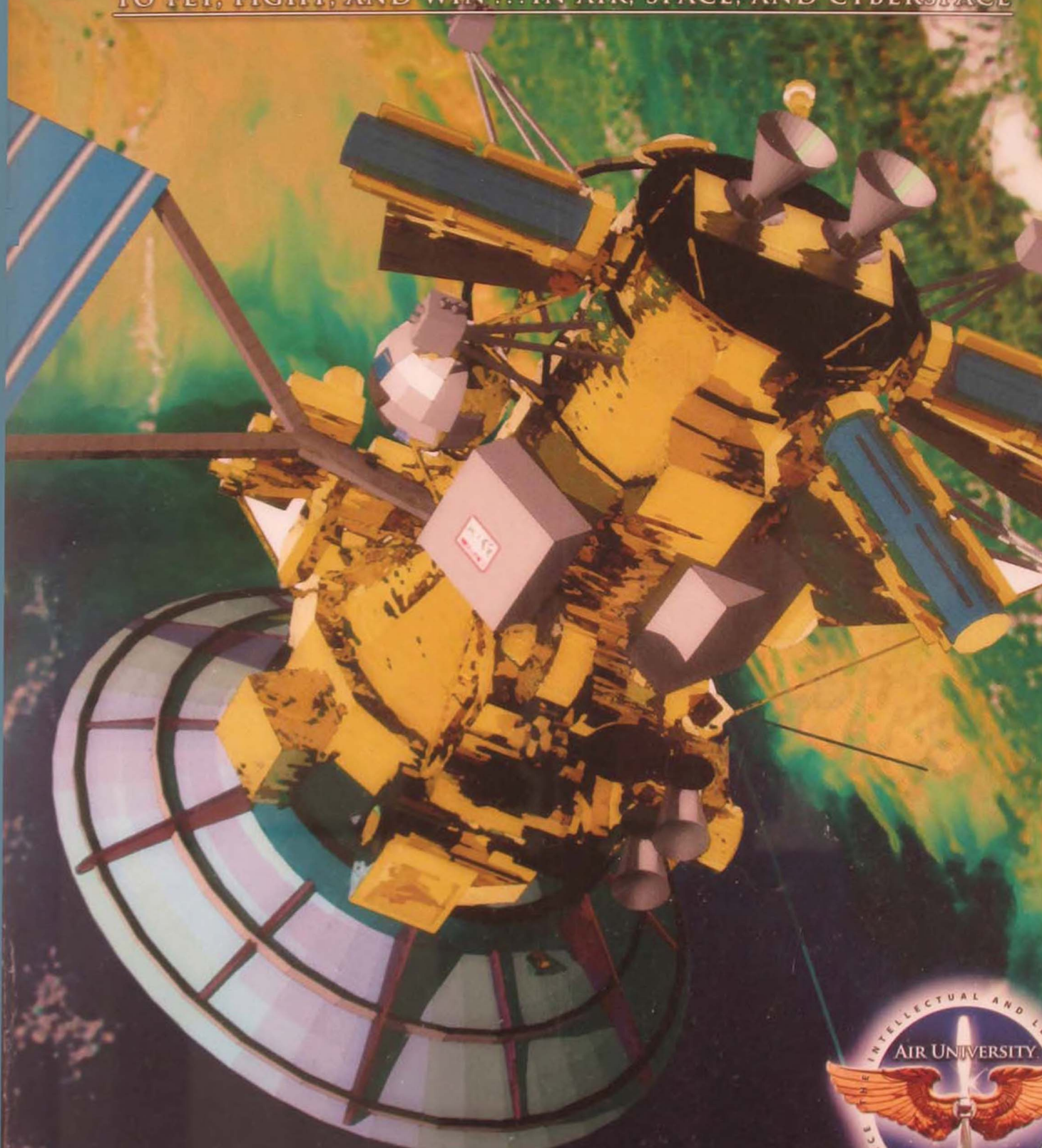


AIR & SPACE POWER

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Toward a New Deterrent

Analysis and Recommendations for the Commission on the Strategic Posture of the United States

BY THE NEW DETERRENT WORKING GROUP*

INTRODUCTION BY VADM ROBERT R. MONROE, USN, RETIRED



Introduction

America's nuclear deterrent, which has kept us safe for over 60 years, is in grave danger of failing. Our nuclear strategy—still that of the Cold War—has little relevance to today's principal adversaries and threats. The nuclear weapons that make up our stockpile are also

virtually irrelevant and well beyond the end of their design life. Our experienced personnel are retiring, and our nuclear facilities are antique and deteriorated.

Secretary of Defense Robert Gates recently stated that “no one has designed a new nuclear weapon in the United States since the 1980s, and no one has built a new one since the early 1990s. . . . The United States is the only declared nuclear power that is neither modernizing its nuclear arsenal nor has the capability to produce a new nuclear warhead.”¹ To make matters worse, if we start a modernization program immediately, pursue it vigorously, and resume essential underground testing, it will still take about two decades before we could begin replacing our stockpile. Thus, the relevant issue is not whether our nuclear deterrent is safe, secure, and reliable today, but what actions we must take today to ensure its effectiveness in 20 years, in an uncertain and dangerous world.

After years of denying funding for nuclear initiatives, Congress last year created a 12-person Congressional Commission on the Strategic Posture of the United States, chaired by Bill Perry, former secretary of defense, and co-chaired by Jim Schlesinger, former secretary

*The New Deterrent Working Group—an informal coalition of experts in national security and nuclear weapons, sponsored by the Center for Security Policy—seeks to inform lawmakers and the public about the need for the United States to maintain a credible and an effective nuclear deterrent.

of defense, secretary of energy, and director of central intelligence. The commission started work in summer 2008, delivered an interim report in December 2008, and will submit a final report in spring 2009.

Quite separately, in early 2008 the New Deterrent Working Group, an informal coalition of experts in national security and nuclear weapons, sponsored by the Center for Security Policy, became concerned that the commission would have only two “nuclear programs” to consider: one the unannounced “nuclear freeze” the United States has followed during the 18 years since the Cold War ended, and the other the “world without nuclear weapons” initiative recommended by Perry, George Shultz, Henry Kissinger, and Sam Nunn for the past two years. Both programs would lead to unilateral nuclear disarmament by the United States—the first unintentionally, the second intentionally. To outline a third program, that of a strong nuclear deterrent, the working group prepared the following remarks and provided them to the commission in the summer of 2008.

America's Failing Nuclear Deterrent

The United States is at a critical moment in its history. To an extent largely unknown to the American people and even to many US policy makers, the nuclear deterrent that has served as the backbone of our defense posture for 50 years is becoming obsolete, unreliable, and potentially ineffective. This is the direct and predictable result of the practice of essentially “freezing” our nuclear-weapons strategy and stockpile over the past 18 years since the end of the Cold War.

Unfortunately, we may freeze weapons policies and modernization programs, but our doing so does not preclude changes to the arsenal itself. To the contrary, such a nuclear freeze serves to ensure that the combined effects of aging and changing strategic circumstances go *unaddressed*, resulting in an inexorable reduction in capability and relevance to the nation's deterrent requirements. We have even refrained from making much-needed

improvements to the stockpile's safety, security, and control rather than undertaking new designs that we could validate only by underground testing.

The problem is not confined to the weapons themselves. At the nuclear labs and plants operated by the National Nuclear Security Administration, the human and physical infrastructure essential to our deterrent is in real jeopardy. There is virtually no one left in that once-great industrial enterprise who has ever designed, tested, or produced a nuclear weapon. Meanwhile, the Defense Department has downgraded the importance and value of nuclear weapons across the board. The investigation that followed a recent, unauthorized B-52 flight with six full-up nuclear weapons revealed a widespread lack of focused military attention to nuclear procedures and policy.² In short, America is years late in transforming its nuclear strategy and stockpile from a Cold War orientation to one focused on today's adversaries—as well as tomorrow's—and to the different and far more distributed threats they represent.

The Nuclear Threats We Face

While America has largely neglected its nuclear arsenal and associated weapons complex for nearly two decades, others have taken a very different approach. Notably, Russia and China are making significant investments in the modernization of their nuclear forces. We have reason to believe that some of these will involve highly advanced, specialized-effects nuclear weapons (known as “fourth generation” weapons).

In addition, nuclear-weapons technology has proliferated of late to a number of rogue states. There is reason to fear that one or more of these nations may be willing to help terrorist organizations acquire nuclear weapons—and perhaps use them.

In short, more states today have active (if, in some cases, still-covert) nuclear-weapons programs than ever before. Apart from the United States, virtually all of these countries—compris-

ing roughly half the world's population—are working to enhance their nuclear capabilities.

Like it or not, tens of thousands of nuclear arms exist around the world, and neither they nor the know-how and capability to make them are going to disappear. Knowledge, once gained, cannot be washed away by treaties—let alone by unilateral US nuclear disarmament. For generations to come, our lives and civilization will depend on effectively countering these threats.

The Failure of Nonproliferation

The accelerating proliferation of nuclear-weapons technology in places like Pakistan, North Korea, Iran, and Syria represents an indictment of the effort to prevent such a danger via arms control. The global nonproliferation regime has been steadily declining for many years, and it has now reached the point of impotence. The last Nonproliferation Treaty Review Conference, five years in preparation, achieved nothing. Non-nuclear-weapon states that have signed the treaty increasingly flout their international obligations by pursuing clandestine weapons programs under the guise of civilian power activities.

The success of such rogue states threatens to trigger regional proliferation cascades, which could soon become global. Some of our allies and friends who formerly relied on the US “nuclear umbrella” for protection could feel constrained to join these proliferators, in part as a result of their loss of confidence in our outdated arsenal and our ability and will to use it. This cascade might well lead to a world characterized by frequent use of nuclear weapons, from which there is no return.

To avoid such a frightening prospect, the United States must both eliminate questions about the credibility of its deterrent and adopt a more effective approach to nonproliferation. If we are to have any chance of fulfilling these two roles and averting an unimaginably dangerous world, we must change our policies and programs significantly.

A Program for Recovery

America must reestablish the posture of nuclear strength that saved the West—and the world—during the half-century-long Cold War. During those decades, our nuclear posture was also the key factor in preventing renewed outbreaks of global conventional wars and the terrible costs they entail. To provide a similar insurance policy for the future, we must undertake *at a minimum* the following eight critical steps:

Immediate Actions

As a matter of great urgency, two initiatives are in order: First, the president must issue a clear, firm statement to the effect that a credible, safe, secure, and reliable nuclear deterrent is essential to America's security and that we will maintain it with highest priority.

Second, we must reestablish the Reliable Replacement Warhead as a vital program in order to prevent the loss of core nuclear-weapon capabilities in the National Nuclear Security Administration's labs and plants, and to provide the optimum replacement approach for those overage weapons in our stockpile that we will need for decades to come. This warhead provides our only current opportunity to recapture the experienced, integrated management expertise necessary to guide new nuclear weapons from concept definition to service introduction. Without it, this invaluable capability, for all intents and purposes, will be lost.

National Debate

The issue of deterring nuclear attack, despite its potentially existential importance to millions of Americans, has scarcely—if ever—been rigorously discussed in a highly visible way since the Cold War ended. If the United States wishes to maintain an effective nuclear deterrent, it will need a strong consensus, reflected in solid bipartisan majorities, sustainable over the decades required to implement that program. We can assure such majorities only by informing the American people and enlisting their support.

Toward that end, we must initiate a thoughtful national debate on (1) the nature of deterrence in this new age, (2) its role in US foreign policy and national security strategy, (3) the role of nuclear weapons in this strategy, and (4) the characteristics and approximate numbers of nuclear weapons needed to provide effective deterrence today and in the future.

Advanced Technology

We must reestablish a continuing, robust research, development, test, and evaluation program. Currently, we should focus on cutting-edge technology in research, exploratory development, and accelerated development across dozens of fields relevant to advanced designs for nuclear weapons.

This scientific approach is absolutely essential if the United States desires to understand the possibilities—for us and for potential adversaries—in physics, weapons effects, materials, explosives, diagnostics, and so forth. Verifiable evidence indicates that our peer adversaries are working very hard to develop new and more usable systems in order to exert leverage over the United States and further their strategic interests. If we allow them to continue unchallenged, we may lose our world leadership position. At the very least, without a corresponding US research and development effort, America's deterrent cannot possibly remain commensurate with the emerging nuclear threat.

Military Preparedness

The Defense Department must recommit to the need to maintain, *for the foreseeable future*, both an appropriate nuclear arsenal and the competencies necessary to field and exercise it. Doing so will entail preserving America's existing nuclear-weapons platforms and capabilities as well as planning, budgeting, and performing the long-range actions needed to contend with an uncertain nuclear future.

Specifically, the armed services must take the following steps:

1. Establish military requirements for new nuclear weapons that will credibly

deter current and future adversaries and threats. These counterproliferation weapons should have low yield, great accuracy, and intrinsic security features to prevent unauthorized use. They must also produce reduced collateral damage and minimal residual radiation yet destroy deep underground bunkers as well as neutralize biological and chemical agents.

2. Plan, program, and budget for follow-on strategic submarines, sea- and land-based intercontinental-range ballistic missiles, bombers, cruise missiles, and so forth.
3. Increase emphasis on nuclear-specialist personnel, nuclear strategy and tactics, and nuclear exercises.
4. Work as a closely integrated team with the Department of Energy and the National Nuclear Security Administration to revitalize and transform our nuclear-weapons infrastructure. In addition, the military's insights and expertise will prove vital to informing the aforementioned national debate.

New Nuclear Weapons

We must adopt anew a national commitment to design, test, and produce, on a continuing basis, new nuclear weapons. We can maintain expertise in these "performance arts" only by engaging in them. Simply put, the extreme complexity and hazards of the work are such that there is no substitute for competent, integrated management, which, in turn, requires continuing, hands-on experience. Although the throughput in terms of numbers of weapons may amount to tens per year (rather than the hundreds routinely in the pipeline at the height of the Cold War years), we can realize no credible deterrent over time without an active pipeline that includes a "hot" production line.

Nuclear Infrastructure

The United States must immediately commence the comprehensive modernization of

its nuclear-weapons infrastructure. We have debated the measures necessary to do so for years and have proposed plan after plan. We have *done* little, however. Meanwhile, our facilities become ever-more antiquated, dilapidated, and unsafe. We most urgently need a modern fabrication facility for the "pits," the heart of a warhead, with adequate flexibility to produce several designs simultaneously and a throughput capacity sufficient to permit replacement of the stockpile's obsolescent weapons at an acceptable rate.

Effects of Nuclear Weapons

We must revitalize the Pentagon's national research and development program for examining the effects of nuclear weapons. The survivability of American weapons systems (conventional and nuclear); our command, control, communications, and computer systems; and our intelligence, surveillance, and reconnaissance systems against a wide range of nuclear-weapons effects depends on our successfully hardening and testing these systems. Good design and simulator testing can help, but actual underground nuclear testing is essential in order to assure survivability. Such test and evaluation is also indispensable for assessing and correcting the vulnerabilities of critical parts of the country's *civil* infrastructure against such threats as electromagnetic pulse.

Prevention of Proliferation

Finally, America must undertake a sweeping course correction with respect to countering nuclear proliferation. Full effectiveness, of course, demands changes in the world's approach to nonproliferation—not just this country's. Still, any improvement in the utility of global efforts to prevent the spread of nuclear-weapons technology and capabilities remains unlikely unless and until the United States adopts a more practical strategy for contending with this threat.

Over the last several decades, the Nonproliferation Treaty has been distorted by the preoccupation of its stewards with promoting nuclear *disarmament* rather than with preventing proliferation. Apart from the steady ero-

sion of the US arsenal, this fixation has neither resulted in the appreciable diminution of existing inventories of nuclear weapons around the world nor prevented a mushrooming of proliferation to other states.

With some 188 signatories (out of about 193 nations in the world), the 40-year-old Nonproliferation Treaty, the accepted cornerstone of the global nonproliferation regime, provides the basis for our efforts. If we wish the treaty actually to prove helpful, however, we must refocus attention and effort on its *actual language and intent*.

The Nonproliferation Treaty's purpose is to prevent proliferation, codifying the right of five nations—the permanent members of the United Nations Security Council—to be nuclear-weapons states and requiring all other signatories to remain non-nuclear-weapons states. Each of the 188 signatory states has voluntarily accepted this inequality and endorsed a treaty that places no restrictions whatsoever on the five nuclear-weapons states as regards designing, testing, producing, and deploying nuclear weapons.

Given the aforementioned hard strategic realities, the United States should redirect its nonproliferation policy along the following lines: (1) emphasize that nonproliferation requires enforcement; (2) urge that the five nuclear-weapons states accept this implicit responsibility; (3) until all five agree, be willing to act unilaterally, or in coalition, as a default action to prevent proliferation; and (4) regularly modernize our stockpile to keep it effective, safe, secure, reliable, and able to enforce nonproliferation. Without these actions, the remnants of global nonproliferation will inevitably become ever-more irrelevant and ineffectual.

America's Choice: Weakness or Strength?

In conclusion, the nation must decide between weakness and strength *now*. Adopting the former by continuing the 18-year-long post-Cold War status quo can only lead to dangerous, unilateral US nuclear disarmament. We would be ill advised to adopt the

agenda for accelerated dismantling of our nuclear arsenal now promoted as a way to “reinvigorate” the moribund nonproliferation regime. Champions of the latter idea propose, among other things, that we (1) cut our nuclear stockpile below its already vastly reduced level, (2) commit irrevocably (by treaty) to forgo necessary testing, and (3) refrain from all essential nuclear modernization or replacement activities. They believe that doing so will cause our adversaries to reduce their arsenals and motivate the entire world eventually to abandon nuclear weapons.³

Regrettably, there is no basis in past experience or in logic for these lofty hopes. To the contrary, history has clearly shown that unilateral US reductions, far from causing a similar response, actually stimulate nuclear buildups by adversaries. Second, as a practical matter, it would be impossible to verify the elimination of all nuclear weapons. Third, reduced numbers encourage first strikes designed to disarm. Fourth, and most importantly, the ultimate goal of a world without nuclear arms is not only unachievable but also a utopian delusion. Nuclear weapons cannot be “uninvented.” Pursuit of such a goal by the United States

would constitute a formula for the further evisceration of America’s deterrent and for a world in which only the most dangerous states and perhaps nonstate actors have these weapons—a world of unimaginable horror and chaos.

For these reasons, the United States has no real choice other than adopt a policy of peace through abiding nuclear strength. The foregoing eight measures will assure that such strength continues far into the future and, with it, will enhance the prospects for a world free of either nuclear war or global conventional conflagrations. □

Notes

1. Secretary of Defense Robert M. Gates (speech to the Carnegie Endowment for International Peace, Washington, DC, 28 October 2008), <http://www.defenselink.mil/speeches/speech.aspx?speechid=1305>.

2. See Defense Science Board Permanent Task Force on Nuclear Weapons Surety, *Report on the Unauthorized Movement of Nuclear Weapons* (Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, February 2008).

3. George P. Schultz et al., “Toward a Nuclear-Free World.” *Wall Street Journal Online*, 15 January 2008. http://online.wsj.com/public/article_print/SB120036422673589947.html.

Air Force communications, ISR [intelligence, surveillance, and reconnaissance], and geo-positioning satellites are the bedrock of the Joint Team’s ability to find, fix, target, assess, communicate, and navigate.

—Air Force Posture Statement 2008

The Use of Airpower in Combating Terrorism in Iraq*

STAFF MAJ GEN QAA'ID K. M. AL-KHUZAA'I, IRAQI AIR FORCE



NATIONS HAVE USED their air forces to fight conventional wars and combat insurgents. Most air force planning, training, and preparation have depended upon a conventional view of warfare, and air forces have proven effective in such conflict. A nation with a strong, effective air force would likely win battles if it properly employed that force during planning, target selection, and execution of combat roles such as strategic bombing, air superiority, and close

air support (CAS), as well as in support operations such as airlift, surveillance, and reconnaissance. Air forces have used various types of aircraft, satellites, and other platforms to perform these conventional roles, and powerful nations have become extremely skillful at using conventional airpower. For example, the United States military has distinguished itself by producing decisive effects by means of air and space power at the desired time and place in the conventional wars it has fought.

*Editor's note: This article is an abridged version of the one published in the Fall 2008 issue of *Air and Space Power Journal-Arabic*, available at <http://www.airpower.maxwell.af.mil/apjinternational/apj-a/2008/fal08/alkhizal.pdf>.

Counterinsurgency (COIN) warfare, however, is another matter altogether. According to Dr. Thomas Searle, "We are very good at conventional warfare. Too bad that isn't enough any more. In Iraq and Afghanistan, the US military quickly defeated enemy conventional military forces and brought down hostile regimes. Afterward, however, counterinsurgency operations did not fare so well."¹ So the US Air Force (USAF) found itself unprepared for this new phenomenon, known variously as terrorism, guerrilla warfare, or COIN—depending upon the various labels/euphemisms given it by politicians, military people, or others. This type of warfare differs from that which the United States and other countries have encountered in such places as Vietnam.

Those of us in the old Iraqi Army experienced COIN warfare in northern Iraq, where a dictatorial regime attempted to put down Kurdish rebels fighting for their legitimate rights. The Kurds fought honorably and targeted those who opposed them—that is, the Iraqi Army. They did not hurt innocent people or use the cowardly tactics of today's terrorists. In that struggle, the Iraqi Air Force (IqAF) undertook reconnaissance and CAS missions, but Saddam Hussein sent weapons of mass destruction against the Kurdish town of Halabja and other places in Iraq. Therefore, we should not be surprised by the practices of his remaining thugs who now use the vilest and most cowardly means available to kill the innocent.

Terrorism

In the last few years of the twentieth century, new enemies appeared—those who threaten civilization and seek to spread terror and commit genocide. Lacking a particular objective or clear ideology, they exploit people whose primary concern is making money. This much is clear to us, based on what these enemies have done in Iraq. They have an Islamic identity and use Islam to justify their actions, yet they besmirch this faith—the religion of love and peaceful coexistence, which abides by the tenet "There is no coercion in religion."

These enemies differ from those involved in the insurgency and rebellion movements that emerged after World War II—"limited wars" in which air forces participated very effectively. Communist rebels employed guerrilla warfare and insurgencies—old forms of conflict—whether their ideology was Communism, Marxism-Leninism, or Maoism. Superpowers openly backed and sponsored these generally well-organized and well-run rebellions, but the new enemy in Iraq and Afghanistan consists of a group of criminals, thieves, rebels, and terrorists similar to those in Colombia and the Philippines. Although several definitions and names have emerged for terrorism, the variety found in Iraq has proven distinctive. I regard as terrorists those who adopt abominable and backward sectarian ideologies, terrify and kill innocent civilians, destroy civilization, and create instability, havoc, chaos, and lawlessness in order to gain money and privileges.

This terrorism in Iraq has enjoyed secret support from a number of nations and well-known people, including non-Arab regional powers as well as Arab states and personalities, in an attempt to export terrorists to places outside their own borders. Tellingly, we hear that a person who kills innocents and stirs up instability in neighboring Arab or non-Arab countries is a terrorist but that one who does the same thing in Iraq is a mujahid. Other neighboring countries have additional motives, such as their fear of emerging democratic trends in the Middle East. The United States and its allies promoted democracy in that region after suffering terrorist attacks of the sort espoused by the rogue regimes of Saddam Hussein and the Taliban. As for those who lost their absolute authority and illicit privileges after the fall of these regimes, they aim to tear apart the fabric of the state by any means possible, including the manipulation of simple criminals who only want to earn money, regardless of its source, and who take refuge among ordinary citizens and then target them. Elusive as fish in the water, these terrorists constantly change their tactics, making them difficult to catch, but they lack discipline and are less proficient with advanced weapons

than many Cold War-era rebels. For the most part, terrorists in Iraq fall into four categories:

1. Members of al-Qaeda—people who have adopted vile, heretical ideas and have veiled themselves as Islamists.
2. Baathists—Saddamists who lost their former privileges and power.
3. Members of the Islamic militias who call themselves “Shiite Islamists” and receive support from Iran and some Arab nations interested in keeping America involved in a guerrilla war inside Iraq. They may also fear the growing trend of democracy in that country, considering that form of government a threat to their existence, future, and position.
4. Terrorists pushed into Iraq by other states under the pretext of participating in a jihad but actually exported to remove the threat they represent to those nations.

Events Following 11 September 2001

The terrorist attacks of 11 September 2001 in the United States alerted the world to a new type of terrorist aggression that will stop at nothing and can strike anywhere. Shocked by this horrifying criminal deed, the world realized that no government could continue to defend the rogue regimes that had supported terrorism, particularly those of Saddam and the Taliban. On the basis of these developments, the United States proceeded to mobilize the world’s media and undertake a military response to bring down these foes, after which Libya and North Korea softened their stances. The US military encountered no difficulty in bringing down Saddam, aided by the discontent of the Iraqi people, who had no will to fight and no desire to sacrifice themselves for a lost cause and a government that neither represented nor appealed to them. Because even the Baathists lacked conviction, we saw no well-known commanders fighting bravely and dying in battle; indeed, not a single

prominent military commander fell in battle alongside his unit. Everybody thought of running away because no one believed in Saddam, who in fact was one of the first to flee, fearful of dying at the gates of Baghdad or at one of his palaces. For this reason, Iraq presented an easy target for the US military. During this battle, the USAF undertook many aerial missions, including strategic bombing, air strikes, air superiority, CAS, and other operations in coordination with ground forces. Transport planes effectively provided air bridges for moving units and carrying out other logistical missions. Other aircraft engaged in all types of reconnaissance.

The USAF achieved excellent results, bringing down Saddam and the Taliban, but a new phase emerged that featured insurgency operations, terrorism, and instability aimed at preventing the restoration of government authority. The paucity of intelligence, inaccuracy of target selection, and general ambiguity of this operational environment have created problems for air and space forces in Iraq. Who are the terrorists? What are their objectives? Their practice of blending in with civilians complicates efforts to locate and deal with them, particularly for the USAF—not that it has performed poorly; it simply lacks a clear vision of the battles being fought. This problem has led to many mistakes and has contributed to a negative psychological reaction on the part of the news media. In short, the situation in Iraq requires particular weapons; accurate, reliable intelligence; and ground/air coordination on all levels, particularly the lower ones, in addition to communications and liaison capabilities.

A lack of clear objectives, inadequate doctrine, and insufficient proficiency in carrying out necessary counterterrorism missions limits airpower’s role in Iraq. Military forces have a problem figuring out how air and space power can contribute to operations that do not involve a major battle. Airpower found itself confined to air transport, maintenance of air bridges, reconnaissance, and other supporting roles. Helicopters, used extensively in Iraq, suffered heavy losses because they fly at low altitudes, presenting an easy target for ter-

rorists deployed in hidden areas hard to discern from the air. However, aircraft did execute a number of effective missions, and remote-controlled planes undertook reconnaissance and bombardment of selected targets, especially in battles involving Najaf as well as Fallujah and other Anbar areas. Nevertheless, served poorly by an inadequate intelligence apparatus and inaccurate target selection, the USAF mistakenly bombed many civilian areas. Later on, airpower's role began to expand in terms of involvement in and adaptation to battles, and intelligence began to improve. The air strike against the criminal al-Qaeda leader Abu Musab al-Zarqawi represented a crowning achievement of this development and coordination; furthermore, it reflected noticeable changes in the use of helicopters and remote-controlled aircraft at night.

