipped with appropriate resources—*in-house red-team expertise*.
- Build a state-of-the-art Silver Flag facility rivaling those at Carlisle Barracks, Pennsylvania, and Newport to educate and train leaders, generate ideas, and develop issues, making it *the* source of OPWAR thinking—*a Silver Flag home*.

The challenge is to reinvigorate the support that wargaming provides to developing the operational art of war by refocusing the objectives of Title X wargaming toward addressing the uncertainties of the future—a challenge laid out by the secretary of defense in the "terms of reference" for the Quadrennial Defense Review. Capitalizing on the significant investments in game-preparation materials made for Title X wargames and coupling that with a transportable gaming capability, one could provide the essential tools for the staffs of the numbered air forces and the commanders in chief to begin exploring their understanding of adversary options as well as branches and sequels.

Just as the US Army is currently wargaming its "transformation" at Carlisle Barracks, so might the Air Force capitalize on the benefit of a Silver Flag center's exploration of new concerns. For example, in addition to the AOC issue already discussed, numerous aspects of weaponizing space relate to homeland defense and pose viable challenges.

A key ingredient to the success of NWC wargaming was the Navy's opinion that the "opportunity to pit one intellect and will against another was seen as an essential element in the education of a naval officer."[20] To promote this concept, service variety in the ranks of senior game assessors and "higher authority" players seems to make good sense. Again, the goal is to examine ideas and explore concepts descriptively rather than prescriptively. Therefore, *we must build a game construct and atmosphere that intensify rather than dilute the competition of ideas. Accordingly, an Air Force–only assessment of Air Force–centered concepts may prove shortsighted.* Air Force members better understand the attributes of airpower when they confront competing arguments—not when they insulate themselves from contrary concepts.

Finally, we can streamline some of the wargaming preparatory process. Under current game-design constructs, participants often spend most of their time deciding how to deploy, employ, and (hopefully) sustain forces—typically, not the major objectives of the wargame but definitely part of their tasking. Certainly, the requirement to develop a campaign plan may be the primary purpose of wargames run in the operational or PME environment, where the learning experience is paramount. On the other hand, briefings by game-control teams on some of the more fundamental matters of force employment and campaign planning, based on limited inputs from key players, *could free players to focus primarily on the key issues identified by the game sponsor without undermining player buy-in to the game.* Typically, however, the Title X games are run to develop a better understanding of a few key issues. Freeing Title X players from the deployment and employment issues allows them to focus on cutting-edge policy issues.

The Newport wargaming that contributed to War Plan Orange involved more than a single game; similarly, our PME institutions

could benefit from increased integration of wargaming (not just capstone experiences) into curricula. The challenge, of course, is limited budgets and limited time. Thus, the coupling of Title X resources for analysis support with PME wargaming, as well as the linking of wargaming assets across the Air Force and Department of Defense, should be a winning combination. The Air Force could benefit from an overall review of its sizable investment in Title X wargaming, modeling, and simulation, keeping in mind the value in using gaming to reach as many of the right people in critical positions as possible.

The main value of wargaming lies in exploring operational art to develop insights into issues and concepts of current and future operations. It does not reside in trying to predict or prove outcomes, such as for budgetary and force-structure justification. The GE experience shows that games can reveal fruitful areas for subsequent in-depth analysis. Issues developed from wargames could serve as a road map to focus the efforts of battle labs, war-fighting centers, joint-experimentation projects, and expeditionary-force initiatives. This map would promote a coherent, efficient, and economical wargaming effort. Just as airmen have learned the most effective ways to apply aerospace power, so should we explore the most productive uses of wargaming. □

Notes

1. Although wargaming is distinct from modeling and simulation, for simplicity's sake, this article uses the terms inclusively to focus primarily on seminar-style educational wargames conducted to explore operational-/strategic-level issues, for the enlightenment of either the sponsor or the participants.

2. Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: Vintage Books, 1991), 26. In *On the Psychology of Military Incompetence* (New York: Basic Books, Inc., 1976), 27–35, Norman Dixon discusses the difficulty of human decision making in the two basic activities of war—delivering energy and communicating information.

3. The purpose is definitely not to argue for wargaming over modeling and simulation. They are complementary tools, each serving a unique and vitally important function for our service.

4. Wargaming literature often omits incidents concerning wargaming's deleterious effects on decision making in war. Although this article touches on just a few historical examples for purposes of illustration, for a more comprehensive look at the history of wargaming, see Matthew Caffrey Jr.'s "Toward a History-Based Doctrine for Wargaming," *Aerospace Power Journal* 14, no. 3 (Fall 2000): 33–56; and Peter P. Perla III, *The Art of Wargaming: A Guide for Professionals and Hobbyists* (Annapolis: Naval Institute Press, 1990), 1–160.

5. Perla, 41.

6. Eric Ash, *Sir Frederick Sykes and the Air Revolution, 1912–1918* (London: Frank Cass, 1999), 99.

7. Perla, 70.

8. Ibid., 73.

9. See course text titled *The Air Force* (Langley Field, Va.: Air Corps Tactical School, 1930), 19; and Caffrey, 42.

10. *The Air Force*, 59. It is interesting to ponder whether Chennault himself, or perhaps one of his disciples at ACTS, scribbled "OUT ! ! ! !" in the margin of a copy of the course text, referring to an underlined passage mandating how pursuit aircraft had to follow a prescribed rendezvous with bombardment aircraft, thereby restricting their freedom of action. See also Robert T. Finney, *History of the Air Corps Tactical School, 1920–1940* (1955; reprint, Washington, D.C.: Center for Air Force History, 1992), 63–68.

11. Perla, 8.

12. Ibid., 163–67. Throughout his book, Perla implies that the principal discriminator between wargames and closed-form, simulation-based analyses is the ability to accommodate the human-decision element.

13. Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (New Brunswick, N.J.: Transaction Publishers, 1994), 3–37.

14. Perla, 24.

15. The Global Wargame series started in 1981 as a summer activity for students arriving to attend the Naval War College. Over time the game grew to be the largest and best-known wargame within the Department of Defense. Although early participants were known to have "proven it at Newport" and at least one game culminated with the NWC president thanking the gamers for having "proven" the maritime strategy, game designers have had considerable license to experiment, both with national-strategy issues and with wargaming methodologies. As a result, the game has been a major contributor to the advancement of the wargaming art form.

16. Such tools generally involve complex, computer-driven algorithmic equations.

17. GE IV took 15 months of preparation. Allied Force took 78 days. The trend is not encouraging: GE VI will take over 24 months.

18. Donald H. Rumsfeld, "Terms of Reference for Quadrennial Defense Review," pamphlet, 22 June 2001, 9.

19. Department of Defense, *Quadrennial Defense Review Report*, 30 September 2001, iv, on-line, Internet, 5 November 2001, available from http://www.comw.org/qdr/qdr2001.pdf.

20. Perla, 68.

The Cult of the Quick

DR. THOMAS HUGHES

Editorial Abstract: Speed is the mantra of the Air Force. We seek rapid aerospace dominance and push to cow enemies quickly with shock and awe. But does fast always mean successful? The doctrinal "cult of the offensive" in World War I championed quick victory in theory but experienced disastrous stalemate in practice. Suggesting the relative newness of our worship of speed, Dr. Hughes uses historical precedent to show that a more gradual approach to warfare can achieve military objectives as well as the quick strike.

cult: great or excessive devotion or dedication to some person, idea, or thing . . . such devotion regarded as a literary or intellectual fad or fetish.

—Webster's Third New International Dictionary

IN OCTOBER 1999, the US Senate Armed Services Committee heard testimony from American leaders of the North Atlantic Treaty Organization's (NATO) air war over Kosovo the previous spring. In his remarks, Lt Gen Michael Short, US Air Force, found fault with the targeting and pace of Operation Allied Force (OAF). Had he been in charge, he told the senators, "I'd have gone for the head of the snake on the first night. I'd have dropped the bridges across the Danube [River]. I'd have hit five or six political and military headquarters in downtown Belgrade. [Serbian president Slobodan] Milosevic and his cronies would have waked up the first morning asking what the hell was going on." Throughout OAF, Short had clashed with his superior, the US Army's Gen Wesley Clark, NATO commander, on a score of issues—to the point that some staff officers for both men believed Clark should have relieved Short. However, on the matter of the proper pace of military operations, Clark agreed with his aggressive subordinate. "I think one of the lessons that comes out of Allied Force," Clark testified, "is the need that once you cross the threshold to move as rapidly as possible to the decisive use of force."[1]

Like the relationship between Clark and Short, the one among US military services is often marked by differences, particularly on issues relating to the nature, preparation, and conduct of warfare. These differences, manifest to even casual observers, make Department of Defense (DOD) efforts such as the *Quadrennial Defense Review* and the process of writing joint doctrine difficult and often acrimonious. But also, like Clark and Short, Pentagon officials appear to speak with one voice on the matter of speed in war. Universally, across all services, among military officers and civilian staffers, and from the chairman's office to the enlisted

corps, those charged with the stewardship of national defense view speed as an inherent advantage in warfare. In their view, speed has intrinsic value in the strategic, operational, and tactical conduct of war. With increasing unanimity, professionals and pundits alike extol the virtues of velocity. They link it inexorably with the decisive use of force and judge any suggestion or effort to restrain the pace of military operations as anathema to the sound principles and long experience of warfare.

Current DOD orthodoxy, however, makes no adequate distinction between time and speed. Rather, military thinkers prescribe rapidity of action as the only way to leverage time in the conduct of war.

War is far too variable and local circumstances are far too diverse to sustain any such hoary maxim. Time, as distinct from speed, is of course an essential element of war; one keen observer believes it "will rule tactically and operationally" and is "undoubtedly the least forgiving of error among strategy's dimensions."[2] Current DOD orthodoxy, however, makes no adequate distinction between time and speed. Rather, military thinkers prescribe rapidity of action as the only way to leverage time in the conduct of war. But the utility of time across all levels of warfare also requires the willingness and ability to reduce the pace of military operations, as any careful examination of military experience demonstrates. Ironically, without tolerance for the gradual and incremental conduct of war, the American military has undercut the value of its vaunted capacity for speed. It is the willingness to modulate operations over time, far more than a simpleminded pressure on the throttle, that makes speed an advantage in war and best defends against enemies who may employ patience—time of a different sort—as a weapon.

Of Doctrine and Dictate

References to speed are everywhere in the DOD. Service doctrine is full of it. "The military's ability to respond quickly and decisively," asserts the Army's basic manual on operations, Army Field Manual (FM) 100-5, *Operations*, "is fundamental to Army operations doctrine."[3] For its part, the Navy's capstone doctrine claims that the forward presence of its ships and aircraft is "essential to permit the United States to act quickly in meeting any crises that affect our security."[4] Beyond this, the Navy believes that "rapid high tempo actions" are among the best ways to exploit the dynamics of war and that "tempo is more than a means to employ weapons better; it is a weapon itself."[5] The Marine Corps, sometimes self-described as the nation's 911 force, agrees. "Of all the consistent patterns we can discern in war," Marine Corps Doctrine Publication (MCDP) 1, *Warfighting*, explains, "there are two concepts of universal significance in generating combat power: *speed* and *focus*. Speed is rapidity of action. It applies to both time and space. Speed over time is tempo—the consistent ability to operate quickly. Speed over distance, or space, is the ability to move rapidly. Both forms are genuine sources of combat power. In other words, *speed is a weapon*" (emphasis in original).[6]

The Air Force, the fastest of the services, also extols speed. Its slender 85-page Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, contains at least 22 references to speed as an advantage in war.[7] Elsewhere, Air Force doctrine asserts a "new American Way of War" that "uses the rapid employment of sophisticated military capabilities to engage a broad array of targets simultaneously, strongly, and quickly, with discriminate application, to decisively shape the conflict and avoid the results of previous wars of attrition and annihilation."[8]

DOD joint doctrine mirrors service pronouncements. Joint Publication (Pub) 1, *Joint Operations of the Armed Forces of the United States*, proclaims, "American arms seek rapid decision in simultaneous application of all appropriate dimensions of combat power."[9] Moreover, the

basic goal in all war operations is a "rapid" decision, and "arriving first with the most capability clearly remains the objective."[10] The basic joint manual for operations goes a step further, mandating that objectives in war "must directly, quickly, and economically contribute to the purpose of the operation."[11] Clearly, at a time when disputes among the services have compelled some Pentagon observers to liken the DOD to a schizophrenic as it tries to relate service and joint doctrine, the entire military pays uniform homage to the important element of speed in war.[12]

This reverence for rapidity is not limited to doctrine. From the Joint Chiefs of Staff's (JCS) *Joint Vision 2010* to *Marine Corps Strategy 21* to an Air Force booklet titled *10 Propositions Regarding Air Power*, official publications revel in speed.[13] Gen Eric Shinseki, Army chief of staff, promises to convert the Army from a plodding, cold-war behemoth to a swift, new-world dynamo in a series of shifts known inside the Army as the "Transformation."[14] Gen John Jumper, Air Force chief of staff, has a similar initiative. His Global Strike Task Force "is a rapid-reaction, leading-edge, power-projection concept that will deliver massive around-the-clock firepower" in a bid to become the nation's "kick down the door force." Through something called "predictive battle-space awareness," Jumper believes that the Air Force should strive not merely for swift reaction but also for fast preemption in the conduct of war.[15] For its part, the Joint Staff's professional journal, *Joint Forces Quarterly (JFQ)*, regularly trumpets the virtue of quickness. The Summer 1998 issue, dedicated to "a look back at the best of *JFQ*," underscored the value of speed. One article claimed that "the need to identify, target, and attack in near real-time is now a fact of life" and that "the commander can no longer afford the luxury of thinking in terms of days, weeks, or months to phase campaigns or move forces."[16] Another article, which grandly identified time as the fourth dimension of war alongside air, land, and sea, insisted that speed was the only way to exploit time.[17] President George W. Bush reflects all this stress on speed. "Military power," he has asserted, is "increasingly defined not by size and mass but by mobility and swiftness."[18]

Perhaps commentary about the 1999 air war over Kosovo best reveals this ingrained dictate for speed. Dozens if not hundreds of news accounts as well as many academic, scholastic, and professional articles added weight to General Short's carping about the pace of OAF.[19] The Air Force, the service with the preponderant responsibility in Kosovo, loudly criticized the conduct of the campaign. A leading Air Force surrogate complained, "Allied Force began as an attempt to signal Milosevic that NATO was serious about using force rather than as a decisive military operation designed to achieve victory." As a result, "it took NATO 30 days to do what General Norman Schwarzkopf did in about three days in the Gulf War."[20] An official Air Force report, while careful to claim the "decisiveness of airpower," also decried the gradual approach of the war. "Admittedly, the campaign did not begin the way that America would normally apply airpower—massively," the report's authors wrote. But as soon as the "air campaign grew in intensity," it "achieved its desired outcome." The authors then set out to undercut whatever precedent might exist in OAF for the gradual application of force:

> Because air power offers the potential for great destruction while ordering relatively few warriors into harm's way, its use becomes an attractive political option. By default then, it becomes acceptable to commit incrementally to military operations calibrated by the success or failure of the previous increment of military action. The attraction is obvious, in that one can avoid a commitment to the intensity and violence required by a decisive and rapid military victory. The risk is failure.[21]

In isolation and at a glance, the DOD's glorification of speed appears reasonable. Strategic circumstances certainly exist in which rapidity of action could be valuable—even critical. However, this bias for speed ignores local conditions. Surely, speed's legitimate advantage in warfare under some circumstances does not ensure its value under all circum-

stances. Kosovo is not the entire Balkans, Persian Gulf, Korean Peninsula, or Chinese mainland, which in turn is not the new topography of international terrorism. At a time when the American military has global commitments arrayed at variable threats, both real and potential, the Pentagon's single-minded view of speed leaves the nation's defenders poorly prepared for the range of military opposition and enemies they may face.

The Journey to Speed

The DOD's love affair with speed is neither ageless nor inevitable. Emerging over time, it is the product of larger cultural trends as well as the Pentagon's perceived lessons of past warfare and its assessment of present threats. Military institutions are part of larger societies, and since the Enlightenment, Western populations have generally pursued the capacity for quickness as an intrinsic good. This pattern, especially prevalent in industrial societies like the United States, has fostered a host of scholastic and popular commentary. The modern computer age has acted as a kind of steroid in this process, elevating speed to a virtual theology.[22]

Larger cultural trends are not the only influences that condition martial ideas, however.[23] Well-developed military institutions are marked by a high degree of internal cohesion. Morever, they maintain rigid entry requirements and provide internal training and education. In other words, they are capable of internal intellectual trends. Within the DOD, then, the quest for speed stems also from beliefs about past military experience and present assessments of future threats.

Rapidity was not always a touchstone in American military thought, despite positive references to it in many of the strategic analyses favored by the Pentagon. In the War of Independence, George Washington's Continental Army leveraged a patient, incremental, and modulated campaign against the world's greatest military force. Eventually, the British Empire decided that further hostilities in the New World were not in its interests. During the Civil War, the Anaconda Plan reflected the Union Army's strategic preference to defeat the Confederacy through a slow and deliberate squeezing; it was the South, the weaker military power, that sought a swift outcome on the battlefield. Throughout the frontier wars, which stretched from well before independence to shortly before 1900, the American Army marched westward no faster than expanding white settlement demanded and required.

The desire for speed gathered momentum in the twentieth century as America's strategic obligations broadened across the globe. After the Spanish-American War, the United States needed to provide a naval defense in the Atlantic and Pacific Oceans using a navy adequate for the protection of only one ocean at a time, a condition that stressed mobility and speed. The Navy's Great White Fleet voyage of 1907–8 was designed to test the nation's ability to reach Earth's four corners, and the Panama Canal was built in large part to ensure a speedy transfer of fighting ships from the Atlantic to the Pacific. Before World War I, War Plan Orange, the Navy's operational plan for combat with Japan, stressed the need to project power quickly across the vast Pacific to protect the nation's new colony in the Philippine Islands. In the interwar years, Orange was also a powerful impetus to the development of aircraft carriers, increasingly seen as a means of rapid movement. In fact, from the genesis of Orange in 1904 until World War II, the speed of a fleet movement across the ocean was the central determinant of the war plan's many variations.[24]

Land-based military aviation furthered this speed-mindedness. In the 1920s, airplane theorists and advocates like Brig Gen William Mitchell trumpeted aviation's capacity to culminate war quickly, an attractive proposition to a generation soured by the memory of long, deadly, and seemingly indecisive trench combat during World War I. In the 1930s, America's growing strategic interests around the world, the memory of the Great War, and the promise of a quicker war next time encouraged a concentration on rapidity among war planners. As

a result, by the eve of World War II, no one seriously questioned the dictum of Gen George Marshall, Army chief of staff, that no democracy could endure a 10-year war.[25]

For good reason, the atomic age further accented the virtues of velocity. During the cold war, the United States, for the first time in its history, stood vulnerable to widespread destruction at a moment's notice. As a result, America's strategic deterrence rested on the tactical ability to deliver a nuclear strike of its own in a matter of hours, even minutes. The military organization first entrusted with this deterrent mission, the Air Force's Strategic Air Command, came to dominate both the fiscal and cultural dimensions of the DOD by the late 1950s. At the same time, the nation's strategic posture in Europe and the Pacific mandated the capacity to fight two major regional conflicts simultaneously. This caused the positioning of vast amounts of war materiel and service members around the globe, hair-triggered to spring into action—a condition that survives today. By the beginning of the Vietnam War, American military organizations had come to value both speed in war and speedy wars as intrinsic goods, preferences not obvious in earlier eras.

These beliefs banged against the reality of limited war in Indochina. American military leaders had hoped to wage a fast, massive air campaign against North Vietnam, but political fears of a wider war with China, or perhaps the Soviet Union, compelled an incremental approach to the war. Operation Rolling Thunder, a gradual escalation of bombing to coerce North Vietnam into surrender, raised hackles among military leaders. The senior American commander for much of the war, Adm U. S. Grant Sharp, labeled this slow campaign a "retreat from reality" that avoided the difficult decisions and "treaded the mushy middle ground." In his view, this incremental approach to war not only betrayed a weak resolve but also emboldened enemies; it was "guaranteed to produce a true strategy for defeat."[26]

After the Vietnam War, the vast majority of military officers and Pentagon observers adopted Sharp's criticism of a gradual approach to warfare.[27] By the 1980s, this view of Vietnam had become conventional wisdom. It was enshrined in Secretary of Defense Caspar Weinberger's famous tests for military involvement abroad as well as in the dictum of Gen Colin Powell, chairman of the JCS, to employ overwhelming force in military operations. Beyond their advocacy of massive force linked to clear objectives, the Weinberger Doctrine and the Powell Corollary also embodied a strong bias toward speed in war. "Decisive means and results are always to be preferred," Powell once explained, "so you bet I get nervous when so-called experts suggest that all we need is a little surgical bombing or a limited attack. When the desired result isn't obtained, a new set of experts then comes forward with talk of a little escalation. History has not been kind to this approach."[28] Drawing on his memory of the Vietnam War, Powell later told the *New York Times*, "As soon as they tell me it is limited, it means they do not care whether you achieve a result or not."[29]

Of Speed and Decision

The short Gulf War of 1990–91 appeared to validate the wisdom of massive force applied with lightning speed. At about the same time, the Pentagon's exultation of a contentious personality reflected an increasingly codified belief in speed. Since the 1960s, Col John Boyd, a maverick Air Force officer, had conducted a lonely campaign to champion his OODA Loop (the observe, orient, decide, and act decision cycle). A fighter pilot, Boyd had derived this schematic from his experiences dogfighting North Korean MiGs, during which he had learned that quicker decisions often led to victory in aerial combat. After the Korean War, Boyd extrapolated this concept from the tactical level of war to a new principle for everything from procurement to national strategic behavior.[30]

For years, the DOD was hostile toward Boyd's ideas, in part because the imperatives of combat at the tactical level of fighting did not easily translate as guidelines for the operational or strategic conduct of war. In the 1990s, how-

ever, an appreciation for war's complexity was combined with the growing potency of tactical weapons to compress and sometimes to obliterate the analytical boundaries between the tactical, operational, and strategic levels of war. In an influential booklet published in 1995, Col David Deptula (now a major general), US Air Force, described how new precision-guided munitions might profitably be used in "parallel war" to "exploit three dimensions—time, space, and levels of war." Using the Gulf War as an example, he exhorted his colleagues to "focus on systematic effects rather than individual target destruction" and argued that new weapon systems could simultaneously shape each level of war.[31] That same year the Pentagon's Joint Pub 3, *Doctrine for Joint Operations*, proclaimed that "advances in technology, information age media reporting, and the compression of time-space relationships contribute to the growing interrelationships between the levels of war. Commanders at every level must be aware that in a world of constant, immediate communications, any single event may cut across the three levels [tactical, operational, and strategic]."[32]

Deptula and others were advocating more careful thought about compelling enemy behavior. However, this exhortation also served to diminish the analytic utility that had buttressed the levels-of-war paradigm for at least a century. As a result, Boyd's ideas of war were more likely to meet acceptance in the nation's military. Before this development, strategists often believed that the factors which shaped speed's value in war varied across the levels of conflict, as Carl von Clausewitz had suggested in *On War*.[33] But with the growing inconsequence of these levels of war, the way was clearer to proclaim speed an intrinsic, inherent advantage in war—in all conditions and at every level.[34]

The Marine Corps was the first to warm to Boyd, and its capstone *Warfighting* doctrine now revels in the idea of the OODA Loop. For marines today, warfare is necessarily a function of decision making, and "whoever can make and implement decisions consistently faster gains a tremendous, often decisive advantage. Decision making in execution thus becomes a time-competitive process, and timeliness of decisions becomes essential to generating tempo."[35] Boyd's own service, the Air Force, which had earlier been belligerent to him and his ideas, now praises the OODA Loop. But in the process, the service confuses speed and time. As explained by one Air Force booklet recommended to all incoming officers,

> Air power increases speed of movement by orders of magnitude. This conquest of time by air power provides surprise, and surprise in turn affects the mind, causing confusion and disorientation. John Boyd's entire theory of the OODA Loop . . . is based on the premise that telescoping time—arriving at decisions or locations rapidly—is the decisive element in war because of the enormous psychological strain it places on an enemy.[36]

Concurrent with this development, swift military operations became officially identified with the decisive use of force, which has constituted the Holy Grail of military strategy since at least the Battle of Waterloo.[37] For the American military, this quest for decisive action has fueled some of the great intramural service squabbles. The Army Air Forces' (AAF) assertion of aviation's decisive effect in World War II drives an ongoing debate, and today each combat arm carefully lays claim to decisive ability in official statements of doctrine and strategy. Through most of the twentieth century, however, the search for and debate about decisive force rested on traditional concepts of decisiveness, classically defined as the ability or capacity to decide some issue or compel some decision on the battlefield.[38] The AAF did not claim to have won World War II quickly, after all; it merely claimed it was the most important element in deciding the contest.