Terrorists and Their Methods

By 2007 the terrorists' objectives had become abundantly clear. On the whole, they wanted to create instability by attacking oil installations, oil pipelines, electrical power stations / power lines, and the country's infrastructure in general. They also attacked civilians and residential areas with car bombs, explosive belts, and booby traps, assassinating persons randomly or according to their names or tribal affiliations. In addition, they struck army camps and air bases with mortars and Katyusha rockets, attacked convoys moving along highways, and set up false checkpoints. Moreover, these terrorists, who also deal in the drug trade that operates in the region, undertook an armed rebellion in Fallujah and Najaf, seeking protection in the midst of civilians. Currently, we see the same activities in the northern province of Mosul and the southern province of Basra, as well as in the relatively inaccessible mountainous areas of Afghanistan.

The Role of Intelligence in Combating Terrorism

The actions of insurgents differ in five substantial ways from those of combatants engaged

in conventional war: "time, civilian-military 'duality,' tactics, logistics, and centers of gravity."² In Iraq, in particular, terrorism differs from that seen elsewhere by virtue of the despicable actions perpetrated, the targets attacked, the terrorists' melting away among civilians, and their forcible use of civilian houses during operations or skirmishes. These factors underscore the importance of assembling accurate intelligence, and airpower offers an important means of such information gathering. Additionally, reliable intelligence enables an air force to perform its missions effectively with the necessary accuracy in terms of time and place. No planning for any military operation—whether in the air, on land, or at sea—can be successful without exact information concerning the enemy, terrain, and so forth. When we combat terrorism, intelligence increases in importance. In my opinion, it becomes three-quarters of the battle. Without proper targeting data, the army and its firepower stumble, accomplishing nothing; people die; and many resources go to waste. The right information, however, allows us to use less force and effort to conduct decisive attacks against terrorist targets—and suffer fewer casualties in terms of lives and equipment. Thus, by taking the initiative, we could weaken the morale of terrorists and strengthen that of our forces.

Fixed-wing aircraft, helicopters, remote-controlled aircraft, satellites, and balloons can play effective roles in gathering information by means of surveillance and reconnaissance. In spite of its small number of aircraft and limited capability, the IqAF has contributed to this effort by undertaking praiseworthy reconnaissance missions involving the detection and pursuit of oil smugglers, thereby helping ground forces realize their objectives. However, we have not yet attained the level to which we aspire in terms of gathering generally accurate information and intelligence. This is true not only of the Iraqis but also of the coalition forces throughout Iraq. For example, many times Iraqi and coalition forces have gone after targets and either found nothing or arrived too late—and our aircraft have erroneously hit the wrong targets. In the meantime, terrorists strike Baghdad's Green

Zone, the center of government and location of foreign embassies, hitting important headquarters and bases with relative impunity. They assail these targets from nearby areas within shooting range of coalition and Iraqi forces, despite our balloons and other means of detection. So our monitoring system remains ineffective, and our intelligence apparatus unsuccessful, insufficient, inaccurate, and unable to ascertain and combat the methods of the terrorists. Clearly, all parties should address this dilemma in terms of means, methods, personnel, management, command, and completion of missions without wasting time and effort.

Despite the aforementioned circumstances, we have seen a fair amount of progress in both American and Iraqi intelligence, in the methods utilized by coalition forces, and in their cooperation with air forces to eliminate al-Zarqawi and other terrorist leaders. Similarly, the IqAF has benefited from US military aid and training in modern US reconnaissance aircraft capable of sending information and aerial images—night and day, under various weather conditions—to ground stations, units, and planes that conduct air strikes. Furthermore, we are encouraged by the willingness of individuals in “awakening councils” throughout Baghdad and the provinces to inform Iraqi and coalition forces about the terrorists’ movements. Nevertheless, much work remains in terms of enhancing the capabilities of coalition forces and the IqAF, improving training, and clarifying doctrine.

Future Horizons

Maj Kenneth Beebe, USAF, notes that “the lack of doctrine has nothing to do with the lack of airpower’s and space power’s applicability [to COIN but that] decisions on the types of weapons systems procured can and should be influenced by COIN doctrine.”³ Certainly airpower plays important roles, including surveillance, reconnaissance, CAS, and supporting communications. But these roles will not attain the desired performance level without clear doctrine, which requires distilling lessons from experience, thoroughly

examining them, incorporating them into training through special counterterrorism programs, conducting exercises, writing pamphlets and publications, and tapping the experience of senior field commanders who have combated terrorism and experienced all of its features. So we have to revise the training system and give sufficient attention to counterterrorism operations in terms of practical exercises and theoretical studies that include the methods, procedures, and art of conducting battle movements. Importantly, we must prepare the entire force because the new Iraqi military does not yet possess sufficient expertise in the type of warfare now waged in Iraq.

Air Force Doctrine for Combating Terrorism

After examining terrorist methods, we should know what we need in the air forces of Iraq, Afghanistan, and the coalition—or in any other air force expected to combat terrorism. The first requirement that comes to mind—selecting the necessary weapon systems—derives from adopting a counterterrorism doctrine and then implementing it. If we rule out the role of air defense at this stage, particularly for the IqAF, we will tend to acquire aircraft meant to provide CAS, including not only helicopters but also reconnaissance and remote-controlled planes equipped with systems for communicating with ground units. Aircraft would operate in accordance with an easy, automated, well-known system and would require joint planning and coordination with land units at multiple levels—that is, with battalions as well as higher commands. As Dr. Searle reasons, “Because of the decentralized nature of counterterrorism operations, we need to push air-liaison elements (real air planners, not just enlisted tactical air controllers) down to lower ground headquarters.”⁴ This policy would apply to both the USAF and IqAF. Once both air forces effectively integrate with each other via command and control systems and possess communications gear suited to controlling and guiding aircraft from the ground

or from helicopters, all parties will need to adhere to the new operating doctrine.

Coordination with US Airpower

We need effective coordination, joint cooperation, and dynamic interaction between the USAF and the IqAF on the one hand, and between the IqAF and US Army aviation on the other. We must do this in order to provide the necessary facilities for conducting battles, exchanging intelligence, conducting domestic and foreign training, providing logistical support, and performing search and rescue operations. Since the IqAF still lacks these capabilities, it is not fully effective at combating terrorism. Coordination is essential because we are all fighting the same worldwide battle against a common enemy—international terrorism.

Coordination among Iraqi Forces

The IqAF needs more effective coordination and liaison at all levels with forces that specialize in combating terrorism, as well as with ground forces. More precisely, we require forces capable of moving quickly after receiving accurate intelligence, utilizing helicopters or ground vehicles, depending on the circumstances. This calls for coordination as well as the use of advanced aerial equipment and wireless communication. For example, to protect the pipeline between Kirkuk and Mosul, we need to station well-trained forces at a nearby base and employ reconnaissance planes and other sensors to patrol and monitor this area. Such platforms would send confirmed information about terrorist movements to ground forces, who would then conduct a quick analysis and relay it to troops located at the aforementioned base; they in turn would fly to the suspected locations via helicopter to attack the terrorists, killing them if they resist or attempt to flee.

Raising another subject worth mentioning from the viewpoint of individual safety and se-

curity, I believe that my experience in Iraq confirms that the military forces, police, and guards who protect oil pipelines and other vital installations should not come from the local population or area. The fact that they are well known to others could subject them and their families to threats and even death, a fate that has befallen many people. Additionally, despite the large numbers of security forces assigned and the small enemy presence, certain local police forces and army soldiers in various sectors have clearly proven ineffective—witness the destruction of installations, pipelines, and electrical power lines as well as the poor performance of police forces in the provinces of al-Diwaniyah, Basra, and other areas in Iraq.

Role of Air and Space Forces in Combating Terrorism

Air and space forces can effectively combat terrorism if they have modern technology and very advanced aircraft flown by expert, well-trained pilots. Examples include conducting reconnaissance and air strikes with remote-controlled aircraft equipped with night vision equipment and precise aiming instruments capable of locating the target, distinguishing it, and accurately hitting it in all types of weather. This would go a long way toward destroying the morale of terrorists. Coalition forces in Iraq have already used these planes. Regarding this matter, Dr. Searle suggests that “we . . . bring our space-based concept down to the counterterrorism level by deploying persistent aerial [intelligence, surveillance, and reconnaissance] platforms that provide similar wide-area coverage focused on the specific signatures of these weapons. The air platforms could take the form of tethered blimps, unmanned aerial vehicles, or manned aircraft. Whatever the system, it would have to provide the location of the enemy weapon that fired.”⁹

We should use light, simply constructed ground-attack aircraft such as T-6s or L-39s. The T-6s, for example, “proved their worth as superb counterinsurgency aircraft in French, British, Portuguese, and South African hands

for decades after World War II. The T-6s were cheap and readily available. Their slow speed and long loiter time made them excellent aircraft for observing artillery fire or for spotting small terrorist bands from the air and marking targets for strike aircraft.⁷⁰ In addition to their good maneuverability and the accurate, modern weapons and targeting systems they carry, such planes are better suited for these missions than are the expensive ground-attack aircraft that fly at supersonic speeds yet require much maintenance and fuel.

These light planes—equipped with navigation and targeting instruments effective during day/night and all weather conditions, weapons such as advanced laser-guided missiles and cannons, and systems enabling contact with ground units—would prove formidable in the fight against terrorists. We need reconnaissance planes able to withstand Iraq's desert climate and able to operate from short, unpaved runways. We also need light, easily maintained turboprop transport aircraft equipped with both side and rear doors and capable of carrying at least 40 soldiers, taking off from short, hastily constructed runways, and functioning under conditions that complex aircraft cannot tolerate.

Light attack helicopters can serve as effective counterterrorism platforms, provided they are maneuverable and can function in unusual environments and weather characteristic of desert and mountain areas. They should feature suitable weaponry and communications systems compatible with those possessed by ground units, sufficient space to transport anti-terrorism forces, and enough mobility/flexibility to concentrate the needed volume of firepower. Furthermore, we must review our methods of using helicopters in Iraq in order to learn from errors that have led to casualties among both coalition forces and civilians.

I have barely touched upon the subject of communications systems, but during my past four years in the new IqAF, working with the USAF, I have seen the importance of communications in command and control as well as in directing fire at the enemy. Moreover, effective command of units and good planning are impossible without a communications system

capable of consolidating control of the air effort in coordination with ground units and antiterrorism forces. We must establish control between units carrying out operations and those conducting air defense. (We envision taking appropriate steps that will soon make the latter completely available in Iraq.) Further, we must emphasize close ties among ground, air, and naval forces via capable liaison officers (something needed in the IqAF and perhaps to some extent in the USAF) and conduct exchanges of such officers with their US counterparts at all levels, offering them special training and determining their role in the counterterrorism fight. Additionally, air controllers, who must become skillful and capable in their work with antiterrorism forces, need training in the system of frontline air control capable of communicating with aircraft and directing them to their targets in the battle arena.

We in the IqAF still suffer from shortages of air bases, logistical support, infrastructure, and personnel. The USAF should help us solve these problems and rapidly build up the IqAF so that it can take the initiative in combating terrorism and relieve the burden on the USAF by assuming many of the missions that it currently performs. Because of the importance of personnel to airpower, we must create innovative mechanisms for encouraging people to volunteer for the IqAF and must use the media to support this effort by conducting an awareness campaign throughout the country. We should establish safe and secure recruiting centers so that we can attract more volunteers who meet the criteria and qualifications specified in our regulations.

Practical and Theoretical Training

We must have joint training with ground and antiterrorism forces, as well as training and cooperation with coalition forces, in order to exchange experiences and benefit from the superior expertise of the USAF in combating terrorism on all levels—from the training of pilots and technical personnel to positions in high command. I believe that IqAF person-

It is important to understand the role of the organization in the process of change. The organization is the primary agent of change, and its actions and decisions are the primary drivers of change. The organization's culture, structure, and processes all influence the change process. Understanding the organization's role in change is essential for developing effective change strategies.

CONCLUSION

The role of the organization in change is a complex and multifaceted one. It is essential for organizations to understand their role in change and to develop effective change strategies that take into account the organization's culture, structure, and processes. This article has explored the role of the organization in change and has provided some suggestions for developing effective change strategies.

Note

1. The concept of organizational change is a complex and multifaceted one. It is essential for organizations to understand their role in change and to develop effective change strategies that take into account the organization's culture, structure, and processes.
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Understanding the role of the organization in change is essential for developing effective change strategies. The organization is the primary agent of change, and its actions and decisions are the primary drivers of change. The organization's culture, structure, and processes all influence the change process. Understanding the organization's role in change is essential for developing effective change strategies.

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The most common finding from all organizational research is that organizations are not always as innovative as they claim to be. This is due to a variety of factors, including organizational inertia, risk aversion, and a lack of resources. Understanding these factors is essential for developing effective change strategies that take into account the organization's culture, structure, and processes.



Flying, Fighting, and Space

THE MISSION OF the United States Air Force is to fly, fight, and win . . . in air, space, and cyberspace. Properly integrating military activities conducted in those three diverse operating domains presents a challenge on a par with successfully harmonizing joint air, land, and sea operations. Excessive compartmentalization of operations could become as undesirable as their imprudent blending. When we contemplate performing a new activity, we usually begin not by using an entirely fresh perspective but by drawing analogies from familiar procedures. As reflected in its mission statement, the Air Force's legacy operating domain is the air, so Airmen naturally think of "flying and fighting" in other domains. The idea of doing so in space seems plausible at first glance, yet familiar aerial-warfare analogies require adjustment when applied to space activities.

Adapting concepts from one operational domain for use in another is nothing new. Because sea-power theory had become well established by the time airpower emerged, sea-power analogies influenced early airpower thought. Both domains employ similar, basic notions of controlling a fluid medium (the sea or the air), but airpower theory is much more than an evolved form of sea-power theory. Likewise, both theories have influenced space-power theory, yet discontinuities exist among these fields of thought. Doctrine, partly derived from theory, follows an analogous pattern of cross-domain influence. Although the doctrines of sea, air, and space power are logically interrelated, space-power doctrine must differ in fundamental ways from the other

two. Rapidly evolving space capabilities require constant reappraisal of doctrine. Indeed, technological breakthroughs or geopolitical shifts may demand drastic overhauls.

Doctrines evolve, but the idea of "fighting" seems more enduring. However, fighting in space may differ considerably from the "flying and fighting" image evoked by the Air Force's mission statement. Spectacular events such as China's notorious antisatellite test of 2007 generate much excitement, but when viewed in effects-based terms, fighting in space can encompass any action taken to produce desired outcomes, despite an opponent's opposition. Hardly any physical combat occurs in space, and some strategists want to keep it that way. Perhaps space—the scene of considerable international cooperation—can remain a sanctuary free from open warfare, but opposing sides will still find ways to struggle against each other there. Space-based communications; intelligence, surveillance, and reconnaissance; navigation; and other activities present tempting targets that potential adversaries will be unable to ignore. Though we would prefer to deter hostile action, our mission statement predisposes Airmen to view actions taken against space assets as fighting, and it encourages them to seek innovative ways to prevail by integrating air, space, and cyber techniques to fly and fight in space—either literally or virtually.

Space power is vital to national security, but we have much to learn about how best to harness it in pursuit of national goals. *Air and Space Power Journal*, the professional journal of the Air Force, dedicates this issue to promoting dialogue about flying and fighting in space. □



Considering *Air and Space Power Journal* a Foreign Language Asset and Presenting the Latest *Chronicles Online Journal* Articles

THE AIR FORCE places a high priority on “developing leaders with the management acumen, cultural sophistication, international expertise, and language skills to successfully lead a diverse, globally engaged force.”¹ *Air and Space Power Journal (ASPJ)*, the professional journal of the Air Force, supports the development of language skills by publishing the latest thought on air, space, and cyber power in six of the world’s most widely spoken languages. *ASPJ* articles focus on topics of interest to Airmen and other military professionals around the world, offering readers concentrated doses of relevant terminology and concepts.

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- Capt Jennifer Henderson, “Holy War: Millenarianism and Political Violence” (<http://www.airpower.au.af.mil/airchronicles/cc/hendersonj.html>)
- Lt Col Stuart Pettis, “The Role of Airpower in the Rhodesian Bush War, 1965–1980” (<http://www.airpower.au.af.mil/airchronicles/cc/pe ttis.html>)

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fer to the submission guidelines at <http://www.airpower.au.af.mil/airchronicles/howto1.html>. To write a book review, please see the guidelines at <http://www.airpower.au.af.mil/airchronicles/bookrev/bkrevguide.html>. □

Note

1. Hon. Michael W. Wynne and Gen T. Michael Moseley, *Air Force Posture Statement 2008* (Washington, DC: Department of the Air Force, 27 February 2008), 22, <http://www.posturestatement.af.mil/shared/media/document/AFD-080310-037.pdf>.



Ricochets and Replies

We encourage you to e-mail your comments to us at aspj@maxwell.af.mil or cadreaspi@aol.com. We reserve the right to edit your remarks.

WHY WE SHOULD END THE AVIATOR CONTINUATION PAY BONUS PROGRAM

I think that Maj Brian Maue's sterile, methodical, certified public accountant (CPA)–style dissection of the Aviator Continuation Pay (ACP) program in his article "Why We Should End the Aviator Continuation Pay Bonus Program" (Winter 2008) misses the mark. However, this is easy to understand because the Air Force missed the mark with ACP. Or maybe I should say the service tried to close the door after the stampede of Air Force pilots to the airlines had already started. I was a career C-130 pilot, commissioned in 1974, and was never eligible for any ACP bonus.

The Air Force came to a sterile, CPA-like decision about how to target the bonus because we had to "sell" ACP to the nonbelievers in our own service. I think that some people were more motivated by looking like they were doing something besides just wringing their hands. I would like to point out that the Navy, with 50 years of experience in executing continuous and recurring deployments afloat (long before the Air Force got into the air-expeditionary-force mode with the first Gulf War, Operation Allied Force, Operation Enduring Freedom, and so forth), had broken the code on ACP and bonuses. Major Maue would do well to conduct a study of why the Air Force ignored a successful sister-service ACP/bonus program

that had been refined over many years, yet I suspect that we would gain nothing from an examination of the Air Force's bureaucratic failures, stovepiped organizational behavior, and resistance to things "not invented here." Many of my friends were on headquarters staffs that contributed to this fiasco. At the time, many of them admitted that the tail was wagging the dog and that no one had any idea whether his or her ACP plan was the correct move—or if it would be successful. The potential benefits of active, fully engaged leadership; shared expectations; and unit cohesiveness were never explored, even though it was widely acknowledged that the overseas units on the "tip of the spear" in Europe and the Pacific had the least loss of pilots to the airlines.

Stephen Lenzi
Hickam AFB, Hawaii

Major Maue's article is interesting but flawed. The author's argument that pilots leave the Air Force for better pay and benefits fails to adequately consider a comparison of military pilots and airline pilots in terms of the number of work hours required to earn their annual compensation. I offer some calculations based on the following assumptions:

1. Both types of pilots receive the same compensation: \$124,000.

2. As stated in the article, airline pilots work half a month, or 182.5 days a year.
3. Military pilots work five days per week, or about 260 duty days a year. (Obviously, this is optimistic, but I'll err on the side of conservatism.)
4. When they work, both types of pilots work 12-hour days.

Based on these assumptions,

1. An airline pilot's per-hour salary would be \$56.62 (12 [hours worked per day] x 182.5 [workdays per year] = 2,190 hours. \$124,000 divided by 2,190 = \$56.62).
2. A military pilot's per-hour salary would be \$39.74 (12 [hours worked per day] x 260 [duty days per year] = 3,120 hours. \$124,000 divided by 3,120 = \$39.74).
3. The difference in hourly compensation is \$16.88 (\$56.62 - \$39.74 = \$16.88).
4. If military pilots earned the same per-hour compensation as airline pilots, a military pilot's annual compensation would be \$176,654.40 (\$56.62 [airline pilot's hourly wage] x 3,120 [hours military pilots work per year] = \$176,654.40).
5. Therefore, the actual difference in annual salary based on hours worked is \$52,654.40 (\$176,654.40 - \$124,000 = \$52,654.40)!

As a military pilot, when I consider the long months away from home, the number of hours I work, and the difference in hourly wages, I say, "Keep the bonus!" Besides, when we military pilots fly, we consistently work 18-hour days, and we definitely work weekends too. Major Maue's article is well researched and well written, but I believe he neglected some of the basic factors regarding military compensation and hours worked.

Capt David Brandt, USAF
Cannon AFB, New Mexico

Major Maue's article is very interesting, but he leaves out an additional important factor. Where does ACP fit into the program when a

pilot who actually used to sit in the aircraft now "flies" an unmanned aircraft system (UAS)? I would argue that a UAS pilot's skill set would not make that person a good candidate for an airline pilot's job. In terms of traditional pilot-skill progression, UAS pilots will never gain enough true flight proficiency, flying hours, or experience to compete realistically for jobs with the major airlines. I would also argue that a UAS pilot's skill set is no more technologically valuable than that of a missile-launch officer. Outside the military, there is minimal demand for highly skilled pilots of remote-controlled airplanes. With the number of pilots now involved in flying UASs and the projected growth in that career field, the ACP, at least in the case of UAS pilots, is completely unwarranted.

Lt Col Dave Johnson, California ANG
Fresno, California

DEFENSE OF US SPACE ASSETS

Kudos to Capt Adam Frey on his article "Defense of US Space Assets: A Legal Perspective" (Winter 2008). It is exciting to see an article of this quality written by an Air Force officer. Captain Frey raises a couple of questions that I would like to address. First, while it is indeed a viable and logical military tactic, his recommendation that that United States could solve the problem of adversaries putting weapons in space by destroying the booster carrying these weapons during launch raises inherent legal issues. In particular, determining whether or not a specific booster is being used to loft a weapon against a US space asset is difficult at best. Under Article 51 of the United Nations Charter, a sovereign state has the right to defend itself, but only against "an armed attack." It is unclear what the standards of evidence would be for destroying a booster that could be carrying a peaceful satellite; it is also unclear whether an attack on a satellite constitutes an attack on the state that owns the satellite. This is a central legal issue with boost-phase missile defense in general and is worthy of in-depth legal analysis. Second, I question Captain Frey's recommendation that "making satellites more difficult to locate and disable also

eliminates the problem of space debris" (p. 81). It is improbable that the United States would be able to track its own "cloaked" satellites while other nations could not. However, even if it were somehow possible to hide an object that needs to transmit and maneuver, legal difficulties would remain. Such an invisible object could pose collision-avoidance problems for other satellite operators. If command and control of such a satellite were lost due to a malfunction or space-weather event, what would the legal issues be for the United States for having deliberately introduced an untrackable collision hazard, possibly into a congested area such as geosynchronous orbit? I look forward to future articles by Captain Frey and hope this journal publishes more articles on this topic.

Brian Weeden
Superior, Colorado

CONTROL OF THEATER INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE FOR THE GROUND COMMANDER

I enjoyed Maj Steven Maceda's article "Control of Theater Intelligence, Surveillance, and Reconnaissance for the Ground Commander" (Winter 2008). I agree with everything in the article's closing statement about the slow intelligence, surveillance, and reconnaissance (ISR) process that exists right now. As a recently retired senior noncommissioned officer in US Army intelligence who served in Baghdad in 2006–7 as the Multi-National Division-Baghdad G2 sergeant major, I know exactly what Major Maceda is talking about. I now work as a command, control, communications, and computers ISR analyst for the Joint Fires Interoperability and Integration Team. My primary focus is working with the US Army brigade combat teams (BCT), divisions, and other ground components in planning, integrating, requesting, and employing joint ISR assets and sensors. One of my main focuses right now is the employment of the Air Force ISR liaison officers (LNO) at the BCT and division levels. I would be very interested

in any assessments of how these ISR LNOs are performing.

SGM Kevin B. Gainey, USA, Retired
Fort Hood, Texas

STRATEGY AND COST

Kudos to Lt Col Lawrence Spinetta for his article "Strategy and Cost: A Gap in Our Military Decision-Making Process" (Fall 2008). During my time on the Air Staff, I felt that when the Air Force articulated program requirements, our typical attitude was that the ends were fixed and that Congress and the administration would just have to come up with the money to achieve them. In light of impending drastic growth in government entitlement programs, flat or even declining defense budgets are a high probability in the very near future. If we fail to articulate the costs of various strategy options and associated trade-offs, then we compel the politicians to make decisions purely on the basis of cost, devoid of any strategic consideration. We serve the nation poorly if we continue to choose this approach. Colonel Spinetta is to be commended for injecting a dose of fiscal reality into the debate.

Lt Col Rob Levinson, USAF, Retired
Fairfax, Virginia

PLANETARY DEFENSE

I appreciate Lt Col Peter Garretson and Maj Douglas Kaupa's article "Planetary Defense: Potential Mitigation Roles of the Department of Defense" (Fall 2008). As former director of the USAF Academy Planetarium, I have been a student of asteroids and comets and have long been concerned about those objects potentially impacting Earth.

I agree with the authors that the "giggle factor" is the greatest obstacle to overcome in building consensus among military and civilian leaders who would control budget and policy for such a costly, long-term program. I'll leave it to the experts to determine the proper agency to handle planetary defense, but the high financial costs of defensive systems and

the apparent remoteness of the impact threat would dissuade most budget-minded administrators from taking action.

The authors mention that nearly 1,000 potentially hazardous asteroids have been detected, but I was surprised that they did not mention an asteroid popularly named "Apo-phis." Experts once gave it a slight chance of hitting Earth in 2029, but they now conclude there is no risk of an impact at that time. However, this asteroid, 700–1,100 feet in diameter, will pass between Earth's surface and the orbits of our geosynchronous communications satellites. The gravitational and tidal effects Earth may experience when Apophis passes over the mid-Atlantic at a distance of 18,300 miles on 13 April 2029 are unpredictable, but we expect the encounter to modify the asteroid's spin rate and path. Depending upon its internal structure, the asteroid could break up, sending fragments into slightly different orbits and perhaps leading to impacts with Earth during some future approach. Only in the caption to figure 5 (p. 40) did the authors mention Rusty Schweickart's presentation to the National Aeronautics and Space Administration (NASA) regarding altering the path of asteroids such as Apophis. Schweickart advocates a NASA mission to place a tracking device on this asteroid to study nongravitational, orbit-changing effects that the asteroid encounters while orbiting the sun.

Schweickart's proposal may help us understand other asteroid hazards. A phenomenon called the Yarkovsky Effect may affect asteroid orbits. As sunlight shines on any small object orbiting the sun, the sun heats the object's sunward side. As the object rotates, the heat absorbed by the rock reradiates into space. The photons of infrared radiation, weak though they may be, will produce a slight acceleration or deceleration in the rotation rate of the object and, to some degree, its orbital motion, thus modifying the orbit in unpredictable ways. We therefore need to track asteroids to see how reradiated energy might change their orbits. Due to the Yarkovsky Effect, and possibly other unknown effects, the orbits of all small objects orbiting the sun are continuously altered, complicating long-term predictions of

their orbits. The Yarkovsky Effect offers one possible explanation of why small bodies in the solar system slowly drift towards the sun, potentially crossing Earth's orbit.

Mickey Schmidt
USAF Academy, Colorado

The article "Planetary Defense: Potential Mitigation Roles of the Department of Defense" is a thought-provoking piece, and its recommendations should be implemented. Recognising the longitude limits of the continental United States, is there merit in a joint US/Russian/European Union/Chinese approach?

David J. Waring
United Kingdom

PLANETARY DEFENSE: THE AUTHOR RESPONDS

The technical merits of such a cooperative approach would depend entirely upon the specific asteroid detection and deflection system used. Experts recognize that there are entire classes of space objects in inclinations that are energetically beyond our deflection abilities, and launch-opportunity windows are dependent on launch sites. I don't know to what extent having multiple launch sites might increase the range of threats we could counter. As for using ground-based telescopes for detection, I think there would be advantages in using locations in different countries.

However, promising concepts for asteroid detection and deflection might involve space-based systems (such as in a Venus-like orbit for an infrared telescope).

International cooperation might be interesting for its own sake, or it might be interesting because of unique capabilities (like a nuclear device with a larger yield). The first international Planetary Defense Conference took place in 2008, and both Study Group 14 and the Association of Space Explorers presented draft international protocols to the Committee on the Peaceful Uses of Outer Space.

Past American Institute of Aeronautics and Astronautics conferences have had inter-

national participants. Lastly, the Russians do have ideas for a system they call Tsitadel.

Lt Col Peter Garretson, USAF
Washington, DC

REDEFINING AIR, SPACE, AND CYBER POWER

Lt Col Paul Berg's article "Redefining Air, Space, and Cyber Power" (Fall 2008) says that our definition of airpower has expanded over the years and will continue to evolve. I agree with that view; however, I disagree with former chief of staff Gen T. Michael Moseley and former secretary of the Air Force Michael W. Wynne, who characterized cyberspace as a unique combat domain.

I am not belittling those who fight using cyber tools. I do not want to divert our attention from dominating cyber warfare. I wish only to assert that including cyberspace with air, land, sea, and space is ridiculous. Cyberspace is no more a unique combat domain than the FM radio spectrum. In deference to our former chief and secretary, I fear that political motivations may have influenced their characterization of a common war-fighting tool as a combat domain.

The domains of air, land, sea, and space interact and intersect, but cyberspace does not—it simply exists. We certainly should exploit cyberspace both to protect our own national interests and to deny its use to our enemies, but this is merely information warfare. Cyberspace is a medium through which data travels.

Unlike the exploitation of air, land, sea, or space, that of cyberspace requires no special tools such as aircraft, tanks, boats, or spacecraft. All the military services use it. An adept hacker with a laptop can exploit it. I don't have to pass through it to reach another combat domain, and I don't need a special vehicle to fight there. I can turn cyberspace off—something not possible with true fighting domains. I cannot make air, land, sea, or space disappear at the flip of a switch or in the aftermath of a well-placed electromagnetic pulse—but I can do that to cyberspace.

I contend that a unique fighting domain requires a unique battlespace, unique weaponry adapted to the domain, and unique expertise in order to exploit it. None of these apply to cyberspace. Secretary Wynne himself stated that "the capital cost of entry into the Cyberspace Domain is low" ("Cyberspace as a Domain in Which the Air Force Flies and Fights" [remarks to the C4ISR Integration Conference, Crystal City, Virginia, 2 November 2006]). Even the secretary recognizes that there is nothing particularly unique about cyberspace or cyber warfare. It is information warfare by another name, and information warriors will, as they always have, mold cyberspace to achieve combat ends in the true fighting domains of air, land, sea, and space. Although that may require a service to champion the effort, monopoly over cyberspace by the Air Force is unnecessary.

When I first entered the Air Force, our mission was to "fly, fight, and win." In less than half a career, our mission changed to "fly, fight, and win in air and space." Now it is to "fly, fight, and win . . . in air, space, and cyberspace." I contend that our recent mission changes are not about emerging roles and strategies but about politics and budget. I contend that our current fascination with "all things geeky," including the fictional notion that cyberspace is a unique combat domain, is unhealthy to our proven combat force. Our sister services balk, and someday future Airmen will snicker. Cyberspace is no more a unique combat domain than is our network of FM radio stations. Cyberspace, like FM, is just another information-warfare tool. Cyberspace is an information medium—not a combat domain.

Maj Christopher A. Rea, USAFR
USAF Academy, Colorado

THE SMART WAY TO WIN THE VIETNAM WAR

Fleming Saunders, the author of "The Smart Way to Win the Vietnam War: Modern Guided Bombs Take on Ho Chi Minh" (*Chronicles Online Journal*, 17 April 2008), falls into the same trap as Secretary of Defense Robert McNamara

and his crew of operations analysts in the 1960s. Targets bombed, bridges dropped, or enemy troops killed are no more significant now, using the “smart bomb” paradigm, than they were when portrayed as the irrefutable metrics of victory in the 1960s. The fact of the matter is that a war is not won when a certain “exchange ratio” is achieved, or some magical number of bombs is dropped, or even some percentage of the viable targets is destroyed. A war is won when the opposition concedes defeat.

In Germany at the end of World War II, it was a simple fact that the German nation quit fighting despite all of Hitler’s threats and exhortations. By way of metrics, consider the numbers of Messerschmitt fighter planes delivered, new technologies fielded, men under arms, and so forth, during the last months of the war. Those metrics suggest that the German war machine was still functional, yet the German nation had collapsed; it was disillusioned, disconsolate, and ready to quit.

In spite of all the ordnance dropped on them, the lopsided casualties suffered by the Vietcong and North Vietnamese Army regulars, and the technological advantages of the United States, the North Vietnamese never concluded that they had lost. Could we have destroyed more targets and killed more of the enemy by using fewer aircraft, flying fewer sorties, and dropping precision-guided weapons? Of course, and the operations analysts could have counted all of the numbers and made impressive charts for the news reporters! Would the additional damage that we could have inflicted on the enemy, or the American lives that may have been saved through safer bombing tactics, or the fewer sorties, aircraft, and gallons of jet fuel used have changed the Vietnam War’s eventual outcome? I seriously doubt it. If military technology, the magnitude of destruction levied, and the hostile body count were the critical factors for victory, then the nation fielding the Me-262 aircraft, the Tiger tank, the Sturmgewehr 44 assault rifle, the Type XXIII U-boat, and the concentration camps’ gas chambers should have won World War II hands down.

As it was, the North Vietnamese lost every battle against American forces using any met-

ric that anyone could care to consider, and technology was to a very great degree the reason. Yet, as Gen Vo Nguyen Giap so concisely noted during the Paris Peace Talks, “That is true. It is also irrelevant.”

Robert B. Keeter
Hanscom AFB, Massachusetts

THE SMART WAY TO WIN THE VIETNAM WAR: THE AUTHOR RESPONDS

Mr. Keeter argues that North Vietnam would never have conceded defeat under an onslaught of modern smart bombs. But even with less accurate “dumb” bombs, we routed and demoralized the enemy. With smart bombs, we would have had far fewer casualties. It would have been politically easier to stay and finish the job.

Unguided bombs alone could have stopped the enemy before the ground war began. As a senior North Vietnamese leader later observed, a bombing campaign in early 1965 could have seriously handicapped his unprepared forces. (See “The Smart Way to Win the Vietnam War: Modern Guided Bombs Take on Ho Chi Minh,” endnote 27.) By swiftly flattening every major target, smart bombs would have put the fear of God into that small, primitive country.

After the war began, the enemy reeled under our massive bombing and search-and-destroy tactics. With 10 or 20 communist troops dying for every American lost, the enemy resorted to desperate measures. Writes James J. Wirtz, “The desire to reverse a deteriorating military situation seems to have been the primary communist motivation behind the Tet offensive. . . . Both North Vietnamese and VC [Vietcong] leaders admitted to themselves that communist units were suffering from an erosion of combat capability. Troop morale was on the decline” (*The Tet Offensive: Intelligence Failure in War* [Ithaca, NY: Cornell University Press, 1991], 270).

Throwing caution to the winds, North Vietnamese leaders sent lightly armed VC guerrillas into open battle during Tet. Although the shocking attack was a public-relations victory for the communist cause, both guerrillas and

North Vietnamese regulars were crushed by allied firepower and aggressive ground forces. The legendary VC may not have wanted to concede, but it is hard to fight when you are dead.

After its regular army was smashed yet again in the invasion of 1972, North Vietnam had nothing left—only a few guerrillas and a battered army. A small American force—including airpower—could have protected South Vietnam indefinitely. With modern all-weather bombs, the task would have been even easier.

The war was not a hopeless quagmire. The enemy was tenacious but not superhuman. Even with the limited bombs of yesteryear, our skilled troops came within an inch of winning.

Fleming Saunders
Burke, Virginia

DEFINING THE “PRECISION WEAPON” IN EFFECTS-BASED TERMS

After reading Maj Jack Sine’s article “Defining the ‘Precision Weapon’ in Effects-Based Terms” (Spring 2006), I will be interested to see how the concept of circular error probable is applied to anticipated directed-energy weapons. Will these by nature be classified as accurate or precision weaponry?

H. David Kaysen
Washington, DC

DEFINING THE “PRECISION WEAPON” IN EFFECTS-BASED TERMS: THE AUTHOR RESPONDS

One of the motivations for the article actually involved directed energy (DE) weapons. At the time, the Air Staff had initiated a large DE push—mostly oriented toward defensive strategies. However, my boss in the Weapons Requirements office used the push to initiate requirements work in the offensive DE applications area.

Our concern with the use of the terms *accurate* and *precision* directly applies to Mr. Kaysen’s question. The fact that the corporate Air Force continues to misuse and misunderstand these terms leads to problems identify-

ing or categorizing technologies for potential weapon applications. Even today with the use of laser-guided bombs and weapons guided by the global positioning system, the terms *CE50* and *CE90* are becoming obsolete. (*CE50* means there is a 50 percent probability that a weapon will land within a given distance of the target; *CE90* means that the probability is 90 percent.) I have participated in arguments centered around a total difference of two meters in *CE90*—an irrelevant matter when talking about 250- to 2,000-pound-class weapons.

In my article, I propose that we define a “weapon” as a tactical effect or, in the case of more abstract weapons (such as psychological operations), the first-order effect. This applies perfectly to DE weapons as well. To further classify a weapon as universally “precise” is folly. I propose that the Air Force doctrinally define “accurate” and “precision” weapons to align more closely with dictionary definitions. The more accurate a weapon, the greater the percentage of the desired effect achieved. The more precise the weapon, the fewer the unintended or undesired effects. Again, as applied to DE weapons, the guidance accuracy really is a relatively minor factor compared to, say, weather conditions. So a laser may be the most accurate weapon but not the most precise if the weather conditions attenuate the laser energy beyond effectiveness. The laser could also be less accurate if weather conditions or the inaccuracy of a guidance mirror refract or aim the energy too far from the point of desired effect.

Ultimately, to determine the preciseness of a weapon, one must consider the context, including guidance accuracy, desired effect, potential undesired or unintended effects, mitigating external conditions (e.g., weather), and so forth. I do not believe anyone who tries to sell me a “precision weapon” (and I have met plenty on the Air Staff) because there is no such thing as a universally precise weapon.

Lt Col Jack Sine, USAF
Washington, DC

Editor’s Note: Major Sine was promoted to lieutenant colonel after his article was published.

The Merge

In air combat, "the merge" occurs when opposing aircraft meet and pass each other. Then they usually "mix it up." In a similar spirit, Air and Space Power Journal's "Merge" articles present contending ideas. Readers are free to join the intellectual battlespace. Please send comments to aspj@maxwell.af.mil or cadreaspj@aol.com.

Preparing the F-15K Coalition Partner

MAJ A. JOEL MEYERS, USAF*

WHY SPEND BILLIONS of dollars equipping our allies when we don't help them integrate into the fight? Although we have extensive programs in place to equip allies with world-class weapon systems, cultural barriers and differences in procedures prevent the formation of a truly unified multinational team. Unified international military efforts play a significant role in the often-overlooked center of gravity of public opinion in today's world. Even having another country contribute forces and arms, regardless of their effectiveness, provides some help in building a unified team. But why not make a greater investment in training our allies *after* equipping them in order to integrate their forces into coalition operations so that they can contribute effectively?

The greater the degree of our participation in training foreign forces, the more closely aligned those forces will be as they project combat capabilities. If our allies' methods of employment resemble those of the coalition after we've provided them equipment, we can more easily integrate their forces into future coalition conflicts anywhere in the world.

South Korea provides an excellent example of such an opportunity. We have the means to prepare the Republic of Korea Air Force (ROKAF) for integrated employment of its F-15K

fighter aircraft into such conflicts. The United States has placed great emphasis on equipping the ROKAF with the F-15K and training it in the use of that aircraft. But could we take other steps to enhance the F-15K's effectiveness in conflicts outside the Korean peninsula? Although the United States has an adequate support structure for training, adjustments in its implementation will better prepare the ROKAF for productive conflict integration.

This article briefly outlines background information regarding the importance of international training, along with the history of South Korea's purchase of the F-15K. It then identifies the goal of integrated coalition operations, citing specific examples of challenges to meeting that goal and outlining steps we should take to overcome any obstacles. Furthermore, it suggests an opportunity for the United States to help the ROKAF bring together many of the steps towards coalition integration during a Red Flag exercise. Finally, the article briefly presents a broader perspective by addressing other contexts beyond the F-15K. Although the complexities of international training have great ramifications in the geostrategic environment, a complete discussion of regional effects lies beyond the scope of this writing.

*The author is an operations officer on the Joint Staff. In 2006 he became the US Air Force's first F-15K instructor pilot assigned to Korea. From 2004 to 2005, he served as F-15E flight commander for eight Republic of Korea Air Force aviators who trained at Seymour Johnson AFB, North Carolina.

Background

The United States invests in future allied support around the world by expending considerable energy to ensure that its allies can operate compatibly with the US military system. It seeks to maintain regional influence and improve the capabilities of its partners to defend themselves and become interoperable in coalition operations. In 2002 South Korea announced its decision to purchase 40 F-15K strike fighter aircraft; in 2006 it bought 20 more. A newer version of the US F-15E air-to-air and air-to-ground two-seat, two-engine fighter aircraft, the F-15K is one of the world's most capable strike fighters. The combination of its unique combat characteristics and capabilities, including the AIM-9X missile, helmet-mounted cueing system, infrared search and track, and excellent air-to-ground weaponry, arguably makes the F-15K the most significant strike platform in the Pacific region. In addition, the extended flight range enabled by the conformal fuel tanks has strategic significance because the aircraft can reach even the northernmost regions of North Korea. Although the purchase took the form of a direct commercial sale from Boeing, the United States established a foreign military sales (FMS) case to support the training, which provided instruction for eight ROKAF crew members—four pilots and four weapon systems operators (WSO)—in a US flying training unit (FTU) at Seymour Johnson AFB, North Carolina, in 2005. It also included provision for a US instructor pilot (IP) to conduct follow-on training in South Korea in the first ROKAF F-15K fighter squadron.

Goal: Integrating the F-15K

Although the FMS-contracted training for the F-15K significantly helped the ROKAF employ the aircraft, it cannot, by itself, ensure effective integration of the platform in coalition operations. Before that happens, we must overcome other significant obstacles.

The ROKAF's ability to contribute effectively in a coalition conflict outside the Korean peninsula is two-faceted. First, on the tactical level, the disciplined and very capable ROKAF

aircrews have significant potential to wield the F-15K's combat power, currently unmatched in the region. For that reason, we should remedy the limitation that prevents utilization of this asset outside the immediate geographic area of South Korea. Second, the strategic contribution of a coalition partner's participation has a value all its own. Having a willing partner unable to participate would prove disappointing on the strategic level because of the missed opportunity for additional political credibility. For tactical and strategic reasons, we must facilitate the ROKAF's worldwide involvement by giving it a higher training priority.

In addition to reaping US benefits, the South Koreans have much to gain by improving their ability to integrate into worldwide coalition operations with their F-15Ks. The number-three air force contributor in Operation Iraqi Freedom, South Korea continues to support coalition operations in the region. Integrating its F-15K aircraft into global coalition operations would help fulfill that country's objective of expanded influence. Although the significant threat of North Korea may preclude deployment of F-15Ks off the peninsula in the immediate future, any political changes between North and South Korea may allow such participation in the years to come.

Challenges to Integration of the F-15K

Unfortunately, several differences in training and employment currently limit South Korea's involvement in coalition efforts. Thus, we must take additional steps in tactical training to prepare the ROKAF's F-15K aircrews for more effective participation. Additionally, communications procedures and structures within South Korea resist easy transplantation to another geographic setting. Finally, a number of cultural barriers could hinder true coalition operations.

Training

A number of procedural training issues may hinder smooth integration. Air-to-air refueling

is the most significant area that has a direct effect on coalition operations. Although difficulties in this area are surmountable, we must make changes to enhance interoperability. The F-15K is capable of air refueling (AR), but ROKAF aircrews do not currently conduct AR training. The fact that the aircrews are not AR qualified significantly limits the option of deploying the F-15K to coalition fights that occur outside Korea. No matter how well the ROKAF can integrate its F-15Ks into coalition operations, that integration will have no significance unless it can deploy assets to other areas.

Communications

In addition to changes in flying training, modifications in communications structure and procedures would benefit F-15K aircrews as they integrate into coalition flight operations. The current aviation communications structure in Korea is based on a two-frequency system: ROKAF frequencies and separate US Air Force (USAF) frequencies. ROKAF aviators speak to ROKAF controllers in English on one frequency, and USAF aviators speak to USAF controllers on another, even though they all fly in the same airspace. Although this system avoids language difficulties within the geographic confines of Korea, we should implement changes to improve coalition communication elsewhere. This limitation in itself does not preclude involvement, but the additional "fog and friction" caused by difficult communications could adversely affect success in combat.

Culture

Awareness of cultural differences would also benefit the ROKAF's integration into coalition operations. A culture for coalition flight operations among the United States and its allies, predominantly influenced by the USAF, already exists, based on recent allied air operations. Although the ROKAF has its own established culture, its success at integrating into a multinational coalition will depend not only upon coalition efforts to include the ROKAF, but also upon the ROKAF's ability to adapt when required. One can analyze USAF efforts

to assist the ROKAF in adjusting to cultural differences on three levels.

First, the differences between South Korea and the United States are significant. Unlike our more numerous Western allies, the South Koreans have an Eastern culture whose characteristics carry strategic implications. Understanding these cultural differences is extremely important and "requires higher and more mature levels of strategic skills."¹ For example, in South Korea senior individuals (based on age or rank, even among civilians) wield absolute authority. Thus, integration challenges could arise if a junior USAF officer were assigned as a mission commander over a senior ROKAF flight lead. Although this is a common practice and poses no concern within the USAF, it would never occur within the ROKAF.

Second, and less widely known, are cultural differences between the ROKAF and the USAF that we must account for, particularly on the operational level. Take, for instance, the difference in safety programs. The ROKAF does an excellent job of emphasizing flight safety, but sometimes the implementation is overly risk-averse, resulting in the leadership's unwillingness to practice challenging but necessary procedures. To take a specific example, the ROKAF abides by a general policy of not conducting flight operations in the rain. During conflict, most people would agree that cancelling missions due to rain on the runway would be overly conservative, yet, in light of the ROKAF's policy, operating F-15Ks on a wet runway might create undue risk. Ironically, ROKAF leadership's efforts to enhance safety could increase risk when its aviators must attempt necessary procedures not regularly practiced.

Third, differences in USAF and ROKAF fighter cultures have an effect on the tactical level. For example, the tendency of the ROKAF formation flight lead to defer decisions to leadership on the ground during contingencies might cause coordination difficulties should an emergency arise during coalition operations. Although cultural differences can be overcome, lack of awareness of such differences by both air forces could have drastic consequences.

Integrating by Bridging the Differences

To produce seamless coalition operations, we must bridge the gap between USAF and ROKAF training philosophies. Doing so will transform two separate but very capable air forces with limited coordinated activities into one unified coalition team capable of smooth integration; it will also maximize synergistic contributions on the tactical, operational, and strategic levels. Therefore, although a number of limitations affect F-15K interoperability, we can overcome them. The following discussion presents available US training structures and forums, analyzing how we can effectively use them to support integration; it then offers specific examples of how to handle differences in training, communication, and culture.

Training Structures and Forums

The first change in training philosophy places more emphasis on the US training structures already available. These structures, analyzed below, include instructor personnel, facilities, units, and other forums of instruction. Significant improvements in coalition capabilities would result if we made only minor adjustments in emphasis and direction to existing systems. Of these many available training structures, the following have been or could be utilized in the F-15K program: mobile training teams (MTT), extended training service specialists (ETSS), USAF F-15E FTUs, and personnel exchange tours between operational squadrons.

Although not selected for use in training F-15K aircrews, the MTT, consisting of “personnel on temporary duty . . . to train foreign personnel,” offers an excellent option for supporting the ROKAF.² Usually working in an overseas location, using equipment purchased by the recipient country, the team serves a tour of 179 days or less.

On the other hand, ETSSs are not bound by the 179-day restriction. In the case of the F-15K, the USAF utilized these specialists instead of an MTT to take advantage of the longer tour length. In 2006, 2007, and again in

2008, the USAF assigned an F-15E IP to the ETSS position in order to instruct and fly with the ROKAF. However, only after numerous delays and increased pressure from South Korea were the additional ETSS positions filled. Although the number of available slots worldwide remains limited due to manning constraints on US IPs, this stands as an example of an ideal role through which the United States can encourage integration.

We should emphasize the unique opportunity for an MTT or ETSS to integrate with the foreign military: “The importance of selecting the most highly qualified military personnel . . . cannot be overemphasized due to the sensitivity of their positions and international impact of their actions.”³ By properly instructing and directing these individuals in the objectives of foreign training, we can greatly help meet the goals of integrated training. We must assure that these instructors recognize that their roles are to *instruct, communicate, advise, and build camaraderie*. The *instruct* role should be professional and emphasize integration among allies. The role of *communicator* can greatly benefit both the USAF and ROKAF since an on-scene specialist with a unique perspective of both sides can often greatly enhance continued coordination between air forces. As *advisor*, the ETSS or member of the MTT should proactively and tactfully present ideas and suggestions to the leadership of both nations to ensure that the program maintains proper focus. Similarly, we should stress the value of *camaraderie* for its long-term effects. Building friendships with our allies can pay dividends in the training program for many years to come. If we emphasize all of these areas in their training, MTT members or ETSSs can become invaluable assets in future integration of the weapon system.

With regard to a third training option—the FTU—we previously mentioned that four ROKAF pilots and four WSOs completed transition and instructor-upgrade programs at the F-15E FTU at Seymour Johnson AFB in 2005. Benefits of this training include learning from an established system, observing strengths and weaknesses of that system, forging allied relationships within a weapon system community,

and returning to South Korea with a shared operational perspective that should encourage integrated operations in the future. Unfortunately, this type of training is expensive for the recipient country, takes away limited training slots from US students, and provides training to relatively few visiting students. Despite these shortcomings, this structure proved an excellent means to encourage integration at the outset of the F-15K training program.

During an exchange program—yet another training option that enhances integration—pilots and WSOs receive assignments to operational flying squadrons in the other nation's air force, thus offering benefits similar to those of the FTU. The ROKAF has requested these assignments, but we have not yet coordinated them for F-15K and F-15E aircrews. While the USAF aircrew member instructs in the South Korean F-15K unit, encouraging integration concepts in a role almost the same as that of the ETSS, a South Korean pilot or WSO could learn USAF flight methodology firsthand in a US operational squadron. This arrangement also presents USAF aviators with an opportunity for informal cultural training—currently emphasized by USAF leadership. Upon completion of the assignment, the ROKAF aircrew member could return to South Korea as an expert in USAF F-15E procedures and could therefore foster the process of integration.

Solving Differences

In addition to the training structures mentioned so far, a number of other existing training forums could help meet the objective of bridging differences. We already use ongoing training exercises with the ROKAF, but additional, specialized integration of the USAF and ROKAF in these enterprises would yield substantial benefits for coalition capabilities. Red Flag exercises in Nevada or Alaska and the Combined Large Force Exercises (CLFE) already regularly taking place in South Korea are perfect for advancing operational and tactical integration at the unit level.

Specific adjustments to training can help overcome difficulties and bridge the gap for

integrated coalition operations. For example, the eight ROKAF aircrew members designated as the initial cadre of instructors in the F-15K all received AR training at the F-15E FTU at Seymour Johnson AFB. They became qualified not only to conduct AR but also to teach AR procedures. Though their currency has expired, they could regain it by flying with an AR instructor. The aircraft is capable of AR, and the instructors have the requisite training. All that remains is coordination between the USAF and ROKAF to facilitate tanker-training operations.

AR operations occur regularly in South Korean airspace, but only for US aircraft. Although we would require coordination on a variety of items, such as funding, we could easily expand these operations to include the ROKAF's F-15Ks. For example, those aircraft could conduct AR from the same US tankers that refuel our F-16s. Periodically, a two-ship of F-15Ks could air-refuel at the end of an AR time block, ensuring that the ROKAF aircrew could obtain and maintain its AR qualifications.

Similar to changes in training, those in South Korea's communications structure would contribute to the desired integration of the F-15K in any deployed location. A possible solution to the problem calls for occasional use of USAF frequencies by Korean F-15K aircrews in South Korea. Simply by speaking more frequently with US air traffic controllers already present in South Korea, those aircrews would gain experience in a required activity in deployed locations. By practicing both their speaking and listening skills on the radio, they could avoid many difficulties in communication. Similarly, although this will present a challenge to USAF air traffic controllers, it would give them valuable, additional exposure to communicating with coalition members.

We can make use of Red Flag in the United States or CLFEs in Korea to educate the ROKAF regarding the culture of coalition operations—a necessary step in achieving smooth integration. Allies of many countries have undergone this "culture training" in a very operationally realistic air-war scenario. Though not part of a formal syllabus, observing the way that the

USAF and its other allies rehearse in these war simulations would quickly contribute to the ROKAF's incorporation into a coalition environment should a real war arise. Granted, the exercises would neither address all of the cultural differences nor educate the ROKAF about them; however, since we "train the way we fight," many important differences would likely present themselves.

Furthermore, we should emphasize cultural differences in other training structures. While remaining sensitive to the ROKAF culture, an ETSS or MTT in Korea could continually give members of that air force insight into differences that might adversely affect coalition operations. Every air force culture need not completely mold into one system, but knowing the differences and minimizing their impact should become the goal.

Like the ROKAF, the USAF also needs to modify its training program to effectively integrate foreign air forces such as South Korea's. Whereas suggested changes for the ROKAF focus on operational capabilities and tactical training, those for the USAF should concentrate on cultural, language, and diplomatic issues that can significantly affect the strategic level. In addition to the *instruction* role, for which most USAF personnel are well trained, they should become familiar with the diplomatic roles of *advising*, *communicating*, and *building camaraderie* before assuming foreign-training duties.

Integrated Exercise: Red Flag

As we address changes incrementally, we can practice and demonstrate increased integration in the form of exercises. Continued dry runs for real combat integration would prove extremely beneficial. Conducted several times a year in Nevada and Alaska, Red Flag, a combat exercise that often encourages allied participation, would provide a fantastic opportunity. Current Red Flag plans call for the inclusion of ROKAF F-15Ks in the near future, and an MTT or ETSS would facilitate smooth integration between ROKAF and USAF participants. Arguably the most realistic and com-

plete combat flight-training exercise in the world, Red Flag offers much more than excellent training. In addition, other phases in the preparation for, logistical support of, and deployment to Red Flag would present invaluable opportunities for the ROKAF to practice and demonstrate many of the skills required to integrate as a coalition member in global combat operations.

Because "training the way we fight" is an important principle for success in combat, we must follow methodical, preparatory steps to prepare a unit for these types of operations. A fighter unit does not engage in combat without proper training, and neither would the ROKAF attempt to prepare for integration without taking such steps—for example, mastering basic skills in air-to-air and air-to-ground missions. Additionally, we should take the following measures to develop skills required for integration.

Unique because of the many USAF fighter units present, South Korea offers a perfect training ground for practicing robust integration during CLFEs, including, for example, honing communication skills by utilizing the same radio frequencies as the USAF. Similarly, integrated briefings, ground operations, flight coordination, and debriefings allow participants to work through cultural and training differences between our forces. Ideally, a USAF MTT member, an ETSS, or an exchange officer in the F-15K unit would assist with coordination and training during this step of integration, as would a US-trained ROKAF aircrew member. These practice coalition exercises in South Korea would enhance the efficiency and effectiveness of integration at Red Flag.