All this changed in the 1980s and 1990s. Speed became, if not synonymous with decisiveness, at least an indispensable adjunct to the concept, a link seen in the 1992 iteration of the *National Military Strategy:*

> Once a decision for military action has been made, half-measures and confused objectives exact a severe price in the form of a protracted conflict which can cause needless waste of human lives and material resources, a divided

> nation at home, and defeat. Therefore, one of the essential elements of our national military strategy is the ability to rapidly assemble the forces needed to win—the concept of applying decisive force to overwhelm our adversaries and thereby terminate conflicts swiftly and with minimum loss of life.[39]

Subsequent versions of the *National Military Strategy* rooted the bond between decisive force and speed deeper into the military lexicon. Today, each service routinely appends the concepts together. Soldiers believe "it is the Army's ability to react promptly and to conduct sustained land operations that make it *decisive*" (emphasis in original).[40] Sailors stress the forward presence of ships around the world as a means to attain a "rapid, favorable end to hostilities," while criticizing slower attrition warfare as "frequently indecisive and inherently costly in terms of personnel, resources, and time."[41] For their part, flyers boldly assert that "decisive maneuver requires rapidly deployable, highly mobile joint forces that can outpace and outmaneuver opposing forces."[42] All this finds reflection in joint doctrine, which holds that "the most important" characteristic of American arms is "the *visible ability to act rapidly and decisively* in regions of U. S. interests" (emphasis in original).[43]

For those in charge of the nation's military strategy, then, a patient approach to war has become antithetical to the decisive use of force. Speeding, already embedded into the military's worldview, had now appropriated the strategic high ground of decisive effect and was no longer the sort of cultural preference all militaries, and societies, exhibit. The demand for speed in war had now become a decree, to be pursued without regard to local circumstance, strategic condition, or enemy character. The quest for speed had become cultish.

Speeding Is Dangerous

This dangerous dictate rests on a facile, even contrived, sense of military experience. Recent history demonstrates the value of rapidity in both combat and war, but it also teaches patience and perseverance. In World War II, both Japan and Germany based their tactical, operational, and strategic war plans on speed; when compelled into longer fights, they lost. In the Korean War, the combatant that struck first and fast eventually lost. In the Vietnam War, the combatant with perseverance and a modulated campaign won the day. Although it is too early to derive sound conclusions, this past decade's fights in the Balkans also seem to buttress incremental war. In 1995, for instance, Operation Deliberate Force saw NATO jets dropping bombs on just 12 of the campaign's 22 days with at least one pause of five days.[44]

A different view of the past also challenges the positive correlation between speed and decision so prevalent in doctrine and strategic thought. When the abrupt end of World War I fuelled theories of conspiracy between the German government and Western powers, discontents like Adolf Hitler seized upon the war's swift conclusion to rise to power and help make the Great War an indecisive conflict. In World War II, despite great emphasis on the Battle of Midway as a turning point and the atomic missions as the culminating point, the basic outcome of the Pacific War turned more on the attrition of combat in the South and Southwest Pacific theaters and the sustained submarine assault on Japanese shipping. Likewise, the incredible crucible of the eastern front, played out over four years, contributed more to the basic decision of the European war than any lightning attack conducted by any combatant.[45]

More recently, the swift pace of the Gulf War may well have worked against its potential for decisive effect by catalyzing a strategic moment on the highway to Basra before military commanders and political leaders could properly interpret plans and modify objectives. Instead, the coalition led by the United States simply stopped the war, which allowed Iraqi president Saddam Hussein to survive and badger the region. Beyond these hot wars, the modulated, patient, and half-century-long cold war was perhaps the most decisive war in American history.

In the 1990s, the quest for swift war, replete with exit strategies and premature cease-fires, has led to less, not more, decisive war, as Edward Luttwak argues. For him, wars nowadays rarely "run their natural course" to "burn themselves out and establish the preconditions for a lasting settlement." Instead, they "become endemic conflicts that never end because the transformative effects of both decisive victory and exhaustion are blocked." The present struggle against terrorism may well prove an acid test for Luttwak's point.[46]

These thumbnail assessments of America's recent wars are not infallible. They do assert, however, an alternative view of military history in which the value of speed and its link to decisive effect are not uniform. The past is a dangerous lover. It promiscuously proclaims lessons to please a variety of insights and interests and seduces suitors according to cultural preference and institutional faction. The Pentagon's insistence that slower wars are necessarily less effective and intrinsically more expensive in material and lives may be intuitively plain to American officers, for instance, but it is not an inherent truth based on military experience or possibility. Only in a society obsessed with speed and only within a military sensitive to civilian restraint, for instance, could the lesson from the Vietnam War be to conduct faster operations next time. A more balanced assessment would certainly include an appreciation for the patient approach, a weapon deployed with great success by North Vietnam. Moreover, nuclear war, certainly swift war by any measure, is materially expensive to prepare and would be immeasurably expensive in lives to conduct.

For the future, the American military's simple view of the temporal dimensions of strategy leaves it vulnerable to adversaries who may place different measures and different values on time. In the physical world, scientists are unsure of time's consistency, and Albert Einstein's theory of relativity rests on time's elasticity.[47] In the political world, cultures use discrepant measures of time. Western societies tend to mark time by constant velocity in standard ways: minute, hour, day, month, and year; this is a pattern especially true of colder-climate societies with large populations and prominent urbanization. However, societies elsewhere may reference time not to clocks but to events; in this worldview, time is less discrete and more variant.[48] Certain languages, moreover, contain no functional analogue to the word *time*, and the conjugation of verb tense is not universal.[49] Surveying the variety of time, one keen observer notes that "some Mediterranean and Arab cultures define only three sets of time: no time at all, now (which is of varying duration), and forever (too long)."[50] Clearly, different cultures approach time with different attitudes.

This potential mismatch is evident between Eastern and Western cultures. The preeminent pieces of strategic writing in each culture, Clausewitz's *On War* and Sun Tzu's *The Art of War*, approach time differently. One scholar argues that "differences in worldview and in concept of time" make for distinct strategic precepts in these books. Sun Tzu conceived strategy over a longer period of time than did Clausewitz, and each marked his own time in the tactical and strategic conduct of war. Sun Tzu characterized time in prolonged, cyclical, and integrated units while Clausewitz measured time in distinct, short, and linear increments.[51] These writings do not correspond directly to strategic choices made by nations in the contemporary world, of course, but their continuing influence indicates enduring national preference in the business of strategy making. At a time when the Pentagon increasingly looks to the East, to strife in the Arab world, and to strategic competition on the Asian landmass, these potential differences in time ought to matter.

Evidence of time's physical and cultural determinants should worry those responsible for the nation's defense. The Pentagon's decree for speed across all levels of war commits a cardinal sin of strategy by assuming a consistent value of velocity between ally and adversary. This decree ignores cultural variety regarding time, and in the process, strategists dismiss their own exhortations of the dangers of mirror-imaging enemies. In making speed a mandated weapon in its repertoire, the Pen-

tagon makes patience an asymmetric threat in the quivers of those who would wait out an impulsive America.

A Way Forward

As with most cults, the range of military thought contains within it the path to reform. Although not numerous, there are skeptics of this demand for speed. Two civilian analysts argue that "the fast, overwhelming and decisive application of maximum force in the minimum time . . . may produce effective, short term results [but it may] be irrelevant, probably even counterproductive, when matched against the very difficult internal problems that form the underlying problems in target countries."[52] A small contingent of officers concurs and believes that the crux of this potential mismatch is a doctrine that prescribes quick and massive force. One experienced pilot, for instance, argues that Air Force doctrine "provides the nation with one and only one way to prosecute an air campaign." This doctrine "prepares airmen quite well to fight their political masters over the right way to prosecute war, but leaves them empty-handed when forced to fight an adversary in a politically constrained environment."[53] Gen Joseph Ralston, NATO supreme commander, believes that while massive application of force may be more efficient and popular than an incremental strategy, "whether or not we like it, measured and steadily increasing use of air power against an opponent may be one of the options for future wars."[54] Although Ralston and others view incremental war as a possible political necessity, instead of as a potentially positive way to conduct operations, they do point to doctrine as one place to remedy the obsession with swift, overwhelming force.[55]

The relationship between doctrine and strategy is close and complex with no one model of interaction adequately describing or explaining their respective orbits. Yet, they undoubtedly influence each other. Doctrine, derived from the Latin verb *doctrina* (to teach), does indeed offer alternatives for the conduct of conflict. Doctrine for military operations other than war (MOOTW), sometimes called simply operations other than war or small-scale contingencies, does not demand speed in war. While it does not openly advocate a patient approach, MOOTW doctrine does recognize conditions under which an incremental approach might work best. Joint Pub 3-07, *Joint Doctrine for Military Operations other than War*, describes MOOTW as actions "more sensitive to political considerations," which are conducted within "more restrictive rules of engagement" than war proper.[56] Often designed to "keep the day-to-day tensions between nations below the threshold of armed conflict or war," operations short of war "may last for an extended period of time."[57] This approach to operations is reflected in service doctrine, especially that of the Air Force. AFDD 2-3, *Military Operations other than War*, defines MOOTW as "those military actions not associated with sustained, large-scale combat operations" and "as a result, the objectives of MOOTW usually do not include overwhelming a military opponent."[58]

Because of perceived differences from war, joint MOOTW precepts promulgate a distinct set of principles to guide commanders in operations short of war. Among these are restraint to "apply appropriate military capability prudently" and perseverance to "prepare for the measured, protracted application of military capability in support of strategic aims. Some MOOTW may require years to achieve the desired results."[59] For its part, the Air Force extols its commanders to use only "appropriate 'tailored' force" to attain and maintain legitimacy while pursuing "the patient, resolute, and persistent pursuit of national goals and objectives," which "is paramount" in MOOTW.[60] Moreover, compared to its war-fighting doctrine, the Pentagon's pronouncements on MOOTW are more sensitive to contextual influences on strategy: these pronouncements advise commanders to understand local conditions, especially religion, through effective interaction with other government agencies and private organizations via an "international civil-military operations center."[61]

Doctrinal publications on MOOTW could moderate the military's love affair with speed in

war. But this reformation faces obstacles. Although many observers view MOOTW as far more likely than war in the near term, military professionals have long been ambivalent toward operations short of war. In their doctrine, they have sought to fire-wall MOOTW from war by espousing very different principles for each; war is guided by offensive, surprise, and mass, while MOOTW relies on restraint, perseverance, and legitimacy.

As a result, military professionals tend to view any action through the prism of war, whether or not those operations fit the definitional parameters of war. Commentary on OAF reveals best this hesitancy toward MOOTW: virtually every professional critique of the operation sprang from a conception that OAF constituted war, when it may have more closely resembled MOOTW. Allied Force was an operation sensitive to issues of legitimacy, designed to keep a smaller problem from becoming a larger one, and conducted within political and coalition constraints. Disputes among Balkan states were not, and are not, ripe for any mature political settlement, and OAF (as well as Operation Deliberate Force, for that matter) was designed to manage, not solve or decide, contention in the region. Seen through the lens of MOOTW, the conduct of OAF becomes less objectionable, if not quite yet a textbook case of the use of coercive force.

If reform through MOOTW doctrine is improbable, it is not impossible. But whether through greater appreciation of MOOTW and its doctrine or by some other mechanism, the DOD should temper its obsession with speed and decisive effect. Speed has not the intrinsic value claimed for it, and its relationship to decisive effect is unclear. Undoubtedly appropriate under some conditions, the ideal of swift, decisive action may not always square with broader geopolitics. The very quest for decision on the battlefield is misplaced in an era when combat is used to manage, shape, and adjust ongoing conflict and tension. Graduated and moderated military campaigns, for instance, might well prove more effective than swift, decisive strikes in the Balkans, the Middle East, and the fight against terrorism.[62] Many military officers believe that in war today, "a commander can no longer afford the luxury of thinking in terms of days, weeks, or months to phase campaigns or move forces."[63] Actually, the opposite will sometimes be true. War will sometimes value thought stretching beyond the horizon even as the technical capacity for rapid movement pulls the mind in another direction. In conventional or nonconventional war, the ability to think counterintuitively just might be a commander's greatest asset in the future.

Obsession with speed denies the fundamental truth that in strategy, everything is contextual, and circumstance is paramount. It transforms doctrine into dogma, a condition that undercuts careful, clear, and nuanced thought about the relationship between power and purpose—the nexus of strategy. When the modern experience of war and its contemporary tools eroded the analytic utility of the levels of war, officers and pundits alike wrongly assumed a uniform value for speed across all levels and in all kinds of conflict. The Air Force's advocacy of preemptive military operations, for example, may well deliver great tactical and operational advantages in the context of war, but their costs at the strategic level of conflict may well be prohibitive, and their effects counterproductive. At a time when the American military faces state, substate, and interstate threats and challenges across the globe, devotion to speed is akin to a dangerous one-kind-fits-all mentality. The Pentagon rightly strives for the capacity to conduct war quickly, but it should not allow that capacity to drive all planning and execution as, for example, the cult of the offensive did at the start of World War I.

In the end, current military thinking about speed mistakes an important and expensive capacity for an inherent and intrinsic advantage. This thinking also brokers little tolerance for competing views that may point the way to success under some of the conditions America may face. To be sure, this cult of the quick is partly the result of broad cultural trends. Some might even argue that today's constant news cycle requires the military's de-

votion to speed. But this devotion also comes from trends and pressures internal to the Pentagon, as well as its own assessments of military history and future threats. Having had a hand in creating it, the Pentagon is not impotent to curb this cult of speed.

Gen Charles Krulak, former Marine Corps commandant, believed that John Boyd's OODA Loop taught officers how to use "time as an ally."[64] This is true only if they appreciate that timeliness may be slow as well as quick. Instead of leveraging time, devotion to speed shackles military professionals to a simple view. Time becomes the master, and soldiers, sailors, and pilots are enslaved to adversaries who might make a different use of strategy's temporal dimension. □

Notes

1. Senate, testimony before the US Senate Armed Services Committee, 21 October 1999 (Federal Document Clearing House [FDCH] Political Transcripts). In his recent book *Waging Modern War: Bosnia, Kosovo, and the Future of Combat* (New York: Public Affairs, 2001), General Clark seems to moderate this belief slightly, going so far as to say that the classic principles of war may not be well suited to modern conflict. However, he could not let go of speed: "In US military thinking, we seek to be as decisive as possible once we begin to use force. This meant that the sooner we could strike the most sensitive targets, the greater the coercive leverage against the Serbs" (449).

2. Colin Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), 43.

3. Army Field Manual (FM) 100-5, *Operations*, April 1995, 1.

4. Naval Doctrine Publication (NDP) 1, *Naval Warfare*, 28 March 1994, 20.

5. Ibid., 40–41.

6. Marine Corps Doctrine Publication (MCDP) 1, *Warfighting*, 20 June 1997, 40.

7. See Air Force Doctrine Document (AFDD)1, *Air Force Basic Doctrine*, 1 September 1997.

8. AFDD 2, *Organization and Employment of Aerospace Power*, 17 February 2000, ix.

9. Joint Publication (Pub) 1, *Joint Warfare of the Armed Forces of the United States*, 14 November 2000, III-2.

10. Ibid., IV-8. See also Joint Pub 3-0, *Doctrine for Joint Operations*, 10 September 2001, vii.

11. Joint Pub 3-0, A-1.

12. See, for example, Alan Zimm, "Desert Storm, Kosovo, and 'Doctrinal Schizophrenia,'" *Strategic Review*, Winter 2000, 32–39.

13. See, for example, *Marine Corps Strategy 21* (Washington, D.C.: Department of the Navy, 3 November 2000). The last decade has seen literally dozens of books published on the virtues of speed in war. For an edited work reflecting this development among senior military officials, see Harlan Ullman et al., *Shock and Awe: Achieving Rapid Dominance* (Washington, D.C.: Center for Advanced Concepts and Technology, 1996).

14. For a popular assessment of this transformation, see *USA TODAY*, 16 January 2001, 1A; and a more careful analysis can be found in Brian Dunn, "The Path to the Future Army," *Military Review*, September/October 2000, 91–95.

15. Gen John P. Jumper, "Global Strike Task Force: A Transforming Concept, Forged by Experience," *Aerospace Power Journal* 15, no. 1 (Spring 2001): 24–33.

16. Frederick Strain, "The New Joint Warfighter," *Joint Forces Quarterly*, Summer 1998, 39 (originally published Autumn 1993).

17. Ajay Singh, "Time: The New Dimension in War," *Joint Forces Quarterly*, Summer 1998, 124–29 (originally published Winter 1995).

18. President George W. Bush, cited in *USA TODAY*, 16 January 2001, 2A.

19. For an example of the former, see William Matthews, "Military Analysts Say Air War Is Lost, Send in the Troops," *Navy Times*, 3 May 1999, 18. For an example of the latter, see Andrew Bacevich, "Target: Belgrade," *National Review*, 3 May 1999, 29–31.

20. Stephen P. Aubin, "Operation Allied Force: War or 'Coercive Diplomacy'?" *Strategic Review*, Summer 1999, 4–12.

21. Brig Gen John D. W. Corley, *Initial Report: The Air War over Serbia: Aerospace Power in Operation Allied Force* (Washington, D.C.: Office of Air Force History, 2000), 33, 36.

22. See, for example, James Gleick, *Faster: The Acceleration of Just About Everything* (New York: Pantheon Books, 1999).

23. For a good case study of culture's influence on military doctrine, see Elizabeth Kier, *Imagining War: French and Military Doctrine between the Wars* (Princeton, N.J.: Princeton University Press, 1997). See also Gray, *28*–29.

24. For a masterful analysis of War Plan Orange, see Nathan Miller, *War Plan Orange: The U.S. Strategy to Defeat Japan, 1897–1945* (Annapolis, Md.: Naval Institute Press, 1991). Miller identifies planners who advocated a quick strike across the Pacific as "Thrusters," while planners who supported a more methodological fleet movement to the western Pacific were "Cautionaries."

25. For a good account of the influence exerted by war planning on the valuation of speed, see Colin Gray, "Defense Planning and the Duration of War," *Defense Analysis* 1, no. 1 (1985): 21–36.

26. U. S. Grant Sharp, *Strategy for Defeat: Vietnam in Retrospect* (Novato, Calif.: Presidio Press, 1993), 105, 131.

27. James Kitfield, *Prodigal Soldiers* (Washington, D.C.: Brassey's, 1997), describes the officer corps's general vilification of the gradual approach in Vietnam.

28. Colin Powell, "U. S. Forces: Challenges Ahead," *Foreign Affairs*, Winter 1992–1993, 40.

29. Editorial, "At Least Slow the Slaughter," *New York Times*, 4 October 1992, E16.

30. The best exploration of Boyd is Grant T. Hammond, *The Mind of War: John Boyd and American Security* (Washington, D.C.: Smithsonian Institution Press, 2001).

31. Gen David Deptula, *Firing for Effect: Change in the Nature of Warfare* (Arlington, Va.: Aerospace Education Foundation, 1995), 5.

32. Joint Pub 3-0, II-2.

33. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 209.

34. Boyd's theories of time were more complex than most people believed; he stressed speed not as some absolute objective but as a relative measure of time, and he allowed for the modulation of speed across time. However, this nuance fell on deaf ears in a sound-bite era, and even today, the DOD "finds it easier to address Boyd's complex truisms with simple models rather than lengthy discourses in their capstone and derivative manuals." (Robert Polk, "A Critique of the Boyd Theory—Is It Relevant to the Army?" *Defense Analysis* 16 [2000]: 272.)

35. MCDP 1, 85.

36. Phillip S. Meilinger, *10 Propositions Regarding Air Power* (Washington, D.C.: Air Force History and Museums Program, 1995), 31–32. Like other defense publications, this booklet equates decision with action, which of course is not the case. It also misstates the OODA Loop's basic thrust; the real object for Boyd was to think more rapidly than the opponent, which is different from an absolute devotion to speed.

37. See Russell F. Weigley, *The Age of Battles: The Quest for Decisive Warfare from Breitenfeld to Waterloo* (Bloomington: Indiana University Press, 1991), for a history of this most elusive military goal.

38. *Webster's Third New International Dictionary* defines *decisive* as something "having the power or quality of deciding."

39. Colin Powell, *National Military Strategy of the United States* (Washington, D.C.: Joint Chiefs of Staff, 1992), 8–9. Although this document used several standard principles to guide strategic behavior (forward presence, collective security, and technological superiority), its emphasis on decisive force stood out. For further reading on decisive force as both a phrase and an analytic construct, see F. G. Hoffman, *Decisive Force: The New American Way of War* (Westport, Conn.: Praeger, 1996).