That exercise also offers integration practice for support personnel in logistics and maintenance. The ROKAF has experience in deploying its C-130 aircraft into other theaters, such as Iraq. Utilizing these assets to airlift maintenance and logistical equipment in support of the F-15Ks' move to Red Flag would provide very realistic preparation for combat deployment. Although some differences exist between combat and exercise deployment of these support assets, many integration steps would remain the same, and a Red Flag de-

ployment would most certainly permit ROKAF maintainers and logisticians to demonstrate and practice their integration into a combined operation. A US MTT made up of several deployment logisticians and maintainers could provide excellent assistance in the weeks required to prepare, deploy, bed down, and re-deploy. The fact that South Korea has its own airlift, maintenance, and logistical support would allow it to use Red Flag to rehearse for combat operations that would involve its F-15Ks.

Moreover, the deployment and redeployment phases themselves represent excellent opportunities to address integration concerns and demonstrate the ROKAF's powerful capabilities to South Korea and the rest of the world. These might even prove to be the most valuable portions of Red Flag training. After all, by successfully deploying F-15K aircraft such a great distance, the South Koreans could see the potential global-deployment capability of their asset. Deployment and redeployment would afford aircrews the opportunity not only to practice but also demonstrate their AR capability in ferrying operations. Although the AR practice and training conducted in South Korea enable aircrews to develop skills they need for "taking gas," the international flight coordination and deployment integration necessary for attending Red Flag provide the next level of training required for aircrews to integrate their F-15Ks into international flight operations anywhere in the world. Once again, a USAF member assigned to the F-15K unit would assist in this process.

Finally, the ROKAF would gain useful experience and integration training at Red Flag itself. As it did during CLFEs in South Korea, the ROKAF could use many phases of Red Flag operations for practicing integration into coalition operations, including mission planning and coordination, briefings and debriefings, ground operations, flight administration, combat administration, and simulated combat operations. Unlike the CLFEs, however, Red Flag would mirror realistic aspects of coalition coordination in all phases, exposing the ROKAF to working with many more allies and operating on a much larger scale. Building upon the integration training

conducted in the CLFEs, the USAF could once again help F-15K aircrews practice communication and training to bridge cultural differences. For example, communication during the combat training phase of Red Flag would help aircrews understand and coordinate an inordinate number of radio calls as well as expose them to radio congestion and aggressive flight profiles that challenge even native speakers of English. Although no one can comprehend every radio call, the exposure would certainly help prepare ROKAF airmen for difficult communication integration in actual coalition combat. No doubt, every phase of Red Flag confers benefits, but integration in its simulated combat operations possibly represents the best opportunity for F-15K aircrews to train the way they fight in the coalition environment.

Broader Applications and Conclusion

Making changes to ROKAF training would apply in other contexts as well. Whether we apply the resultant benefits to other changes within South Korea or other nations, the implications can enhance coalition participation anywhere. All of the advantages of the proposed alterations for coalition conflict beyond the Korean peninsula would also add value for any conflict on the peninsula itself. Similarly, these concepts would prove useful to all South Korean aircraft, not just the F-15Ks. The USAF should consider applying the training changes to aircrews of other ROKAF fighters, such as KF-16s, F-4s, or F-5s.

On a broader spectrum, this proposal has similar implications for other countries anywhere in the world. Singapore, for example, finds itself in the early stages of the process experienced by the ROKAF. When Singapore agreed to purchase F-15SGs, aircraft much like the F-15K, it too gained an asset that could contribute significantly to a coalition fight outside that country. Now is the time for the United States to consider the training and integration that the USAF will provide in sup-

port of Singapore's new world-class fighter and its potential coalition contributions.

On an even broader level, we must emphasize training from the outset with a strategic vision of not only equipping our allies with fighter aircraft but also offering comprehensive training that enables them to contribute effectively to future coalition conflicts. Obviously, the concepts presented here are not limited to fighter aircraft—or to aircraft at all, for that matter. Many of them could apply to any branch of the military. Although many details are specific to South Korea, we can adapt the broader ideas and implications to other nations and cultures as well. Regardless of the international context, all such training is important. By utilizing appropriate international-training measures and support and by bridging

differences in training, communication, and culture, we will enable many of our allies to contribute to coalition conflict effectively and efficiently, regardless of the type or location.

Assistance to our allies remains vitally important. It is “far more than an economic occurrence, a military relationship, or an arms control challenge—arms sales are foreign policy writ large.”⁴ Rather than merely helping nations procure weapon systems, the United States should assist those partner countries in taking the next steps towards integration into coalition conflicts. By prioritizing ongoing international integration with our allies as we prepare for conflict, we can strengthen relationships and build sustained, combined war-fighting capability. □

Washington, DC

Notes

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Space superiority, like air superiority, has become a fundamental predicate to Joint warfighting. Indeed, America's space superiority has completely transformed the way America fights.

—Air Force Posture Statement 2008

Transforming United States Air Forces in Europe and Empowering Poland

F-16s Fly East

LT COL CHRISTOPHER S. SAGE, USAF*

USAFE continues to transform itself . . . with a greater focus on Eastern Europe.

—Gen Tom Hobbins, USAF, Retired
Former Commander
United States Air Forces in Europe

Poland is probably the most pro-American society in Europe.

—Lech Kaczyński
President, Republic of Poland

IN THE INTERNATIONAL arena of strategic alliances, windows of opportunity for momentous change are rare and fleeting. Creation of the North Atlantic Treaty Organization (NATO) at the start of the Cold War was one of them; the end of the Cold War and the global strategic environment following the terrorist attacks of 11 September 2001 (9/11) present the next opportunity. Poland stands out as an eager member of NATO and a strong supporter of US policy. Indeed, the Polish military recently took unprecedented steps to embrace Western concepts, training, and hardware.¹ At the same time, United States Air Forces in Europe (USAFE) is tasked with broadening relations with new NATO nations in Eastern Europe, gravitating away from its significant Western European presence during the Cold War.² Therefore, it is in the national interest of the United States to continue to transform USAFE by relocating US F-16s currently in Italy to new bases in Poland.

Strategic, military, and political interests for both Poland and the United States are aligning to make this move possible, but only for a short period of time. A staunch supporter of US foreign policy in Iraq and Afghanistan, having committed troops to both theaters, Poland is eager for US reciprocity.³ Hosting US fighters, combined with agreeing to base part of the United States' ballistic missile defense (BMD) shield on its soil, will make Poland a stronger strategic partner in the region. Poland is currently upgrading its civil and military aviation infrastructure as F-16s continue to arrive, an acquisition made possible by an unprecedented foreign military sales deal coupled with US congressional loans and business investment.⁴ A US-friendly political environment persists in Poland as Russian rhetoric intensifies, but this situation could change as nationalistic voices sometimes critical of US policy get louder.

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Author's note: Since this article was written, the conflict in Georgia and renewed plans to deploy missiles to Kaliningrad reveal that a resurgent Russia is increasingly willing to confront friends and allies of the United States in its sphere of influence. Such actions reinforce the need to strengthen US military relationships with Poland.

The Strategic Environment

The *National Military Strategy of the United States of America* (2004) addresses the importance of proper posturing and presence to assure our friends, enhance interoperability, and improve our ability to prosecute the global war on terror (GWOT). It also challenges combatant commanders to adjust troop levels to enable "multinational forces to act promptly and globally."⁵ A decision to move F-16s into Poland would meet these objectives at a time when Russia is flexing its muscles, specifically at Poland, over controversy surrounding the BMD initiative. In 2002, through a program known as Poland Peace Sky, the Polish Air Force purchased 48 F-16s, thus ensuring hardware commonality, heightened interoperability, and in-depth training in US tactics and operational warfare.⁶ The initial cadre of Polish F-16 pilots is training at US bases until the Polish Air Force can stand up training of its own with the help of US instructor pilots serving as exchange officers.⁷ Poland's emerging modern fighting force will put that nation on the leading edge of technology, able to respond regionally and globally under the NATO banner.

USAFE's Theater Security Cooperation Program office published a directive in 2006 calling for stepped-up relations with Poland, including increased military-to-military cooperation and training with the goal of gaining air and base access, as well as building up the forces of our NATO ally.⁸ The larger strategic implications of establishing closer ties with Poland involve the embracing of changing European relationships and the quiet positioning of forces closer to Russia in the interest of strategic influence.⁹ Moving US forces further east will also disperse our strong presence in Western Europe, which could be crippled if governments deny the deployment of forces from their territory during unpopular wars.¹⁰

Conditions in Italy

Clearly a staunch supporter of US policy since the early days of the GWOT, Italy hosts thousands of service personnel, including the

US Sixth Fleet, multiple Army posts, and air bases, as well as NATO's Defense College and Southern Command. But governments change, and political and social attitudes less supportive of US foreign policy persist in some sectors of Italian society. These feelings became evident in 2006 when newly elected prime minister Romano Prodi was almost driven from power over the controversial decision to authorize the expansion of Camp Ederle in Vicenza.¹¹ Opposition to an increased US presence garnered huge rallies numbering between 40,000 and 100,000 protestors.¹² These same hostile elements within Italian society also present security and force-protection concerns to US commanders in Italy.

Aviano Air Base (AB), located in northern Italy, 75 miles north of Venice, hosts the 31st Fighter Wing, two operational squadrons of F-16s, and approximately 1,700 personnel, not including dependents.¹³ On the local level, Aviano has its challenges. At the time of the base's establishment in 1911 by the Italian Air Force, it was located in a rural area.¹⁴ Today, however, growing villages and towns surround Aviano, dividing it into seven separate geographic areas—a situation that poses logistical challenges as well as force-protection concerns.¹⁵ Limited real estate inside Aviano's perimeter renders base housing virtually nonexistent.¹⁶

The base had a history of expeditionary fighter visits until the United States permanently relocated Air Force fighters from Spain in 1992. Tactical-training conditions have slowly deteriorated since their arrival, with increased airline operations across Europe and the Adriatic Sea having gradually degraded medium-altitude airspace used for air-to-air training.¹⁷ Moreover, low-altitude training suffers from population encroachment and political sensitivities—heightened by an incident involving a Navy EA-6B that caused a cable-car disaster in 1998—and for all practical purposes, air-to-ground training does not exist.¹⁸ Additionally, the absence of usable ranges in Italy prevents training with live ordnance, a skill critical to tactical fighters.¹⁹

The United States' long-standing relationship with Italy has weathered the storm, but underlying challenges and concerns persist,

which US leaders must mitigate to the best of their abilities. Although Italy will most likely continue to host large numbers of US forces, one can make the case for seizing the opportunity to move US fighters to a friendlier and less restrictive political environment in the Republic of Poland.

A Friend in Poland

A nation in transition, Poland eagerly threw off the chains of communism, quickly embraced Western ideals and institutions, and began a continuous program of military modernization. NATO rewarded its efforts in 1999 with alliance membership. A friend of the United States in the GWOT, supporting operations in both Iraq and Afghanistan with few or no restrictions, Poland even led the Multinational Division Central-South in Iraq from 2003 to 2007 and is currently considering sending more troops to Afghanistan.²⁰ The Polish president recently stated that "it's not a gesture. It's an obligation. We are a member of an alliance. We feel it our duty to respond. . . . So we count on reciprocity."²¹ At a time when the promised payback of Iraqi contracts never occurred and when the United States is asking more of Poland with regard to missile basing for the BMD shield, the president's statement reflects a sentiment that his country is ready for *quid pro quo* in the form of bilateral security guarantees.²² Some analysts think that this will come in the form of Patriot missiles, but an equally assuring gesture of US commitment to Poland involves the proposed basing of two squadrons of US fighter aircraft.²³ Such a move would help strengthen our NATO partner on the eastern frontier.

We could easily colocate fighter aircraft at current Polish F-16 bases undergoing world-class modernization as they continue to receive their new fleet of fighters through 2009.²⁴ Sharing bases would accelerate training, benefiting both air forces while quickly integrating the new Polish squadrons at the operational and tactical levels within NATO. Poland's excellent low-level flying routes as well as air-to-air and air-to-ground training ranges, including

much-needed access to live-weapons ranges, would greatly enhance training for US pilots.²⁵ As Gen Tom Hobbins, former USAFE commander, pointed out, "The traditional [Western] European civilian air traffic environment has drastically constrained our ability to train."²⁶ These constraints do not exist in Eastern Europe.

Basing two US squadrons with the accompanying support package, including families, would also benefit the local economy and enable the United States to affect Polish society through direct engagement. This integration should meet little resistance since the Polish people tend to be a homogeneous, pro-American society with little internal turmoil or conflict.²⁷

Russia Responds

When Poland secured its F-16 contract from the United States, Russia immediately based new S-300 air defense systems in Belarus, leaving little doubt that moving US fighter squadrons into a country that borders Russian soil (Kaliningrad) would invoke a response.²⁸ Such a proposed move, coupled with the current controversy over the BMD shield, requires the United States to tread cautiously and diplomatically.

That is, we must consider and skillfully mitigate the strategic risk that this action introduces to US and NATO relations with Russia. The United States should build on the fact that there are currently two US instructor pilots in Poland who are training Polish aircrews and frame the movement as a continuation and expansion of the agreed-upon training program. The United States could also associate the move with the current BMD initiative, presenting it as a related bilateral security agreement.

We need additional, careful calculation to gauge the Russian response. Aggressive Russian action could potentially destabilize the region, and Russia could remove itself from additional arms- and troop-limiting treaties, building on its recent suspension of the Treaty on Conventional Armed Forces in Europe.²⁹ The US presence in Central Asia also prompted Russia to move troops and aircraft to a nearby Russian airfield in 2003.³⁰ Based

on this recent posturing, the United States and Poland should expect similar Russian responses to this plan.

Challenges

No doubt, the proposed move of fighters to Poland is ambitious and will face many challenges—especially the cost to American taxpayers. Locating our forces at a Polish base already undergoing modernization by the host country can mitigate the financial burden, but expected expenditures could possibly exceed \$1 billion, the estimated price tag for the Army's expansion in Italy.³¹

Other challenges include environmental concerns and decaying infrastructure left over from the Soviet era as well as poor logistical support in Eastern Europe.³² We also need to evaluate and improve the air-traffic-control infrastructure. Furthermore, quality-of-life issues could emerge because Polish living standards, though rapidly improving, still lag behind those of Western Europe. Also worth noting is the fact that recent public discourse in Poland revealed a split in opinion over the US BMD plan.³³ Those who oppose BMD basing in Poland will no doubt attempt to block the arrival of US fighter squadrons by using similar arguments. Though daunting, these challenges can be overcome by relying on the

United States' experience with setting up bases in allied countries.

Conclusion

In an unstable post-9/11 world, Europe has experienced more stability than other regions, but the security environment in Eastern Europe continues to change. Gen Bantz Craddock, commander of European Command, is currently reevaluating a 2005 security plan that restructures current basing in Europe and reduces US troop levels from more than 110,000 to 60,000.³⁴ One analyst remarks that troop levels must stay at a level high enough to send a "forceful message to allies and potential foes alike."³⁵ Moving F-16s from Aviano AB to Poland would send precisely this message, cementing US-Polish relations. It would also increase the interoperability of NATO allies flying the same weapon system, strengthen an emerging ally eager for our support, and enhance the combat capability of USAFE F-16 units by removing barriers to training prevalent in Western Europe. This proposal is a strategic move that would benefit the operational and tactical environments. We must act now since the window of opportunity will not remain open for long. □

Washington, DC

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Medals for Mediocrity

How to Restore Meaning to Air Force Decorations

LT COL RAYMOND M. POWELL, USAF*

IVIVIDLY REMEMBER MY first medal. As a 20-year-old airman first class in 1987, I received the Joint Service Achievement Medal for winning the Defense Language Institute's Commandant's Award. Proud and excited, I knew that I'd accomplished something truly special. With my friends and family in attendance, I felt 10 feet tall. The occasion was a tremendous motivator. It was also the only time in my 22-year career I can recall being excited about receiving a medal.

That medal was special because I'd earned it the hard way—by outperforming my peers on a difficult, year-long language course. Completely unexpected, it was exceptional because it was the exception.

Unfortunately, for most of us at most times, medals have become rather unexceptional and commonplace. We get them at the end of each tour, and we know what we'll receive because the written and unwritten rules tell us. Enlisted people value them primarily for their promotion points, but officers barely notice them—unless, of course, we don't receive one that we believe we're entitled to.

This chagrin over medals that pass us by frequently happens when the proliferation of decorations becomes too much for its overseers and a dramatic pullback occurs. Such was my experience following my 90-day squadron command in Iraq, after which a new regime initiated a crackdown on excessive medals and canceled the one my boss had submitted for me. I was disappointed, not because the medal was particularly special but because I'd expected it—in fact, I'm embarrassed to say that I felt somewhat enti-

tled to it. After all, most people had gotten it for doing what I did.

Even more revealing is the case of one of my top noncommissioned officers (NCO) during my most recent command assignment. After voluntarily spending two years on a remote assignment and performing with extraordinary distinction under austere conditions, he found that the approval authority had denied his end-of-tour medal. The rationale? That he'd recently received a medal for outstanding achievement under the previous regime and that another would be one too many. The message came through clearly: we cannot reward outstanding achievement without significant risk to end-of-tour recognition.

This type of thinking produces a grotesque effect. Too many medals mean excessive promotion points under the Weighted Airman Promotion System (WAPS). Therefore, medals based on achievement and meritorious service become mutually exclusive, so that we protect the end-of-tour decoration received by most individuals at the cost of rewarding the exceptional performers. In effect, we pass by excellence to guarantee rewarding the mediocre with the usual.

Thus the system fails to meet its objectives and, in the process, becomes a bloated, labor-intensive, impersonal bureaucracy. Squadron commanders have no authority to grant even the most basic medals. In most organizations, processing a medal takes not only months but also untold reviews by disinterested administrators who make minor changes and pronounce judgments—often ill informed. Meanwhile, frustrated subadministrators clamor for

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simplified rule sets from the upper echelons so they can anticipate changes. In this way, we fashion the cookie cutter and expunge all original or personal references that might make the citation truly special.

Let me state clearly at this point my belief that people who operate as cogs in the great administrative wheel are generally great Americans, devoted to their work and trying to do their best for all concerned. I've served as a cog in this wheel myself. But the wheel is broken and needs redesigning.

Let's start over and consider the purpose of what we're trying to do. Our decorations program must meet the objectives of celebrating outstanding performance in a timely fashion, with a minimum of administrative workload. We can do so fairly simply, I believe, by applying methods and principles we've already tested in other personnel-related endeavors. We can begin by pushing power down to the lowest level.

Because squadron commanders routinely make far more consequential decisions than selecting who receives a Commendation Medal, we can certainly trust them to make that determination as well. However, our present attempts to control medal proliferation prevent us from allowing them to do so. But we can regulate that process in other ways, such as a simple quota system similar to the one we use routinely for other personnel purposes. Let me illustrate.

Suppose we gave each commander a quota of, for example, 10 percent of members eligible to receive Air Force Commendation Medals per year. In order to keep things in balance, we would need to limit such eligibility so that a rank-heavy squadron wouldn't have a disproportionate share of medals appropriate for its smaller number of junior personnel. We would calculate the allocation annually, rounding down to the nearest whole number and aggregating the remainder up to the next echelon, much the same as we do for many promotion formulae. We could derive a similar formula for Achievement Medals. Meanwhile, the much smaller number of higher-level medals should continue to retain the scrutiny and prestige of more senior endorsement.

Under such a system, the commander would own the process and therefore take pains to make sure that only top achievers received medals. Then troops would recognize them as something truly exceptional. Removing two echelons of review and approval would dramatically reduce processing time and workload.

When the commander wants to go above the squadron's allotment, he or she can appeal the case to the group commander, who would then select the appropriate time for dipping into the aggregate to reward personnel who truly distinguish themselves. This process, of course, continues to the higher echelons as well.

Of course, some persons may object to quotas, arguing that a deserving Airman might miss out on a medal because the unit has expended its allotment—a possible situation but not really new. For example, we have unit quotas for officer-promotion recommendations and enlisted Stripes for Exceptional Performers. In the larger sense, in fact, every promotion board has quotas. There's no such thing as a perfect system, but at least quotas provide us with a well-understood construct under which to operate.

Enforcing quotas and empowering squadron commanders would have the effect of doing away with today's virtually automatic end-of-tour medals. This practice long ago devolved to the point that such medals essentially became farewell gifts, perversely meaning more to those denied them than to those receiving them. The time for this obscene practice to end has long since passed.

We should handle separation and retirement medals differently, however, granting them with "100 percent opportunity" according to a published rank chart (e.g., Commendation Medals for E-6 or O-3 and below, Meritorious Service Medals for senior NCOs and field-grade officers, etc.). The wing commander would approve exceptions to this basic rule.

The new system would work equally well for the expeditionary force. Deployed squadron commanders spend an inordinate amount of time processing and reprocessing medals for further processing and eventual approval under the watch of a distant, overtasked office at

Shaw AFB, South Carolina. The procedure has to begin around the halfway point of a 120-day deployment, just to ensure completion before all the supervisors depart. It doesn't conclude until long after the troops and even the commander have left the scene. The results are predictably labor intensive, arbitrary, and delayed. Oh, as to the "pin 'em where you win 'em" goal of awarding a medal prior to an Airman's departure? It's simply impossible under this system.

Instead, what if the commander could dip into the squadron's quota, producing and presenting medals to his or her outstanding performers before they depart? The medals would be meaningful and timely, and the flood of decorations inundating Ninth Air Force would slow to a trickle.

Clearly, there are details to work out and discuss. For example, we need to carefully examine points awarded under the WAPS to ensure that things don't fall out of balance with

the variety of other medals having point value. We must factor in the value of end-of-tour medals presented by joint organizations and defense agencies to the new formula, perhaps requiring exceptions for extraordinary circumstances. Moreover, we should dissuade commanders from unnecessarily holding medals until the end of the fiscal year. Such are the details to consider and work out during the course of producing new policy.

Still, the basic principles should hold: we must push down the authority to grant medals, eliminate end-of-tour decorations, and avoid unnecessary administrative steps. All of this change would require a huge cultural shift and, no doubt, would prove difficult to absorb at first. But success would bring great rewards. Air Force medals would once again recognize excellence, and the associated administrative overhead would plummet—truly an "outstanding achievement." □

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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 use this department to let readers know about items of interest.

The Dilemmas of Providing Language Instruction for the US Air Force

LT COL JAY J. WARWICK, USAF, RETIRED*

IF ANYONE WERE to objectively compare the Air Force's program for having its Airmen learn a foreign language with that of the other US military services, the Air Force would not fare very well. Learning a foreign language simply hasn't been a part of Airmen's genetic makeup. The Air Force has never had a comprehensive language program for all Airmen, despite cries in the wilderness for decades to do better. As more and more personnel find themselves in complex cultural environments as part of everyday duty, having Airmen learn a foreign language becomes increasingly important. The fact remains, however, that beyond the limited number of positions identified for professional linguists (primarily in the fields of intelligence and regional/political-military affairs), the Air Force has never specifically identified institutional expectations or requirements for language. In fact, 14 years have passed since the Air Force formally addressed the issue at the institutional level. Air Education and Training Command and the Office of the Deputy Chief of Staff for Personnel, Headquarters Air Force, chartered the latest assessment—conducted in the mid-1990s by the Officer Foreign Language Skills Process Action Team—with a stated goal to

“examine enhanced language skills as improvements to USAF global operations.”¹ The team made over 30 specific recommendations to improve the Air Force's foreign language capability.² To date, only a few of these recommendations have seen implementation.

An obvious question comes immediately to mind: why has this been so hard? What issues caused Air Force leadership to ignore such a critical enabler to operate effectively within the expeditionary environment? This article briefly explores these causes, provides a snapshot of how Air University (AU) is addressing the issue of language instruction within the context of the Air Force's professional military education (PME), and offers some prescriptions for a language program that would include every Airman.

Causes of the Problem

Learning a foreign language is an extremely complex activity. Developing a program for language learning that applies to a broad section of Airmen is an equally complicated endeavor. Although this difficulty probably lies at the root of inaction, additional challenges,

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outlined below, make it uniquely hard for the Air Force.

Language Study Not a Priority

Traditionally, the Air Force has had a peculiar way of looking at the world—from 30,000 feet. The line of thinking goes something like this: Air operations launch from a secured airfield resembling a self-sustaining island fortress in the middle of some foreign land or safely from the US homeland. The Air Force conducts those operations in the air, far removed from societies on the ground below, and controls them from within a standardized air and space operations center not dependent on its location within the foreign land. Hundreds of support and operations people fly aircraft, maintain and repair them, provide personnel services, perform logistics operations, and do a hundred other functions—all without direct contact with anyone from this foreign country. Col Gunther A. Mueller, a recent chairman of the Department of Foreign Languages at the Air Force Academy, perhaps defined this mind-set perfectly: “Air Force people raining down fire and steel [from far above] had few motives for cross-cultural understanding.”³ With such an institutional attitude, is it any wonder that the Air Force has struggled to define language requirements for the force at large?

Focus on Technology and Equipment: The Hallmark of Air Force Success

Who can argue with success? Air Force history makes a fantastic case study of how a military service has leveraged technology and superior equipment to achieve stunning success unimaginable to the most radical, visionary proponents of airpower early in its development. We revel in the ability to place a guided bomb in the second-story window of an enemy’s headquarters building. We have gleefully witnessed the progressive evolution of “precision strike,” which now boasts a 90 percent probability of kill with a single bomb from a single B-2 bomber. In remarks to AU students and faculty, Secretary of Defense Robert Gates was quick to recognize these achievements, noting also that the last Air Force jet lost to aerial

combat went down in the Vietnam War.⁴ Furthermore, he connected that success, at least in part, to the way Airmen have pushed technology to its realizable limits. On a cautionary note, however, the secretary suggested that changes—however necessary—would prove difficult for an organization that has enjoyed so much success for six decades.⁵ Past obsession with technological accomplishment has inhibited the Air Force’s capacity to consider other roles appropriate to airpower in the twenty-first century, particularly those less technical in nature and relying on “softer” skills such as language. The stereotypical Air Force community is quick to commend pilots for perfectly launching a weapon into that second-story window but seems oblivious to the potential for much greater operational success from an air delivery of humanitarian-relief supplies handed off to an impressionable local tribal leader by an aircrew member able to muster a few words in that leader’s native tongue.

The Unique Nature of Air Force Expeditionary Operations

Airmen are organized for deployment differently than American soldiers, sailors, or marines. This presents some unique challenges with respect to the management of an Air Force language program, particularly given the long lead time necessary to acquire and maintain proficiency in a foreign language. Substantial portions of the Army, Navy, and Marines take the form of units that train, deploy, and operate together in combat, recurrently returning to the same geographical area. For example, the 22nd Marine Expeditionary Unit deploys to the Mediterranean as a self-contained force of 2,200 marines on a rotating basis with other such units to serve as a landing force for the Sixth Fleet. Because these marines tend to spend a good part of their careers assigned to units like the 22nd, which deploy and operate within the same geographical area, it is possible to develop regional and linguistic expertise over the span of several years. This situation simplifies the process of selecting a language (in this example, Arabic) they will need to master in order to

engage with the local population. Despite many exceptions, the same generally holds true for US Army brigades and US Navy carrier battle groups: with fair reliability, one can forecast the geographical area in which these units will operate, making language training easily focused. This is not the case with Airmen. By and large, those who participate in the cyclical air and space expeditionary force deploy as individuals from a home base to the operational area, assigned to a provisional unit comprised of personnel and equipment that originated from other disparate, home-based units. In such a structure, Airmen may deploy to Iraq in one cycle, Turkey in the next, and Latin America in the next, essentially preventing them from receiving anything other than just-in-time survival phrases as they board the deployment-bound aircraft. Since there is no way to guarantee that Airmen will return to the same geographic area on successive deployments, no practical means exist for selecting a specific language in which to seek proficiency. Because they cannot possibly become proficient in four or five different languages to cover the range of possible deployments, the Air Force as an institution has simply shrugged its shoulders and taken the attitude that the problem remains too difficult to address. Air mobility operations present an even more complex issue since an aircrew will likely make multiple stops in diverse geographic areas on a single deployment. How could we effectively cover all the possible contingency needs for language proficiency? Currently, the Air Force has no answer to this unique problem.

Language Requirements: Past and Present

This is no longer our grandfathers' Air Force. In the past, the service could fulfill its modest language requirements within the small community that offered this unique expertise, primarily within the specialties of intelligence and regional/political-military affairs. We could rectify shortfalls through contract linguists or native "heritage" speakers who also happened to be Airmen. Everyone else in the Air Force

was content to focus on the core missions of flying, fighting, and winning. This traditional Air Force world, as we once knew it, has since been turned on its head and simply does not exist anymore. The radical change began in the 1990s with Operations Southern and Northern Watch and exploded after 11 September 2001. For the first time, the Air Force frequently began to remotely station its personnel en masse. Gone were the single, one-year remote tours that could carry an Airman through a 20-year career. The service is and will remain an *expeditionary* Air Force for the foreseeable future. It must also deal with the cold, hard realities of drawdowns in personnel and equipment. These factors have combined to form a perfect storm of unforeseen consequences, one of which is that ordinary Airmen now find themselves performing very untraditional roles and missions they never could have anticipated a few years ago. Increasingly, Airmen have regular contact with foreign cultures on myriad different levels, driving the need for some basic level of foreign language skill, if not proficiency. Air Force officers lead provincial reconstruction teams in Iraq. Air Force personnel have been working closely with Iraqi counterparts to create a post-Saddam Iraqi Air Force. Approximately 14,200 Airmen perform Joint Expeditionary Tasking on the ground in Iraq or Afghanistan, where, for example, an Air Force civil engineer might replace an Army heavy-construction engineer, or an enlisted member could become a truck driver on Iraqi roads for the Army.⁶ As Secretary Gates observed in his remarks at AU, Airmen more frequently engage with cultures foreign to their own and find themselves in complex situations requiring immediate interaction, from securing air-basing rights to contracting negotiations. Coalition partnerships have become the norm in all military operations. Finally, the nation increasingly calls upon the Air Force to conduct civil-military or humanitarian operations with interagency partners and nongovernmental organizations that must deal directly with local populations, putting a premium on foreign language and cultural expertise.⁷

Addressing the Issue

By 2008 traditional mind-sets and attitudes within the Air Force may have turned a corner. Although movement towards serious engagement on an Air Force-wide language program had moved slowly, in fits and starts, the change became noticeable. In January 2005, the Department of Defense outlined general goals in its *Defense Language Transformation Roadmap*, whose objectives, however, focus too closely on requirements for the language specialist rather than form a coherent program for all Airmen.⁸ In 2007 the Air Force chief of staff shared the service's vision, titled "Global Cultural, Regional and Linguistic Competency Framework."⁹ Although this document highlights the importance that senior Air Force leadership now places on culture and language issues, it does not provide enough specificity to serve as a framework for a comprehensive language program designed to meet the needs of all Airmen. Until late 2007, the Air Staff, seemingly ready to follow the same path as the US Army, contemplated an enterprise-wide purchase of a language software tool for all Airmen. The Army had recently spent \$4.2 million to renew its own two-year-old language software contract, making this tool available to all soldiers.¹⁰ By mid-2008, the Air Staff had backed away from that stance. However, the Air Force undertook another initiative to address its language issues, creating in December 2007 the Air Force Culture and Language Center (AFCLC) at Maxwell AFB, Alabama. Part of Air University, this Air Force-level organization now has responsibility for defining, coordinating, and implementing cultural, regional, and foreign language education and training programs to satisfy the service's requirements.¹¹ At the heart of the center's work is the development of a scientifically sound and institutionally sustainable course of action to develop cross culturally competent (3C) Airmen through the PME system.¹² The AFCLC aims to infuse cross-cultural knowledge (focusing on concepts, theories, and methods), skills (particularly communication, negotiation, and interpersonal relations), attitudes, and learning approaches.¹³ Its concept, now

adopted by the Air Force, relies on learning foreign languages as an integral part of the larger approach to developing 3C Airmen. As the center further refines its implementation of the 3C concept throughout the service, it will assist the Air Force Senior Language Authority, part of the Air Staff, in thinking through a language program for all Airmen.

The Senior Language Authority has also formed standing advisory and executive-level steering groups consisting of experts from around the Air Force to brainstorm policy options with respect to cultural, regional, and foreign language requirements for Airmen. The work of the AFCLC, as well as that of the advisory and steering groups, was just beginning in mid-2008. In the absence of an Air Force-wide language program, the service has seen an increasing number of smaller local initiatives. Some command libraries in US Air Forces in Europe and Air Education and Training Command have purchased language software licenses for use by their Airmen.¹⁴ Additionally, a very small percentage of those Airmen destined for deployment have received language-familiarization training through mobile training teams provided by the Defense Language Institute (DLI). Those endeavors, however, are mostly targeted for special niche efforts, such as air mobility operations.

The Role of Air Force Professional Military Education in Language Learning

At the Air Force chief of staff's direction, AU has been at the forefront of executing the Air Force's fledgling efforts in language learning for the force at large. In February 2006, the chief directed that AU begin language instruction at Air War College (AWC), Air Command and Staff College (ACSC), and the Senior Noncommissioned Officer Academy in four "strategic" languages: Spanish, French, Mandarin Chinese, and Arabic. By 2008 it was evident that the AU senior leadership had taken the task seriously. However, AU has struggled to define its program in terms of specific proficiency objectives, reflecting the

rudderless direction of the Air Force-wide language program. Such issues as method of instructional delivery, quantity, content, and learning assessments have been central to the debate. Early into implementation of the chief's language directive, AU determined that producing proficient linguists lay beyond the scope of PME resources, given the already robust curriculum workload for students. The de facto goal soon became language familiarization/exposure, with the further expectation that students would be motivated to continue learning on their own.

Three Different Schools, Three Different Solutions

The language program at AU faces the critical challenge of teaching language from a cold start to Americans who have not been lifelong language learners and to busy military students who already have a full complement of academic subjects on their schedule. Between 2006 and 2008, AU tackled this challenge by experimenting with three kinds of language learning. Squadron Officer College (SOC), which teaches lieutenants and captains, instituted a voluntary program involving the issuance of language software licenses to students who wanted to learn a language on their own. ACSC, which teaches majors, used a mandatory program whereby in-residence students had to complete an assigned number of language software modules in one of the four strategic languages as a graduation requirement. These students took the Defense Language Aptitude Battery Test at the beginning of the academic year to determine which language each one would study. In addition to the mandatory completion of modules, students had the option of using DLI instructors, made available through mobile training teams. The AWC language program, which instructs lieutenant colonels and colonels, had two requirements for in-resident students: use of DLI software in conjunction with computer video players, and face-to-face mediated instruction by DLI teachers. In its distance learning program, AWC has recently experimented with

offering completion of a small number of language software modules as an elective course.

The Results

Now that AU has experienced two full academic cycles with language instruction, we can make some definitive statements about what has succeeded and what has not.

What Worked

Face-to-face mediated instruction was by far the best-received method used by AU schools. It also succeeded in motivating students to continue language study on their own. Although the effectiveness of language learning depended largely on the specific DLI instructor, AWC students had an overwhelmingly favorable experience with these teachers. During the fall 2007 term, over 58 percent of the students rated this type of instruction excellent or outstanding in effecting language familiarization; almost 70 percent indicated that they were either likely or very likely to continue language study on their own.¹⁵ DLI findings, supported by AU experience over two years, suggest that 30 hours of face-to-face mediated instruction is the minimum required for a credible familiarization program in any of the four strategic languages taught at AU. This level of effort seemed to strike a good balance between providing meaningful language familiarization for students on the one hand, and not becoming too invasive with regard to the core AWC curriculum on the other.

What Didn't

For language learning during resident PME, students did not have high regard for the language software and video player options, which failed to produce significant language capability and did not appear to motivate students to continue language learning beyond mandatory requirements.¹⁶ Among ACSC students, the software's instructional methods, which involved inductive learning (a series of action pictures associated with an accompanying phrase in the target language), particularly

frustrated them. After a short period of use, many students lost their motivation to learn and concentrated more on "beating" the software.¹⁷

SOC students in the distance learning program encountered a different problem with the software. Although this voluntary program initially generated enthusiasm, as evidenced by a rather lengthy waiting list for license use, completion rates for software modules were abysmal. Over a 15-month period, a total of 2,667 SOC students signed up for licenses, but only 67 of them (2.5 percent) completed 50 or more hours.¹⁸ Completion rates for more difficult languages (such as Chinese) were particularly low, the majority of students completing only two of 19 units. Without program incentives (either carrots or sticks) to encourage completion, students quickly found that the program became difficult to fit into their everyday priorities and that the software tool wasn't a "magic pill" that allowed them to bypass the very hard work required to learn a language.

AWC students in the distance learning program also had the option of using language software voluntarily. Unlike SOC, however, AWC offered it as an elective, replacing a pre-existing graduation requirement. This provided "teeth" to a distance-learning language program necessary to motivate students to complete it. The pilot program in AWC has proven extremely popular among students and has enjoyed very high completion rates. AU may have found a "way ahead" for future distance-learning language programs.

The Future of Language in Professional Military Education

In November 2007, AU held a "language summit" in an effort to shape a coherent future approach out of the disparate avenues attempted by its colleges. The summit included representatives from each of the AU schools, as well as experienced language professionals from around the Air Force and Department of Defense. Although AU had acknowledged the feasibility of a "cold start" language program for midgrade and senior officers, given realistic expectations, the summit determined

that the long-range nature of Air Force PME demanded a broader and more comprehensive scope than the current program. PME, as well as any larger Air Force-wide program, should emphasize language learning early in a career—the earlier the better. Therefore, the Air Force approach to language acquisition for general-purpose forces should stress language learning in officer accession programs, including the Air Force Academy and Reserve Officer Training Corps. Over time, this will produce a core of Airmen with significantly greater language skills than exists today. At that point, PME will play an important role in enhancing, sustaining, and maintaining existing language skills, while retaining a small capability to handle those mid- and senior-level officers who wish to begin learning a language later in their careers.¹⁹

As AU moves towards this long-range goal, it will continue to refine its program, capitalizing on the successes experienced since beginning language instruction in 2006. Since DLI-mediated face-to-face instruction proved such a great motivational tool for language learners at AWC, the ACSC resident program will join the one at AWC in moving to mandatory teacher-mediated instruction for all US students by 2010. This, however, does not mean that AU will completely discard language software tools as an avenue for language learning—some such tool will be offered to willing and able students for self-study. Additionally, distance learning programs almost inherently require some kind of software learning option. The question regarding the best tool remains unanswered, however, given the mixed reviews of the existing software. AU is in the process of evaluating other software options for distance language learning.

Holes to Fill

Despite some success with a language program created from scratch, AU still wrestles with a number of difficult questions. The primary issue involves implementing language programs in schools whose course length is too short to permit adding language instruc-

tion to an already full curriculum. This is particularly true of enlisted PME since none of those courses lasts longer than about a month. Even if foreign language instruction were offered, its short duration likely would have negligible impact. One possible solution for the enlisted force would entail offering increased opportunities for language learning through the Community College of the Air Force. Or AU might offer a two-hour class on language-learning strategies, focusing on the "best fit" learning styles of individuals interested in language. Course length also hampers language instruction at SOC. AWC's distance learning experience may prove a valuable guidepost in offering an alternative curriculum choice for students interested in language learning.

Prescription for an Air Force Comprehensive Language Program

Attendees of the AU language summit agreed that it was impractical and undesirable for all Airmen to be language specialists.²⁰ Depending upon the language, an individual could take longer than a year in an immersion-style course to become minimally functional. The Air Force simply cannot afford to have all Airmen out of their operational specialty for that amount of time. Additionally, experience has identified motivation and capability as the key factors in language learning. Not all Airmen possess the motivation to learn a foreign language or maintain proficiency; neither are all of them predisposed to language learning. However, the attendees agreed that all Airmen capable of learning a language should have the opportunity to do so if they wish—and if their duties and/or career fields dictate the need. These basic principles have immense implications, not only for determining the nature and character of the AU language program, but also for the formation of a comprehensive program for all Airmen.

The process of examining AU's experiences in creating a language program and applying the broad principles agreed upon at the AU summit yields a number of recommendations

for a comprehensive Air Force program, including the following:

- Designate (as the chief of staff did for PME in 2006) the top five or six languages that have strategic importance for the Air Force as a whole over the long term; this list should account for 75–80 percent of the total Air Force need for the next 20 years.
- Through an accessions vetting program, earmark Airmen willing and able to become career-long language learners in one of these strategically important languages. These Airmen will arrive on active duty with a baseline language capability. For those needs requiring low-density or rarer languages, the Air Force can continue to rely on the existing programs of hiring contract linguists and recruiting native heritage speakers.
- Have each Air Force career field designate a portion of its total force for a language capability. This initiative would go far beyond the current language-specialty career fields (intelligence and regional/political-military affairs). After conducting a comprehensive survey of language needs, senior leaders in each career field should make a forward-looking estimate of how much contact in an increasingly coalition- and partnership-oriented environment their Airmen would have and adjust their target goals accordingly.
- Direct assignment specialists to marry the group of willing and able language-capable Airmen to the appropriate career field and track their careers through the personnel system. Since the Air Force may consider these language-trained individuals low-density/high-demand assets, it should set and enforce limits on how often they nonvoluntarily deploy out of cycle. Overburdening these personnel with excessive deployments may keep their language skills current but at the same time may diminish their technical skills and discourage them from making a career of the service.

- Assure that Air Force PME focuses the language program to maintain, sustain, and enhance the core language capability initiated during the accessions vetting process. PME will use face-to-face teacher-mediated language instruction as an effective “booster shot” during a career-long, progressive language-learning journey, assisted by the appropriate software tools to enhance self-study.

Can we do this? Yes, but only if senior leadership makes a commitment to follow through on bringing all the working parts together—education and training, policy, and the personnel system. Only then will it be sustainable. Is this a monumental effort? Yes, but the dividends likewise would prove enormous. For the first time in its history, the Air Force would have a comprehensive language program available to the entire force at large—and that would be a worthy effort indeed. □

Notes

1. “Executive Summary,” *Officer Foreign Language Skills Process Action Team Report and Recommendations* (Colorado Springs, CO: US Air Force Academy, December 1995), 1.

2. Col Gunther A. Mueller and Lt Col Carl Daubach, “Global Skills: Vital Components of Global Engagement,” *Airpower Journal* 12, no. 2 (Summer 1998): 68, <http://www.airpower.au.af.mil/airchronicles/apj/apj98/sum98/mueller.pdf>.

3. *Ibid.*, 67.

4. Secretary of Defense Robert M. Gates, “Secretary Gates [*sic*] Remarks at Maxwell-Gunter Air Force Base, Montgomery Alabama, [21 April 2008]” (Washington, DC: Department of Defense, Office of the Assistant Secretary of Defense, Public Affairs, 2008), <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4214> (accessed 29 October 2008).

5. *Ibid.*

6. *Ibid.*

7. *Ibid.*

8. *Defense Language Transformation Roadmap* (Washington, DC: Department of Defense, January 2005), <http://www.globalsecurity.org/military/library/policy/dod/d20050330roadmap.pdf>.

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10. Kristin Atwater, “U.S. Army Extends Language-Learning Partnership,” 2 November 2007, <http://www.govpro.com/RBD.aspx?t=%2fNews%2fArticle%2f75515%2f>.

11. Headquarters USAF/A1 and Headquarters AU, Air Force Culture and Language Center Charter, 26 December 2007.

12. Dr. Brian Selmeski, “Air University’s 2008 Quality Enhancement Plan: Cross-Culturally Competent Airmen,” 15 February 2008. Cross-cultural competence is

defined as the ability to quickly and accurately comprehend—and then appropriately and effectively act—in a culturally complex environment to achieve the desired effect, without necessarily having prior exposure to a particular group, region, or language.

13. *Ibid.*

14. John C. K. Daly, “UPI Intelligence Watch,” United Press International, 5 December 2006.

15. Briefing, Lt Col Jay Warwick, USAF, retired, Air Force Culture and Language Center, subject: Air University Language Update, 5 May 2008.

16. *Ibid.* Oral proficiency interviews from ACSC students who graduated in 2007 indicated that 41 percent of 51 personnel scored a “0+” (defined as memorized proficiency—the ability to satisfy immediate needs using rehearsed utterances) or better on the Interagency Language Roundtable scale. This compares to 81 percent of AWC’s oral-proficiency interviewees who scored the same. A majority of ACSC students who graduated in 2007 (64 percent) rated the language software tool as either marginal or unsatisfactory for language familiarization in Arabic, and 31 percent rated it as either marginal or unsatisfactory for Mandarin Chinese. Fifty-nine percent of AWC students rated the video player’s effectiveness as marginal or unsatisfactory.

17. *Ibid.* A small sampling of ACSC students (nine total) participating in a student survey stated that the language software tool didn’t meet their expectations. Eighty-eight percent either disagreed or strongly disagreed that the tool motivated them to continue language learning.

18. *Ibid.* SOC students’ usage rates included in this report covered the 15-month period between September 2006 and November 2007.

19. Lt Col Jay Warwick, USAF, retired, “Language Summit Proceedings” (Maxwell AFB, AL: AFGLC, 10 December 2007).

20. *Ibid.*

The Air Base Network Serving French and Coalition Operations in Afghanistan

1ST LT MICKAËL AUBOUT, FRENCH AIR FORCE*

THE REQUIREMENT FOR an air base infrastructure near military theaters of operation remains a constant that applies equally to operations in Afghanistan. The air base remains an indispensable tool for the sustained and continuous application of airpower due to its capacities to support and project both force and power. Therefore, the air bases serving operations in Afghanistan constitute the backbone of aerial actions undertaken in that theater.

Ever since the first air raids launched against al-Qaeda and Taliban troops on 7 October 2001, American aircraft have had to deal with the absence of air bases close to the Afghan theater. The majority of the first aerial bombardment missions staged from American bases in the Middle East, the island of Diego Garcia, and US Navy aircraft carriers. Aircrews, therefore, were obliged to air-refuel several times and make round-trips of more than 5,000 kilometers in order to operate from the nearest bases. Subsequently, allied ground-force engagements also necessitated air bases located closer to the theater. Additionally, ground troops, upon deployment in Afghanistan, needed resupply and, especially, close air support (CAS). Negligible aerial opposition from the enemy allowed allied air forces to focus on CAS; bombardment; and intelligence, surveillance, and reconnaissance. Over seven years later, this situation still prevails.

Currently, military aircraft engaged in Afghanistan operate from four main air bases located in Kabul, Bagram, Kandahar, and Mazar-e-Sharif. These bases constitute the principal staging sites for coalition attack aircraft. Built by the Soviets during the 1980s, these sites have become the primary ports of entry for

both personnel and materiel, regularly welcoming tactical transport aircraft shuttling between bases located in neighboring countries. Situated on the "front line," they constitute merely the last links in a chain or network of air bases.

Constitution and Evolution of the Air Base Network

An assortment of air bases cannot truly be considered a network unless it shares one or more common objectives. The need to deploy airpower to strategically situated bases is nothing new for France, a country with a long heritage of overseas aerial interventions. For example, since prior to World War II, the French Air Force has projected airpower far beyond its borders to conduct counterinsurgency operations in support of French national policy. In the present case, the network of air bases serving operations in Afghanistan shares a common goal—the support of ongoing operations in the Afghan theater.

The months following the terrorist attacks of 11 September 2001 witnessed the formation of a large international coalition. Traditional Middle Eastern allies, as well as members of the North Atlantic Treaty Organization (NATO) who fulfilled Article 5 of the Treaty of Washington, assured the United States of their support, effective 12 September 2001.¹ Additionally, several Central Asian countries joined the coalition in various degrees. Countries such as Russia, Turkmenistan, Azerbaijan, and Kazakhstan authorized overflight of their territory, while Pakistan, Kyrgyzstan,

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Uzbekistan, and Tajikistan offered to accommodate aircraft.²

The first countries to receive American combat aircraft included Pakistan, notably at a base in Jacobabad, and Uzbekistan, at Karshi-Khanabad Air Base. During October 2001, these bases were used for aerial reconnaissance and strike missions against the Taliban. At the end of that same year, Washington and Paris engaged in discussions with Dushanbe and Bishkek concerning the deployment of aircraft to Tajikistan and Kyrgyzstan, respectively. A few months later, in Operation Hercules, the first French Mirage 2000D and C-135 aircraft landed at Manas Air Base, Kyrgyzstan, along with American F-18s and F-15s. Manas, which hosted Dutch, Danish, Norwegian, and Spanish aircraft, became one of the principal allied bases, occupying a major position within the network of Central Asian air bases.³ Possessing a runway approximately 4,500 meters long, it can accommodate the landing of heavy aircraft bringing in supplies that tactical airlift aircraft subsequently deliver to sites in Afghanistan. Thus it literally serves as the resupply hub for forces in Afghanistan.

In 2002, following the advance of coalition troops in Afghanistan, the air base network would henceforth include sites in Afghanistan, and its features would continue to evolve. First, aerial assets were transferred in order to bring them closer to the theater of operations, with the Americans assigning F-15s, F-16s, and AV-8Bs to Bagram Air Base. France transferred its Mirage 2000Ds to Dushanbe, leaving its C-135s at Manas. Meanwhile, following American criticisms of the Uzbek government after the massacres in Andijan, the Uzbeks asked the Americans to withdraw from their country.⁴ Six months later, in November 2005, Karshi-Khanabad Air Base was evacuated.

Despite their great importance, one cannot consider the air bases located close to the Afghan theater the only network elements that permit operations in Afghanistan. One must also take into account the bases located in Europe—the origin of the logistical flows into the region. For example, the vast majority of the supplies delivered to Manas come from the US base at Ramstein in Germany. For

France, Istres Air Base fulfills this role. Due to its privileged geographic location near the Mediterranean, Istres has long served France as a power-projection platform and gateway to Africa and Asia.⁵

The Network as a System

Schematically, this air base network can be depicted as a grouping of concentric circles (see fig.). Within these circles, each base has its own function and accommodates specific aerial means. The first (innermost) circle corresponds to the air bases situated in Afghan territory and within the countries along the edge of the theater of operations (Tajikistan and Pakistan). This circle lies at the heart of combat and enables a robust reaction capability by minimizing the time between requests for air support and the takeoff of fighter-bombers. These bases also maximize the endurance of on-call CAS patrols. The bases of the first circle serve the primary purposes of dispatching fighter-bombers and receiving supplies. The second circle, encompassing bases that deliver supplies to the first circle, includes

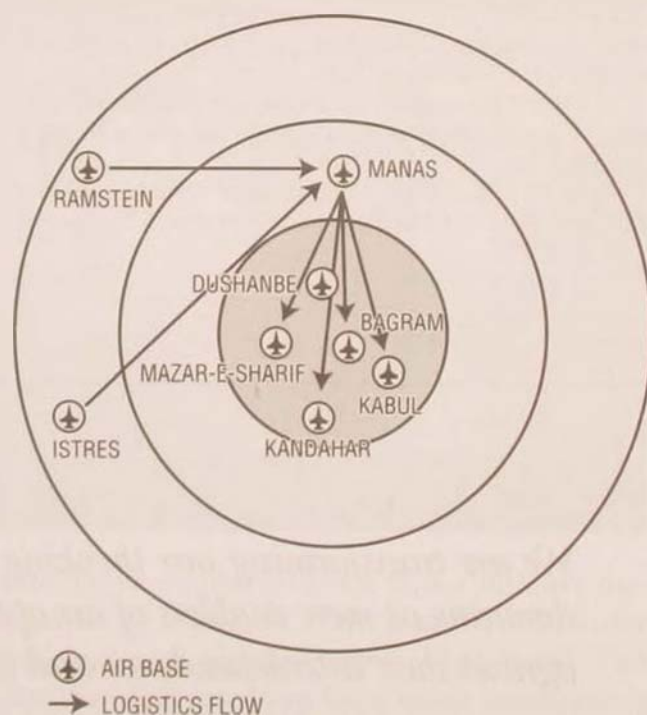


Figure. Air base network

departure points for airlift aircraft operating in Afghanistan. Manas is a notable case in point. The third circle includes the airfield infrastructure from which depart the principal logistical flows that feed the Central Asian bases. Each circle corresponds to a group of bases characterized by specific missions.

Ultimately, when faced with an elusive enemy, one can easily understand that endurance and speed of response constitute measures of effectiveness for aerial forces. These qualities are reinforced by the proximity of infrastructure capable of accommodating and launching aircraft. The transfers of French Air Force Rafale aircraft to Dushanbe and of Mirage 2000 and Mirage F1 aircraft to Kandahar in March 2007 gave the coalition a supplementary strike force located closer to the combat zone.

Within the framework of operations taking place far from our home country, Afghanistan has been a proving ground for projecting force and power in an allied and international context. Since the vast majority of the bases are multinational and under NATO authority, all assigned forces must receive training in allied procedures. French aviators, through their mastery of NATO procedures, bring their support to two distinct, yet complementary, operations. They can intervene in support of the International Security Assistance Force while fulfilling American requests in support of Operation Enduring Freedom.⁶ Finally, beyond the necessity to possess a network of efficient air bases, the Afghan example illustrates how air bases serve as a foundation of airpower. □

Notes

1. According to Article 5 of the North Atlantic Treaty, "The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them . . . will assist the Party or Parties so attacked by taking . . . such action as it deems necessary." "The North Atlantic Treaty: Washington D.C. - 4 April 1949," North Atlantic Treaty Organization, 29 November 2007, <http://www.nato.int/docu/basic/txt/treaty.htm>.

2. Overflight applies under certain conditions since some countries, such as Russia, authorized only humanitarian flights.

3. In October 2002, a detachment of Dutch, Norwegian, and Danish F-16s deployed to Manas. The Spanish

participated with a detachment of C-130 Hercules transport aircraft.

4. On 13 May 2005, troops of the Uzbek Interior Ministry and National Security Service fired into a crowd of protesters in Andijan, Uzbekistan, killing an unknown number of people.

5. In a similar sense, the French presence in N'Djamena, Chad, during the colonial period gave the French Air Force access to French territories along the Indian Ocean (notably Madagascar) via air bases located in French territories in North Africa.

6. The International Security Assistance Force, under NATO command since August 2003, exists under a United Nations mandate.

We are transforming our thinking from considering the space and cyber domains as mere enablers of air operations to a holistic approach that recognizes their interdependence and leverages their unique characteristics.

—Air Force Posture Statement 2008



Guarding the High Ocean

Towards a New National-Security Space Strategy through an Analysis of US Maritime Strategy

COL JOHN E. SHAW, USAF

Editorial Abstract: By and large, the medium of space is still fairly unregulated. China's recent no-notice, unilateral targeting of a low-orbit weather satellite produced space debris that will cause ongoing navigation issues; this action will also redefine space as a contested medium. The author argues that such activity has geopolitical security significance and requires the United States to establish a consistent space strategy. By drawing parallels with and inspiration from US maritime strategy, he postulates a new model for space.



WHAT IS THE nature of the medium of outer space from a geopolitical and "astropolitical" perspective? Is it a peaceful environment for shared exploration? Is it a free and open frontier for pursuit of commercial activities and

intelligence collection? Or is it a military medium to be mastered in the pursuit of broader national and global-security objectives? The fundamental assertion here holds that space is necessarily *all* of these and that an effective US national-security space strategy would inte-

grate ways, means, and ends to ensure the effective implementation of broader US national space policy that recognizes and supports all in a unified manner.