40. FM 100-5, chaps. 1 and 2.

41. NDP 1, 9, 33.

42. AFDD 2-1, *Air Warfare*, 22 January 2000, 4.

43. Joint Pub 1, III-1.

44. For the Air Force's tortured assessment of Deliberate Force, see Robert Owen, ed., *Deliberate Force: A Case Study in Effective Campaign Planning* (Maxwell AFB, Ala.: Air University Press, 2000). Owen acknowledged Deliberate Force's success, but he worried that the campaign might encourage "half-hearted or incomplete air operations," which "would be indecisive" (476). Lacking any appreciation or framework for the potential of a graduated air campaign, another author of the study wrote in bewilderment of "Deliberate Force's remarkable success, which was largely unpremeditated and resulted from the unforeseen impact of the stopping and restarting of the air campaign" (127). In fact, the study devotes an entire chapter to an excellent counterfactual scenario that explores the possibility that another, more robust, operation would have worked better. See Lt Col Robert D. Pollock, "Roads Not Taken: Theoretical Approaches to Operation Deliberate Force," in *Deliberate Force*, 431–53. This fine introspection stands alone in the annals of official air surveys; other reports on air operations more closely aligned with preconceived ideas do not benefit from similar questions, though the inquiry has validity independent of individual cases. See, for instance, *The United States Strategic Bombing Survey* (New York: Garland Publishing, 1976) (World War II); and Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, 5 vols. (Washington, D.C.: Department of the Air Force, 1993).

45. For World War II's strategic contours, see Gerhard Weinberg, *A World at Arms: A Global History of World War II* (Cambridge: Cambridge University Press, 1994).

46. Edward Luttwak, "Give War a Chance," *Foreign Affairs*, July/August 1999, 36, 45.

47. For a short description of the physical qualities of time, see Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988).

48. Robert Levine, *A Geography of Time: The Temporal Misadventures of a Social Psychologist* (New York: Basic Books, 1997).

49. The Sioux language, for example, has no word to express time, lateness, or waiting.

50. Grant Hammond, "Time, Elasticity, Tempos, and Rhythms," unpublished manuscript in author's possession. I acknowledge a debt to Hammond for pointing out the cultural determinants of time. For a published view of similar matters, see Robert Bathurst, *Intelligence and the Mirror: On Creating an Enemy* (New York: Sage Publications, 1993).

51. Laure Paquette, "Strategy and Time in Clausewitz's *On War* and in Sun Tzu's *The Art of War*," *Comparative Strategy* 10 (1991): 37, 48.

52. Donald Snow, *From Lexington to Desert Storm: War and Politics in the American Experience* (Armonk, N.Y.: M. E. Sharpe, 2000), 325–26.

53. Ellwood Hinman IV, "Airpower's Political-Military Gap," *Strategic Review*, Fall 2000, 26.

54. General Ralston, cited in Elaine Grossman, "Ralston Sees Potential for More Wars of Gradual Escalation," *Inside the Pentagon*, 16 September 1999, 1.

55. For supporting commentary, see Lt Col Paul Strickland, "USAF Aerospace-Power Doctrine: Decisive or Coercive?" *Aerospace Power Journal* 14, no. 3 (Fall 2000): 13–25; and David Tucker, "The RMA and the Interagency: Knowledge and Speed vs. Ignorance and Sloth?" *Parameters*, Autumn 2000, 66–76.

56. Joint Pub 3-07, *Joint Doctrine for Military Operations other than War*, 16 June 1995, vii, I-1.

57. Ibid., viii, I-7.

58. AFDD 2-3, *Military Operations other than War*, 3 July 2000, 1.

59. Joint Pub 3-07, II-4.

60. AFDD 2-3, 1.

61. Ibid., 5. Air Force exhortations on religion reflect an understanding of the importance of circumstance in strategic choice: religion "will often play a major role in the lives of local inhabitants. An understanding of host nation or regional religious beliefs is vital to the success of many types of MOOTW" (47). For Air Force experience in MOOTW and its future possibilities, see James Corum, "Airpower and Peace Enforcement," *Airpower Journal* 10, no. 4 (Winter 1996): 10–25; and Carl Builder, "Doctrinal Frontiers," *Airpower Journal* 9, no. 4 (Winter 1995): 6–13.

62. For insight into the nature of decisive war, see Michael Howard, "When Are Wars Decisive?" *Survival* 41, no. 1 (Spring 1999): 126–35. After 40 years of patience, the Korean Peninsula may be one place increasingly ripe for some kind of decision to be found on a battlefield.

63. Strain, 39.

64. Krulak, quoted in Hammond, 3.

The hurrier I go, the behinder I get.

—folk saying

Thinking about China and War

DR. JEFFREY RECORD

Editorial Abstract: The current focus on international terrorism does not mean that China has gone away. This thought-provoking piece by Dr. Record not only reminds us that China remains an area of potential future conflict but also uses the perspective of past conflict to paint a picture of what a future war with China might look like. China's leaders aren't as naïve as Saddam Hussein in their appreciation of America's high-tech capabilities.

CHINA'S XENOPHOBIC AND increasingly strident nationalism reinforces the argument that it is destined to become America's next great strategic rival and, therefore, that the United States should begin to think seriously about the possibility of war with that country.[1] The combination of continued autocracy in Beijing, China's militant assertiveness across the Taiwan Strait and in the South China Sea, and the growing influence of the People's Liberation Army (PLA) "in the development of China's national identity and security policy" all point to a determination to displace American power in East Asia and the Western Pacific.[2]

The new Bush administration is certainly prepared to take a harder line than its predecessor on the noneconomic dimensions of the Sino-American relationship, including Beijing's myriad human-rights abuses and military bullying of its neighbors. The administration has rejected the illusion of strategic partnership with China, has been explicit on US protection of Taiwan against an attack from the mainland, and is openly reorienting America's primary strategic focus from Europe to Asia. It is, in short, moving to contain China even while it embraces expanded trade with that country. Indeed, for the Bush administration, trade serves as a means of containment; trade promotes economic democratization, which, in turn—or so it is believed—will undermine the very autocracy that has embraced extreme nationalism as a legitimizing substitute for failed communist ideology. The Bush administration sees eye to eye with its predecessor on the attractiveness of attempting to subvert China politically via trade-assisted economic democratization.

A policy of containing Communist Chinese expansionism is hardly new. It began in 1950, when the Truman administration ordered the interposition of the Seventh Fleet between

the mainland and what was then known as Formosa as a means of preventing Mao Ze-dong's takeover of that island. The administration subsequently fought Chinese forces to a standstill in Korea. Containment continued during the 1960s, when the Kennedy and Johnson administrations escalated US military intervention against the advance of Vietnamese communism, which they believed was a stalking-horse for Chinese imperialism in Southeast Asia. Even during the era of Sino-American tacit strategic alignment against the Soviet Union in the 1970s and early 1980s, the United States insisted on a nonviolent resolution of Taiwan's relationship with the mainland.

But the China that the United States sought to contain during the Cold War was poor and preindustrial and, under Mao Ze-dong, periodically plunged into domestic political upheaval. For Mao, political purification was always more important than wealth creation, and his notions of industrialization were idiotic. Accordingly, the Chinese economy remained a shambles until the late 1980s. Moreover, for most of the Cold War's last two decades, China's military posture was defensive and focused northward on the Soviet Union.

Although the emergence of China as a qualified strategic rival is far from inevitable, it is time to think about a future war with China. Beijing's core political values are hostile to everything America stands for; China is territorially unsatisfied; its military *potential* is impressive if only slowly mobilizable; and Sino-American flash points are present in the Taiwan Strait and the South China Sea. Moreover, history teaches that the *relative* power and influence the United States enjoys around the world today will inevitably decline *at some point*. That point may be 50 or even 200 years away, but it will come—because no great power remains so forever.

The history of both China and the international political system as a whole also suggests that an emergent Chinese hegemon is unlikely to be a cooperative state willing to accept a continued American-dominated international order.[3] For most of its long history, the Middle Kingdom was the dominant power in its world; only recently, beginning with the Opium Wars of the midnineteenth century, did China fall victim to over a century of Western and, later, Japanese intrusion and humiliation. China, notes Henry Kissinger, "has rarely had the experience of dealing with other societies on the basis of equality."[4] Even unburdened of its profound sense of victimization by the West, China as a rising power is likely to insist on an international order that reflects its power growth relative to that of the United States.

Precautionary thinking about a war with China must address at least four issues: the economic, political, military, and foreign-policy ingredients of China as a qualified strategic rival; the likely causes of a Sino-American war; the strengths and weaknesses each side would bring to the conflict; and the likely scope of combat. Thinking about a war with China also profits from an examination of the Korean War—the one and only Sino-American war to date and a marathon of mutual incomprehension and miscalculation.

China as the Next Strategic Rival

Postulation of China as the next functional equivalent of the Soviet Union rests on several necessarily speculative assumptions. The first is that China will continue to sustain high growth rates in gross national product. China's economic growth in the late 1980s and 1990s was impressive, to be sure, although it has slowed over the past several years. But the economic boom started from a very low base and has been jarringly uneven between the coastal provinces and the still-backward interior.[5] Much of China's industrial production remains economically worthless, state-owned goods. Corruption is rampant throughout the economy, and levels of unemployment and underemployment are staggering and potentially destabilizing.[6] Even if China's official statistics were reliable, no basis exists for a simple extrapolation of past growth rates into the future.

Nonetheless, even the most conservatively estimated growth rates still significantly surpass

those of the United States and reaffirm the strategic wisdom of Deng Xiaoping's momentous decision to unleash capitalism in China. Unlike his politically dreamy and romantic predecessor, the realist Deng understood that security could not be had without power and that the foundation of national power was wealth creation. Economic success remains a prerequisite for China's military competitiveness. The Soviet Union lost the Cold War because it became a one-dimensional superpower whose declining economic performance could not sustain its imperial ambitions.

A second assumption is continued autocracy in Beijing. During the past two decades, dictatorial rule has taken a beating around the world, including East Asia, and both the history of Europe and recent political change in Taiwan and South Korea suggest that economic democratization can indeed exert a powerful and ultimately irresistible pressure for political democratization. Thus, prospects for a democratic China cannot be dismissed, and the evidence suggests that democracies are much less warlike toward one another than are autocracies to each other and to democracies. (This certainly does not mean a peaceful transition; more often than not, the road from autocracy to democracy is a violent one because autocrats are not disposed to relinquishing power without a fight.)

Yet, even if Adam Smith and James Madison beat Lenin in China, the question remains whether a democratic China would be less fervently nationalist. The present regime in Beijing has both excited and curbed the expression of popular nationalist passions: witness the encouragement of street demonstrations after the accidental US bombing of the Chinese Embassy in Belgrade and the subsequent suppression of such demonstrations following the Chinese ramming of a US electronic-surveillance aircraft. Could not a democratic regime become more a prisoner of nationalist passions than a dictatorial one?

A third assumption is that China remains unified. Its long history has been one of cyclical alternation between effective central political control and degeneration into warlordism.[7] Though ethnically homogeneous (except along its northern and western peripheries), China has always been difficult to govern, even in the absence of significant social and economic change. Post-Marxist China, however, has invited enormous change; never before has any regime tried to move so many people so quickly into economic modernity, and it is far from certain that Beijing's rulers can pull it off without revolutionary upheaval, which was the norm for China in the twentieth century. The ongoing crackdown on the seemingly harmless Falun Gong spiritual movement underscores the regime's insecurity and its preoccupation with preserving its own legitimacy, which in the post-Marxist period has rested heavily on economic progress as well as nationalism. Richard Betts and Thomas Christensen properly caution that "before one laments the rise of Chinese power, one should consider an even more uncertain alternative: Chinese weakness and collapse. Nothing ordains that China's march to great power status cannot be derailed."[8]

A fourth assumption is that China has imperial ambitions whose realization would compromise fundamental American security interests. Unlike the Soviet Union, China has no pretensions to a global imperium. Its ambitions are neither global nor ideological but national and regional in scope, including the assertion of sovereignty over Taiwan and the South China Sea. The real issue is whether China is prepared to act on those ambitions in a way that would elicit a violent US response. The United States could hardly object to a peaceful incorporation of Taiwan on terms satisfactory to both the Chinese and Taiwanese, even though it would significantly increase China's economic and latent military power. American interest lies in the manner—not the fact—of China's reunification. As for the South China Sea, China has seized small bits of disputed rock there, but it has not challenged international freedom of navigation through the sea.

Beyond Taiwan and the South China Sea are those territories over which Imperial China held sway at one time or another. They include much of Central Asia and the Russian Far East (RFE) as well as northern and central

Vietnam (which China ruled for a millennium). Will China seek to recover these "lost" territories, and will it be prepared to use force to do so? Or has it come to understand, as do most modern industrial and postindustrial states, that extent of territory per se is not a key ingredient of modern national power? The scope of China's ultimate territorial and other ambitions in Asia is simply not evident at this juncture in history—probably not even to China itself.

US security interests in East Asia are also subject to change. Indeed, they could evolve over the coming decade to the point where one could come to regard the present robust, forward American military presence as unnecessary. The bottom-line justifications for that presence today are deterrence of North Korean aggression against South Korea, any attack on Japan, and a Chinese invasion of Taiwan. Yet, these justifications would be hard to sustain in the event of Korean reunification, a Sino-Japanese rapprochement, or Taiwan's willing return to governance by mainland China. Even in the absence of such events, there remains the possible emergence of irresistible domestic political pressure for US military retrenchment overseas. The American people have never lusted for the costly burdens of being a great power.

War Starters

The most obvious war starter would be a mainland assault on Taiwan in the form of either an overt military invasion or an attempt to wreck Taiwan's economy by blockade and other acts of intimidation of the kind Beijing employed in 1996 to influence Taiwan's first genuine presidential election. A forcible takeover of a democratic and economically vibrant Taiwan would be strategically unacceptable to the United States. Another casus belli would be Chinese attempts to challenge freedom of navigation in the South China Sea (or anywhere else in the western Pacific). Freedom of navigation is a bedrock principle of American statecraft, and through the South China Sea move oil and other commerce critical to the economies of Japan and other US allies and friends.

Chinese military action against Asian mainland states not allied with the United States probably would not occasion a direct, armed US response. Sino-Russian, -Indian, and -Vietnamese war scenarios of the kind that transpired in 1962, 1969, and 1979, respectively, would not directly engage the vital interests of the United States—unless they spilled over into attacks on US forces and allies. Why would the United States intervene in such conflicts? To be sure, it has a general interest in peace and stability on the Asian mainland and a specific interest in deterring nuclear war between other states. But would it go to war to prevent a nuclear exchange between, say, Russia and China? It was certainly not prepared to do so to deter an Indo-Pakistani exchange during the South Asian nuclear-war scare of 1999.

What if China began absorbing the RFE? This prospect is certainly plausible. Moscow's control over the RFE has steadily weakened since the Soviet Union's demise; the RFE's economy is fast becoming a subsidiary of China's; and Chinese demographic infiltration of the RFE could eventually raise the issue of the RFE's self-determination in China's favor.

Yet, on what basis would the United States intervene against even an overt Chinese invasion of the RFE, and could it intervene effectively? To be sure, China's assumption of control over the RFE's littoral and Siberia's vast, if hard to extract, resources would call for a fundamental reassessment of Chinese intentions and capabilities in Asia—perhaps leading to the creation of new security alliances in South and Southeast Asia and major increases in defense expenditure. But it is difficult to imagine an American war on behalf of Russian attempts to hold on to nineteenth-century czarist territorial gains in the Far East. But for its long-range nuclear missiles, one could consider Russia finished as a great power; in any event, it is highly doubtful that US airpower alone could overturn a Chinese invasion of the RFE. During the Cold War, the

United States and its Pacific allies lived with a hostile East Asian mainland littoral stretching from the Bering Sea to the South China Sea. Why should the United States fear Chinese nuclear missiles in the RFE more than it did Soviet missiles there?

A Sino-Indian war, which for reasons of geography would be waged largely in the air (and potentially in space) and perhaps at sea, also would not engage US war-fighting interests. The same may be said of Chinese aggression against Vietnam, which has recurred throughout Vietnam's history—most recently in 1979.

Obviously, a Chinese attack on Japan (or any other US treaty ally) would be an automatic war starter. Such an attack could be preventive, aimed at thwarting the resurrection of a militarist Japan. China is hardly the only victim of past Japanese aggression that is upset by a still unalterably racist Japan whose leaders and citizen inhabitants are in an increasingly disturbing state of denial of their nation's behavior in Asia from 1895 to 1945. In a Sino-American crisis, Japan might also invite attack, or at least armed intimidation, because of the access it provides US military power in Northeast Asia. Attempted coalition busting is a must for most American adversaries because the United States relies heavily on coalitions for political legitimacy and logistical access. Peeling off Japan from the United States in the middle of a Sino-American military confrontation in Asia would be an enormous coup for Beijing.

One should not forget that the emergence of Japan as a great power in the first half of the twentieth century came largely at China's expense: first, the extraction of economic concessions, then the conversion of Manchuria into a Japanese puppet state, and finally the invasion and brutal occupation of much of China proper. Although China has only minor territorial disputes with Japan, the emergence of China as a great power will inevitably come in part at Japan's expense in terms of its economic and political clout in Asia. This will be especially the case if Japan's economic and demographic stagnation continues.

Comparative Advantages and Disadvantages

Primary Sino-American war starters seem to be Chinese aggression against Taiwan and in the South China Sea. Yet, a US defense of Taiwan and of freedom of navigation in the western Pacific would play greatly to America's traditional military strengths while at the same time exploit long-standing Chinese weaknesses.

Historically, China's sole strategically impressive war-fighting suit has been the quantity of its ground forces, which counts for little in the pursuit of offshore imperial ambitions. Asserting and maintaining dominance over Taiwan and the South China Sea require mastery of air and naval power—arenas in which the United States is peerless and likely to remain so for decades (assuming no retreat to isolationism plus a determination to maintain both conventional military supremacy and a forward military presence in East Asia—neither to be taken for granted). Chinese naval and air forces are rudimentary by US standards, but perhaps an even greater deficiency is the absence of any modern combat experience. China has not fought a major war since Korea (where US airpower pummeled the PLA), whereas the United States has had a virtual cornucopia of such experience since the end of the Cold War. Practice may not make perfect, but it is surely better than sitting on the military bench for almost half a century. (China's brief and highly restricted invasion of Vietnam in 1979 pitted masses of poorly armed and trained Chinese troops against better-equipped North Vietnamese combat veterans.)

Crucial to sound thinking about war with China is recognition that to shift America's primary strategic focus from Europe to Asia is to shift from a predominantly ground-air to a predominantly air-sea theater of operations. Why? Because of the asymmetrical distributions of wealth and power between the two regions. Most of Asia's wealth and power still lies in offshore and peninsular states, whereas in Europe it is concentrated ashore. Thus, maintaining a balance of power in Europe

(i.e., preventing Europe's domination by a hostile power) mandated a willingness and capacity to wage ground warfare deeply inland. In contrast, maintaining an Asian balance of power requires performing the simpler task of keeping offshore and peninsular Asia outside a continental hegemon's grasp.[9] Large land-warfare operations in the Asian interior are not just unnecessary; they are to be avoided at all costs because they would pit US weaknesses against a continental hegemon's strengths. Even Gen Douglas MacArthur, who in 1951 wanted to expand the Korean War into an air and sea assault on China, declared that "it would be a master folly to contemplate the use of United States ground troops in China," adding that "I can conceive of no strategic or tactical position where I would put in . . . units of American ground troops in continental China."[10]

In addition to naval and air inferiority, China would approach war with the United States with significant strategic disadvantages. Regionwide suspicion of China's imperial ambitions has deprived Beijing of significant allies and even friends in East Asia, whereas the United States is rich in both. India remains a strategic competitor, and Chinese behavior in the South China Sea has alienated most of Southeast Asia. The post–Cold War rapprochement between China and Russia has not eliminated centuries-old national and racial animosities between the two countries, animosities that can be heightened only by the growth of Chinese economic influence and demographic "aggression" in the RFE. In any event, Russian military power has virtually evaporated in Asia. A robust, land-based strategic nuclear deterrent is the only real asset that Moscow could make available to China in a Sino-American war, but it staggers the mind to imagine that Russia would invite its own destruction on behalf of promoting Chinese interests in East Asia.

Finally, a war with the United States could be economically and even politically catastrophic for the communist rulers in Beijing. Unlike the defunct Soviet Union, China has an enormous stake in the international capitalist trading order. Indeed, China's whopping annual trade surpluses with the United States have been indispensable to sustaining China's remarkable economic growth and have provided large amounts of hard currency with which to finance its selective military modernization. A war with the United States would destroy Sino-American commerce (as well as China's lucrative trade with and investment from Taiwan). China's attractiveness as a magnet for foreign capital would cease. The consequent effects of collapsed growth would not be just economic. Because the post-Marxist regime in Beijing has staked so much of its legitimacy on its ability to deliver higher living standards, a war-caused economic depression could topple the government itself.

Over time, of course, China's stake in the international trading order could diminish if China shifted its primary focus from expanding its export markets to developing internal markets. The historic Middle Kingdom was more or less economically self-sufficient, and a future China bent on displacing an American-dominated international political and economic system would have a powerful interest in reducing its dependence on that system. Indeed, it is critical to distinguish between economic growth as an end in itself and economic growth as a means to a political end. Clearly, China has opted in the near term and midterm for the primacy of economic growth and its attendant dependency on the American-dominated international economic order. But to what end? For its own sake? Or for the purpose of putting China in a position some decades hence to assert political and military primacy in Asia?

A recent RAND Corporation assessment of these questions concludes that a policy of assertiveness is likely for two reasons: "First, the unique and long-standing Chinese experience of geopolitical primacy and the association of that primacy with good order, civilization, virtue, and justice, may make the pursuit of geopolitical centrality through assertive behavior again attractive." Second, "an assertive China is likely to appear over the long haul . . .

precisely because the United States, the established hegemon, will—if the historical record pertaining to previous declining hegemons holds—prepare to arrest its own gradual loss of relative power and influence."[11] Both history and ideology inform the Chinese that the United States cannot avoid decline, and many people involved in managing Chinese security believe that the United States is already in *military* decline—a recipe for miscalculation if there ever was one.[12]

Hope that China's participation in a globalizing economy will alter its approach to security issues may be misplaced. David Lampton believes that while "it is easy to assume that globalization will slowly erode Beijing's dedication to its narrow national interest and practice of realpolitik" and while "there is plenty of evidence of increasing Chinese cooperation and conformity with international norms, there is little evidence that considerations of national interest and realpolitik figure any less prominently in Chinese thinking than they always have."[13]

To be sure, by any rational calculation of interest, China—now and for the foreseeable future—would be foolish to risk war with the United States over the future of Taiwan and the South China Sea. Yet, states are motivated by fear and honor as well as by calculations of interest, and China's hypernationalism could easily become an enemy of strategic prudence. The Chinese are exceptionally touchy about righting real and imagined wrongs visited upon them by Western, Japanese, and Russo-Soviet imperialism during the century stretching from the outbreak of the first Opium War to the consolidation of the Chinese Communist revolution. Betts and Christensen believe "there is little reason to assume that sober economic interest will necessarily override national honor in a crisis."[14] Were a crisis to occur, Beijing's leaders could lose control of popular nationalist passions and find themselves facing the stark choice of making strategically reckless decisions or risking their own domestic political survival.[15]

Moreover, China would bring to war some important advantages over the United States

Chinese Dong Feng-31 transporter-erector launcher on parade.

that might encourage a decision for war in a Sino-American crisis. First and foremost of them, especially in a fight over Taiwan, would be a greater strength of interest and, therefore, a willingness to sacrifice. The future of Taiwan can never be as important to the United States as it is to China, and China could be expected—as was the case in Korea, where it felt directly threatened by MacArthur's advance to the Yalu River—to display a much higher tolerance of casualties than would the United States. The analogy most relevant here is the Vietnam War, in which superior American firepower and technology was defeated by an enemy whose greater strength of will to win manifested itself in a remarkable strategic patience and willingness to accept horrendous manpower losses.