Unfortunately, no such wide-ranging and inclusive national-security space strategy currently exists.¹ This void appeared in sharp relief in January 2007, when China conducted a rather spectacular test of an antisatellite (ASAT) capability, destroying—without notice—an old weather satellite in low Earth orbit and producing a significant debris field in the process. In addition to sparking an international firestorm of criticism, this event also exposed the cognitive dissonance pervading the current US (and, to some extent, international) approach to space security. It seemed to highlight the dangers inherent in an unconstrained and uninhibited approach to space, one that could lead to disorder and chaos in the heavens. At the same time, the Chinese action confirmed the view of space as a contested medium, indicating that the concept of space as a sanctuary devoid of competition had become increasingly, perhaps permanently, untenable. Further, the event exposed the lack of established norms that typify the free and open space environment. (Nevertheless, the resultant debris cloud, though a significant hazard to space navigation, likely to remain for dozens of years, did not constitute a violation of any formal norm or existing agreement on space.)² To resolve these divergent views and circumstances, we need a coherent and integrated national-security space strategy to implement broader US space policy.

The argument here towards such a strategy proceeds in two parts: first, current geopolitical security issues and challenges demand a consistent approach to space and an accompanying national-security space strategy as never before. Second, the most recent US maritime strategy, published in October 2007, addresses many of these very same challenges from the maritime point of view, and its proposed imperatives, implementing actions, and priorities can inform an effective national-security space strategy—one that enables the United States to better ensure security through guarding the high ocean of space.

An Indefinable Ideology of US Space Security?

What, truly, is or has been the United States' ideological position with regard to security challenges in the space arena? Various attempts have sought to provide a useful taxonomy of space-security ideologies, conceptual frameworks, or schools of thought. In 1988 David Lupton defined four doctrines across the spectrum of potential space warfare, stretching from sanctuary to survivability to high ground to control school.³ More recently, Karl Mueller provided six such schools of thought on the narrower topic of space weaponization, ranging from the pure sanctuary idealist to the pro-weaponization space hegemonist.⁴ Most revealingly, neither analysis (as well as others like them) adequately and unequivocally states which position the United States, as a nation, advocated at any given time in its space history—chiefly because America has never really had a truly all-encompassing implementation strategy for national-security space policy and issues, one that integrates differing, but not necessarily incompatible, approaches. Such approaches include the civil view of space as a peaceful global commons, the commercial view of space as an open forum (mirrored in many ways by the intelligence community's desire for an "open skies" environment), and the Department of Defense's (DOD) view, led by the Air Force, of it as a medium for control and exploitation.⁵

To be sure, previous presidential administrations have disseminated numerous, broader US space *policies* (encompassing civil, commercial, military, and intelligence uses), and the second Bush administration released its own such policy in 2006. But no implementing space-security strategy has accompanied those policies, leaving national-security space with a policy-directed compass heading but somewhat rudderless in its ability to steer the policy course. For example, the current policy, a relatively short 10-page document, generally directs the secretary of defense to "develop capabilities, plans, and options to ensure freedom of action in space, and, if directed, deny such freedom of action to adversaries."⁶ But

what are the end goals that identify the requirements for such capabilities, especially in consideration of the various approaches (civil, commercial, etc.) to space, mentioned above? And what ways and means should be employed (or *not* employed) to achieve them?

The acknowledged need for a national-security space strategy is not new.⁷ The 2001 Space Commission, chaired by Donald Rumsfeld before he became secretary of defense, recommended not only a revised US space policy but also an implementing strategy supported by broader space capabilities.⁸ At a forum on space and defense issues in early 2008, Cong. Jane Harman (D-CA) declared that, seven years after the Space Commission's report and a year after the Chinese ASAT test, "We still do not have an adequate space strategy."⁹ Similarly, a March 2008 memorandum from the Government Accountability Office warned the Senate's Committee on Armed Services that the "DOD and the intelligence community have not developed, agreed upon, or issued a National Security Space Strategy" and that "without a strategy in place to link the defense and intelligence communities, future space programs, plans, and new space concepts . . . will be developed without the overarching strategic guidance that a national strategy could provide."¹⁰

The Need for a Coherent Strategy—What Drives It?

Thus, as described above, the United States requires an implementing national-security space strategy to accompany its national space policy. In fact this need is greater than ever before, driven and reinforced by four key trends in the current geopolitical environment with regard to space. The first and perhaps most dominant trend is the enhanced degree to which spaceborne and space-related capabilities *are now integrated into terrestrial activities* of all kinds. During the first few decades of human activity in space, the medium was much more a separate stage, one of more abstract political and strategic activity.¹¹ That has changed quickly and dramatically; space has

woven itself into the economic, sociocultural, and security fabrics of modern global society. In many ways, space capabilities are collectively the central nervous system of the global economy, delivering vital, information-based products (communications, imagery, precision navigation and timing, etc.) and underpinning economic infrastructure (banking, transportation, etc.). In fact it is now essentially impossible to quantify how much human activity relies on space because it has cascaded into second- and third-order applications and beyond. Also, this intertwining of space and non-space, particularly in the defense arena, has had the collateral effect of reshaping policy paradigms. The age-old debate over "weaponization of space" (which struggles even to define the basic terms *weaponization* and *space*, let alone shape the various positions around varying definitions) finds itself on the brink of obsolescence. Because treating the medium of space separately and distinctly from its terrestrial counterparts has become increasingly difficult, if not impossible, it is correspondingly almost impossible to practically discuss weaponization of space without the subject's having embedded (and likely intractable) implications for terrestrial weapons and forces.¹² This new and ever-increasing inseparability of activities in or through space and the terrestrial environment—whether political, economic, military, or some other form of activity—demands a corresponding, integrated space-security strategy.

A second trend, the *proliferation of actors* gaining access to and conducting operations in space, includes not only nation-states but also transnational organizations and other nonstate actors. During the Cold War, space was essentially a bipolar medium, dominated by US and Soviet government-only activities. Now, however, many states (both developed and developing), corporations, and other actors have achieved or seek access to the space medium. Iran, for example, recently announced its intent to conduct its first space launch in 2009.¹³ Increasingly diverse commercial and private ventures, ranging from space tourism to privately sponsored contests (such as Google's Lunar X Prize) are entering

the space domain. Part of this proliferation stems from a decrease in the cost of getting to space: companies such as Surrey Satellite of the United Kingdom are providing smaller and more cost-effective satellites for whoever is interested in gaining a foothold in space.¹⁴ The overall proliferation of spacefaring actors presents a significantly different operating environment from the one of simple bipolar presence that existed during the Cold War and its immediate aftermath. In many ways, it mirrors multipolar developments in terrestrial geopolitics, accompanied by the same challenges of complexity and increasing disorder.

The proliferation of spacefaring actors and the general increase in the use of space across the spectrum have given rise to a third trend: a growing need to *preserve the space environment*, chiefly due to an exponential rise in the number of artificial objects in orbit and the collective navigation hazard they represent. Operating satellites make up only a fraction of those objects; the vast majority is "space junk" (inoperative satellites, spent upper stages, and orbital debris from accidental or intentional collisions). This trend represents a common threat to all spacefaring actors, and we must address it through an effective strategy.

We see a fourth trend in a developing set of *resource shortages* in key areas of the space medium, most notably (1) in operating/maneuver space within or near the geosynchronous belt and (2) in the availability of electromagnetic frequency, but destined to spread to other resources as well. As demand for space access increases, competition for these dwindling resources will likely intensify, presenting yet another "threat" that a comprehensive strategy must address.

Thus, as now described by the confluence of these geopolitical trends, space (at least in terms of nearer Earth orbit) is no longer the boundless, desolate, and remote ocean of the twentieth century. Rather, it has become an increasingly crowded central sea, crisscrossed by shipping lanes filled with myriad traffic bound for far-off destinations—a medium that requires a fresh paradigm for making, planning, and executing security strategy.

The Applicability of the Maritime Model and a Review of Maritime Strategy

Given that we need a coherent national-security space strategy now more than ever, what strategic direction should it endorse, what should it encompass, and what kinds of ends, ways, and means should it employ? Are there any models to draw inferences from, especially ones that acknowledge some of these same geopolitical developments and resultant challenges mentioned above? The *maritime environment* may hold some answers or, at the very least, provide an initial framework for strategic thought.

Parallels exist between the space and maritime mediums.¹⁵ Ontological similarities include relative vastness, inhospitability to human habitation, and nearly homogeneous topology except for sparse scatterings of "terrain" defined more by their intersection with other domains than by their own features (e.g., littoral areas for the seas, the geosynchronous belt [defined by its orbital alignment with terrestrial rotation] for space). The two mediums also share conceptual similarities: both are widely seen and accepted as global commons and as more abstract, connective mediums linking more tangible regions of terra firma.

Beyond the ontological and conceptual similarities—and most relevant for discussion here—a practical convergence of geopolitical challenges can certainly inform responses to security issues in both arenas. The defining geopolitical factors described above regarding space have their direct counterparts in the maritime domain. Just as space faces the trends of increased integration with other domains, the proliferation of actors, shared navigation hazards, and competition for scarce resources, so does the maritime environment confront similar challenges: (1) greater interconnectedness via globalizing dynamics, (2) increasing numbers and types of maritime actors, (3) heightened navigation challenges in increasingly crowded seas, and (4) intensifying competition for coveted maritime regions

and resources. Wayne P. Hughes gives an example: "Going beyond long-standing disputes over fishing rights, in recent years the competition for seabed mineral resources has led to broad claims of ocean 'ownership' that increasingly will threaten freedom of navigation and breed maritime confrontation."¹⁶ If there is a convergence in terms of strategic issues and challenges for both the seas and for space, can there also be a similar convergence in strategic responses? How is the United States addressing national-security issues in the maritime environment? And how can this inform possible approaches to a US national-security space strategy?

In the fall of 2007, the US chief of naval operations, along with the commandants of the Marine Corps and Coast Guard, released a new maritime security strategy entitled *A Cooperative Strategy for 21st Century Seapower*.¹⁷ This new strategy first identifies the "challenges of a new era," highlighting all of the factors identified above regarding the maritime environment: increasing and more diverse maritime activity that undergirds the global economy, a growing number of transnational actors, shared security challenges, and so forth. It then identifies six key tasks (also called strategic imperatives) for maritime security: (1) "limit regional conflict with forward deployed, decisive maritime power," (2) "deter major power war," (3) "win our Nation's wars," (4) "contribute to homeland defense in depth," (5) "foster and sustain cooperative relationships with more international partners," and (6) "prevent or contain local disruptions before they impact the global system." Declaring that it will implement these imperatives through forward presence, deterrence, sea control, power projection, maritime security, and humanitarian assistance / disaster response, the strategy concludes with three implementation priorities: "improve integration and interoperability," "enhance awareness," and "prepare our people."¹⁸

But what are the overarching themes or principles woven into this new maritime strategy that transcend the maritime environment and suggest applicability to the space domain? Are there broader currents of thought that might

translate into similar arguments for a space-security strategy? The first such overarching theme—one that serves as the foundation for the rest of the strategy—entails an evaluation of the current global strategic context that recognizes the globalized interconnectedness of the world: "Because the maritime domain . . . supports 90% of the world's trade, it carries the lifeblood of a global system that links every country on earth."¹⁹ Moreover, it affects not only economies but also "human migration patterns, health, education, culture, and the conduct of conflict."²⁰ Robert Rubel, involved in the early development of the maritime strategy, describes this as a "big idea" that developed during gaming activities to develop the strategy, adding that the "existing global system of trade and security . . . provided both the context for the new strategy and the intellectual glue that tied together all regions of the world."²¹

A second overarching theme unequivocally emphasizes sea power as an essential means to deter, fight, and win the nation's wars. No reader of the new maritime strategy can help noticing the primary focus on "the use of sea power to influence actions and activities at sea and ashore" and a mandate that "seapower will be globally postured to secure our homeland and citizens from direct attack and to advance our interests around the world."²² The first four of the six key tasks or strategic imperatives in the strategy (listed above) concentrate on the direct application of sea power; central to this primary focus is the need for effective sea control since "the ability to operate freely at sea is one of the most important enablers of joint and interagency operations."²³ Rubel describes this as the "war-winning power" dimension of the strategy.²⁴

A third key theme deals with recognition that an important function of sea power involves contributing to the maintenance of stability and international law: "Our challenge is to apply seapower in a manner that protects U.S. vital interests even as it promotes greater collective security, stability and trust. . . . Maritime forces enforce domestic and international law at sea."²⁵ In a sense, this theme unifies the first two, demonstrating that, in

the interconnected global system, sea power can be used not only to project military power in wartime but also to maintain order and assist in prevention of war since “the creation and maintenance of security at sea is essential to mitigating threats short of war.”²⁶

A fourth theme—the one that has received the most attention since the strategy’s release—describes the new emphasis on the cooperative approach, acknowledging that the United States cannot conduct effective global maritime security (especially as described in the third theme, above) on its own since “we also join navies and coast guards around the world to police the global commons and suppress common threats. . . . No one nation has the resources required to provide safety and security throughout the entire maritime domain.”²⁷ Indeed, the word *cooperative* is part of the very title of the document. The first of the strategy’s three implementation priorities—to “improve integration and interoperability,” mentioned above—clearly intends to enhance such cooperation. Rubel describes this theme within the strategy as “catalytic” as opposed to “coercive” or “brute force,” aimed at “cooperating to protect the global system.”²⁸

A closely related fifth theme recognizes the need for enhanced awareness, which holds that “there must be a significantly increased commitment to advance *maritime domain awareness*” (emphasis in original).²⁹ Again, cooperation is necessary to achieve a safe level of transparency so that “new partnerships with the world’s maritime commercial interests and the maritime forces of participating nations will reduce the dangerous anonymity of sea borne transport.”³⁰

Lastly, in the course of this analysis, it is prudent to ask whether the maritime strategy got it right. Did it miss any major themes or concepts? In the short time since its release, the strategy has also undergone scrutiny and received some criticism. Former Navy secretary John Lehman (who produced the last enduring maritime strategy in the 1980s) declares it a “bravura performance” but observes that it lacks a fourth implementation priority, “Field the Right Gear,” which would translate the broader imperatives into better defined

capabilities.³¹ (In fairness, Rubel explains that, to avoid an early degeneration into an equipment debate, “the strategy project banned any discussion of force structure.”)³² Also, retired rear admiral William Pendley suggests that the strategy lacks proper prioritization and focus, “fails to differentiate clearly and prioritize present-day threats,” and similarly “lacks even a prioritization of capabilities.” In particular, he points to a lack of discussion on sea basing, which he sees as imperative if the United States is to maintain a global maritime presence.³³

Towards a National-Security Space Strategy: Analysis and Recommendations

In light of this review of the new maritime strategy, and against a geopolitical backdrop that presents similar security challenges in both mediums, some basic principles to inform an effective national-security space strategy can follow. First, although I have noted the increased integration of space activities with terrestrial ones, it would be helpful for a new space strategy to recognize, as the maritime strategy does, that its integration is *part of a broader globalized framework and context of increasing interconnectedness and interdependence* that transcends technologies and economics—and that it involves “human migration patterns, health, education, culture, and the conduct of conflict,” mentioned above. In fact, I argue that such recognition of omnipresent interconnectedness is even more important for space, which, due to its global nature, has the capability to directly and more immediately affect *all* terrestrial regions—in a sense, its littoral areas are everywhere. This also suggests that space, like the seas, actually *enables* globalization through the connectivity and capabilities it delivers around the world.

Second, given an acknowledgement of this broader strategic context, I also recommend that just as the primary focus of sea power capabilities is to deter, fight, and win the nation’s wars, so must the United States *maintain primary focus on the ability to field and apply space power with freedom of action* to continue to do

the same in support of terrestrial operations. That is, making a substitution in the wording of the new maritime strategy. "The ability to operate freely [in space] is one of the most important enablers of joint and interagency operations."⁴⁴ And, just as maritime capabilities enable sea control, so must space capabilities enable space control. This will likely resemble what Rubel describes (again, making appropriate substitutions in his wording) as the Corbettian approach (after Julian Corbett, the noted sea power strategist), in that it will require "control of [space]—at least in the new sense of [space] security and [space] domain awareness—[to] be exercised day in and day out."⁴⁵ Addressing the ways and means employed to achieve this desired end of effective space control will present a key challenge to a national-security space strategy.

Third, just as the new US maritime strategy recognizes the role of sea power not only in supporting military operations but also in maintaining stability and enforcing international law, so should a space strategy *consider how space power and capabilities can contribute to greater stability and enforcement of norms in the space environment*. A false dichotomy in some current space thinking frequently places "freedom of action" and "norms" in opposition. The maritime strategy (indeed, one could argue, the entire history of security activities on the seas)⁴⁶ demonstrates that the two are actually synergistic—that those capabilities which demonstrate sea power and exercise sea control also serve to regulate and preserve the maritime environment for all actors within it. With this line of reasoning comes an imperative to *transition the aging "weaponization" debate from a capabilities-based argument to a norms-based one*—the question should not concern "what weapons or capabilities" but "what enforcement actions." Further, as is the case in the sea environment, the establishment of internationally accepted norms for routine traffic and operations need not encroach upon necessary freedom of action for military and other security operations. In fact, such norms can actually contribute to addressing security challenges effectively by enhancing visibility and predictability—and by providing the basic framework

for routine activities (e.g., commercial, civil, and private) that security actions, should they become necessary in times of war or other crisis, can "steer clear of" and avoid.

This, of course, presumes the existence of a coherent body of norms to enforce in the first place—some "rules of the road" for space roughly analogous to general laws of the sea. Unfortunately, very few such norms, regulations, and universally recognized rules exist; thus, a fourth key recommendation is to *pursue appropriate international norms for all spacefaring actors to better meet growing challenges in the increasingly crowded and diverse orbital environment*. Many continue to find it surprising how little truly exists in the realm of international space law and regulation. Again, much of this stems from the Cold War approach to space as a detached and boundless medium, and the few norms agreed upon by the superpowers were limited to larger issues involving nuclear weapons or lunar bases.⁴⁷ Little has really changed, and international agreements remain at a bare minimum. To this day the International Telecommunication Union agreements allot orbital slots for geosynchronous satellites only by frequency, not by physical location. Thus, multiple satellites operating at different communications bands can, and often do, occupy orbital positions in close proximity to one another, with no clear "right of way" rules or norms for conjunction (intersection of orbits) avoidance. Such minimum norms should start with a "best practices" of space operations, such as specifying right-of-way rules during conjunctions, standards of responsible station-keeping behavior in geosynchronous orbit, and procedures for disposing of satellites at the ends of their useful lives. A need also exists for a more formal agreement on preventing space environmental contamination caused by debris from either planned or unplanned collisions.⁴⁸

Such norms can be established through bilateral and multilateral agreements between nations, but perhaps the most effective approach would involve the establishment of an organization at the international level that can set reasonable and acceptable standards for *all* spacefaring actors. Such an organiza-

tion might model itself after the United Nations' (UN) International Maritime Organization, whose framework for maritime security offers a good model for establishing reasonable norms for routine traffic and activities, while acknowledging operations of military and other security-related forces in the same medium.³⁹

A fifth and related recommendation springs from the maritime strategy's overarching theme of cooperation. To enhance security in the space domain, the United States should continue to *pursue cooperative relationships*, especially to achieve the goals of increased norms of behavior and enhanced awareness, mentioned above. The 2001 Space Commission report includes this as a key recommendation: "The U.S. will require . . . engaging U.S. allies and friends, and the international community, in a sustained effort to fashion appropriate 'rules of the road' for space."⁴⁰ Such cooperation begins with simple agreements and sharing of information to achieve greater transparency, especially in the space domain's equivalent of "maritime commercial interests." The need for greater "space situational awareness" coincides with the repeated theme in the maritime strategy of achieving "enhanced awareness." But cooperation could also extend to direct linking of space-mission capabilities: Col Tom Doyne has proposed, at least conceptually, the idea of a "100-satellite constellation" (a modification of the cooperative "1,000-ship Navy" concept in current maritime discussion) of networked space capabilities shared by multiple spacefaring actors, all in the interest of promoting security and increasing awareness.⁴¹

A sixth recommendation for a new space strategy addresses the criticism levied at the new maritime strategy by former secretary Lehman and Rear Admiral Pendley. Specifically, we should *articulate and prioritize, in view of identified ends and ways, desired capabilities that would constitute the means* of executing a new national-security space strategy. Although Rubel correctly cautions that a premature focus on capabilities and force structure can doom effective strategy making, it is equally insufficient, in an environment of constrained

resources, to fail to prioritize among the means available to ensure an optimal mix of capabilities within the envelope of the possible.

Further, one must consider the inevitable question, *Who should be responsible for developing a US national-security space strategy?* Answering that question lies beyond the scope of this article, but it is instructive to observe that the new maritime strategy was endorsed not only by the chief of naval operations but also by the commandants of the Marine Corps and the Coast Guard. Such a collective interagency approach is commendable, but one must note the absence of the geographic combatant commanders, who have a clear stake in the employment of maritime forces in their areas of operations. Certainly a new national-security space strategy will also have multiple stakeholders across government agencies—which it should acknowledge. The question of the involvement of combatant commanders appears more simplified for space since the US Strategic Command commander is the single such commander assigned operational responsibility for the space medium.

Finally, it may be useful to examine some of the comparative analysis here for yet another medium of interest to national security: *cyberspace*. Certainly many of the same convergent challenges in the maritime and space domains (e.g., proliferation of actors, including transnational organizations, integration into global infrastructure, etc.) can apply to cyberspace as well, and may aid a separate effort to define an effective national-security cyberspace strategy.

Conclusion

The preceding analysis and recommendations are consistent with the overarching goal of establishing an integrated national-security space strategy that recognizes space as an interconnected and interdependent environment for exploration, commerce, and military operations. This is also precisely how the United States views the maritime environment; thus, the new US maritime strategy provides a useful point of departure for the needed space-security strategy. The current

similarities in geopolitical challenges faced in both mediums also compel constructive comparison. However, employing the maritime domain as a metaphor for the space-domain comparison can go only so far. Ultimately, an effective national-security strategy will have to chart its own final course of ways, means, and ends to contribute to achieving greater national-security objectives.

Just as the Chinese ASAT test in 2007 exposed the lack of an integrated strategy, so might another event help point the way towards one. The recent US shutdown of an ailing spy satellite offers a good example of a unified security approach to space and responsible space operations. Operation Burnt Frost, executed on 20 February 2008, involved the firing of a Standard Missile 3 from a naval vessel in the Pacific Ocean to destroy a malfunctioning reconnaissance satellite and, more precisely, its full tank of hydrazine fuel that posed a potential health hazard upon reentry.⁴²

In accordance with many of the recommendations listed above, the operation (1) employed effective space-control capabilities, (2) did so in a transparent manner emphasizing cooperation and awareness (the United States gave full notification to the world), and (3) pursued a constructive, security-enhancing (in this case, humanitarian) end—mainly, to minimize the danger of a reentering satellite while also minimizing any collateral effects.⁴³ This event stands in sharp contrast to the Chinese ASAT test a year earlier, which occurred without prior notice or coordination with the greater spacefaring community and which left behind a long-term navigation hazard in the form of a gigantic cloud of space debris. The US operation thus stands as a prototypical example of how US space capabilities, guided by an effective, integrated national-security space strategy that incorporates many principles of current maritime strategy, can serve to guard and preserve the high ocean of space. □

Notes

1. As described later in this article, there have been many recent calls for a national-security space strategy, so the idea of producing one is not new. Work on a draft strategy, spearheaded by the Pentagon's National Security Space Office, has actually gone on for several years but has never been published. As I argue here, it is time to publish and implement such a strategy to properly drive the priorities, activities, and resources in the national-security space arena.

2. Suggested guidelines on mitigation of space debris have appeared, most notably ones proposed by the Inter-Agency Space Debris Coordination Committee (IADC), of which the China National Space Administration (the Chinese civil space organization) is a member. But no formal agreements or regulatory language existed. Since the Chinese ASAT test, the United Nations (UN) Committee on the Peaceful Use of Outer Space and the UN General Assembly have adopted voluntary guidelines as proposed by the IADC, but this still does not reach the threshold of "regulated norms."

3. See Lt Col David E. Lupton, *On Space Warfare: A Space Power Doctrine* (Maxwell AFB, AL: Air University Press, 1988), <http://aupress.au.af.mil/Books/Lupton/lupton.pdf>.

4. See Karl P. Mueller, *Totem and Taboo: Depolarizing the Space Weaponization Debate* (Arlington, VA: RAND Corpo-

ration, 2002), <http://www.gwu.edu/~spi/spaceforum/TotemandTabooGWUpaperRevised%5B1%5D.pdf>.

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6. *U.S. National Space Policy* (Washington, DC: Office of Science and Technology Policy, Executive Office of the President, White House, 2006), 4, http://www.globalsecurity.org/space/library/policy/national/us-space-policy_060831.pdf (accessed 18 September 2008).

7. The term *national-security space* traditionally includes both defense (represented by the DOD) and intelligence (represented by the broader intelligence community) aspects of US space activities. But it could certainly be considered more inclusive as other government agencies develop stakes in space-security matters.

8. Donald H. Rumsfeld et al., *Report of the Commission to Assess United States National Security Space Management and Organization* (Washington, DC: Commission to Assess United States National Security Space Management and

Organization, 11 January 2001), xvi, <http://www.dod.mil/pubs/space20010111.pdf>. Col John E. Hyten also remarks on this in "A Sea of Peace or a Theater of War? Dealing with the Inevitable Conflict in Space," *Air and Space Power Journal* 16, no. 3 (Fall 2002), <http://www.airpower.au.af.mil/airchronicles/apj/apj02/fal02/Fall02.pdf>, noting that "the United States still lacks a coherent, long-term space vision. Although the current national policy (1996) provides top-level guidance for each of the nation's space sectors—civil, commercial, intelligence, and military—it does not fully integrate the US space program or provide a long-term vision" (80).

9. Cong. Jane Harman (remarks at the Center for Strategic and International Studies' National Space Forum, Washington, DC, 7 February 2008).

10. Davi M. D'Agostino, director, Defense Capabilities and Management, to Hon. Bill Nelson, chairman, and Hon. Jeff Sessions, ranking member, Subcommittee on Strategic Forces, Committee on Armed Services, United States Senate, memorandum (GAO-08-431R Defense Space Activities), 27 March 2008, 3, 10, <http://www.gao.gov/new.items/d08431r.pdf>.

11. Walter A. McDougall's *The Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books, 1985) is still perhaps the best single-volume history of the early space age, colorfully explaining how the early US and Soviet activities in space were dominated by political and strategic objectives.

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13. Victor Zarbosky, "Iran's SLV Program: 1st Reactions and Implications," *Space News*, 2 March 2008, 29.

14. Richard Wilson, "EADS Astrium Buys Surrey Satellite," *Electronics Weekly*, 8 April 2008, <http://www.electronicsweekly.com/Articles/2008/04/08/43483/eads-astrium-buys-surrey-satellite.htm>.

15. Of course, some significant differences between the maritime and space environments cannot be overlooked or oversimplified.

16. Wayne P. Hughes Jr., "Implementing the Seapower Strategy," *Naval War College Review* 61, no. 2 (Spring 2008): 50, <http://web.ebscohost.com/ehost/pdf?vid=7&hid=103&sid=222406245811-4deb-9dd7-130af46194e6%40sessionmgr104>. These similar geopolitical challenges also appear in the new US maritime strategy. Some of these current challenges may force a reexamination of the UN Convention on the Law of the Sea, last updated in 1994.

17. *A Cooperative Strategy for 21st Century Seapower* (Washington, DC: United States Marine Corps, United States Navy, United States Coast Guard, October 2007), <http://www.navy.mil/maritime/MaritimeStrategy.pdf>. See also Ann Scott Tyson, "New Maritime Strategy to Focus on 'Soft Power,'" *Washington Post*, 17 October 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/17/AR2007101700536.html>.