The Chinese are not afraid to threaten or use force, even in circumstances in which the objective military balance is weighted heavily against them, as it was in Korea in 1950 and the Taiwan Strait in 1996. Indeed, the Chinese appear to believe that military weakness requires a superior will to use force. John Garver argues that "Chinese strategic thinking has often concluded that periods of weakness required forceful policies precisely because the enemy may be tempted to exploit China's vulnerability." Examples of this inverse relationship between bellicosity and strength in Chinese foreign policy include "the decision for war with the United States in October 1950; the decision to launch an intense political struggle against Khrushchev in 1960 just as China's economy was collapsing;

the 1962 decision for war with India when China was experiencing mass famine and its alliance with Moscow had collapsed; and the 1969 decision for military confrontation with the Soviets on the Ussuri River as the PLA was preoccupied with the chaos of the Cultural Revolution."[16]

Nor do the Chinese confuse military success with casualty minimization. China has an excessive population and a long history of subordinating individual human lives to the imperatives of statecraft. Communist China has used force in Korea and Tibet; against islands held by the Nationalist Chinese off the mainland coast; and against India, Vietnam, and Soviet forces along the Ussuri River. China also accepts war as a continuation of politics rather than as a substitute for politics, and force as an indispensable companion to diplomacy with unfriendly states.

China's geographic proximity to Taiwan and the South China Sea also works to its advantage. Chinese lines of communication are short compared to those separating East Asia from the United States. Even though Chinese naval and air forces would be no match for their American counterparts for the foreseeable future, China has an expanding missile force capable of striking Taiwan and targets in the South China Sea directly from mainland launch positions. Bringing Taiwan under sustained missile strikes could wreck Taiwan's economy, to say nothing of complicating the island's defense.

A third advantage is the high probability that the Chinese would avoid challenging American military power on its own terms. The Chinese have learned from the Gulf War that trying to beat the Americans at their own game is a recipe for disaster. The Chinese almost certainly would pursue an asymmetric war against the United States involving attempted preemption of US military access to the region; disruption of US sea and air lines of communication; and attacks on US command, control, and communications, possibly including satellites. The Jominian American military would be confronted with the deceptive warfare of Sun Tzu. The Chinese recognize their technological—including informational—inferiority, but they also represent a military tradition, as Gerald Segal points out, that places an "unusual emphasis" on "cunning stratagems" and "minimizing brute force."[17] They also have reoriented their strategic focus from continental defense to preparation for "local, limited war under high-tech conditions" (i.e., precisely the American threat they perceive).[18]

Limited War by Default?

Assuming the absence of mindless escalation to a general nuclear exchange, a war between China and the United States would be constrained by limited military capacity and political objectives. For openers, neither China nor the United States is capable of invading and subjugating the other, and even if the United States had the ability to do so, avoidance of a land war on the Asian mainland has long been an injunction of American strategy. The objectives of a Sino-American war over Taiwan or freedom of navigation in the South China Sea would be limited—just as they were in the Sino-American war in Korea. And since the outcome in either case would be decided by naval and air forces, with regular ground forces relegated to a distinctly secondary role, a war over Taiwan or the South China Sea would also be limited in terms of the type of force employed. This was not the case in the Korean War, in which ground combat dominated. (To be sure, the US position on the ground would have been untenable without air dominance.)

During the Korean War, however, the United States refrained from attacking targets in China. (The Truman administration was feverishly rearming the United States and did not wish to escalate a war in Asia at a time when Europe remained defenseless against a possible Soviet invasion. Thus, it rejected MacArthur's call for what amounted to a limited war against China itself in place of the limited war being waged against *Chinese forces in Korea*.) Could an effective defense of Taiwan or freedom of navigation be mounted without attacks on mainland targets? Obvi-

ously, Chinese naval and air units approaching Taiwan or operating in the South China Sea could be attacked separately. But what about their operating bases on the mainland? And what about missile launch sites, especially in the absence of effective Taiwanese theater missile defenses? In circumstances of air and missile attacks on Taiwan, military and political pressures for counterattacks against associated targets on the mainland would likely prove irresistible. But such counterattacks, in turn, would invite Chinese escalation against US bases in the western Pacific and perhaps even terrorist assaults on population targets in the United States itself. How would an American president respond to a Chinese-suspected-but-not-provable biological or chemical attack on an American city?

The Last Sino-American War

China and the United States last warred in Korea from 1950 to 1953, and although each country's knowledge of the other has greatly expanded since then, cultural and historical barriers to effective communication remain formidable enough to provide grist for war via miscalculation. Henry Kissinger's depiction of the two countries' differing approaches to policy bears quoting at length:

> China's approach to policy is skeptical and prudent, America's optimistic and missionary. China's sense of time beats to a different rhythm from America's. When an American is asked to date a historical event, he refers to a specific day on the calendar; when a Chinese describes an event, he places it within a dynasty. And of the fourteen imperial dynasties, ten have lasted longer than the entire history of the United States.
>
> Americans think in terms of concrete solutions to specific problems. The Chinese think in terms of stages in a process that has no precise culmination. Americans believe that international disputes result either from misunderstandings or ill will; the remedy for the former is persuasion—occasionally quite insistent—and, for the latter, defeat or destruction for the evildoer. The Chinese approach is impersonal, patient, and aloof; the Middle Kingdom has a horror of appearing to be a supplicant. Where Washington looks to good faith and good will as the lubricant of international relations, Beijing assumes that statesmen have done their homework and will understand subtle indirections; insistence is therefore treated as a sign of weakness, and good personal relations are not themselves considered a lubricant of serious dialogue. To Americans, Chinese leaders seem polite but aloof and condescending. To the Chinese, Americans appear erratic and somewhat frivolous.[19]

The Korean War stands as a case study in miscalculation by both Washington and Beijing, notwithstanding repeated attempts by both sides to signal intentions to each other. The United States grossly underestimated China's willingness and ability to defend its strategic interests in Korea; indeed, the Truman administration had difficulty accepting the very presence of such interests. Max Hastings observes that because the "United States was convinced that its policies . . . presented no threat to any legitimate Chinese interest[,] Washington therefore persuaded itself that Peking would reach the same conclusion."[20] As MacArthur's forces crossed the 38th parallel and advanced toward the Yalu, the administration believed it sufficient simply to declare that it had no designs on Chinese territory; it apparently never occurred to President Truman or Secretary of State Dean Acheson that Beijing might regard the establishment of a reunified, anticommunist Korea adjacent to China's industrial heartland as a strategic threat. (After all, had not the Japanese used Korea as a jumping-off point for their conquest of Manchuria?) This lack of imagination contributed in turn to the administration's virtual deafness to Beijing's numerous warnings that it was prepared to enter the war rather than accept an American client state along the Yalu. Even when first contact was made with Chinese forces, the administration refused to believe that it represented anything more than political posturing, a token intervention.[21]

The administration's incomprehension of China's motives—specifically, its failure to grasp that country's strength of interest in

Korea—was attended by disdain for China's military capacity. MacArthur and the rest of the American military had nothing but contempt for Chinese fighting power; indeed, MacArthur assured Truman that he would make short work of the Chinese if they tried to intervene. At his meeting with Truman on Wake Island, he said there was "very little" chance of Chinese intervention. "They have no air force. Now that we have bases for our Air Force in Korea, if the Chinese tried to get down to Pyongyang, there would be the greatest slaughter."[22] From an American perspective, an army of simple peasants armed with bolt-action rifles and lacking air cover was no match for US forces, and if this fact was self-evident to the Americans, then obviously it would also be to the Chinese. MacArthur's pet corps commander, Gen Edward Almond, exhorted his Yalu-bound troops, "Don't let a bunch of Chinese laundrymen stop you."[23] There was no appreciation of the strengths of the PLA—its superb discipline, tenacity, and capacity to endure hardship—or the degree to which terrain in northern Korea could be exploited by guerrilla tactics at the expense of a conventional, roadbound army.

Yet, if the Americans miscalculated in Korea, so did the Chinese leadership. Mao Zedong not only believed that Chinese intervention was imperative, he also believed that the PLA could sweep the Americans off the peninsula—a conviction strengthened after the PLA routed the Americans along the Yalu.[24] If the Americans placed excessive faith in material superiority, Mao believed that human factors—superior will, discipline, and fighting skills—and, above all, a superior cause could defeat firepower-rich US forces. He regarded US troops as roadbound, creature-comforted softies who were fighting for the evil cause of imperialism—and, therefore, were incapable of mustering the capacity for sacrifice characteristic of seasoned PLA forces.[25]

The PLA's actual performance against US forces was impressive, especially the massive surprise assault in late November 1950, which inflicted upon MacArthur the longest retreat in American military history. In this and in subsequent operations, the PLA displayed a mastery of march discipline, night-infiltration tactics, concealment, and camouflage that partially offset the US advantage in firepower. PLA commanders also displayed an insensitivity to casualties relative to that of their American counterparts. Yet, the PLA's initial success along the Yalu owed much to MacArthur's own recklessness and the Truman administration's inability to control its vain Far Eastern commander. Moreover, US firepower, while unable to crush the Chinese, proved more than adequate to block any chance of a Chinese expulsion of US forces from Korea (only MacArthur was panicked into believing that US forces were headed for an Asian Dunkirk). By the spring of 1951, the combination of ceaseless aerial pounding of lengthy Chinese supply lines and the savage application of firepower against massed frontline Chinese forces had severely restricted the PLA's ability to sustain offensive operations over both space and time. Unfortunately for many PLA soldiers, the Chinese commander in Korea recognized this unpleasant fact well before Mao, who continued to believe that will alone was the key to victory and ordered yet additional—and doomed—offensives aimed at sweeping the Eighth Army into the sea. US troops, especially with the arrival of Gen Matthew Ridgway as Eighth Army commander, also fought with a degree of skill and determination that belied Mao's preintervention assumptions about the Americans' fighting qualities.

Because the Korean War was fought to a military stalemate, neither side could claim a decisive victory. The United States restored South Korea's territorial integrity but failed to reunite the Korean peninsula under an anticommunist government. Likewise, China saved North Korea but failed to reunite the peninsula under communist auspices. But China, by far the weaker side, was nonetheless the relative winner of the conflict. That the Chinese David had even stalemated the American Goliath greatly elevated Chinese prestige throughout Asia and emboldened communist revolutionary movements everywhere. The war established China as a tough risk-taker

and a force henceforth to be reckoned with, quite a contrast to China's prewar image as an object of contempt and a soft punching bag for the imperial powers. There would be no more talk of Chinese laundrymen.

China's intervention and military performance in Korea also exerted a chilling effect on subsequent US military intervention in the Vietnam War. For fear of provoking a repetition of Chinese intervention, the Johnson administration limited the US war aim to the preservation of a noncommunist South Vietnam and placed significant restrictions on air operations against North Vietnam. As Premier Chou En-lai noted to President Nixon in 1972, "America [was] more careful about China in the Vietnam War than it had been in Korea."[26]

The idiosyncrasies of the Korean War tell us nothing about how a future Sino-American war would come about and play out. But as distant as that war is, it remains an object lesson in cultural incomprehension and consequent political and military miscalculation. And while thinking about war with China is hardly predictive—China's emergence as America's next qualified strategic rival is not inevitable—ignoring the possibility of war would be a professional dereliction of duty. □

Notes

1. See, for example, Steven W. Mosher, *Hegemon: China's Plan to Dominate Asia and the World* (San Francisco,: Encounter Books, 2001); Richard Bernstein and Ross H. Munro, *The Coming Conflict with China* (New York: Alfred A. Knopf, 1997); and Robert Kagan, "What China Knows That We Don't," *The Weekly Standard*, 20 January 1997. For a more benign view of an emergent China's implications for US security, see Andrew J. Nathan and Robert S. Ross, *The Great Wall and the Empty Fortress: China's Search for Security* (New York: W. W. Norton and Co., 1997); Gerald Segal, "Does China Matter?" *Foreign Affairs*, September/October 1999, 24–36; and Nicholas Berry, "China Is Not an Imperialist Power," *Strategic Review*, Winter 2001, 4–10.

2. Nan Li, *From Revolutionary Internationalism to Conservative Nationalism: The Chinese Military's Discourse on National Security and Identity in the Post-Mao Era* (Washington, D.C.: United States Institute for Peace, 2001), 12. See also Koro Bessho, *Identities and Security in East Asia*, Adelphi Paper 325 (London: International Institute for Strategic Studies, 1999), 27–37.

3. See Michael D. Swaine and Ashley J. Tellis, *Interpreting China's Grand Strategy: Past, Present, and Future* (Santa Monica, Calif.: RAND Corporation, 2000), especially pages 151–241.

4. Henry Kissinger, *Does America Need a Foreign Policy? Toward a Diplomacy for the 21st Century* (New York: Simon and Schuster, 2001), 139.

5. In 1997 gross domestic product per capita (in *yuan*) ranged from 25,750 in Shanghai Province to 2,215 in Guizhou Province. See Peter T. Y. Cheung and James T. H. Tang, "The External Relations of China's Provinces," in *The Making of Chinese Foreign and Security Policy in the Era of Reform, 1978–2000*, ed. David M. Lampton (Stanford, Calif.: Stanford University Press, 2001), 95.

6. See Bruce Gilley, "People's Republic of Cheats," *Far Eastern Economic Review*, 21 June 2001, 59–60.

7. The "Chinese state has been united as a single entity under Chinese rule for only approximately one-half of the period since the end of the Han Dynasty in 220 A.D. During the other half of this period, China has been embroiled in domestic conflict, divided between Chinese and non-Chinese regimes, or entirely ruled by non-Han Chinese invaders." Swaine and Tellis, 13.

8. Richard K. Betts and Thomas J. Christensen, "China: Getting the Questions Right," *The National Interest*, Winter 2000/2001, 29.

9. Imperial Japan's conquest of Manchuria and of coastal China proper did not pose a direct threat to core US security interests in Asia. That threat emerged only when Japan expanded its aggressive focus to offshore and peninsular Asia.

10. Senate, *Testimony of General Douglas MacArthur before the Armed Services and Foreign Relations Committees of the United States Senate*, 82d Cong., 1st sess., 103, 108 (3–5 May 1951; reprint, Paterson, N.J.: Hour-Glass Publishers, 1966).

11. Swaine and Tellis, 231, 233.

12. See Michael Pillsbury, *China Debates the Future Security Environment* (Washington, D.C.: National Defense University Press, 2000), 63–105.

13. David M. Lampton, "China's Foreign and National Security Policy-Making Process: Is It Changing and Does It Matter?" in Lampton, 25.

14. Betts and Christensen, 22.

15. See James Miles, "Chinese Nationalism, U.S. Policy and Asian Security," *Survival*, Winter 2000–2001, 51–57; and Joseph Fewsmith and Stanley Rosen, "The Domestic Context of Chinese Foreign Policy: Does 'Public Opinion' Matter?" in Lampton, 151–87.

16. John W. Garver, *Face Off: China, the United States, and Taiwan's Democratization* (Seattle: University of Washington Press, 1997), 62–63.

17. Gerald Segal, *Defending China* (Oxford: Oxford University Press, 1985), 40.

18. See Paul H. B. Godwin, "The PLA Faces the Twenty-First Century: Reflections on Technology, Doctrine, Strategy, and Operations," in *China's Military Faces the Future*, ed. James R. Lilley and David L. Shambaugh (Washington, D.C.: American Enterprise Institute, 1999), 39–63.

19. Kissinger, 137–38.

20. Max Hastings, *The Korean War* (New York: Simon and Schuster, 1987), 135.

21. Assessments of Chinese behavior and American miscalculations in the fall of 1950 appear in Allen S. Whiting, *China*

Crosses the Yalu: The Decision to Enter the Korean War (New York: Macmillan, 1960); Chien Jian, *China's Road to the Korean War: The Making of the Sino-American Confrontation* (New York: Columbia University Press, 1994); Hao Yufan and Zhai Zhihai, "China's Decision to Enter the Korean War: History Revisited," *The China Quarterly*, March 1990, 94–115; Thomas J. Christensen, "Threats, Assurances, and the Last Chance for Peace: The Lessons of Mao's Korean War Telegrams," *International Security*, Summer 1992, 122–54; Michael H. Hunt, "Beijing and the Korean Crisis, June 1950–June 1951," *Political Science Quarterly*, Fall 1992, 453–78; H. A. DeWeerd, "Strategic Surprise in the Korean War," *Orbis*, Fall 1962, 435–52; David S. McLellan, "Dean Acheson and the Korean War," *Political Science Quarterly*, March 1968, 16–39; Eliot A. Cohen, " 'Only Half the Battle': American Intelligence and the Chinese Intervention in Korea, 1950," *Intelligence and National Security*, January 1990, 129–49; Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974), 140–234; and John Lewis Gaddis, *We Now Know: Rethinking Cold War History* (New York: Clarendon Press, 1997), 54–84.

22. Quoted in Clay Blair, *The Forgotten War: America in Korea, 1950–1953* (New York: Times Books, 1988), 348.

23. Quoted in Russell Spurr, *Enter the Dragon: China's Undeclared War against the U.S. in Korea, 1950–51* (New York: Newmarket Press, 1988), 260.

24. Ibid., 239.

25. For the best work on Mao's excessive confidence in the PLA and incomprehension of the fighting power of American forces in Korea, see Shu Guang Zhang, *Mao's Military Romanticism: China and the Korean War, 1950–1953* (Lawrence, Kans.: University Press of Kansas, 1995). See also *Memoirs of a Chinese Marshal: The Autobiographical Notes of Peng Dehuai (1898–1974)*, trans. Zheng Longpu, ed. Sara Grimes (English text) (Beijing: Foreign Languages Press, 1984); Bin Yu, "What China Learned from Its 'Forgotten War' in Korea," *Strategic Review*, Summer 1998, 4–16; and Xiaoming Zhang, "China and the Air War in Korea, 1950–1953," *Journal of Military History*, April 1998, 335–70.

26. Quoted in James Mann, *About Face: A History of America's Curious Relationship with China, from Nixon to Clinton* (New York: Vintage Books, 2000), 45.

Airpower versus a Fielded Army

A Construct for Air Operations in the Twenty-First Century

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Editorial Abstract: Most readers are familiar with Col John Warden's five-ring theory and the reticence of Air Force commanders to use aerospace power to attack fielded ground forces. However, political realities will likely dictate that we do so in future, as evidenced by Operation Allied Force. Colonel Haun feels that we must learn from Kosovo and prepare to support an air-first strategy. The services need to organize, train, and equip for such operations, especially in the areas of target location, identification, and battle damage assessment.

SINCE OPERATION DESERT Storm, Air Force strategic planners have been enamored with Col John Warden's five concentric rings and the underlying assumption that enemy military forces are of limited importance compared to enemy leadership. However, Warden's attractive paradigm reduces airpower's flexibility when a deemphasis on attacking military forces serves to atrophy the Air Force's ability to strike ground forces. The joint force air component commander (JFACC) is tasked with attacking centers of gravity identified by the objectives of the National Command Authorities (NCA) and the joint force commander. Recent shifts in policy and strategy have favored airpower

as the military instrument of choice to attack not only traditional strategic targets but also fielded forces, independent of friendly ground operations. As air operations in both Bosnia and Kosovo illustrate, political leaders are seeking to coerce opponents by ordering direct attacks on fielded forces, conducted primarily—if not solely—by airpower.

Although people still debate over whether such attacks represent the most effective use of airpower, events over the last decade have made this strategy a reality. During that time, America's leaders have directed the Air Force to attack an enemy's fielded forces, so our service should prepare itself to do so again when the next call comes. Valuable lessons from the experience in Operation Allied Force point to a new, systemic, operational, and tactical framework for more efficiently conducting air operations against fielded forces.

Operation Allied Force: Attacking the Serbian Third Army

For anyone who believed that one could attack fielded forces only on a flat, open desert, Allied Force demonstrated otherwise. During that operation, a combination of context, policy, and overall military strategy compelled airmen to apply airpower in direct attack of a fielded army. The much-publicized caveat that the Serbian army would face no threat from North Atlantic Treaty Organization (NATO) ground forces further complicated the situation.[1]

Planning for possible air operations against Serbia began in earnest in May 1998. By July, Gen Wesley Clark, supreme allied commander Europe, was focusing NATO's military actions around a phased air operation.[2] However, during negotiations at Rambouillet, France, General Clark ordered the Air Force's combined force air component commander, Lt Gen Michael Short, to increase the scope of planned attacks from punitive strikes against fixed targets to attacks on the Serbian Third Army deployed in Kosovo (fig. 1), even though General Short was not convinced that direct attacks constituted the best use of airpower.[3] However, NATO drove the planning, and its stated military objectives included two that dealt directly with the Serbian fielded forces: deterring further Serbian action against the Kosovar Albanians and reducing the ability of the Serbian military to continue offensive operations against them.[4]

This was no easy task! Concealed within the verdant, cloud-covered valley of Kosovo roamed 40,000 soldiers of the Serbian Third Army equipped with hundreds of tanks, armored personnel carriers (APC), and artillery pieces—interspersed with over a million Kosovar Albanians. In addition, a wall of mobile, radar-guided surface-to-air missiles; man-portable missiles; and antiaircraft pieces, as well as a squadron of MiG-21 fighters, protected Third Army from NATO air forces.[5]

In developing plans to use against the Serbian Third Army, US air planners relied on suppression of enemy air defenses and electronic jamming assets to confuse and degrade the Serbs' integrated air defense system. But after strike aircraft could safely enter Kosovo, two tactical problems remained: how to locate and identify the targets and how to successfully attack them while limiting collateral damage. A-10 and F-16CG (Block 40) forward air controllers airborne (FACA) trained in visual reconnaissance and air-strike control would identify targets and limit collateral damage.[6] FACAs would search out targets identified either from intelligence, surveillance, and reconnaissance (ISR) assets during premission planning or real time from joint surveillance, target attack radar system (JSTARS) aircraft. After the targets were identified, the FACAs would control strikes, using available NATO aircraft.

Air attacks against targets in Serbia and Kosovo were conducted under strict rules of engagement (ROE), part of which included an above-ground-level altitude restriction of 15,000 feet (later lowered to 10,000 feet for FACAs) to protect NATO aircraft from hostile ground fire.[7] As Allied Force progressed, the ROE underwent continual adjustment to restrict the types of targets for attack. By early

Figure 1. Kosovo

A-10 FACAs provided visual reconnaissance and air-strike control during Operation Allied Force.

June, FACAs had to receive permission from the combined air operations center (CAOC) for *any* targets attacked.

NATO's first air missions against Serbian fielded forces occurred on 30 March.[8] FACAs circled overhead, searching for Serbian Third Army units that kept their military vehicles off the roads as hundreds of thousands of Kosovar Albanian refugees streamed out of Kosovo. Problems quickly surfaced for FACAs facing a static enemy. Intelligence support and imagery provided to aircrews proved insufficient to accomplish the mission. Tactical imagery of the Serbian Third Army was inadequate, both in quantity and timeliness of dissemination. Poor weather over Kosovo during late March and early April prevented reconnaissance assets from producing imagery, and the products received were outdated. Even with good weather, requests for tactical imagery had to compete at the NCA level for priority. Aircrews often received timely photographs of refugees hiding in the hills but no accompanying imagery of the Serbian armor that had driven them there.[9] In-theater tactical-reconnaissance assets were available; however, dissemination of the information proved inadequate.

Serbian soldiers sitting still on the sides of the roads during strike windows limited the usefulness of JSTARS and its ground moving-target indicator.[10] But the real limitation of JSTARS was the lack of a viable, onboard target-identification capability. Even when JSTARS could see vehicles moving around Kosovo, it still could not distinguish a tank from a tractor pulling a trailer loaded with refugees. Eventually, JSTARS crews did develop tactics in an attempt to overcome this deficiency and, on occasion, were able to correlate vehicle-identification data supplied by unmanned aerial vehicles (UAV) to provide real-time targeting information to FACAs. For example, the Predator UAV could identify targets through its real-time video output. Yet, UAVs also experienced efficiency limitations during Allied Force, due mostly to the lack of integration with operational forces. UAVs had never been integrated into the air tasking order with strike packages, and the lack of training between UAVs and FACAs made tasks such as altitude deconfliction and target talk-ons difficult. Even so, the ability of UAVs to locate and identify Serbian forces was a much-needed capability, and operational techniques were patched together as quickly as possible. In the end, UAV-FACA employment techniques were still in their infancy as Allied Force drew to a close, and they had yet to produce a significant number of target engagements.

NATO's in-theater intelligence organizations at the joint analysis center in Molesworth, England, and at the CAOC in Vicenza, Italy, monitored the Serbian Third Army. Neither facility was fully prepared for the enormous demand for tactical imagery that aircrews needed to attack fielded forces efficiently. In particular, lack of a strong Army intelligence presence at the CAOC was part of the problem.[11] This overall weakness in intelligence capability existed throughout the operation, but arrival of the Army's Task Force Hawk in Tirana, Albania, and construction of a flexible targeting cell within the CAOC improved matters somewhat.

Given the limited support from intelligence, imagery, JSTARS, and UAVs, the FACA had to independently locate and identify the Serbian army. Specifically, FACAs had to positively identify all targets prior to attack. Visual target identification proved difficult during the day and virtually impossible at night, even with the use of night-vision goggles and targeting pods. On the other hand, despite the difficulty of locating and identifying targets, destroying them was relatively easy after they were identified. Precision-guided munitions proved effective against Serbian armor, as did cluster bomb units and general-purpose bombs dropped by aircraft with computed delivery systems. For the most part, once FACAs identified a target, aircraft could kill it.

Despite this capability, results against Third Army were mixed and merit some explanation. Measuring the effectiveness of air strikes proved as problematic as locating and identifying Serbian armor. Unlike Desert Storm, whose mission objectives called for 50 percent attrition of Iraq's armor, no such quantitative objective was ever set for Allied Force. Furthermore, total numbers of Serbian armored vehicles in Kosovo were never well tracked, leaving no way for NATO intelligence to adequately assess attrition rates, even if that had been an objective. When asked in a NATO news conference of September 1999 how much of Third Army had been destroyed, General Clark replied, "Enough."[12] The measurement of success lay not in counting the number of vehicles destroyed but in how well air attacks prevented the Serbs from conducting offensive operations and deterred them from acting against the Kosovar Albanians.

Obviously, battle damage assessment (BDA) is critical because war fighters need to know whether they have met objectives and airmen need to know whether they have to fly in harm's way once again to meet those objectives. Unfortunately, controversy has clouded Allied Force's BDA ever since the air strikes in Kosovo ended. But that controversy has concerned a discrepancy in numbers reported from several sources (table 1). Regardless of which numbers approximate reality, however, an accurate number/percentage of vehicles destroyed remains meaningless without some yardstick to measure overall effectiveness.[13]

Table 1

Tactical BDA Estimates from Allied Force

BDA Source	*Tanks*	*APCs*	*Artillery*
Gen Henry Shelton (10 June 1999)	120	220	450
Serbian army	13	6	27
Newsweek (15 May 2000)	14	18	20
NATO (16 September 1999)	93	153	389

Architecture for Attacking Fielded Forces

Allied Force demonstrated that target location, identification, and BDA are three of the most important and challenging aspects of applying airpower. Easily located and identified fixed-target sets tended to be politically sensitive, and the targets most politically acceptable for attack—namely, the Serbian Third Army in Kosovo—were much more difficult to locate and identify. Yet, how were our airmen trained going into this war? They were trained, prepared, and organized to attack exactly the types of fixed targets that ended up being off limits! And they were relatively untrained and ill prepared to attack a mobile army in the field. The challenge of attacking fielded forces from the air is not limited to the Air Force but requires a joint/combined approach. The Air Force has no monopoly on the requisite ISR assets and intelligence expertise; furthermore, given the realities of the joint/combined command structure, an airman might not make key airpower decisions.

Therefore, the argument presented here does not call for the Air Force to abandon its

capabilities for strategic attack, based on the politically sensitive nature of its target set. Rather, it urges acknowledgment and acceptance of the reality that enemy fielded forces will continue to be viable targets and that the Air Force will continue to attack these forces prior to the onset of, or in the absence of, friendly ground operations.

Again, the key to future success lies with target identification and BDA. The JFACC must contend with the unique challenge and special requirements of attacking an army from the air without the helpful, clarifying presence of friendly ground forces.

When attacking fielded forces, one must integrate a unique set of capabilities into a system designed for the rigorous, fast-paced nature of war against a reactive and mobile enemy. At the operational level, the JFACC must have a joint air operations center (JAOC) with an intelligence shop (J-2) capable of maintaining an up-to-date ground order of battle while simultaneously processing applicable ISR products for real-time or near-real-time use by combat operations—a monumental task. Intelligence should use an Allied Force–styled flex-targeting cell to receive and integrate BDA to continuously update the battle-space picture for the JFACC. At the tactical level, a mixture of national- and tactical-level ISR assets should be used to locate, identify, and track fielded forces in real or near-real time. Joint assets such as the US Navy's tactical-reconnaissance pods or the US Army's counterbattery radar may be required to provide capabilities not available from Air Force assets. Terminal-attack-control assets capable of final target identification and collateral damage assessment will remain critical, as will strikers trained to attack mobile targets and accurately deliver a variety of munitions.

It is at the tactical level that targets are physically destroyed, and the JFACC influences these attacks by designating terminal-control authority[14] as necessary to address the nature of the conflict and the types of missions conducted. During close air support (CAS) missions in proximity to and coordination with friendly ground forces, terminal-control authority resides with a terminal-attack controller.[15] Likewise, when attacking fielded forces without the help of friendly ground forces, the JFACC may assign terminal-control authority to an airborne terminal-attack controller in order to limit the potential for collateral damage and to accept responsibility for the difficult task of locating and identifying mobile targets.

Terminal-attack controllers must first be able to develop and maintain situational awareness in order to orchestrate successful attacks. This means surviving within the battle space in order to observe and maneuver to identify not only targets but also threats and the potential for collateral damage. Second, controllers must have onboard target-identification capability. Third, they must be trained in attacking fielded forces, which entails recognizing enemy armor and understanding how to direct strikers onto targets. Controllers must also be familiar with strikers' capabilities and limitations as well as tactics. In short, controllers are key tacticians who determine what targets will be attacked and how.

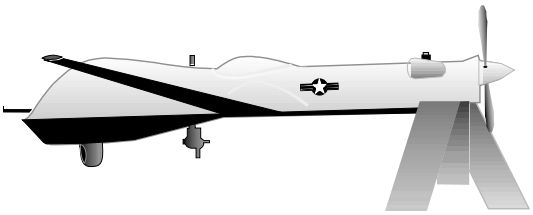
Terminal air controllers have responsibility for final identification and prioritization of targets, but the striker delivers the firepower.[16] In determining the suitability of a striker, one must consider three critical characteristics: the aircrew's training, the platform, and the munitions available. During Vietnam, the entire Air Force fighter community was well versed in CAS procedures. With the introduction of the A-10 in the late 1970s, however, CAS became the specialty of one airframe, while the remainder of the fighter force gravitated towards interdiction, strategic attack, and air-superiority missions. Today, most fighter aircrews no longer receive training in CAS. Although, by definition, attacking fielded forces without the presence of friendly ground troops is not CAS, the fundamental skills remain the same.[17] These skills include an understanding of terminology and coordination procedures, target marking and talk-on procedures, restrictions, and final control procedures. Aircrews performing striker missions must also have proficiency in weapons deliv-

ery. Only direct hits kill armor, particularly armor that is dug in or on the move. The potential for collateral damage may further restrict attack headings or delivery options, making successful attack more difficult.

Strikers must also have a survivable platform—a factor the JFACC needs to weigh against the risk of shootdown. The platform must also have a compatible secure-communications suite. Otherwise, strikers may degrade communications security, which, in turn, degrades survivability. Further, the platform should be able to accurately deliver a variety of munitions, whether precision-guided or free-fall weapons delivered from the altitude dictated by the ROE. The best possible aircrew proficiency imaginable cannot make up for a platform that cannot deliver munitions with requisite accuracy.[18]

Finally, munitions must be able to destroy the target without causing undue collateral damage. The munition of choice depends upon the situation, but a combination of precision and nonprecision weapons normally provides the flexibility needed for successful aerial attack.[19]

Obviously, this architecture for attacking fielded forces is systemic, relying on the existing JAOC structure and modifications at the operational and tactical levels to promote time-critical targeting required to attack mobile targets successfully. The flex-targeting cell becomes the central location for processing ISR inputs and for developing and distributing targeting products, as well as maintaining the enemy's order of battle. Operations (J-3) then becomes responsible for the command and control of assets, ensuring the translation of the commander's intent into appropriate action. At the tactical level, terminal air controllers are responsible for identifying and prioritizing targets as well as determining attack restrictions, based on criteria such as potential collateral damage or ROE. Finally, with inputs and guidance from the terminal air controller, the striker completes the attack.



Over Kosovo, UAVs like the Predator provided real-time targeting information to FACAs.

Conclusion

Given US policy makers' current preference for using airpower in crisis situations, the US military should prepare to support an air-first strategy. Its services need to organize, train, and equip for such operations. Airpower can destroy what it finds; however, an enemy under air attack quickly adapts, using dispersal and deception to conceal his location. Based on the experience of Allied Force, a systems approach helps to efficiently locate and attack such an enemy. At the operational level, the JAOC's J-2 requires a flex-targeting cell, manned by Air Force and Army intelligence personnel, to build and maintain situational awareness on enemy ground forces and to process ISR products for near-real-time targeting and BDA. Intelligence must have immediate access to a variety of ISR assets, and it must be able to process the information quickly. This includes not only Air Force and national assets but also joint and combined assets, such as Army and coalition UAVs, counterbattery radar, and Navy and coalition tactical-reconnaissance platforms.

This systems approach will be effective only if one can prosecute the targeting information at the tactical level. Terminal air controllers, such as FACAs, must have the capability to locate and identify targets on the battlefield. Advances in optics and infrared targeting systems continue to increase the capability of medium-altitude target identification during day-and-night operations. Likewise, developing tactics, techniques, and procedures during peacetime to more fully

integrate UAVs into operations will improve the target-marking or talk-on ability of these aircraft. Finally, strikers must train with FACAs to attack mobile targets and become familiar with the unique and flexible nature of attacking fielded forces.

The Air Force needs to adjust its training and tactics. The adage of "train the way you fight" has validity. It makes sense to take into combat time-tested tactics and techniques honed during peacetime training. In the heat of battle, military forces have no option other than fighting the way they have trained. Training develops the tactical skills and mindset that define a combat force's capabilities. Major exercises such as Red Flag and Air Warrior should incorporate attacks on fielded forces without the presence of friendly ground forces as a primary mission. Given this mission's unique challenges, if the Air Force fails to develop adequate training or effective tactics, it will likely fail to meet the combat expectations of either the theater commander in chief or the NCA. □

Notes

1. This article uses the terms *Serbia* and *Serbian* to refer to the Federal Republic of Yugoslavia and its forces, respectively.

2. *Air War over Serbia: Initial Report* (Ramstein Air Base, Germany: United States Air Forces in Europe, Studies and Analysis Directorate, April 2000), 8.

3. General Short believed that the key to meeting NATO's objectives lay in attacking the political leadership in Belgrade. Lt Gen Michael Short, USAF, retired, lecture, School of Advanced Airpower Studies, Maxwell AFB, Ala., 21 November 2000.

4. *Air War over Serbia*, 9.

5. R. Jeffrey Smith and William Drozdiak, "Anatomy of a Purge," *Washington Post*, 11 April 1999, A1.

6. Lt Col Phil M. Haun, unpublished A-10 war diary, March–June 1999. Eventually, FACAs expanded to include US Navy F-14s and Marine F/A-18D Hornets.

7. Ibid. Later, further modifications to the ROE allowed strike aircraft to fly as low as 8,000 feet above ground level during diving deliveries of weapons. This altitude restriction was further reduced to 5,000 feet after the bombing of a Kosovar refugee column by F-16CG FACAs on 14 April 1999.

8. Due to poor weather over Kosovo, the first strikes against mobile targets did not take place until 6 April.

9. Lt Steven Smith, intelligence officer, 81st Fighter Squadron, discussions with author, April 1999.

10. JSTARS is a long-range, air-to-ground surveillance system aboard the E-8C (a modified Boeing 707) consisting of (1) a synthetic-aperture radar capable of producing an image of a selected area and (2) a moving-target indicator designed to locate slow-moving ground targets.

11. Unlike Air Force intelligence, Army intelligence assesses the capabilities of the enemy army. Its familiarity with the ISR assets best suited for observing enemy ground forces adds a wealth of expertise to the CAOC in this area.

12. Gen Wesley Clark, USA, and Brig Gen John Corley, USAF, NATO press conference, Brussels, Belgium, 16 September 1999, on-line, Internet, 18 September 2001, available from http://www.nato.int/kosovo/press/p990916a.htm.

13. Briefing, Secretary of Defense William Cohen and Gen Henry Shelton, chairman of the Joint Chiefs of Staff, subject: Initial BDA Assessment, Washington, D.C., 10 June 1999, on-line, Internet, October 2000, available from http://www.defenselink.mil/news/Jun1999/t06101999_t0610asd.html. On 16 June 1999, Lt Gen Nebojsa Pavkovic of the Serb army refuted the numbers offered by Cohen and Shelton, citing a much lower total. Rebecca Grant, "True Blue: The Real Story behind the Kosovo Numbers Game," *AFA Issue Brief*, 1 June 2000, on-line, Internet, October 2000, available from http://www.afa.org/library/issues/trueblue.html. By mid-July, General Clark had ordered an Air Force mission-effectiveness analysis team to go see what was on the ground. On 16 September, General Clark presented NATO's BDA—similar to Cohen and Shelton's but with slightly lower numbers, based on multiple strikes that had previously been double-counted. Clark and Corley, NATO press conference.

14. Air Force Doctrine Document (AFDD) 2-1.3, *Counterland*, 27 August 1999, 98. Terminal control, a type of air control, is the authority to direct the maneuver of aircraft delivering ordnance to a specific target.

15. Ibid. A terminal-attack controller is a qualified officer or enlisted member who, from a forward ground or airborne position, provides terminal control to aircraft performing CAS to ground forces.

16. This does not mean that controllers with inherent kill capability may not perform both controller and striker functions.

17. AFDD 2-1.3, 92. CAS involves air action by fixed- and rotary-wing aircraft against hostile targets in proximity to friendly forces, requiring detailed integration of each air mission with the fire and movement of those forces.

18. An excellent example is use of the British GR-7 during Allied Force. Although Royal Air Force pilots were some of the most professional and well trained available, at medium altitude the GR-7 delivered the BL-755 cluster bomb unit extremely inaccurately due to the absence of a computed delivery solution for this munition. Thus, the pilots had to perform a modified manual delivery from medium altitude with the aid of an electro-optical targeting pod. The first canister impacts were recorded as far away as one to two kilometers from the target. Haun diary.

19. A common misunderstanding is that the use of precision munitions lowers the potential for collateral damage. Although precision munitions such as laser-guided bombs or Maverick missiles are more accurate than free-fall munitions, if precision weapons do not guide properly, they can miss their targets by miles. Compare this to free-fall general-purpose bombs delivered from a dive, which might miss by meters but never by miles.

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 aerospace-power items of interest.*

C-9 Nightingale

From Dedicated Aeromedical Evacuation to Theater Transport

CAPT GILLES VAN NEDERVEEN, USAF, RETIRED*

IN ORDER TO provide specialized aeromedical evacuation, the Air Force bought 24 variants of the commercial DC-9 series 30 model in 1968. Twenty C-9A Nightingales—the only dedicated medical-airlift aircraft in the world—continue to serve with the 86th Airlift Wing at Ramstein Air Base, Germany; the 374th Airlift Wing at Yokota Air Base, Japan; and the 375th Airlift Wing at Scott Air Force Base, Illinois. In 2000 the C-9As based in the continental United States (CONUS) transported over 30,000 patients in 1,300 missions to military, Department of Veterans Affairs, and civilian hospitals. Aircraft at the overseas locations moved more than 10,600 patients in Europe and another 1,000 in the Pacific theater, helping ensure that those patients received the specialized care they needed. Additionally, three VC-9Cs configured as VIP transports operate from Andrews Air Force Base, Maryland, as part of the 89th Airlift Wing. (The remaining aircraft crashed in a fatal accident.)

Capable of carrying a mix of litter or ambulatory patients, the C-9A has numerous modifications—including oxygen outlets, a medical refrigerator, a separate ventilation system, and a folding ramp—designed to provide for the care and comfort of 40 patients. In peacetime, patients are stabilized prior to transport, but equipment on board the aircraft allows medical personnel to stabilize patients in flight.

C-9A

VC-9C

*Capt Gilles Van Nederveen, a former associate editor of *Aerospace Power Journal,* is a career intelligence officer who flew on RC-135, EC-130, and E-8 aircraft. He has worked in both national and joint intelligence assignments.

However, age is quickly catching up to these airframes, which have noisy, inefficient engines; an older cockpit layout; and outdated navigational aids. Although the Air Force has recently updated some of the avionics, it still needs to replace the aircraft between fiscal years 2004 and 2010. In the interim, Air Mobility Command (AMC) is working on roll-on/roll-off pallets so it can use other aircraft in the aeromedical role. These pallets will allow aeroevacuation nurses to stabilize patients, but most of the other AMC airframes, such as the C-21, cannot transport patients until they have been stabilized. Furthermore, in an attempt to cut costs for dedicated platforms, the Air Force is conducting an ongoing analysis of AMC aircraft, looking for aeromedical-evacuation alternatives. Like the C-141 before it, the C-17 already flies long-distance aeromedical flights from overseas theaters to the CONUS. Both the elimination of the C-141 in active-duty squadrons and the small number of C-17s have forced airlift planners to look at other airframes for theater-evacuation missions, including the use of Civil Reserve Air Fleet aircraft such as the Boeing 767.

Meanwhile, downsizing of the US military overseas has proved stressful for intratheater airlift. As the need to move large numbers of patients has declined, C-9s have been pressed into service for nonmedical airlift duties. Consequently, in order to comply with the Geneva convention covering the use of the Red Cross symbol, the Air Force is removing the cross from the T-tails of the C-9 fleet so that it can use these aircraft for other airlift missions.

Current service planning has not identified a replacement for the C-9 Nightingale. Part of the answer may involve the 89th Airlift Wing's three VC-9Cs, which a VIP/special air mission (SAM) fleet review found lacking in terms of range and carrying capacity. Specifically, the VC-9C can transport 22 passengers for only 2,150 nautical miles—too short a distance for medium VIP airlift. Thus, AMC has recommended the purchase of three C-40Bs to replace the VC-9C airframes.

Indeed, according to an announcement by Boeing, the company "is being awarded a contract worth up to $800 million from the U.S. Air Force to supply as many as seven C-40B and C-40C aircraft and 10 years of logistics support. The aircraft are based on the Boeing Business Jet and will be used to support the needs of Air Force commanders-in-chief and the Air National Guard. The firm order for one C-40B makes it the second such aircraft procured by the Air Force."[1] The first C-40Bs will be based at Andrews Air Force Base, where they will replace the C-22 (Boeing 727) transports used by Headquarters Air National Guard.

C-40

The US Navy also is currently buying the C-40—a Boeing 737-700—to replace its C-9 cargo/passenger fleet. The C-40's range of 3,700 nautical miles; glass cockpit; and newer, quieter, and more efficient engines make it attractive to the US military. The Navy version comes equipped with a seven-by-11-foot door, which facilitates the loading not only of cargo pallets but also litter patients if the C-40 is used as an aeromedical-evacuation aircraft. Thus, the US military is taking steps—including the updating of existing airframes and the purchasing of new aircraft—to ensure that the vital mission of medical airlift continues uninterrupted. □

Note

1. "U.S. Air Force to Award C-40B Contract," *Forum*, on-line, Internet, 24 September 2001, available from http://www.boeing.com/commercial/forum/issues/0301/htm/a06.htm.

The art of war is divided between art and stratagem. What cannot be done by force must be done by stratagem.

—Frederick the Great

The War on Drugs
Two More Casualties

LT COL STEPHEN P. HOWARD, USAF*

WE MUST ADD two more names to the casualty list of America's so-called war on drugs. On 20 April 2001, a Peruvian military aircraft shot down a civilian Cessna 185, killing American Christian missionary Roni Bowers and her seven-month-old daughter Charity:

> A CIA-contracted American crew aboard a US drug interdiction aircraft tried to stop Peruvian authorities from shooting at a plane that turned out to be carrying American missionaries. . . .
>
> Three Americans contracted by the Central Intelligence Agency, and a Peruvian air force officer, were aboard the Cessna Citation 2, about one mile (1.6 km) from where the missionaries' plane was flying, the official said. . . .
>
> The two-engine US Department of Defense aircraft was providing tracking and detection information as part of joint US-Peruvian efforts to stem drug trafficking.[1]

Incidents like this give us the opportunity to reflect upon the broader implications of policies that have gone awry.