18. *Cooperative Strategy*, [3–16].

19. *Ibid.*, [2].

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21. Robert C. Rubel, "The New Maritime Strategy: The Rest of the Story," *Naval War College Review* 61, no. 2 (Spring 2008): 71, <http://web.ebscohost.com/ehost/pdf?vid=7&hid=115&sid=c413425f-fa2a-4471-9337-a865dc3b5eef%40sessionmgr103>.

22. *Cooperative Strategy*, [6].

23. *Ibid.*, [11].

24. Rubel, "New Maritime Strategy," 76–77.

25. *Cooperative Strategy*, [2, 12].

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28. Rubel, "New Maritime Strategy," 77.

29. *Cooperative Strategy*, [14].

30. *Ibid.*

31. John Lehman, "A Bravura Performance," *US Naval Institute Proceedings* 133, no. 11 (November 2007): 22–24, <http://web.ebscohost.com/ehost/detail?vid=6&hid=105&sid=11f4e683-155f-44e2-97d8-c74e2285aa2b%40sessionmgr104&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=mth&AN=27473509>.

32. Rubel, "New Maritime Strategy," 72.

33. William T. Pendley, "The New Maritime Strategy: A Lost Opportunity," *Naval War College Review* 61, no. 2 (Spring 2008): 63, 66, 68, <http://web.ebscohost.com/ehost/pdf?vid=7&hid=113&sid=ded757b1-ce47-46d0-8499-2328d2e5f196%40sessionmgr107>.

34. *Cooperative Strategy*, [11].

35. Rubel, "New Maritime Strategy," 73. Another characteristic of Corbett's approach is the concept of "concentrating" capabilities when needed. For space capabilities, inherently global in nature, this concentration is not spatial but more likely focused on limited time, spectrum, and collateral effects.

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37. The Outer Space Treaty of 1967, one of the few such agreements during the Cold War, does not forbid all weapons in space—only nuclear devices (and military presence on the moon).

38. See note 1.

39. The International Maritime Organization has a Naval Security committee as well as a Naval Architectural group. The existing UN Committee on the Peaceful Use of Outer Space is a large, ad hoc committee whose mission is "to review the scope of international cooperation in peaceful uses of Outer Space, to devise programmes in this field to be undertaken under United Nations auspices, to encourage continued research and the dissemination of information on Outer Space matters, and to study legal problems arising from the Outer Space." "UN Committee on the Peaceful Uses of Outer Space to Hold Forty-Sixth Session in Vienna, 11–20 June 2003," United Nations Information Service, 6 June 2003, <http://www.unis.unvienna.org/unis/pressrels/2003/os260.html>. The UN committee does not (yet) institutionalize inter-

national norms, as does the International Maritime Organization or the International Civil Aviation Organization.

40. Rumsfeld et al., *Report of the Commission*, 17–18.

41. Thomas Doyne, "Taking a Cue from the 'Thousand Ship Navv'—21st Century Combined Space Operations: A '100 Satellite' Solution," draft, Fall 2007.

42. Gen Kevin Chilton, commander of United States Strategic Command (remarks at the Air Force Association's Air Warfare Symposium, Orlando, FL, 21 February 2008), <http://www.stratcom.mil/Spch&test>.

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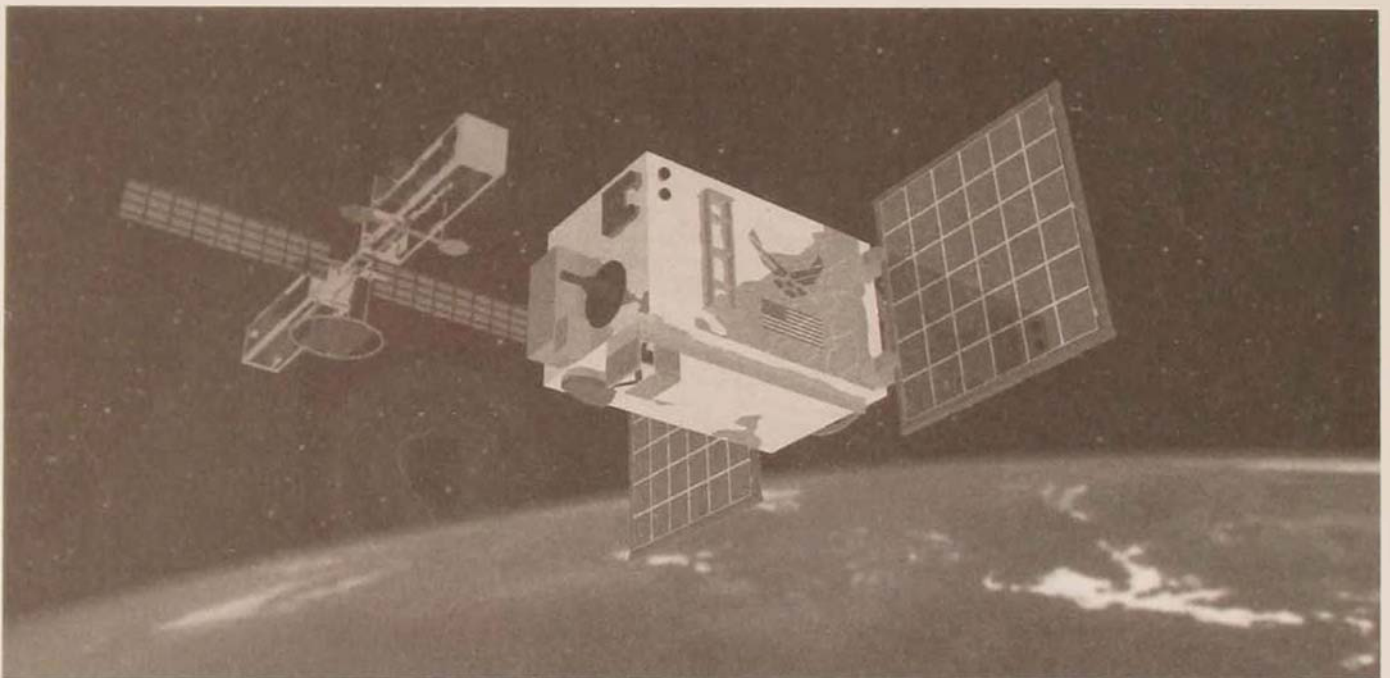
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Soft Power and Space Weaponization

TREVOR BROWN

Editorial Abstract: The United States has taken steps to weaponize space despite the objections of world powers such as China and Russia. Other nations interpret US actions as an attempt to develop proprietorial domination of the medium. The author argues that this perception has incurred a geopolitical backlash and has diminished our soft power (the ability to attract others by the legitimacy of policies and the values that underlie them). Drawing parallels with maritime history, he develops a new approach that protects US interests and achieves space supremacy through competitive scientific and commercial pursuits that are less confrontational.



THE UNITED STATES has plans to weaponize space and is already deploying missile-defense platforms.¹ Official, published papers outline long-term visions for space weapons, including direct-ascent antisatellite (ASAT) missiles, ground-based lasers that target satellites in low Earth orbit, and hypervelocity rod bundles that strike from space.² According to federal budget documents, the Pentagon has asked Congress for considerable resources to test weapons in space, marking the biggest step toward creating a space battlefield since the Strategic Defense Initiative during the Cold War.³ Although

two co-orbital escort vehicles—the XSS-11 experimental microsatellite and the Autonomous Nanosatellite Guardian for Evaluating Local Space—are intended to monitor the space environment and inspect friendly satellites, they possess the technical ability to disrupt other nations' military reconnaissance and communications satellites.⁴ These developments have caused considerable apprehension in Moscow, Beijing, and other capitals across the world, resulting in a security dilemma.

Russia and China believe that they must respond to this strategic challenge by taking measures to dissuade the United States from

pursuing space weapons and missile defenses. Their response will likely include developing more advanced ASAT weapons, building more intercontinental ballistic missiles, extending the life of existing ballistic missiles, adopting countermeasures against missile defenses, developing other asymmetric capabilities for the medium of space, and reconsidering commitments on arms control.⁵

The military options for Russia and China are not very appealing since neither can compete directly with the United States in space on an equal financial, military, or technical footing. Consequently, their first and best choice is the diplomatic route through the United Nations (UN) by presenting resolutions and treaties in hopes of countering US space-weaponization efforts with international law. Although such attempts have thus far failed to halt US plans, they have managed to build an international consensus against the United States. Indeed, on 5 December 2007, a vote on a UN resolution calling for measures to stop an arms race in space passed by a count of 178 to one against the United States, with Israel abstaining.⁶

The problem for the United States is that other nations believe it seeks to monopolize space in order to further its hegemonic dominance.⁷ In recent years, a growing number of nations have vocally objected to this perceived agenda. Poor US diplomacy on the issue of space weaponization contributes to increased geopolitical backlashes of the sort leading to the recent decline in US soft power—the ability to attract others by the legitimacy of policies and the values that underlie them—which, in turn, has restrained overall US national power despite any gains in hard power (i.e., the ability to coerce).⁸

The United States should not take its soft power lightly since decreases in that attribute over the past decade have led to increases in global influence for strategic competitors, particularly Russia and China. The ramifications have included a gradual political, economic, and social realignment, otherwise known as “multipolarism” and translated as waning US power and influence. “Soft power, therefore, is not just a matter of ephemeral

popularity; it is a means of obtaining outcomes the United States wants. . . . When the United States becomes so unpopular that being pro-American is a kiss of death in other countries’ domestic politics, foreign political leaders are unlikely to make helpful concessions. . . . And when U.S. policies lose their legitimacy in the eyes of others, distrust grows, reducing U.S. leverage in international affairs.”⁹ Due to US losses of soft power, the international community now views with suspicion any legitimate concerns that the United States may have about protecting critical assets in space, making it far more difficult politically for the Air Force to make plans to offer such protection.

The Necessity of Defenses

Without a doubt, we must guard at all costs the celestial lines of communications that link society and the military. Consider the consequences if satellites that we use every day for military operations, financial transactions, communications, weather forecasting, and air navigation failed without warning. Devastating strikes on critical nodes in space not only could place the lives of millions at serious risk, but also could result in incalculable economic losses to the nation.

Throughout the Cold War, the United States struggled to obtain a position of military superiority over the Soviet Union in order to protect American values and interests. A legacy of that struggle is the United States’ current space capability. Should the United States permit security for its values and interests to lapse by discontinuing attempts to retain the military superiority that it has achieved? Are we to believe that US security could somehow increase by forgoing military supremacy?

Some people speak as if they believe that a country can choose whether to pursue national security through arms or through arms control.¹⁰ But Russia’s interest in banning space weapons is motivated by a desire to stunt the growth of US military space programs in order to buy time for covertly advancing its own space-weapons program and achieving technological parity.¹¹ Russia bases its opposition

to space weaponization not on a scrupulous set of principles but on strategic objectives. Two scholars contend that “to understand whether Russia could indeed change its position on the weaponization of space, we need to go beyond official statements and discussion among Russian military experts. The course of the military space program in Russia will be determined primarily by the availability of the resources required to support the program and by the ability of the industry and the military to manage development projects for the military use of space.”¹²

Despite China’s repeated calls for a ban on all space weapons, historical evidence suggests that little separates Chinese and Russian motivations for such bans. “Because a broad interpretation of space weapons would rule out almost all U.S. missile defense systems, Chinese officials who want to limit U.S. missile defense deployments would advocate a ban that used this interpretation.”¹³ Interestingly, after the Clinton administration scrapped the Strategic Defense Initiative in 1993, China redoubled its efforts in military space and gained ground on the United States.¹⁴ By 1999 “China’s test of a spacecraft intended for manned flight demonstrated a low-thrust rocket propulsion system that could be used to make warheads maneuver to defeat a BMD [ballistic missile defense] system.”¹⁵

Perhaps there remains a belief in the US strategic community that “the deployment of U.S. space weapons is likely to make space assets—including commercial communications and broadcast satellites—even more vulnerable, since no other country is pursuing, let alone deploying, space attack weapons.”¹⁶ Such notions were shattered when China conducted its first successful ASAT test in January 2007, suggesting that it had spent many years developing ASAT capabilities. The United States—as well as the rest of the world, for that matter—should not allow itself to be duped. The record shows that although officials in the Chinese Communist Party rail against military space as a threat to peace and stability, the People’s Liberation Army busies itself with the acquisition of space weapons.

The notion that the United States can keep space from becoming a “shooting gallery” by agreeing to a comprehensive ban on space weapons is naïve.¹⁷ The hard truth is that as long as US economic and military power depends on massive, complex, and expensive sets of vulnerable space assets, the incentive for any potential foe to develop ways of attacking them remains too great to be overcome by any international agreement.¹⁸ If, however, such an agreement can constrain the United States from developing and deploying effective countermeasures, foes would have every reason to pressure Washington into limiting its own actions.¹⁹ As space technology spreads, the incentives for small and medium states to seek space-warfare capabilities increase, and the destruction of a major US satellite would represent both a substantive and symbolic victory over the United States.²⁰ There is, therefore, no question of whether to proceed with space weapons—only a question of how to do so with the requisite political skill in order to retain soft power while expanding hard power.

Rhetoric and Posturing

Official rhetoric clearly has a significant role to play in the skillful execution of US space policy—take for example the US National Space Policy paper of 2006. Other nations believed that the document contained uncompromising language and that the United States had taken a “proprietary attitude” toward space.²¹ Whether or not the document’s actual language is proprietary may be open to dispute, but it nevertheless appeared that way to an international audience. In the political arena, perceptions are often more important than reality, and it is likely that the manner in which the Bush administration conducted foreign policy at the time led other nations to believe that the United States sought to impose an onerous domination of space on the rest of the world.

Analysts have argued that the rest of the world accepts US space supremacy, but the Bush administration was claiming space dominance—a condition that other countries will

not accept.²² Evidently the world can tolerate the notion that the United States will possess space supremacy, which implies the ability to dominate, yet finds insufferable the idea that America could actually exercise this dominance. Perhaps the world believes that "dominance" connotes an oppressive, unilateral, or dictatorial position, while "supremacy" suggests merely a position of leadership.

What, then, do nations believe that future US space dominance would mean? Retired Chinese military officer Bao Shixiu, a research fellow at the Academy of Military Sciences in Beijing, has stated that "the monopolization of space by a single country . . . cannot be accepted."²³ Maybe the rest of the world is inclined to share this conception of a "monopoly" due to analysts' concern "that the U.S. government might pursue a strategy that would aim to maintain a veto over other countries' ability to access space."²⁴

The fact is that space is now a great "commons" for space powers, much as the sea was for sea powers centuries ago, not because of any international law or treaty but because of the nature of the space medium. Similar to maritime communications long ago, space assets must conduct all of the surveillance and reconnaissance, attack warning and assessment, communications, signals interception, navigation, munitions guidance, meteorology, and so forth, in a neutral or "common" zone. According to Sir Julian S. Corbett, "You cannot conquer sea because it is not susceptible of ownership, at least outside territorial waters. You cannot, as lawyers say, 'reduce it into possession,' because you cannot exclude neutrals from it as you can from territory you conquer. In the second place, you cannot subsist your armed force upon it as you can upon enemy's territory."²⁵

Space forces allow the United States to act with unprecedented speed and thoroughness around the world in much the same way that England's sea power "allowed her forces to act on distant points, widely apart as Cuba, Portugal, India, and the Philippines, without a fear of serious break in their communications."²⁶ However, assets and information in space, as on the sea, must pass along lines of communi-

cations not only shared by other participants but also open to dispute. It follows that since space has inherent value as a means of obtaining and communicating information, a critical objective in space must always concern the securing of celestial lines of communications. Corbett notes that

command of the sea, therefore, means nothing but the control of maritime communications, whether for commercial or military purposes. The object of naval warfare is the control of communications, and not, as in land warfare, the conquest of territory. The difference is fundamental. True, it is rightly said that strategy ashore is mainly a question of communications, but they are communications in another sense. The phrase refers to the communications of the army alone, and not to the wider communications which are part of the life of the nation.²⁷

A recent analysis contends that "key to understanding Corbett's thinking is that command of the sea actually exists only in a state of war. For if one claims command of the sea during times of peace, it is done rhetorically and only means one state has adequate naval positions and a sizable fleet to secure command once hostilities are commenced."²⁸

Corbett goes further: "To aim at a standard of naval strength or a strategical distribution which would make our trade absolutely invulnerable is to march to economic ruin. It is to cripple our power of sustaining war to a successful issue, and to seek a position of maritime despotism which, even if it were attainable, would set every man's hand against us. All these evils would be upon us, and our goal would still be in the far distance."²⁹

For this reason, the United States should seek a position of space supremacy whereby it can exercise control and effectively dominate the medium in the event of war. At the same time, it should maintain a stance in peace that is politically acceptable to all other participants by refraining from overextended and unnecessary exercises in domination. The United States should especially avoid creating the perception that it has grandiose desires for imposing a domination that smacks of orbital tyranny.

Evidently, rhetoric emanating from the United States regarding space has made members of the international community suspicious that America could bar them from the medium on nothing more than a whim. Such apprehensions unnecessarily contribute to further reductions in soft power. The United States should take care to ensure that other nations receive the impression that it has no intention of hindering their peaceful use of space. If those countries find current US space supremacy tolerable, then perhaps in time they could endure the United States' possession of weapons if this were a significant aspect of US primacy in space and maintenance of the status quo. But if US rhetoric and posturing leave other nations with the belief that the United States has stratagems for orbital despotism, then the international system will hesitate to look to it for leadership. Furthermore, even if most nations cannot compete in space, they will nevertheless do whatever they can to oppose the United States.

“Merchant Shipping”

The United States would do well to keep a low profile for its military space program and burnish its technological image by showcasing its commercial and scientific space programs. Doing so would enable it to accumulate rather than hemorrhage soft power. Such a rationale is not lost on the Chinese, who certainly have had their successes in recent years in building soft power and using it to extend their influence around the globe. According to National Aeronautics and Space Administration (NASA) administrator Michael Griffin, the Chinese have a carefully thought-out human-spaceflight program that will take them up to parity with the United States and Russia. They're investing to make China a strategic world power second to none in order to reap the deals and advantages that flow to world leaders.³⁰

Analysts believe that the United States' determination to maintain dominance in military space has caused it to lose ground in commercial space and space exploration. They maintain that the United States is giving up its

civilian space leadership—an action that will have huge strategic implications.³¹ Although the US public may be indifferent to space commerce or scientific activities, technological feats in space remain something of a marvel to the broader world. In 1969 the world was captivated by man's first walk on the moon. The Apollo program paid huge dividends in soft power at a time when the United States found itself dueling with the Soviets to attract other nations into its ideological camp. Unless the United States has a strong presence on the moon at the time of China's manned lunar landing, scheduled for 2017, much of the world will have the impression that China has approached the United States in terms of technological sophistication and comprehensive national power.³² If recent trends hold, this is likely to come at a time when the new and emerging ideological confrontation between Beijing and Washington will have intensified considerably.³³

The most recent space race reflects the changing dynamics of global power. “Technonationalism” remains the impetus for many nations' space programs, particularly in Asia: “In contrast to the Cold War space race between the United States and the former Soviet Union, the global competition today is being driven by national pride, newly earned wealth, a growing cadre of highly educated men and women, and the confidence that achievements in space will bring substantial soft power as well as military benefits. The planet-wide eagerness to join the space-faring club is palpable.”³⁴ India and Japan are also aggressively developing their own space programs.³⁵

But the United States does not necessarily have to choose between civilian and military space programs since much of the technology developed for space is dual use. The space industry provides a tremendous opportunity for militaries that desire more affordable access and space assets that can significantly augment terrestrial forces. As Alfred Thayer Mahan pointed out, “Building up a great merchant shipping lays the broad base for the military shipping.”³⁶ The US military can maximize its resources, not only financially but also politi-

cally, by packaging as much military space activity as possible into commercial space activity.

One example involves satellite communications. The arrangement the Pentagon has with Iridium Satellite LLC gives the military unlimited access to its network and allows users to place both secure and nonsecure calls or send and receive text messages almost anywhere in the world.³⁷ Another example involves space imagery. Even though the government must maintain sophisticated imaging capabilities for special situations, it could easily meet the vast majority of its routine requirements at lower cost by obtaining commercially available imagery.³⁸

The Air Force could also use space transportation, another emerging industry, to maximize its resources. Private ventures now under way are reducing the costs of space access considerably. It is possible that one enterprise could become an alternative to Russian Soyuz spacecraft for NASA's missions to the International Space Station.³⁹ Such enterprises could prove attractive, cost-effective options for delivering the Air Force's less-sensitive payloads to Earth orbit. Space tourism, a growing industry, could enable the Air Force to procure affordable capabilities to routinely operate 60 to 90 miles above Earth.⁴⁰ Advances that entrepreneurs are making in suborbital space flight could eventually evolve to a point where the Air Force would find it far easier, politically as well as financially, to acquire platforms capable of delivering munitions from space.

Conclusion

A glance at the global strategic situation reveals many nations rushing to develop space capabilities. Ostensibly civilian, the capabilities in development around the world are largely dual use and will have profound effects on the balance of power. The United States, therefore, would be foolish to slow the pace of its own space development. The issue at hand is not whether to proceed with space weapons but how to proceed with these capabilities and effectively manage the security dilemmas that will inevitably arise.

By assuming a posture which suggests that its intentions in space are competitive scientific and commercial pursuits—and which does not suggest the desire to barricade the medium in times of peace for the purpose of geopolitical leverage—the United States can proceed without causing undue angst in the international community. Once we have laid the foundation for commercial activities (i.e., “merchant shipping”), military capabilities—or “military shipping”—will follow in due course and with far less controversy. If US policy makers can showcase scientific and commercial space endeavors while avoiding the perception of orbital despotism, they can steadily build dominant military space capabilities and retain soft power. □

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Our Nation depends on its space capabilities as an integral part of its military strength, industrial capability, and economic vitality.

—Air Force Posture Statement 2008



Examining Space Warfare

Scenarios, Risks, and US Policy Implications

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Editorial Abstract: Militaries plan for contingencies involving space, but few studies have examined the issue with the intent of helping guide policies necessary for shaping military planning. This article takes a practical approach by examining space warfare, beginning with current US political policy and military space doctrine. After examining how the United States intends to fight, the author addresses current fielded capabilities that exist to conduct these battles, both in the United States and in nations considered potential space opponents. Analyzing possible confrontations with space competitors, he concludes that realistic scenarios involving military confrontation in space are extremely limited and, as a corollary, that space weaponization is neither an efficient nor effective way to reduce US vulnerabilities.

THE US MILITARY faces a security dilemma because of both the essential and increasingly vulnerable nature of its orbiting space assets.¹ The United States owns over 400 of the almost 900 active satellites in orbit, whose combined commercial activities added \$123 billion to the world economy in 2007.² All military branches leverage the “high ground” of space for essential communications; intelligence, surveillance, reconnaissance (ISR); and navigational purposes by using dedicated military satellites and the communication infrastructure of civil satellites. The US military has solely dedicated at least 83 satellites to its use and controls many more for such purposes as navigation and

Earth observation.³ Space assets no longer simply enhance US military forces; they are essential to effective combat operations. At the same time, these assets have become increasingly vulnerable to attack, as demonstrated by China’s successful antisatellite (ASAT) missile test in 2007.⁴

The simultaneous rise in the necessity and vulnerability of space assets led the 2001 Space Commission to warn of a potential space “Pearl Harbor”—a warning that confirmed the beliefs of those who seek increased militarization of space, including space-based weapons, to ensure the nation’s security.⁵ Since that time, others have argued that the deployment of space-based weapons, at best, will lead to a

destabilizing space-weapons race and, at worst, will result in the long-term, catastrophic contamination of highly useful regions of the space environment in a truly Pyrrhic defense of national interests.⁶ This article contends that the very concept of a space Pearl Harbor conflicts with the reality of current space-warfare possibilities and that, contrary to the beliefs of “space dominance” advocates, it is still possible to maintain space as a sanctuary while protecting US military capabilities.⁷

The article examines scenarios in which space warfare might occur in the next five to 10 years—first, by assessing the state of US space policy and military doctrine that guide US military planners and then surveying the space-warfare capabilities of the United States and plausible opponents. Based upon this foundation, it examines several possible scenarios involving space warfare to demonstrate the narrow set of conditions that would prompt the use of space weapons, and to reveal the fallacy of the Pearl Harbor scenario. It concludes by returning to the vulnerability of US space assets, suggesting that the United States would gain greater utility not by weaponizing space but by reducing its military dependence on such assets and creating conditions for the establishment of space as a sanctuary.

US Policy and Doctrine

Policy and doctrine, the cornerstones of military operational planning, would direct US actions in a near-term conflict. US space policy describes its idea of permissible actions by other nations as follows: “The United States is committed to the exploration and use of outer space by all nations for peaceful purposes.” It is not nearly as restrictive in its description of US activities: “The United States will: preserve its rights, capabilities, and freedom of action in space; dissuade or deter others from either impeding those rights or developing capabilities intended to do so; take those actions necessary to protect its space capabilities; respond to interference; and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests.”⁸ The

key item here notes that the United States does not explicitly support other nations’ rights to operate militarily in space, reserving this right for itself. For military planners, this implies that there are no restrictions on US military action in outer space except for those already set by treaty. Revealingly, US space policy no longer mentions current space-treaty obligations, which seems to agree with the 2001 Space Commission’s recommendation to restrict as little as possible US application of national power in space.⁹

As defined in Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States*, 14 May 2007, doctrine “promotes a common perspective from which to plan, train, and conduct military operations. *It represents what is taught, believed, and advocated as what is right (i.e., what works best)*” (emphasis in original).¹⁰ JP 3-14, *Joint Doctrine for Space Operations*, 9 August 2002; Air Force Doctrine Document (AFDD) 2-2, *Space Operations*, 27 November 2006; and AFDD 2-2.1, *Counterspace Operations*, 2 August 2004—the primary sources of guidance for the employment of space forces—provide insight into capabilities the US military has considered and the effects they should produce. However, doctrine does not specify the type of weapon or system to be used; rather, it specifies the outcomes that space operations need to achieve and advises how to match those objectives with available resources. For this reason, the article first examines doctrine and then considers current military capabilities that could produce the required outcomes.

JP 3-14 and AFDD 2-2 divide military space operations into four categories: space force enhancement, counterspace, space force application, and space support.¹¹ Space force enhancement includes support functions such as surveillance, missile warning, communication, and meteorology. Counterspace includes those capabilities necessary to achieve and maintain the desired level of space superiority, defined as the “degree of dominance in space of one force over another that permits the conduct of operations . . . at a given time and place without prohibitive interference by the opposing force.”¹² Counterspace capabilities include surveillance, protection, prevention,

and negation. Space force application involves missions “with weapons systems operating in, through or from space which hold terrestrial-based targets at risk.”¹³ Finally, space-support functions include satellite launch and control—enablers to the other missions. This description of different space operations considers all manner of existing and nonexisting capabilities appropriate for operational planning. Space force application “from” space in addition to “through” space implies space-based weapons for ground attack, while counterspace “negation” refers to ground-to-space or space-to-space attacks. Clearly, US doctrine on the use of space forces provides for all conceivable methods of space warfare.