The facts and miscalculations of this incident will probably never receive full disclosure. News reporters, commentators, and others will "spin" the episode into a "terrible tragedy," "careless accident," or "unfortunate incident." We will have difficulty uncovering the truth because too many special interests have a hand in this war on drugs. Each of these groups tries to push its own agenda instead of promoting what is best for solving America's illegal-drug dilemma.

Political transitions such as the one currently under way in Washington, D.C., provide the opportunity to look at previous policies from a new

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perspective. On the one hand, the course of action followed by the United States for over a decade to counter the "supply side" has not yielded the results hoped for by the American people. Supply-side advocates say that the US surveillance flights (like the one that tipped off the Peruvian air force, which ultimately shot down the Bowers' plane) play a vital role in stopping the spread of illegal drugs in America. What they will fail to say is that such interdiction efforts have failed miserably for over 10 years.

On the other hand, "demand side" advocates point to this incident as another example of overzealous law enforcement and of military officials trampling the rights of average citizens. They suggest that full funding of treatment programs for addictive behavior would do more good than shooting down civilian aircraft.

Neither view is completely correct. The most important point at stake in this issue is that the US military is the wrong tool for stopping the use of illegal drugs in America. We should not involve military force in domestic law-enforcement issues either inside or outside the borders of the United States. Rather, we should train, equip, and prepare our military forces to fight the nation's "real" wars. Because of ignorance and self-serving agendas, many people have lost sight of the intended use of the US military.

Uninformed individuals support counterdrug interdiction operations by the military (such as the Peruvian aircraft shootdown) because they have little understanding of what military force can or should do. To them, the military is an expensive burden that should find gainful employment. Counterdrug interdiction operations sound like just the right sort of employment for the military. Although such operations squander America's military capability, some advocates are willing to misuse our national-defense assets in return for drug-seizure headlines and costly, yet ineffective, surveillance and interdiction operations.

Furthermore, some special interests prosper financially or philosophically by using America's military personnel to fight a war that doesn't exist. The Nixon administration transformed America's perspective on illegal drugs from "concern" to "war" in 1971, when the president first proclaimed a war on drugs. Like the war on poverty, it was a catchy phrase. In their haste to do something, well-intentioned government leaders could say, "We're taking action." Sadly, a great deal of misguided "action" has also taken place while presidential administrations have tried to figure out how to deal with the problem of illegal drugs in the United States.

But this problem is so complex and profitable that it defies dissection and analysis. Each administration since 1971 has looked for a quick fix to stem the tide of illegal drugs flowing over our borders. For national-defense crises, the nation's "911" capability lies within the Department of Defense. Because drug trafficking had become a transnational problem, it seemed logical to pass the responsibility for battling illegal drugs to the military.

Until 1990, US generals and admirals had opposed such a tasking. They knew of the huge physical and philosophical differences that existed between

law enforcement and military operations. However, after America won the Cold War, those same generals and admirals feared losing their market share in the New World Order. Without the Soviet Union to fight (or at least to prepare to fight), senior military leaders sought missions that would maintain their relevancy in the minds of the American people. The "peace dividend" represented an alarming concept to the military-industrial apparatus (both civilian and military) that had staked its future on the Cold War. When that war ended, it sought any mission that would maintain the US military's Cold War infrastructure. Whether the military was the correct tool or not, senior military leaders reversed themselves and embraced an active military role in counterdrug interdiction operations. But at what cost?

According to the US Department of Justice, the federal government has spent more than $179.5 billion over the last two decades combating the importation and illegal use of drugs in the United States. Yet, according to those same statistics, the supply and purity of illegal drugs have increased. At the same time, the price of illegal drugs has decreased. What have we purchased with those billions of tax dollars?

For one thing, military readiness has steadily declined during the past 10 years. The war on drugs isn't solely responsible, but it has contributed. Likewise, military recruitment and retention are falling. This decade has seen sharp declines in the numbers of men and women willing to serve in the military. Again, counterdrug operations are not the sole cause here but do contribute to the problem.

The reliability of military equipment and hardware is also on a steady decline. Interdiction operations tend to create shortages of spare parts, reduce the time devoted to routine maintenance, push weapon systems beyond their reasonable life cycles, and add to the wear and tear on personnel—all of these effects reduce military capability. We cannot entirely blame counterdrug operations for the military's decline, but they are a factor. And the US taxpayer receives little benefit from this considerable expenditure of funds and manpower.

If America continues to wage a war on drugs, more lives will be lost and more costs will be incurred. What if the downed Cessna aircraft had carried a load of cocaine? Would it have mattered? Would the price of cocaine in New York City, Atlanta, Chicago, and Los Angeles have risen? US government statistics clearly show that one airplane full of drugs has no impact on the total quantity or retail price of cocaine on the streets of America. What price did we pay over the jungles of Peru? And for what purpose?

Today, according to Roger Rumrill, a Peruvian author and expert on the drug trade, "more than 70 percent of the drug traffic between Peru and Colombia now moves by sea along the Pacific coast, not by air."[2] Since the air-interdiction effort has forced drug traffickers to change their business practices, should we launch submarines from Hawaii or San Diego to interdict and sink boats suspected of carrying illegal drugs? Is this the next logical step in the war on drugs?

Illegal drug use in the United States is a terrible dilemma that requires serious thought and action. However, military action is not the answer. Instead, perhaps it is time to transfer responsibility for the war on drugs from the military generals and pass it to the surgeon general. Using America's soldiers, sailors, airmen, and marines is not the solution to this "war." Instead, we should continue to prepare them for the wars they are meant to fight. □

MacDill Air Force Base, Florida

Notes

1. "Official: CIA Crew Opposed Peru Plane Attack," *China Daily*, 23 April 2001, on-line, Internet, 4 October 2001, available from http://www1.chinadaily.com.cn/highlights/docs/2001-04-30/3357.html.
2. Quoted in Kevin G. Hall, "Peru Is Fighting Drugs—And Itself," *Philadelphia Inquirer*, 24 April 2001, on-line, Internet, 24 September 2001, available from http://www.mapinc.org/drugnews/v01/n719/a06.html.

Aerospace Power Chronicles

"Feedback and Discussion"

In the Summer 2001 edition of *Aerospace Power Journal*, we introduced the *CGO Voices* Web page, which has received favorable feedback. Lt Jeff Mustin leads the discussion of our July/August topic, "The Future of Pilots in the Cockpit," declaring that "humans, not machines, fought Desert Storm, and their training in the technology, not the technology itself, won the war." In "To UAV or Not to UAV: That Is the Question: Here Is One Answer," Capt Patrick Eberle responds to Mustin by arguing that contemporary advancements in weapons are seldom revolutionary, but failure to look to such advances in technology and warfare will lead to service stagnation and demise. He further notes that lack of diversity and poor strategy rather than reliance on technology are the causes of technology failures. We encourage you to join this good discussion by submitting articles and/or ideas for topics and comments to *CGO Voices* at apj@maxwell.af.mil.

In our Contributor's Corner section, 2d Lt Katrine M. Waterman discusses whether women are capable of being successful in military flying careers. Her article "The Aviatrix in Military Aviation" observes that achieving such success requires motivation, dedication, and knowledge. Visit our Web site at http://www.airpower.maxwell.af.mil to check out these articles or E-mail the editor at apj@maxwell.af.mil.

Security measures imposed as a result of the recent terrorist attacks have intermittently prevented access to our site from locations outside the Department of Defense. We regret the inconvenience to our readers and appreciate everyone's patience. Please continue to check *Chronicles* for access.

Luetwinder T. Eaves
Managing Editor
Aerospace Power Chronicles

Ricochets and Replies
Continued from page 7

ciation for the work airmen accomplish. Everyone has a need for feedback to varying degrees, but regardless of one's generation—whether boomer or Generation Xer—a little positive reinforcement and the tried-and-true "pat on the back" go a long way toward recruiting and maintaining a quality force.

I am the father and father-in-law of two active-duty Air Force E-4s (Generation Xers). Guess what aspect of the Air Force displeases them most? (Hint: it isn't the pay, the deployments, or the home-station operational-readiness exercises or 12-hour shifts.) It is very simply the lack of positive feedback from immediate and midlevel supervisors. To a lesser degree, senior NCOs and squadron and wing commanders who purport to lead airmen are also among the guilty. The focus of these so-called leaders is merely production, to the detriment of a motivated workforce that looks forward to reenlisting and providing service above self. To me, LBWA is the real "passion for the responsibility of command" and is the way leaders "inspire airmen to continue to move forward," as stated by Gen Michael Ryan in his introduction to *APJ*'s Summer issue.

In my 27-year Air Force career as a follower and a leader, I have seen the best and the worst. Now that I am more of a leader, colleagues often ask me how I recruit and retain hardworking NCOs and officers who always maintain a positive attitude and work ethic. LBWA is the answer.

Lt Col Gregory Miller, USAF
Texas Air National Guard
Lackland AFB, Texas

LEADERSHIP ISSUE APPRECIATED

I was very impressed with the Summer 2001 issue of *APJ,* which featured articles on leadership. Every one of them contained information I can use. Although *APJ*'s principal audience is the officer corps, I feel that this journal should be in every office, back shop, and organization on base. Thank you for the inspiration that you provide.

TSgt Matthew W. Denslow
Biloxi, Mississippi

BOOK REVIEW REVIEWED

I commend Col Eric Ash for his insightful review of the long-awaited biography of John Boyd *The Mind of War: John Boyd and American Security* by Grant Tedrick Hammond in the Fall 2001 issue of *APJ*. I take issue with only one of Ash's statements: "Counterfactual speculation is ahistorical and antischolarly." Recent counterfactual scholarship by Niall Ferguson, Philip Tetlock, Richard N. Lebow, and others firmly refutes this proposition. *Virtual History,* a collection of essays edited by Ferguson, is particularly compelling. The forthcoming collection *Unmaking the West: Counterfactual Thought Experiments in History,* edited by Tetlock, Lebow, and Geoffrey Parker (with some chapters already available in draft form on the Internet), holds the same promise.

Lt Col Ralph Hitchens, USAFR, Retired
Washington, D.C.

Net Assessment

War is a science which depends on art for its application.

—B. H. Liddell Hart

Military Assistance: An Operational Perspective by William H. Mott IV. Greenwood Publishing Group (http://www.greenwood.com), 88 Post Road West, Westport, Connecticut 06881, 1999, 384 pages, $65.00.

This work provides readers a comprehensive study of the dynamics that affect wartime military-assistance programs. Although most of the author's eight case studies address American experiences with assistance programs from the twentieth century, he includes examples of French and British assistance from the eighteenth and nineteenth centuries. Mott's premise is that successful assistance programs have certain uniformities that increase the potential for meeting donor aims, while programs that lack these uniformities—what Mott terms "lawlike regularities"—are more likely to fail. For policy makers, Mott provides a touchstone for judging if a given assistance program has the right policy mix to meet its goals. For the operator who is personally involved in military-assistance programs, Mott provides a rich, historical reference that may shed light on why particular initiatives are destined to succeed and others to fail. Personnel involved in the process of providing military assistance in any service branch and at any level will benefit from reading this book.

Prior to delving into the case studies, Mott, a political scientist at heart, takes time to address the history behind military assistance and the different methodologies commonly employed to analyze such assistance. Authors dealing with the social sciences sometimes attempt to quantify historic data to make their work appear more "scientific." But Mott manages to address the military-assistance issue through qualitative analysis and does a fabulous job of meeting the multidisciplinary challenge posed by the subject. His paradigm of lawlike regularities between donor and recipient nations is reinforced by the parallels he draws among the case studies.

Mott advances his argument of uniformities among the case studies by asserting that "relevant components of the donor and recipient relationship . . . coalesce in four prominent features that seem holistically associated with achieving donor aims" (p. 21). The following briefly summarizes those features: *convergence* of donor and recipient goals, *control* by the donor, *commitment* of donor combat forces, and *coherence* or suitable integration of donor military assistance with other donor policies and strategy. Mott later points out that "the presence of all four features . . . provides high confidence that military assistance can be expected to achieve donor aims" (p. 266). Simply put, the more features present in a given donor-recipient relationship, the greater the odds of donor success.

One of two observations I found of interest, as regards the author's analysis of American assistance, was the tendency for policy makers to recommend greater amounts of economic aid and military assistance even though such assistance, by itself, might not achieve their aims. For example, Mott states that "simply increasing aid and expecting the Vietnamese to help themselves, had not produced results" (p. 196). It follows that, without tying assistance to specific aims, it is unrealistic for donors to assume that increasing the funding for a program will ensure its success. The second flaw, often present in US assistance programs, is the tendency to focus aid efforts on only one group of indigenous elements in a recipient country. In postwar China, "American diplomacy had no means readily available to influence the Communists" (p. 152). In Vietnam, advisors told President Kennedy, "We have virtually no contact with meaningful opposition elements and we have made no attempt to maintain a U.S. position independent of [President Ngo Dinh] Diem" (p. 195). These quotations illustrate how the tendency to focus assistance efforts on one actor limits the ability of donor nations to exert pressure on aid recipients, which may ultimately result in a failure to meet donor aims.

The aforementioned remarks about donor experiences as regards America's past roles only scratch the surface of the lessons Mott shares with his readers. Assuming that his audience consists primarily of Americans, I have one complaint about the chapter that addresses US involvement in Vietnam. Knowing

the different phases of American involvement in Vietnam, the author appropriately divides analysis of US military assistance into three studies. However, he could have included a case study that addressed either Soviet or Chinese military assistance to North Vietnam. Such a juxtaposition would have better balanced the latter part of the book and given readers an opportunity to see Mott's paradigm fit an example other than American military assistance in the twentieth century.

Mott includes nine appendices that contain quantitative analysis, tables of assistance funding, and topics ranging from the Strategic Hamlet program to the impact of National Security Council directives on the evolution of US military-assistance programs. Much of the data in the appendices doesn't fit the case-study paradigm but is essential to further study of variables that tend to affect military-assistance programs.

Military Assistance should be required reading for all personnel involved in military-assistance programs. Mott illustrates aspects of donor-recipient relationships that may indeed lend themselves to law-like regularities or uniformities, which form the basis for a policy paradigm. Such a paradigm should help policy makers determine if the correct policy mix is being applied to a given relationship, which should increase the chance of attaining donor aims. At a minimum, readers will gain a better understanding of what dynamics are involved in military-assistance programs and how we can avoid the mistakes of our predecessors.

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Pearl Harbor by Touchstone Pictures. Starring Ben Affleck, Josh Hartnett, Kate Beckinsale, Cuba Gooding Jr., Tom Sizemore, Jon Voight, Dan Aykroyd, and Alec Baldwin. Produced by Jerry Bruckheimer and Michael Bay, written by Randall Wallace and directed by Michael Bay, 183 minutes, rated PG-13 (mild profanity and sanitized violence).

Adm Thomas Fargo, commander of the US Pacific Fleet, said it best: "No single event is more central to our concept of national tragedy and conviction than the events of December 7, 1941." Indeed, the shock of Japan's surprise attack against Pearl Harbor still resonates in the American psyche, almost 60 years after that fateful Sunday morning. Pearl Harbor has provided the grist for more than 100 books and at least seven motion pictures—evidence of our lasting fascination with America's worst wartime disaster.

Although many of the books about Pearl Harbor have been outstanding (Walter Lord's *Day of Infamy*, Gordon Prange's *At Dawn We Slept*, and Robert Stinnett's recent *Day of Deceit),* the battle's record on the silver screen is less than impressive. Realistic films on Pearl Harbor (such as 1970's *Tora, Tora, Tora)* proved ponderous and dull, while some of the better movies about that era (e.g., *From Here to Eternity)* use the Japanese attack as a counterpoint for other story lines. So far, the definitive movie about what happened on 7 December 1941 exceeds Hollywood's grasp.

Perhaps that's why *Pearl Harbor,* the latest film to depict this epic event, generated such anticipation. In tackling the project, producer Jerry Bruckheimer *(Top Gun)* and director Michael Bay *(The Rock, Armageddon)* vowed to make a Pearl Harbor movie "by which all other films are measured." Pledging to honor the service and sacrifice of those who served at Pearl Harbor, they told the US Naval Institute, "Our goal is to stage the event with utmost realism."

Sadly, their film fails to deliver on any of its promises. Instead, Bruckheimer and Bay offer up a rather conventional (and dull) love story, cast against an improbable series of events that lead up to the attack on Pearl Harbor. The plot features a pair of Tennessee crop dusters turned Army Air Corps pilots—Rafe and Danny (played by Ben Affleck and newcomer Josh Hartnett, respectively). While assigned to a training unit on Long Island—commanded by Lt Col Jimmy Doolittle—Rafe falls in love with a Navy nurse named Evelyn (Kate Beckinsale). Unfortunately, their romance is cut short when Rafe is transferred to England, where he participates in the Battle of Britain as a sort of "combat exchange officer" with the Royal Air Force (RAF).

By this time, even the most casual viewer realizes that Bay and screenwriter Randall Wallace *(Braveheart)* are quite willing to suspend historical facts in the interest of plot development. The reality that Doolittle wasn't on active duty in early 1941 and that American volunteer pilots *resigned* their commissions before joining the RAF becomes less important than getting Rafe off the screen—at least for a while—so Danny can fall in love with Evelyn. Predictably, their love affair blossoms after both are transferred to (surprise!) Pearl Harbor, just months before the Japanese attack.

If this concept of "romance against the backdrop of disaster" sounds familiar, it should. Bay and Wallace have borrowed heavily from director James Cameron's playbook, creating a sort of *Titanic* meets World War II and meshing a rather pedestrian love story with eye-popping special effects. Unfortunately, Wallace's screenplay seems less inspired by *Titanic* than by every B movie produced by Warner Brothers during World War II. Rafe, Danny, and Evelyn are little more than stock characters, mouthing lines that are trite and unintentionally funny. When Rafe told Evelyn, "If I only had one more night to spend, I'd spend it with you," there were more than a few groans in the theater, and rightly so. It is odd—and disappointing—that such twaddle came from an Oscar-winning screenwriter. Wallace is clearly off his game in *Pearl Harbor.*

Likewise, director Bay devotes too much time to the love story and not enough to events leading up to the attack. By the time enemy aircraft arrive over Diamond Head (roughly 80 minutes into the film), many viewers will be rooting for the Japanese, hoping for anything that might enliven such leaden proceedings. Fortunately, the battle sequences don't disappoint, thanks (in part) to impressive visual effects from George Lucas's Industrial Light and Magic organization. Scenes of exploding battleships, sailors trapped in capsized vessels, and hundreds of dead bodies floating in the harbor are quite stunning, adding a gritty realism that is so often missing from this picture.

Regrettably, Bay dilutes the impact and power of the battle sequences by placing his cardboard characters squarely in the middle of the action. Not content to let Rafe and Danny get off the ground and engage Japanese fighters in their P-40s, Bay also has them play a game of aerial "chicken," causing four Zeros to collide in midair. Moments later, these intrepid pilots even stage an ambush of the attacking Japanese, luring more enemy aircraft past the base's control tower, where their colleagues blast them with a .50-caliber machine gun.

Still unsatisfied, Bay and Bruckheimer devote the final minutes of their film to a further distortion of historical fact. Anxious to avenge Pearl Harbor, President Roosevelt approves a plan to attack Japan, using B-25 bombers launched from an aircraft carrier—the famous Doolittle raid. And whom does Doolittle recruit for his daring mission? Why, none other than Rafe, Danny, and their fellow pilots from Pearl Harbor. It doesn't take a genius to figure out that one of our heroes will die during the raid, allowing final resolution of the love triangle between the pilots and Evelyn.

There is much to dislike in this movie. Historians and military buffs will cringe at the ersatz mix of fact and fiction. At one point, Jon Voight's FDR—looking like he just came from Madame Tussaud's Wax Museum—rises unaided from his wheelchair, trying to inspire a timid staff. A detailed re-creation of Pearl Harbor's battleship row is spoiled by the sight of modern warships, somehow augmented into the 1941 fleet. And a prewar sequence on the USS *Arizona* was clearly filmed on the USS *Missouri*, a poor substitute for a World War I–era dreadnought.

From a cinematic standpoint, *Pearl Harbor* proves equally disappointing. Affleck, Hartnett, and Beckinsale's cutout characters do little more than occupy the screen between battle scenes. Although Bay's action sequences represent a high point in the film, even those segments seem oddly disjointed. For example, when casualties begin streaming into Beckinsale's naval hospital, Bay shoots the entire sequence in gauzy, soft focus, thereby losing an opportunity to underscore the harsh reality of Pearl Harbor and its aftermath.

In all fairness, the film has its moments—although they are decidedly few and far between. The aerial sequences involving Affleck in the Battle of Britain are quite good, and Cuba Gooding Jr. delivers a fine performance as Dorie Miller, the Navy mess steward who became the first African-American to win the Navy Cross for shooting down two Japanese planes at Pearl Harbor. In less than 10 minutes of screen time, Gooding creates a character that is far more compelling than anything concocted by Wallace, Bay, or the other actors.

Perhaps one day Hollywood will get it right: a historically accurate film about Pearl Harbor that's equally entertaining. *Pearl Harbor* clearly falls short of that mark. Despite a lavish production—and the associated hype—*Pearl Harbor* is a tedious film with absolutely no historical value. Audiences looking for a realistic account of events at Pearl Harbor would be well advised to read Gordon Prange's book or rent a copy of director John Ford's award-winning documentary *December 7th.* Comparatively speaking, this newest Pearl Harbor film lives up to its advance billing in only one sense. By releasing *Pearl Harbor,* Bruckheimer and Bay have produced a disaster rivaled only by the real Japanese attack in 1941.

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MacArthur and the American Century: A Reader edited by William M. Leary. University of Nebraska Press (http://www.nebraskapress.unl.edu), 233 North 8th Street, Lincoln, Nebraska 68588-0255, 2001, 538 pages, $40.00.

Gen Douglas MacArthur is one of a handful of admirals and generals to be given five-star rank (admiral of the fleet or general of the army). MacArthur was complex, controversial, and brilliant; right or wrong, he ranks among the most important military figures in US military history. Many books have been written about him, and scholars still debate aspects of his career. The latest volume, *MacArthur and the American Century*, contains 36 essays and accounts. Some of the essays were written by MacArthur himself; others were penned by distinguished historians like Stephen Ambrose and Clark Reynolds.

Most Americans remember the flamboyant general wading through the shores of Leyte in the Philippines in 1944. This fulfilled a promise he made in 1942 to return to the islands, where he served as field marshal to President Manuel Quezon. But had MacArthur not participated in World War II, he would be remembered as a hero of World War I, an innovative superintendent of the US Military Academy, and Army chief of staff (the Army's equivalent to the Navy's chief of naval operations). But controversy was not far behind.

For example, MacArthur was instrumental in clearing out the Bonus Expeditionary Force camped in makeshift shacks around the nation's capital in 1932. These World War I veterans were demanding bonuses appropriated by Congress for future payment. President Hoover authorized the US Army to clear the marchers and burn the shacks. This blunder would cost Hoover his presidency and would mar General MacArthur's reputation. Even at the end of his life, the general maintained that Communist insurgents had infiltrated these marchers.

The book's essays cover these topics as well as explore the reasons why MacArthur would survive (politically) the Japanese invasion of the Philippines while Adm Husband Kimmel and British flag officers in Singapore and Malaya would be rooted out of their respective armies and navies. In his essay, Clark Reynolds highlights a General MacArthur who looks beyond terrain into a maritime strategy of defeating Japan's Imperial Army. The general's lessons learned, which called for using combined air, land, and sea forces, would be repeated at Inchon, Korea, in 1950. The final essays deal with MacArthur's open insubordination and contempt for President Harry Truman, which led to his being relieved of command. This conflict further strengthened our constitutional democracy and cemented the importance of the subordination of military leaders to their commander in chief. *MacArthur and the American Century* provides a fascinating look at a general who made an indelible mark on American history.

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Desert Warriors: Australian P-40 Pilots at War in the Middle East and North Africa, 1941–1943 by Russell Brown. Banner Books (http://www.banner-books.com.au), 122 Walker Street, Maryborough, Queensland, 4650 Australia, 2000, 320 pages, approximately $49.00 (US).

It is always refreshing to see a book come along that has the ability to drastically change one's perception of a significant historical event. *Finally*, there is a book dealing with the contributions of Australian pilots in North Africa during the middle stages of the Second World War. Although there have been many books dealing with this largely forgotten episode of military history, most of them deal with either a general explanation of the desert air war or, more likely, simply discuss it through either German or British eyes. This story of Australian aviators has certainly been decades in the making.

Russell Brown is a relative newcomer to the writing of aviation history. Although he has authored several magazine articles, with this book he has hit the proverbial home run at his first appearance at the plate. A retired schoolteacher from Australia, the author has completed a wonderfully researched and masterfully presented book that is certain to make an impact in the area of the desert air war. *Desert Warriors* deals primarily with the Royal Australian Air Force's 3 and 450 fighter squadrons and with other Australian pilots flying in Royal Air Force fighter squadrons in North Africa and the Middle East. For those readers familiar with *Fighters over the Desert*, Hans Ring and Christopher Shores's definitive work on the desert air war, *Desert Warriors*, follows a similar chronological format. Since Brown focuses strictly on the Australian contributions, however, there is understandably less information reported on a daily basis. This in no way detracts from the book but

bolsters the author's thesis by concentrating on Australian contributions. This, in turn, allows Brown to shed light on aspects of the desert air war, about which most people will likely have little or no knowledge.

In order to capture the spirit and intensity of this conflict, the author uses many primary sources, including original squadron operational records and pilot interviews. Very few original documents other than combat reports can give a reader the timely flavor of actual warfare, and Brown successfully uses these to great advantage throughout the book. Having studied the desert air war for years, primarily from the German side, I found it both refreshing and enlightening to see combat reports from Australian pilots in actual combat with the Luftwaffe. In addition to so much valuable primary reference material, the author has included 166 superb photographs. Coming from private collections, most of these have never before been published and are a wonderful testament to the Australian commitment in North Africa. Finally to be able to put faces to the names of men who fought in the desert is something that, in itself, makes this book a worthwhile study. *Desert Warriors* is also replete with 14 appendixes that cover aspects such as Australian aces, decorations, victory claims from each of the Australian squadrons, short biographies of some notable pilots, and 16 impressive P-40 color profiles painted by artist Juanita Franzi.

Perhaps the true significance of this book is Brown's detailed and scholarly research, coupled with its excellent presentation. In many books and articles on the desert air war, pilots of the desert air forces, primarily Australian and South African, are often considered second rate. When we view them through our typical ethnocentric American eyes, we often want to downgrade their abilities in order to justify the apparent kills of their German counterparts. It is apparent that the Australian pilots had their fair share of "Stuka parties" and drew blood against the Luftwaffe on a regular basis. However, they are often incorrectly portrayed as hapless pilots forced to cower for safety in the defensive Lufbery Circle while hotshot Luftwaffe pilots had their way with them, shooting them down in droves time and time again. In our minds, how else could the top Luftwaffe aces have achieved the victories they claimed if their opponents were anything but substandard? Not only does this book demonstrate the quality, professionalism, and tenacity of pilots within the Royal Australian Air Force, but also it debunks the myth of natural German superiority. Although the Germans did have very successful pilots in North Africa, the author is able to compare some German claims to actual losses on several occasions, demonstrating the not-too-uncommon habit of German overclaiming. The author does this not to imply that German claims were widely distorted, admitting that overclaiming occurred on both sides, but to suggest that, on occasion, things were not as they necessarily seemed.

Without a doubt, *Desert Warriors* is a valuable contribution to the history of the North African campaign. It is by far the most important book written in years on this aspect of the Second World War. Although Brown is an Australian, there appears to be little or no bias in his reporting, and, as a student of the Luftwaffe in North Africa, I believe I would have spotted any unfair or critical bias immediately. It is about time this aspect of the desert war was brought to light, and the author has done an excellent job in presenting objective information. Because of this book, my respect for Australian aviators in the Second World War has grown immensely, and my hope is that, somewhere in South Africa, some writer is doing the same thing for the contributions of the South African air force pilots in this theater.

I highly recommend this book to anybody interested in the air war in North Africa and the Middle East. It is rare for me to stress something as a "must have" book, but *Desert Warriors* is just that. It would indeed be almost impossible to have a full and balanced understanding of the desert air war without this book as an indispensable reference. Since *Desert Warriors* is published in Australia, one can order it directly from the publisher's Web site (see above) or from the only US distributor, Paul Gaudette Books in Tucson, Arizona, telephone (602) 791-3868.

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Angels Zero: P-47 Close Air Support in Europe by Robert V. Brulle. Smithsonian Institution Press (http://www.si.edu/sipress), 470 L'Enfant Plaza, Suite 7100, Washington, D.C. 20560, 2000, 176 pages, $29.95 (hardcover).

Robert Brulle's book is an interesting cross between a firsthand memoir and an operational account of the air war in Europe from the pilot's perspective. The author served with the 390th

Squadron in the 366th Fighter Group, flying P-47s in the tactical-air-support role and completing 70 combat missions. During this time, he destroyed a great deal of German war materiel. He saw German aircraft in the air only once, during the strikes on various American airfields on 1 January 1945, when he shot down one FW-190. Although the subtitle includes the phrase *Close Air Support,* a great many of Brulle's missions were armed reconnaissance or interdiction sorties, while frontline support made up a smaller percentage.

The greatest strength of *Angels Zero* is the combination of firsthand recollections mixed with an overall perspective of events. Brulle relies on his own memory and a diary he kept during the war to give the usual memoir feel of "I did this" and "I felt like this" that one would expect. He uses his active membership in the 366th Fighter Group Veterans' Association to include other pilots' firsthand accounts to broaden his study. He also did a fair amount of secondary research to give an operational perspective of the various campaigns. The result is a balanced narrative that relates the individual's perspective while keeping the reader informed of the overall flow of events. Because neither aspect is so detailed or overwhelming that it becomes tedious, this creates a uniquely readable, informative book. The pilot's view of the entire war experience is foremost throughout the book. Brulle includes two short chapters on his pilot training that remind us how long it took to prepare a combat pilot. He began on 30 January 1943 and did not finish until 8 June 1944. Even then, he had to undergo an additional 26 hours of intheater training before he was assigned to the Fighter Group.

Brulle's account shows that the pilots found column-cover missions during the drive across France very satisfying. Results of their attacks were easy to determine, and the panels displayed to indicate American units were easy to identify. Unfortunately, this period of high morale soon gave way as the Battle of Hürtgen Forest began. Brulle shows us that infantrymen were not the only ones to suffer during this protracted battle of attrition. His group lost more pilots here than at any other time. The static lines allowed German flak to concentrate on likely targets, creating a hazardous environment for low-flying aircraft. Group morale also declined due to the monotony of the missions, lack of observable targets, and indeterminate results. In addition to the dangers of flying low-level missions, landing on the airfields was often equally dangerous. The pierced-steel planking used to cover the ground was prone to pull up, become irregular due to wet ground, or become very slippery and coated with ice during the winter.

Missions flown during the Battle of the Bulge were still very dangerous but had greater rewards than previous ones. Brulle states that the pilots were less concerned over the seriousness of the attack since they felt that once clear weather returned, they would severely pummel the attacking German columns. Despite living in tents for the duration and facing overcasts that made taking off, forming up, and landing exceedingly dangerous, the Fighter Group flew as often as possible to aid the ground units. Oftentimes they attacked through very narrow holes in the clouds into the teeth of intense German flak. Although losses were still heavy, pilot morale was higher during this period. The fact that the Army greatly needed their help and that they had discernable targets, including several columns hit while the Germans were traveling in the open under what they thought was safe cloud cover, contributed to the heightened morale.

Brulle finishes with the final battles into Germany. During this time, he took his turn as an air/ground controller for two weeks. Although he agreed that having pilots direct their squadron mates onto targets was desirable and that two weeks was too short to adequately learn the duty and carry it out, he did not enjoy the time on the ground. The Germans were obviously beaten, but flak in the Ruhr Valley continued to be dangerous up to the end.

Angels Zero is an excellent account that gives a pilot's unique perspective of the war. Instead of recounting endless dogfights or mission recaps, Brulle shows the attitudes and viewpoints of the men who were primarily engaged in tactical air support. He places the Fighter Group's efforts in the larger picture without losing that personal perspective. Anyone interested in World War II airpower would be well advised to read this book.

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Ripcord: Screaming Eagles under Siege, Vietnam 1970 by Keith William Nolan. Presidio Press (http://www.presidiopress.com), P.O. Box 1764, Novato, California 94948, 2000, 480 pages, $29.95 (hardcover).

At first glance, Keith Nolan's *Ripcord* seems to have little to do with the Air Force other than to

serve as a reminder of the importance the F-4 played in close air support and the B-52 played in the bombing campaign in Southeast Asia. After all, this is the story of Fire-Support Base Ripcord, an Army installation. The fight in the hills around Ripcord was an infantryman's fight, holding little or no interest for an Air Force audience.

Although this is true, members of the Air Force, especially its leadership, would do well to read Nolan's book. What it chronicles, beyond the horrific scenes of battle, is the story of several hundred men fighting a battle they have already lost. It tells how these troops, faced with an impossible mission, begin to mistrust their leadership and how their anger begins to spread.

Fire-Support Base Ripcord was established as the first part of a campaign to push the North Vietnamese Army (NVA) out of the A Shau Valley, an operation that never really came to fruition as originally conceived. The ridge on which Ripcord would be built was seized in April 1970 but reverted to the NVA only three months later, on 23 July. Because of political considerations, writes Nolan, "division headquarters proved reluctant to be drawn into the kind of bloody slugging match that would have been required to push the enemy out of their entrenchments around Ripcord" (p. 11).

Ripcord is especially powerful when it examines leadership, from the platoon all the way up to division level. Nolan expertly and evenhandedly dissects eyewitness accounts of both good and bad leadership in the field. The grunts who followed their leaders into battle often did so reluctantly, largely because of the overwhelming nature of the obstacles before them. In the interviews and letters Nolan presents, these soldiers' impressions of platoon and company leadership are mostly positive. The questions surrounding leadership arise mostly at the battalion level and above, starting with Lt Col Andre Lucas, the battalion commander tasked with the defense of Ripcord, and with Brig Gen Sidney Berry, acting commander of the 101st Airborne Division. Each of their subordinates has a different opinion, and Nolan is careful to let readers make up their own minds about each man's leadership qualities. Again and again, the book returns to the issue of leadership: what proved effective and what did not; whether a commander could have done more or less; who had responsibility; and what leadership could have done differently.

Beyond this case study in leadership is the fascinating story of several battalions of men who faced the horrors of war every day. Nolan takes his readers on patrol with the ranging platoons as they probe the jungles around Ripcord to test enemy strength. He follows them up nearby Hill 1000, from which the NVA pounded Ripcord with mortar and 55 mm fire. Nolan tells of the men on Ripcord who provide suppressing fire for the men in the field around the camp, and he walks with the men in the field who try in vain to knock out mortar and gun emplacements that threaten Ripcord. Finally, he follows the men off Ripcord as they evacuate the base while NVA troops victoriously swarm the hilltop.

Although the besieged men were happy to evacuate their living hell, they questioned the reasons for establishing the base if it was to be abandoned so quickly. Chris Straub, a retired lieutenant colonel who saw action during the Ripcord siege, wrote to Nolan, noting that the evacuation "confirms my view that from the start the 101st's push into the Ripcord AO [area of operations] was not in consonance with what the U.S. was trying to accomplish in Vietnam in 1970" (p. 411). If Ripcord did not mesh with overall US objectives, one wonders why so many men died before it was abandoned. Again, the question of leadership raises its head.

Ripcord is a quality piece of investigating, and Nolan deserves credit for his dedication to revealing as many sides of the story as he can. His ability to humanize the men who fought is commendable. Most importantly, however, Nolan is able to provide present military leadership with a case study in effective battle management. We owe it to future conflicts to read and internalize the lessons *Ripcord* presents.

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Attack and Die: Civil War Military Tactics and the Southern Heritage by Grady McWhiney and Perry D. Jamieson. University of Alabama Press (http://www.uapress.ua.edu), Box 870380, Tuscaloosa, Alabama 35487-0380, 1982, 232 pages, $15.95.

The Myth of the Lost Cause and Civil War History edited by Gary W. Gallagher and Alan T. Nolan. Indiana University Press (http://www.indiana.edu/~iupress), 601 N. Morton Street, Bloomington, Indiana 47404, 2000, 256 pages, $29.95.

The Cause Lost: Myths and Realities of the Confederacy by William C. Davis. University Press of Kansas (http://www.kansaspress.ku.edu), 2501 West 15th Street, Lawrence, Kansas 66049, 1996, 240 pages, $24.95.

Drawn with the Sword: Reflections on the American Civil War by James M. McPherson. Oxford University Press (http://www.oup-usa.org), 198 Madison Avenue, New York, New York 10016, 1996, 272 pages, $27.50 (hardcover), $14.95 (softcover).

Perhaps no other subject of American history has more written about it than the US Civil War. There seems to be no end to the interpretations, reinterpretations, and re-reinterpretations. Just when an author writes the definitive biography of some general or of some battle, new information becomes available that destroys long-held convictions. Most historians strive to be accurate and to explain "what happened," but a few deliberately bend the truth for personal or political reasons. The "lost cause" myth is one example of bending the truth. These four histories, which attempt to set the record straight, are a must for any person interested in the Civil War and the lost cause.

As Alan Nolan eloquently states in his essay in *The Myth of the Lost Cause and Civil War History*, there are two versions of the history of the Civil War. First, there is the truth—the account of what actually happened, when, why, and how. Then there is the Southern interpretation of the truth. The editors have assembled a superb cast of leading historians to write essays that persuasively demolish the elements of the lost-cause myth. Nolan certainly sets the tone of the book and attempts to knock the Southern apologists' collective noses out of joint. Space does not permit a recounting of each argument. Quite frankly, some are stronger than others. Suffice it to say that Nolan debunks the myths that slavery was not the issue that caused the war, that the South would have given up slavery eventually, that slaves were happy, and that Southern war leaders were without fault. Each of the book's nine chapters tackles a different aspect of the lost cause. Perhaps the most interesting are Gary Gallagher's assessment of Gen Jubal Early and his contributions to the creation of the myth; Jeffry D. Wert's examination of the vilification of James Longstreet for daring to criticize Robert E. Lee in writing; and Brooks D. Simpson's summary of historical distortions of Ulysses S. Grant in order to explain away his victory over Lee.

James McPherson's *Drawn with the Sword* is a collection of previously published works. On the one hand, it has no true unifying theme. On the other hand, McPherson has synthesized over a decade of scholarship into one compact volume. The author divides the 15 chapters into five parts or themes. The first section, "Origins of the Civil War," contains three chapters, "The War of Southern Aggression" perhaps being the most enlightening. McPherson outlines the steps taken by the South in general and South Carolina in particular that led to the war. Although it is still popular in the South to call the Civil War the "War of Northern Aggression," McPherson turns that phrase on its head when he quotes candidate Abraham Lincoln replying in 1860 to Southern claims that a Republican administration would lead to war: "You say you will destroy the Union and then, you say, the great crime of having destroyed it will be upon us! . . . A highwayman holds a pistol to my ear, and mutters . . . 'Stand and deliver, or I shall kill you, and then you will be a murderer!' " McPherson includes a section of four chapters on why the North won. Ultimately, the South lost not out of loss of will, more Yankees, or weak central government but because Union armies defeated Confederate armies and because the North's first string of leaders was better than the South's first string. Other themes in the book include "The War and American Society," "The Enduring Lincoln," and "Historians and Their Audiences." Each chapter in the book is thought provoking and sometimes directly, sometimes indirectly, destroys an aspect of the lost-cause myth.

William Davis's *The Cause Lost*, like *The Myth of the Lost Cause* and *Drawn with the Sword*, is a collection of the author's thoughts about the Civil War. However, unlike McPherson, Gallagher, and Nolan, Davis writes from a more Southern-centric point of view. In fact, several of the chapters deal more with the strategy and tactics of the war than with lost-cause topics. *The Cause Lost*'s four sections deal with Jefferson Davis, war on the periphery, excuses for losing, and the Confederacy in myth and memory. By far the two most interesting chapters concerning the lost cause are the one on the South's lost will to fight and the one that describes the myth and reality of the Confederacy. In the lost-will chapter, Davis argues that the Union succeeded because, even in defeat, it had a stronger sense of nationhood than did the Confederacy. When the South started losing, the will to fight and resist slowly but irrevocably declined. In the chapter on myth and reality, Davis shows that, despite

the revisionists' best efforts to argue that the war was not about slavery, that the North was responsible for causing the war, or, incredibly, that the South simply *withdrew* from the war, a careful reading of history and an examination of the facts easily bring out the truth.

Attack and Die, although not a lost-cause book, nevertheless supports many of the arguments of the other three books. Its basic theme is that Confederate leaders wasted their chances to win by throwing away their troops in suicidal offensives. All Southern leaders, from Lee on down, receive criticism for not understanding how warfare had changed since the end of the Mexican-American War. Rifles had rendered the massed charge obsolete, and Lee realized too late that he could not compete with the North when it came to manpower. Although conventional wisdom says that the Southern soldier was better because the South suffered fewer casualties, the authors dispel this myth. In a series of very enlightening tables, McWhiney and Jamieson support debunkers of the lost-cause myth, showing that while Lee might have inflicted 134,000 Union casualties while suffering only 121,000, he crippled his own army in doing so. For all his tactical genius, Lee suffered 20 percent casualties while inflicting only 15 percent on his enemy. Grant, on the other hand, suffered 18 percent casualties but inflicted 30 percent on his enemy. The authors argue that the South should have adopted the tactical defensive, forcing the Union armies to attack. After all, one man in a trench was worth three or four attackers.

These four entertaining books are a joy to read. They shed new light—at least for this reader—on many of the sacred truths of the US Civil War that were not true after all. They deserve a place on the shelf of every Civil War buff and every academic.

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The Korean War by the Korea Institute of Military History, introduction by Allan R. Millett. 3 vols. University of Nebraska Press (http://www.nebraskapress.unl.edu), 233 North 8th Street, Lincoln, Nebraska 68588-0255, 2001, 2,621 pages, $95.00 (paper).

One of the enduring problems of American military history is that operational history is written from an American viewpoint. Not only do we have little material on our former enemies (with the possible exception of the Germans), but also we have precious little on our allies. In some cases, however—Vietnam, for example—we have more on the Vietcong and North Vietnamese than on our South Vietnamese allies. This bold effort by the Korea Institute of Military History attempts to come to grips with this situation regarding the Korean War.

The series consists of three huge volumes (volume one is over 900 pages, and volumes two and three are each over 800 pages). They are updated and condensed versions of an earlier 11-volume study begun in 1967. The study makes use of US and Republic of Korea (ROK) sources as well as Communist documents. The first volume relates the conflict from its beginnings to the Chinese intervention in late November 1950; the second traces the story up to the stalemate and armistice of June 1951; and the third follows the final course of the war.

On the positive side, these books offer a detailed and candid view of the war from an ROK perspective. The English is fairly fluid although not altogether smooth in places. Language problems and frequent typographical errors are sometimes annoying but not serious—readers will have no trouble overlooking them. The tone is rather flat and devoid of hyperbole, reflecting both the professionalism of the authors and the 50-year perspective. Numerous maps helped this reader considerably.

On the negative side, the books are very long and dense. They spend an inordinate amount of time on US forces and thus place too much reliance on US sources. Frequently, the reader follows units day by day and place by place with seemingly little purpose. In short, we have much narrative but little analysis.

Clearly, all students of the Korean War—and twentieth-century warfare, for that matter—should be aware of this series. For that reason, major libraries should include it in their collections. Personally, I much prefer the less detailed and shorter (thus narrower) *From Pusan to Panmunjom* (Dulles, Va.: Brassey's, 1992) by Paik Sun Yup. It is shorter, much better written (and perhaps translated), and more clearly gives the ROK view. *The Korean War* is an important contribution to military history, but is not for the everyday reader.

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Right Backed by Might: The International Air Force Concept by Roger Beaumont. Praeger Publishers (http://www.greenwood.com/imprints/index.asp?ImprintID=I8), 88 Post Road West, Westport, Connecticut 06881-5007, 2001, 216 pages, $64.00.

This is a challenging book both to read and to understand. Part of the problem is the inherent difficulty in attempting to write the history of a nonevent—an international air force has never existed. Writing the history of an *idea* has special problems and requires a deft hand. The author does not help matters by employing convoluted and leaden prose, continually mixing the chronology, and writing vaguely about precisely what he is examining.

Widespread attempts to abolish war have occurred for more than a century. A variety of peace groups and pacifists, as well as sober statesmen who understand the cost of war, has sprung up in various times and places, advancing schemes to promote world peace—usually through some sort of international government. Paradoxically, many of the people who promote such ideas have been willing to use force to keep the peace. Airpower would play a key role in that enforcement. Roger Beaumont, a military historian with several books to his credit, attempts to tell this complex story, emphasizing the role of airpower and the ways it would be used.

Regrettably, Beaumont quickly descends into a semantic morass from which he never emerges. Terms such as *disarmament, isolation, collective security, pacifism, internationalism,* and *appeasement*, although related to some degree, are not the same thing. But Beaumont too often treats them as if they were. People who advocated these concepts generally had varying goals, methods, and levels of support. An "America firster" like Charles Lindbergh, for example, was unquestionably both a strong believer in airpower and a staunch isolationist. He was not, however, an advocate of disarmament—much less pacifism.

The author's failure to define clearly these terms and movements makes for a confusing melange that never comes into focus. Thus, he tends to combine the idea of a notional international police force (IPF), which would encompass land, sea, and air forces, with that of an international air force (IAF), which constitutes only one component of that police force. Because an IAF has never existed, however, he resorts to concentrating on the numerous, though still mostly unsuccessful, attempts to form an IPF. In addition, he spends much time covering the League of Nations, collective security arrangements, and various disarmament initiatives during the interwar period, but this tends only to confuse the issue. In fact, there were more attempts to *abolish* airpower between the wars than there were to turn it into a coercive instrument of world peace.

His coverage of World War II and the five decades since is similarly unfocused and meandering. Ironically, as the new century dawns, some people see a movement towards an IPF composed largely of a powerful IAF. Conflicts in the Persian Gulf and the Balkans were marked by broad international support and were dominated by airpower. Yet, the real story of the past decade has been the greatly expanded role of the United Nations in peacekeeping (as opposed to peacemaking) operations around the world. However, peacekeeping forces tend to be composed largely of ground troops, not always armed, who are relegated to police and humanitarian functions. These operations have principally used airpower's airlift and intelligence-gathering capabilities—subjects barely touched upon in this book.

The numerous factual errors throughout this work are surprising, given the credentials of the author and publisher. Some of them are relatively minor (though still inexcusable), such as giving erroneous dates for the Casablanca Conference and the duration of the Rolling Thunder air campaign, and promoting Carl Spaatz to five-star rank. Others are a bit more serious—placing Dienbienphu [*sic*] in Laos rather than Vietnam and basing USAF B-52s in the Philippines. Still other mistakes, however, call into question the author's credibility and basic knowledge of the subject: he misses the date when the Air Force began receiving the largest share of the US defense budget by nearly a decade; President Eisenhower threatened China, not North Korea, with nuclear weapons in 1953; and air operations over Serbia in 1999 were not more intense than those in Operation Desert Storm—they were far *less* intense (an average of around 300 combat sorties per day versus over 1,700). Indeed, the profusion of errors dealing with easily verifiable facts makes one wonder about the accuracy of his major premises.

Right Backed by Might does have utility, however. Beaumont has done an enormous amount of research on the diverse topics he discusses. His footnotes (there is no bibliography), therefore, contain a wealth of contemporary sources that should prove a useful starting point for other researchers.

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Black Sheep One: The Life of Gregory "Pappy" Boyington by Bruce Gamble. Presidio Press (http://www.presidiopress.com), P.O. Box 1764, Novato, California 94948, 2000, 384 pages, $29.95.

Black Sheep One is an engaging, informative, and at times shocking biography of the leading Marine Corps ace of World War II, Medal of Honor winner, and former prisoner of war (POW). Through detailed research, Gamble weaves an in-depth picture of a very unconventional hero who was dogged throughout life by horrendous personal problems.

Written chronologically, the book thoroughly describes Boyington's early years growing up in Idaho and Washington State. These years marked the themes that would dominate his life: a dysfunctional family, alcoholism, financial hardship, a need to find acceptance, perseverance, and a love of flying. His alcoholic father—who, he would later discover, was really his stepfather—moved from job to job because of his drinking, causing constant money woes for the family. Despite these problems, Gregory managed to do well in high school and then entered the University of Washington to study engineering. He joined the Reserve Officer Training Corps, earned a degree in aeronautical engineering in 1934, got hired by Boeing, and then entered the first of four marriages.

While working as a draftsman on the XB-15, a test bed for the B-17, he dreamed of flying, but during the Great Depression there was little opportunity to do so. In April 1935, however, Congress passed the Aviation Cadet Act, designed to train thousands of new pilots. He applied via the Marine Corps Reserve program but lied about his marital status (applicants had to be single); he was accepted and went off to Naval Air Station Pensacola, leaving his wife and a newborn back home.

Forty percent of the people who started flight school washed out; surprisingly, the future ace (28 kills) almost did just that on more than one occasion. In fact, he busted nine check rides and met three review boards during his training. From there he went to Quantico, Virginia, to fly the UF-9M. He immediately got in trouble by entering an unauthorized dogfight directly over the base just three days after he arrived. He finally brought his family with him but did not advertise the fact that he was married. Debt problems began to pile up, along with a drinking habit he had developed in flight school. From Quantico he went to Coronado, California, where he began to cheat on his wife as he further developed his reputation as a skilled fighter pilot whose professionalism on the ground was inversely related to his flying skills. One event at Coronado indicates his moral bankruptcy—he got a woman pregnant but resolved the "problem" by making a quick trip with her to Mexico.

After a deployment on the famed aircraft carrier *Yorktown*, Boyington was barely promoted to first lieutenant because of his mounting personal problems and sent back to Pensacola, Florida, to be an instructor pilot. Here his problems came to a head. His wife—now an alcoholic, like him—filed for divorce, and a judgment for $4,000 from 28 debts in five states finally caught up with him. After he met a recruiter for the famed Flying Tigers, he signed up with them to make the big bucks so he could get out of debt. His pay with them was two to three times more than he earned in the Marine Corps, and he received a bonus for every Japanese plane shot down. He resigned from the Marines, and the corps made sure his problems were adequately documented in his personnel records so he couldn't rejoin.

While with the Flying Tigers, Boyington continued his streak of impressive flying and personal irresponsibility. He flew P-40s out of bases in Burma and racked up six supposed Japanese kills, although only two were ever confirmed. After getting into continuous trouble with Claire Chennault and the staff of the American Volunteer Group, and after the entry of the United States into World War II, he left the Tigers, earning a dishonorable discharge because he broke his contract with them.

The highlight of *Black Sheep One* occurs in the South Pacific after he was barely allowed back into the Marines. The corps needed pilots, especially those with combat time. Flying Corsairs and later the F4U from airfields in Guadalcanal, Bougainville, Turtle Bay, and others, he racked up a total of 22 more kills—several questionable—earned the Medal of Honor for making five kills in one day, became a squadron commander, and finally got shot down by a Zero. He was picked up by a Japanese sub—sunk just 13 days later—and spent the next 20 months in three prison camps. The description of his POW experiences was the most moving and poignant account in the entire book.

Throughout his exploits as a Flying Tiger and Black Sheep, he received enormous press coverage, and by the time he was shot down, he had become a media sensation. Initially, the public knew little about his drinking, unprofessional conduct, and sorry personal life, but all of this came out after the war, when he went on a tour promoting the Marine Corps but began appearing at func-

tions drunk. By August 1947, the Marine Corps had had enough and medically retired him.

For the rest of his life, Boyington struggled through three more marriages; frequent periods of destitution; struggles with alcohol (including long periods of sobriety but also relapses involving driving under the influence [DUI]); and the publication of two books, including *Baa Baa Black Sheep* in 1958 (a big best-seller) and a novel that mocked Chennault, for which he was heavily criticized. In the 1970s, his famed squadron became the only military flying unit used as the subject of a TV series; Robert Conrad starred as Boyington.

The following are some interesting facts I learned about Boyington from *Black Sheep One:*

- He was an absentee father to his three children. One daughter committed suicide, and one son graduated from the first Air Force Academy class in 1959.
- He suffered from cancer twice—lung and prostate—but continued to smoke and drink. I was surprised that he lived as long as he did (75 years).
- He often flew either drunk or with a hangover, frequently endangering both himself and his squadron mates. Later in life, he was arrested for DUIs but was never busted for flying under the influence (FUI) while on active duty.
- The original name for his famous squadron was "Boyington's Bastards," but the unit's public-affairs officer made them change it to "Black Sheep." He was the commander only four months before getting shot down.
- He often embellished his accomplishments, especially his accounts to the media and those in his autobiography; several of his kills were never fully confirmed.
- The Black Sheep Squadron did not house a bunch of misfits, as depicted in the TV series and popular lore. Actually, the squadron—unlike Boyington—was very disciplined. The unit's alumni association ostracized him because of the way he depicted its members.

He died of cancer and was buried in Arlington National Cemetery with great fanfare. At the end of *Black Sheep One,* I felt a sense of emptiness for Boyington. Despite his heroic contributions—which included surviving 20 months as a POW in horrific Japanese prison camps and earning the Medal of Honor—his moral and ethical bankruptcy overshadowed his accomplishments.

I recommend this book to readers interested in military history and matters of character. The only criticisms I have of *Black Sheep One* are that it is too detailed at times; it occasionally offers inferential analysis; and it includes some trite phrases. Despite these minor flaws, the book is well worth a reader's time.

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The Three Meter Zone: Common Sense Leadership for NCOs by J. D. Pendry. Presidio Press (http://www.presidiopress.com), P.O. Box 1764, Novato, California 94948, 2000, 256 pages, $24.95.

The Three Meter Zone provides a comprehensive yet easy to follow review of several fundamental leadership principles for noncommissioned officers (NCO). Not only is the book a work of art, but also it has functional value for today's NCO. The author addresses the principles of NCO leadership via personal and professional experiences, quotations from political and military leaders, historical military accounts, and extracts from US Army field manuals. Command Sergeant Major Pendry, USA, presents the material in such a way that NCOs in any military service can easily use it to take care of their people and accomplish the mission.

The book is essential reading for the junior, midlevel, and senior NCO, offering a practical prescription for tackling leadership issues in the twenty-first century. The author candidly discloses personal experiences—each striking anecdote lends clarity and realism to leadership concepts such as selfless service, integrity, trust, and confidence. In a sense, Pendry invites the reader into a very natural discussion about leadership philosophy, one that underlies the NCO's role as mentor, disciplinarian, motivator, and communicator. He declares that an NCO's influence is indispensable to the character and growth of the military organization, insisting that the NCO is the backbone of the US armed forces.

A second key strategy of the author involves the frequent use of probing questions to challenge the reader to carefully examine the implications of leadership decisions. This in-depth exploration of leadership issues suggests that the NCO may often confront situations which require more than a

superficial solution. More importantly, NCOs may need to use a holistic approach to fully understand all facets of a leadership challenge prior to advocating or implementing a decision. Similarly, Pendry suggests that yesterday's leadership solutions are not necessarily appropriate for today's peacekeeping, humanitarian, or combat-superiority missions. Such constant questioning is not only welcome, but also essential to the continued physical, mental, and emotional development of the NCO.

A third element that distinguishes this text from other books is the author's unique writing style. I was pleasantly surprised to see that Pendry tells us what he truly feels about NCO leadership! He candidly discloses his personal and professional perspective on leadership and the role of the NCO: accomplish the mission and ensure the welfare of the soldier. These convictions reflect years of military tradition, tutelage under both good and bad leaders, and training in one of the nation's finest military branches of service. Furthermore, end-of-chapter summaries effectively encapsulate the principles under discussion, giving today's NCO the knowledge and motivation to lead, discipline, communicate, and motivate.

The Three Meter Zone is an excellent book that will capture its readers' attention and challenge them to examine their long-held leadership beliefs and practices. I encourage NCOs in any military service to invest a few hours of leadership-development time in reading this text. In turn, I challenge my fellow NCOs to test his ideas and instill fundamental precepts of leadership and followership. In the final analysis, our subordinates, our military profession of arms, and our great nation ask for nothing less!

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Winter Journey through the Ninth: The Story of Tactical Air Power as Illustrated by the Exploits of the Ninth Air Force in Europe by Harry A. Franck. Prince of the Road Press (http://www.p-ndesigns.com), 8987 E. Tanque Verde, no. 309-155, Tucson, Arizona 85749-9399, 2001, 305 pages, $21.95.

In November 1944, the Army Air Forces (AAF) had Harry Franck write the story of its Ninth Air Force, the tactical air force supporting US troops in the European campaign. The author was unusual: in his 60s, he had served 19 months in World War I and earned his living writing travel books about his extensive journeys. His experience, writing skills, and language abilities made him a natural to turn this book out quickly. The military granted Franck exceptional latitude by allowing him to interview its top leaders—the numerous air and ground generals in the theater—as well as many group and squadron commanders and aces. The book was finished by May 1945 but was not published. Franck's grandson and wife annotated the book and published it in 2001.

Winter Journey is a narrative of the author's experience from the time he departed the United States in the fall of 1944 to his service in newly defeated Germany in May 1945. It does have pictures, a name index, explanations of the origins of the book, and an epilogue written 50 years later by Franck's subordinate and traveling companion. The body of the book consists of vignettes of the author's experiences during his travels across western Europe and conversations with both the famous and those "who also served." Franck was a true adventurer, flying on one medium-bomber mission and suffering a slight wound in the last days of the war as he watched a tank-artillery duel in a German town. Writing in a journalist style that includes long quotations from GIs and generals, he notes the varied background of AAF officers and their youth, especially relative to their rank. Throughout the book, he displays his language skills by using French and German phrases. Concerning the language issue, Franck is critical of Americans, decrying their inability to speak foreign tongues: "Evidently even worse taught now in the United States than they were back in the days of World War I." He also deplores Americans who speak French "with a sophomoric ineptitude that emphasizes our provincialism" (p. 81).

The result is a unique work because of its candor, detail, and viewpoint. Franck is candid and critical in describing a number of American problems, attitudes, and failures. He details poor AAF bombing accuracy and instances of US aircraft bombing friendly forces; he also mentions an American study which found that the claims of vehicle destruction in the famous Falaise-Argentan pocket were only 10 percent accurate. Also noted is the callous talk of American pilots who believed that "any living thing east of the Rhine was fair game" (p. 150). In Franck's words, "Most fighter-bomber pilots reminded me . . . of high school boys, basketball players more than anything else; naïve and uncultured, even a little ill at ease, like most American kids outside their own business—which is flying—but at that were superbly con-

scious of their competency" (p. 151). One Army general lived quite well, in "almost barbarian splendor," while others' accommodations were more spartan. Another commander had "a Lincolnesque gentleness or sweetness . . . which is all too rare among regular Army officers" (p. 63).

Franck includes details seldom mentioned in other accounts, such as the AAF's lack of training, fear of flying, and less than admirable officers. The author also mentions German and American atrocities, as well as American looting. He repeats the views of aircrews about fighting and flying, together with the virtues and vices of various AAF tactical (medium) bombers and fighters. The book makes clear that AAF losses seemed both substantial and almost arbitrary: one B-26 unit lost only 13 men in 11 months of action but also had 61 men missing in one day.

The book and story are not above reproach, however. *Winter Journey*'s oftentimes heavy prose and richness of detail may prove slow going for some readers. Some of the author's feelings, words, and attitudes may strike a sour note with a modern audience since they occasionally betray his "ugly American" views. But one must keep in mind that this annotated, unedited (uncensored) publication is the product of a 62-year-old man writing 55 years ago.

In sum, this book is a firsthand account of the American tactical air war in France during the last months of World War II by a careful, experienced, nonflying observer. The author conveys both the spirit of the day and details available nowhere else, giving us feelings and facts about the last months of the war from an American perspective. Although overly long and tedious at times, *Winter Journey* offers refreshing and often critical views on some familiar subjects while adding a number of interesting details. As such, students of tactical airpower in World War II should consider this book a "must" addition to their libraries.

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The Second-Luckiest Pilot: Adventures in Military Aviation by D. K. Tooker. Naval Institute Press (http://www.usni.org/cgi-bin/SoftCart.exe/press/press.html?E+scstore), 2062 Generals Highway, Annapolis, Maryland 21401, 2000, 216 pages, $27.95.

D. K. Tooker, a pilot who flew nearly 150 combat missions over Korea and retired as a Marine Corps lieutenant colonel in 1968, describes his personal experiences along with those of his fellow pilots in *The Second-Luckiest Pilot*, an exhilarating book. Each chapter is dedicated to a different, true-life incident concerning survival. Most of the accounts describe surrealistic events that usually involve cheating death—but not always. Some of the events are heartbreaking instances of lives lost.

The title refers to Tooker's personal story, describing the time he ejects from his aircraft, lands in the sea, and is luckily rescued by a Navy destroyer. Although some accounts are autobiographical, most of them relate other pilots' bone-chilling encounters.

Tooker's narrative extends from World War II to the 1990s. In one example, an F-8 Crusader pilot falls 15,000 feet with an unopened chute but survives, suffering two broken ankles, a severed tendon in his left foot, a fractured right pelvis, a fractured vertebra, a partially collapsed left lung, and completely inactive kidneys and intestines. In one account, however, Lady Luck is not so forgiving. Trapped in a burning Corsair, Ensign Jesse Brown has no choice other than sending his help away and facing death alone. Tooker offers that "it is only for God to know whether the fire, the cold, or the enemy stilled Jesse Brown's heart forever." The men involved in the rescue attempt cannot forget this haunting event.

With the exception of Jesse Brown, Tooker knew each person he writes about; for that reason, he is able to bring his own insights into play. Thus, he conveys to his readers not only the details of the incidents, but also the victims' thought processes and emotional experiences.

Photographs scattered throughout the book complement the stories, imbuing them with realism and personality. They capture the camaraderie and dedication exemplified by these men throughout their careers.

The book is heavy with emotion, evoking laughter in one chapter, disbelief in the next, and tears in yet another. Obviously not a scholarly study, *The Second-Luckiest Pilot* concerns itself with people and emotions rather than wars and politics. Anyone who appreciates the dangers of military aviation should read this delightful book and be prepared for an unforgettable, touching experience.

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The Ultimate Terrorist by Jessica Stern. Harvard University Press (http://www.hup.harvard.edu), 79 Garden Street, Cambridge, Massachusetts 02138, 1999, 214 pages, $24.00 (cloth).

This book immediately catches the reader's attention with a sobering fictional vignette that portrays the effect of a small, one-kiloton nuclear device detonated in New York City. The device would kill thousands and devastate the infrastructure for miles. Stern's book continues in an orderly overview of nearly every conceivable weapon-of-mass-destruction (WMD) issue in today's world. She explores the employment of chemical, biological, radiological, or nuclear weapons by terrorists against the United States. She finishes her work with a reasonable but brief list of recommendations on how the United States should proceed if it is to thwart the efforts of "the ultimate terrorist." This book is a superb primer for any individual who is serious about wanting to understand this emerging threat—it is factual, compelling, and easy to read.

Starting with a brief history of terrorism dating back to the first century zealot, Sicarrii, Stern explains how some consider terrorism moral while it is repugnant to others. This contrasting of ideals provides a deeper understanding for the reader. Stern does an excellent job in describing why the use of WMD is more attractive than ever before to the modern terrorist. She makes a particularly sobering point—one terrorist may be all it takes to carry out an effective and devastating WMD event in the United States. Stern makes good use of three recent situations—the Aum Shinrikyo cult, the relative ease of obtaining WMD in the former-Soviet states, and the ongoing issue of WMD in Iraq—and builds a solid basis for her conclusion and recommendations.

Criticisms, though minor indeed, are that a reader well versed with WMD issues might find it a bit too basic and repetitious. On the other hand, the book is an overview, and the repetition provides positive reinforcement during the learning process to the nascent student of WMD terrorism. Additionally, Stern's remarks regarding funding and missile defense might seem to be confusing—if not incorrect.

For example, Stern's point that the United States needs to put more funding toward deterring the threat of WMD terrorism is well taken, but her belief that building five fewer Stealth bombers would save an estimated $10 billion is somewhat of a non sequitur. Currently, there are no plans to build additional Stealth bombers. Perhaps a better comparison would be the cost savings resulting from another round of military base closings against the proposed cost of a nationwide antiterrorism program.

Additionally, her belief that "WMD terrorists will probably not use ballistic missiles" is likely correct, but her inference that the current administration and the Department of Defense have a misguided emphasis toward ballistic-missile defense is somewhat off the mark. Obviously, the current president's proposal for a missile defense system targets "rogue nations" such as North Korea and Iraq—not terrorists. In reality, both a missile-defense system and a robust antiterrorism program are necessary.

In addition to being a superb overview of many of the WMD threats facing our nation, the 33 pages of citations fortify the credibility of the many interesting vignettes Stern uses. Readers wanting to do more advanced study into this subject will certainly find the references a rich source of material.

The Ultimate Terrorist is recommended reading for both the beginner who needs a good introduction to the current WMD threat as well as the more seasoned reader for its detailed citations.

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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. Unless otherwise indicated, the reviews have been written by an APJ *staff member.*

Intelligence and the War against Japan: Britain, America and the Politics of Secret Service by Richard J. Aldrich. Cambridge University Press (http://www.cup.org), 40 West 20th Street, New York, New York 10011-4221, 2000, 524 pages, $34.95.

Using recently declassified documents from American and British archives, Richard Aldrich looks at Anglo-American secret-service activities against the Japanese during World War II in the Indian and Chinese theaters. He quickly touches on the pre–Pearl Harbor years from the British and American perspectives, refuting the claim that Britain did not warn the United States about the Japanese plans to attack Pearl Harbor. He divides the Far East into four areas: India, whose citizens resented the strong British colonial presence; China, involved in an internal three-way struggle in addition to the war with Japan; the Southwest Pacific, isolated from the secret services by General MacArthur; and Southeast Asia. Aldrich focuses on how the secret services worked in India and China, setting up overlapping divisions and units. *Intelligence and the War against Japan* is an excellent choice for anyone who wants to understand the byzantine workings of the American and British secret-service elements in India and China.

Defending America: The Case for Limited National Missile Defense by James M. Lindsay and Michael E. O'Hanlon. Brookings Institution Press (http://www.brook.edu/press/press_hp.htm), 1775 Massachusetts Avenue NW, Washington, D.C. 20036-2188, 2001, 200 pages, $24.95.

Few current defense topics spark as much controversy as national missile defense (NMD). Lindsay and O'Hanlon cut through the rhetoric of both the left and the right to give us the unadulterated facts about this important issue. They meticulously analyze current and future ballistic-missile threats at all levels, from the future of the Russian ICBM arsenal down to Iraq's potential for deploying ICBMs in the next 20 years. This analysis includes discussion of the types of weapons of mass destruction (WMD) practically deployable on missiles likely to be used by so-called rogue states. The authors also eloquently scrutinize the likelihood of alternative methods of WMD employment by these states (e.g., they expose the myth of the "suitcase nuke" as an exaggeration). After concluding that the threat of ICBM proliferation to nations hostile to US interests is limited but real, Lindsay and O'Hanlon proceed to explore the political implications of various strategies for NMD and theater missile defense (TMD), especially with respect to US-Sino-Russian relations. *Defending America* also examines the status of the technologies required to make TMD and NMD realities, again parting the veil of rhetoric that has surrounded the reporting of missile-defense tests. The book's appendices contain the full text of the ABM Treaty and pertinent excerpts from the Rumsfeld Commission report and national intelligence estimates. This important book provides the most balanced treatment of this difficult topic to date. □

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OUR CONTRIBUTORS

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