AFDD 2-2.1 more specifically identifies possible threats and military offensive and defensive responses that planners must consider in order to establish and maintain space superiority, which, along with air superiority, represents a “crucial first [step] in any military operation.”¹⁴ This document discusses the entire space system, consisting of satellites, ground telemetry and processing stations, links between space and ground, launch facilities, and manufacturing infrastructure. Civil third-party space systems are included since they increasingly affect the potential use of space by an adversary.¹⁵

AFDD 2-2.1 examines short- as well as long-term threats that the United States could face. As a corollary, it also serves as a list of capabilities that America could develop for its own offensive purposes. Ground facilities and infrastructure could face direct kinetic and electronic attack, jamming, or attack by malicious code from traditional and special operations forces.¹⁶ Ground-, air-, or space-based lasers, depending on their output power, can harm satellites by either blinding optical sensors or overheating the satellite bus, potentially causing critical damage to sensitive electronics.¹⁷ Electromagnetic pulse (EMP) weapons can damage unprotected electronic equipment and threaten space- and ground-based segments of space systems. Finally, the threat list contains traditional kinetic-kill ASAT weapons that destroy satellites by colliding with them at high speed or exploding a warhead in close

proximity.¹⁸ Although the document specifies that this list may not be all inclusive, it obviously intends it to be as inclusive as possible, given the unclassified information available at the time of publication. Thus, we have a list of possible threats to US space forces that AFDD 2-2.1 uses to consider possible offensive and defensive options.

Defensive capabilities have both passive and active components, the former including hardening and camouflaging ground facilities as well as hardening and dispersing space assets in multiple orbits. Active defenses include changing orbital parameters to avoid ASAT targeting, changing or hopping frequencies to avoid jamming, encrypting to prevent malicious-code attacks and interception of information, and applying direct force against the enemy’s counterspace weapons.¹⁹ Due to acquisition and launch restrictions, most forms of counterspace defense must be incorporated in the design phase, adding cost and complexity to space programs. For economic reasons, few commercial space systems are currently designed with combat in mind. The threats that this doctrine plans to defend against and our assets it intends to use differ considerably from the current capabilities of our forces and those of our potential adversaries.

Space-Warfare Capabilities

If a conflict occurs in the next five to 10 years, the long acquisition process for space systems and limited space-launch schedules will confine the main space systems involved to those now fielded. Therefore, a survey of current counterspace assets is necessary in order to understand how space-warfare scenarios would likely occur. The following considers only those countries most likely to confront the United States militarily in space in the near future—specifically, nuclear states with domestic space-launch and satellite capabilities, nuclear powers possessing ballistic missiles, and nonnuclear states with ballistic missiles capable of direct ascent into occupied space orbits. Each group has the potential to engage in space combat along a spectrum ranging from

creation of a crude debris field to targeted space attacks. Limiting the study to the most plausible threats, the discussion focuses on the capabilities of Russia, China, North Korea, and Iran, citing examples that cover most of the space-warfare spectrum and applying lessons to other countries of interest.

Many works about space weapons quickly move from what the United States and its adversaries can do now to what they could possibly do soon, principally because few fielded terrestrial weapons can attack space assets and because no declared space-based attack assets exist.²⁰ We could probably field a few promising technologies rapidly in wartime conditions, but as former defense secretary Donald Rumsfeld commented, "You have to go to war with the army you have, not the army you want."²¹ Fielded weapons include only the ones tested and turned over to military forces trained to employ them as an integrated part of battlefield forces.²² The discussion addresses only weapons that target orbiting space assets since all other conventional force capabilities (air, ground, and sea) are already well known.

The United States has just one counter-space weapon—an electronic countercommunication system specifically designed and fielded with the intent of disrupting enemy satellite communications.²³ Recently, however, we successfully utilized the Standard Missile 3 in a dual-use role as a kinetic ASAT weapon.²⁴ Although the political repercussions from creating additional space debris will likely prohibit further tests, the missile and supporting systems are already fielded in an antiballistic missile (ABM) role; therefore, we consider it an ASAT system that we could field in the near term. The United States can also conduct asymmetric space attacks (e.g., an EMP produced by exploding a US nuclear-tipped ballistic missile in space). Since the United States possesses nearly half of all orbiting satellites, such an indiscriminate attack would do more harm to US interests than to those of the enemy. But what about our opponents' capability? Does a space weapon "gap" exist?

Even after the collapse of the Soviet Union, Russia remains the United States' greatest potential adversary in space. The Soviet Union

fielded an operational co-orbital ASAT system in 1979 and, even earlier, a nuclear-armed ABM system around Moscow. It also developed, though never fielded, a space-based platform for delivering nuclear warheads and a high-powered, ground-based ASAT laser system.²⁵ Once again, however, the question is not what the Russians possessed in the past, but what capabilities they wield today. According to current estimates, the Russian co-orbital ASAT is not operational, and new development of any ASAT capability would require dramatic change in the present structure of Russian forces.²⁶ So, although Russia has the technological history conducive to fielding effective counter-space forces, its force structure suggests that it likely has neither the current capability to strike in space nor the political desire to create such a capability. However, it remains a major military power and, like the United States, possesses robust space launch. It has nuclear weapons and ballistic missiles that could effectively carry out asymmetric attacks in space. Additionally, the fact that Russia supplied Iraq with global positioning system (GPS) jammers prior to Operation Iraqi Freedom indicates that it has fielded earthbound counterspace technology.²⁷

Other than Russia, only China can field substantial counterspace forces. China's successful test of a direct-ascent ASAT weapon in 2007 demonstrated its ability to compete in the space battlefield.²⁸ But China's fielded forces remain unknown. Since this ASAT test was Beijing's first success, the Chinese have probably not yet fielded or integrated the system into battle planning. Given their great interest in the development of ASAT weapons, however, they are presumably in the process of fielding it, which would make the system at least partially operational in any near-term conflict.²⁹ Recent reports have also suggested that China has many components of a ground-based ASAT laser system, but its operational status remains unknown.³⁰ We also believe that China possesses jamming technology similar to Russia's, and, like Russia, it boasts space launch, ballistic missiles, and nuclear weapons.

North Korea, which has developed a nuclear weapon, came close to developing a missile capable of reaching orbit, as demonstrated

by the failed test of the Taepo Dong 1 in 1998, which reportedly threw debris 4,000 kilometers (km) downrange from the launch site.³¹ Such a missile, however, could easily reach sufficient altitude to act as a direct-ascent ASAT carrying a nuclear payload, as would North Korea's better tested and fielded Nodong missile, having a range of 1,300 km and carrying a payload of 700 kilograms.³²

Iran, the least space-capable of our potential opponents, has no nuclear capability at present. Because that country lacks the advanced tracking and guidance systems necessary to intercept a satellite, its only weapon capable of reaching space—a ballistic missile armed with a conventional warhead—would explode blindly, creating a dangerous debris field in valuable low Earth orbits. Iran's most capable missiles, the Shahab-3 and Shahab-4, could possibly reach direct-ascent altitudes of 650 and 1,100 km, respectively.³³

After all the hype about space warfare and space weapons, an examination of currently fielded forces capable of direct counterspace operations against satellites clearly shows that few countries can conduct this type of warfare. Most threats envisioned in the US military's space doctrine simply do not exist in an operationally deployed form.

Space-Conflict Scenarios

Because current US space policy considers the entire space infrastructure a vital national interest, an attack against it or even preparation for one would likely incur a military response.³⁴ Rationally, then, we would think that other nations would refrain from attacking US space assets unless they are engaging or already engaged militarily with us. In this regard, the deterrent threat of US retaliation would establish a lower limit to space conflict, much as it does with other forms of military confrontation.

The scenarios offered here include conflicts between the United States and three of the four nations capable of space attack mentioned above: China, North Korea, and Iran. Each highlights different aspects of US vulner-

ability and ways of constraining the United States in its responses. Russia is excluded due to its apparent lack of current capability and its similarity to China as another state with nuclear ballistic missiles. Considering the major nuclear powers, any direct conflict would occur over objectives below the level of national survival in order to avoid the risk of a nuclear exchange—the upper limit to realistic space-combat scenarios. With these lower and upper limits set, the scenarios include a limited conflict with China; a direct conflict with the more space-capable of the smaller opponents, North Korea; and a confrontation at the lowest level of space warfare with Iran. The development of these scenarios incorporates information available from war-game results that have included counterspace operations.

Though little has appeared publicly concerning the series of Schriever space war games conducted by the US Air Force since 2001, the third round, completed in 2005, included operations to temporarily deny opponents access to space assets.³⁵ The most recent unclassified war-game experience involving space assets—the RAND Corporation's Army After Next study in 1999—closely approximates our US-China scenario since it involves a space-technology competitor with significant space-based ISR assets.³⁶ The scenario involved "Blue" forces (similar to those of the United States) deploying to forward locations and then attacking enemy "Red" forces (similar to China's). Red found it in its best interest not to attack Blue's space-based assets during the deployment phase because it did not want to jeopardize its own ISR space assets, which it needed to monitor Blue's deployment. After Blue had forward-deployed, Red could conduct reconnaissance using aircraft, thus putting it in a better position to begin attacking enemy space assets—which it did.

All of these scenarios assume only two players, with other nations neutral to the conflict but involved insofar as their interests include commercial and possibly manned space assets. According to the second assumption, the United States forward-deploys to engage its opponent abroad and does not defend itself from invasion. The RAND study highlights the point

that the nondeploying nation has certain advantages in space warfare, such as the ability to supplement space-based ISR assets with nationally based air-breathing assets and reduced dependence on space-based communications. The preponderance of US strength as a superpower also makes a US deployment scenario more likely.

In the first scenario, the United States deploys to defend Taiwan against China's attempt to subdue the island forcibly. As in the RAND study, China would likely refrain from attacking US space assets to preserve its own space ISR capability, which it needs to monitor the US buildup. The United States would also delay full counterspace operations until fully deployed in order to prepare for retaliation with assets in place instead of in transit, where space disruption would cause much more confusion. With the United States almost fully deployed, China would do well to utilize any counterspace weapons it possesses before the United States targets them. Given its limited ASAT capability, China would likely target US military communication and reconnaissance satellites, avoiding permanent damage to dual-use commercial satellites to preserve its global reputation and protect its own third-party commercial space contracts. The Chinese would use kinetic attacks and any rapidly deployed ASAT lasers against low-altitude satellites, such as those performing reconnaissance, while likely attacking high-altitude communication satellites by jamming or feeding them malicious code. In addition to hitting space assets, China would probably deploy high-powered GPS and other signal jamming throughout the theater to degrade US bombing accuracy and complicate navigation.

US doctrine, which places priority on air and space superiority, suggests that the first US attack would target China's ground-based counterspace capability, using the full range of joint-attack forces and munitions. This first wave of ground attacks would also combine with counterspace offensive operations of a nondestructive nature, as highlighted in the Schriever war games, to temporarily blind Chinese ISR satellites and jam communication and signal-collection satellites. A few po-

litical caveats attach to this doctrine-directed target list, however. China's launch facilities are far inland, thus raising the possibility that it would consider strikes in these areas a significant escalation, just as the United States would consider Chinese attacks on US launch facilities at Cape Canaveral, Florida, and Vandenberg AFB, California, provocative. The United States would also have to avoid targeting ground-based missile-launch-detection capabilities, which China might interpret as preparation for a nuclear first strike.

As mentioned in the RAND war-game scenario, China would be far less affected than the United States by the loss of most space assets at this point because its air-breathing ISR assets could cover the immediate theater and short-range ground communications that do not rely upon satellites.³⁷ Conversely, once US forces have deployed, they would rely heavily upon space assets. In a limited military engagement such as this, it is unlikely that the United States would attempt to facilitate ISR flights by establishing air superiority over all of China. US forces would thus remain highly reliant upon satellites for ISR over mainland China and for communication with the homeland and between deployed units.

The RAND study also pointed out that China would likely contract commercial third-party space assets to provide needed capabilities, complicating repercussions from US attacks. All told, counterspace operations would probably prove as discriminate as possible to prevent strategic escalation. Both sides would hesitate to utilize kinetic-kill ASATs against anything but very low-altitude satellites for fear of incurring international condemnation and increasing debris hazards for their own resources.³⁸ In all likelihood, the United States would not use its kinetic ASAT capability, preferring to utilize its limited number of sea-based Standard Missile 3s for ABM defense of forward-deployed forces. Thus, the number of satellites destroyed or permanently disabled would be very low.

As limited as this scenario appears, it bears out realistic actions taken under current policy and doctrine, given the resources available to each side. In this case, it is difficult to see how

even one of our most capable space adversaries would have either the capability or the motivation to attempt a surprise attack on US space assets that would rise to the level of a space Pearl Harbor. It is also difficult to understand how the cost of deploying hundreds or even thousands of US weapon satellites to ensure space dominance would greatly affect the outcome of this scenario. Even a deployed space-based missile-defense shield probably would not encourage the United States to intentionally escalate a limited regional conflict with another nuclear power to a full nuclear exchange if there were any risk of nuclear warheads reaching US soil.

The next scenario assumes the United States deploys in response to North Korea's marrying a nuclear warhead to its Nodong missile and massing troops at the demilitarized zone between North and South Korea after negotiations over fuel and food shipments have broken down. Believing its only option to force negotiations and prevent collapse of the regime is to test its new nuclear missile, North Korea sends the Nodong into a direct-ascent profile, exploding the nuclear warhead 500 km over the Sea of Japan and arguing that its test is no different than US atmospheric nuclear testing in the 1960s. In this worst-case scenario, North Korea avoids US ballistic missile defenses either by launching decoys or by some other means. The resultant EMP of the nuclear blast shuts down power throughout most of mainland Japan, including that on the bases of many forward-deployed US troops.³⁹ Dozens of satellites are disabled or destroyed immediately, with nearly every commercial and even some hardened military satellites in low Earth orbit disabled in the coming days.⁴⁰ The United States must now decide how to respond.

Despite the great damage, no lives have been lost, so nuclear retaliation against North Korea resulting in heavy civilian casualties would be inappropriate. Although military confrontation with North Korea would similarly put many lives at risk, it remains the most likely international response to ensure regime change and prevent additional nuclear explosions. In this case, there is little place for coun-

terspace operations because North Korea has no space assets for the United States to attack. The United States would deem any remaining missiles and launch facilities high-priority targets in its first retaliatory strikes. Destruction of launch and satellite communication centers would obviate the need for further offensive space operations. One could possibly consider this case an attack justifying the "Pearl Harbor" label, but *all* spacefaring nations—not only the United States—would become victims. Rather than derive strategic benefit from the attack, the North Korean regime would only guarantee its demise.

Finally, any scenario involving conflict with Iran includes the possibility that that country would use its ballistic missiles to attack US space assets. Because attacking a specific satellite would involve tracking and targeting resources that Iran does not possess, such an attempt would amount to a blind strike against the orbital environment. By scattering debris at altitudes used by the United States' ISR satellites, Iran could hope to degrade or disable as many such satellites as possible. Although this threat is real, many reasons argue against carrying it out. First, debris clouds are indiscriminate and would potentially damage satellites from every nation that uses those specific altitudes. The guaranteed international condemnation would only serve to strengthen the US political position globally with respect to the conflict. Second, the United States' ability to model and track debris clouds to a certain extent would enable it to mitigate some post-attack risk from debris. Finally, the use of Iranian ballistic missiles in this manner would make them unavailable for attacks against US forces on the ground.

Conclusions

Clearly, these scenarios are simplified. Yet, taking into account policy, doctrine, and current capabilities, one sees that they indicate that counterspace operations are useful within only a small piece of the large spectrum of warfare between terrorist attacks and nuclear exchanges. The fear of an adversary's creating

a space Pearl Harbor does not fit the capabilities and constraints that exist in possible conflict scenarios with any opponent who would expect to derive strategic benefit from the attack.

Of the conflicts that would utilize the space-based weapons sought by those who advocate space dominance, we are left with limited, regional fights with nuclear and spacefaring nations as the only current, applicable scenarios for robust counterspace operations. Even in the most vivid dreams of such advocates, the development of space-based kinetic or directed-energy defenses against dominant space powers would not prevent jamming, laser, or ground-station attacks from denying or damaging space capabilities. In the worst case of unintended consequences, these new weapons in space would inspire attacks from other space-based weapons or from ground-based kinetic ASAT weapons, likely leading to a multiplication of space debris.

The scenario of a space Pearl Harbor fails to take into account the fact that a kinetic attack against a single satellite becomes a debris-cloud attack against all satellites in or crossing that orbit. Thus, what is presented as a handful of limited attacks against one nation becomes an indiscriminate attack against all present spacefaring nations—and could create a debris field that might render many valuable orbits unusable for decades or even centuries.⁴¹ Kinetic space weapons, therefore, have long-lasting environmental effects similar to those produced by the use of nuclear weapons on the ground, in that they create contaminated, idle regions.

The main argument for US weaponization of space turns on the inherent vulnerability of space assets and the fundamental need for them to ensure national security and prevent another Pearl Harbor. Space-based weapons and ASAT systems seem to reduce vulnerability either through active defense or deterrence (though that assertion becomes questionable if one takes into account the likely weapons race that would result). They do nothing, however, to address the dependence of military forces upon such systems and create a re-

quirement for a permanent “global fortress” in space. But recently, near-space technologies such as high-altitude unmanned aerial vehicles have shown potential for reducing military dependence upon space-based assets by performing command and control, communication, and ISR missions similar to those conducted by satellites.⁴² Sensible policy making requires debating the implications of trying to directly defend space assets versus developing *alternative* military capabilities that would reduce our military reliance upon space and thus diminish the attractiveness of space assets as targets for our adversaries. Though long-term investments, both space-based defenses and near-space vehicles create very different potentials for US space policy.

Uncontested control of the high ground of space seems tempting, especially for a superpower. It is unrealistic to base US policy on this school of thought, however, due to the ability of other spacefaring states to counter US interests by developing their own space weapons and beginning a new arms race—or simply bypassing deployed defenses.⁴³ Though stable, current US space policy cannot last without a strong diplomatic structure. The rise of another nation to challenge the United States in space will surely alter the status quo in a manner unacceptable to us. Bruce DeBlois articulates a better choice: “The decision to weaponize space does not lie within the military (seeking short-term military advantage in support of national security) but at the higher level of national policy (seeking long-term national security, economic well-being, and worldwide legitimacy of US constitutional values).”⁴⁴ This view uses the current US ability to lead negotiations from a position of authority and power to ensure the creation of rules of the road and, eventually, treaties that will protect US space interests in the future. Combined with existing passive defenses and the development of near-space defenses for addressing security vulnerabilities and requirements, a “space sanctuary” provides economic, political, and even security advantages.⁴⁵ □

Notes

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26. *Ensuring America's Space Security: Report of the FAS Panel on Weapons in Space* (Washington, DC: Federation of American Scientists, September 2004), 131, http://www.fas.org/pubs/_pages/space_report.html (accessed 21 March 2008).
27. Liza Porteus, "Russian Dealers Provide Iraq with Supplies, Electronics," *Fox News*, 23 March 2003, <http://www.foxnews.com/story/0,2933,81917,00.html> (accessed 21 March 2008).
28. Pillsbury, *Assessment*, 3.
29. Matthew Mowthorpe, *The Militarization and Weaponization of Space* (Lanham, MD: Lexington Books, 2004), 105.
30. *Ibid.*, 101.
31. *Ensuring America's Space Security*, 136.
32. *Ibid.*, 134.
33. "Iran Profile: Missile Overview," *Nuclear Threat Initiative*, August 2008, http://www.nti.org/e_research/profiles/Iran/Missile/index.html (accessed 12 April 2008). Direct-ascent altitudes are commonly estimated at half the range of the missile.
34. US space policy explicitly notes that "the United States considers space capabilities—including the ground

and space segments and supporting links—vital to its national interests. Consistent with this policy, the United States will: preserve its rights, capabilities, and freedom of action in space; dissuade or deter others from either impeding those rights or developing capabilities intended to do so; take those actions necessary to protect its space capabilities; respond to interference; and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests.” *U.S. National Space Policy*, 1–2. The idea of denying space capabilities hostile to US national interests could easily imply preemptive action against nations preparing for an attack upon US space assets.

35. Jeremy Singer, “Space War Game Focused on Tactical-Level Operations,” *Space News*, 17 February 2005, http://www.space.com/spaceneews/archive05/game_arch_021405.html (accessed 21 March 2008).

36. Walter Perry, Bruce Pirnie, and John Gordon IV, *The Future of Warfare: Issues from the 1999 Army after Next Study Cycle* (Santa Monica, CA: RAND, 2001), 120, http://rand.org/pubs/monograph_reports/2007/MR1183.pdf (accessed 21 March 2008). This war game included advanced space-based laser weapons, so only the first few moves of the game are of use here.

37. *Ibid.*, 35.

38. China’s interest in international opinion would focus more on limiting further international involvement in what it considers an internal conflict as well as preserving access to third-party space assets. For an examination of orbital-debris policy issues related to ASAT employment and space security, see Moltz, *Politics of Space Security*, 53–54.

39. About 800 miles separate North Korea from the Tokyo area. A US nuclear blast in space a similar distance from Hawaii knocked out power in 1962. See Lt Col Clayton K. S. Chun, *Shooting Down a “Star”: Program 437, the US Nuclear ASAT System and Present-Day Copycat Killers*, CADRE Paper no. 6 (Maxwell AFB, AL: Air University Press, April 2000), 4, <https://research.au.af.mil/papers/ay2000/cadre/chun.pdf>.

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41. Moltz, *Politics of Space Security*, 52.

42. Lt Col Edward B. Tomme, “The Paradigm Shift to Effects Based Space: Near-Space as a Combat Space Effects Enabler,” Research Paper 2005-01 (Maxwell AFB, AL: Airpower Research Institute, 2005), http://www.au.af.mil/au/awc/awcgate/cadre/ari_2005-01.pdf.

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44. Lt Col Bruce M. DeBlois, “Space Sanctuary: A Viable National Strategy,” *Airpower Journal* 12, no. 4 (Winter 1998): 41, <http://www.airpower.au.af.mil/airchronicles/apj/apj98/win98/deblois.pdf> (accessed 21 March 2008).

45. *Ibid.*, 53.

The Air Force will continue to develop space situation awareness (SSA) capabilities to help protect space assets from future threats. We are also pursuing more robust space protection measures to warn of attacks, provide redundant command and control, harden electronics, and defend against direct attacks.

—Air Force Posture Statement 2008

Emphasizing Effect over Domain

Merging Three Organizations to Enhance the Efficacy of Our Nation's Intelligence Production*

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Editorial Abstract: Dr. Tomme proposes a new split in the Air Force's organizational structure that de-emphasizes the domain and stresses effects; this involves separating combat effects from combat-support effects for the best exploitation of these effects-based synergies. An Air Force Space Command combined with the new Air Force Intelligence, Surveillance, and Reconnaissance Agency would become the cornerstone of a new combat-support command that would enable a single commander to support joint Department of Defense operations and the intelligence community more effectively than is possible under the current structure. Such a new command could quickly become the nation's preeminent provider of high-ground command, control, communications, computers, intelligence, surveillance, and reconnaissance effects.

AIR FORCE SPACE Command (AFSPC) is currently organized around a domain: it does things in and through space. Such organization is not optimal because it ignores synergies gained from effects-based organization—the grouping of missions according to similar effects instead of by similarity of platforms and platform locations.

I propose a new split in the Air Force's organizational structure to de-emphasize the domain and place more stress on effects: the separation of combat effects from combat-support effects in order to better exploit these effects-based synergies. An AFSPC combined with appropriate elements from the new Air Force Intelligence, Surveillance, and Reconnaissance Agency (AFISRA), much of the op-

*Editor's note: The author adapted this article from his longer monograph *Expansion or Marginalization: How Effects-Based Organization Could Determine the Future of Air Force Space Command*, Research Paper 2008-1 (Maxwell AFB, AL: Air Force Research Institute, July 2008), http://www.au.af.mil/au/aul/aupress/ARI_Papers/Tomme%20AFRI%20Paper%202008-1.pdf. The monograph fleshes out some of the arguments presented in the article.

erational structure of the National Reconnaissance Office (NRO), and all support functions working in cyberspace would become the cornerstone of a new combat support command that would enable a single commander to support joint Department of Defense (DOD) operations and the intelligence community more effectively than is possible under the current structure. Such a new command could quickly become the nation's preeminent provider of high-ground command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) effects. The question of whether one command absorbs the others or whether rough equals merge is only a matter of semantics; the important concept is that the consolidation would enhance our military's ability to deliver coordinated C4ISR effects.

Effects are the foundation upon which our modern military is based. *Effects-based operations* has circulated as a common buzzword for almost two decades now. Such operations have the goal of effectively and efficiently producing desired results where the focus is on the ends and not the means, with emphasis on the outcome and not necessarily on raw military destructive power.¹ The crux of my article is its suggestion of a path for organizationally separating producers of combat effects from units that produce support effects, taking advantage of synergies gained from organizing and training similar units together to form a more potent fighting force. Organizing along lines of common effects instead of domains aligns perfectly with the Air Force's goals of maximizing cross-domain dominance, enabling enhanced defense capabilities for our nation, and filling critical seams that exist within the current structure.

Effects are what matter, not the location or platform that produces those effects. An article in which the term *effects* is so germane to the discussion must define up front the meaning of combat effects and combat-support effects. Some have suggested splitting effects along kinetic/nonkinetic lines.² Such a division appears artificial, a red herring; whether one destroys the target with bombs, light, or binary

code, the destructive effect is all that matters. A more natural and organizationally useful split occurs between combat and combat-support effects. Combat effects are the results of direct actions taken to deny the enemy the use of an asset or direct actions taken to defend a friendly asset. However, combat effects are not necessarily kinetic. Maneuvering a small spacecraft near an enemy's imaging satellite and placing a screen to obstruct its cameras is an example of a nonkinetic action that produces the combat effect of negating the usefulness of that space asset. Taking action through the Internet to incapacitate systems necessary to the operation of an enemy nation's financial system illustrates a cyber-based nonkinetic action that results in a combat effect. Conversely, support effects are the results of actions that enable combat effects to occur, but those actions are not the ones associated with combat effects.

One may find a good doctrinal example of the difference between combat effects and combat-support effects in the dynamic-targeting kill chain of find, fix, track, target, engage, and assess (F2T2EA). Joint doctrine states that "the find, fix, and track steps tend to be ISR-intensive, while the target and engage steps are typically labor-, force-, and decision-making intensive."³ If an organization does not carry out the actual targeting and killing of the enemy asset in the F2T2EA kill chain, then that unit performs a combat-support function.* Many providers of combat effects *can* independently perform all steps in the kill chain, but they are most often assisted by providers of combat-support effects, who do not target or engage.

The use of the term *combat support* is not intended to denigrate those missions or imply that they are only secondary considerations. On the contrary, combat-support effects within the kill chain are becoming ever more important. In a recent article, Lt Gen David Deptula noted that "finding the enemy has become a great challenge. . . . Knowledge—having always been key—is assuming precedence over kinetics as the prerequisite 'weapon' of war. . . . We are in an era when we can already kill prac-

¹Here, one may interpret *killing* to mean any method along the spectrum of negation—the ability to deny, disrupt, deceive, degrade, or destroy an enemy asset.

tically any target we can find. Our chief challenge is to *find-fix-track* low-signature targets, however fleeting and unique they may be. Without this capability, precise shooters are of little use" (emphasis in original).⁴ My article concerns itself mainly with the appropriate method of organizing our forces so these combat and combat-support functions operate as effectively as possible to ensure that the shooter has the best information obtainable.

Domain versus Effect

In the early 1990s, the Air Force reorganized many major commands (MAJCOM) to take advantage of synergies that come from grouping assets that deliver similar effects to the war fighter.⁵ For example, Air Combat Command (ACC) delivers primarily destructive kinetic effects, and Air Mobility Command delivers the effect of rapid, responsive logistics. There remains only one real holdout within the Air Force on the service's push toward universal effects-based organization: AFSPC, the organization that prides itself on delivering "space effects."

In congressional testimony and in a recent public speech at a major space conference, Gen Kevin Chilton, AFSPC commander at the time, stated that the first of his four main priorities for the command was to "preserve and expand our ability to deliver *space effects* to the joint fight" (emphasis added).⁶ This worthy goal has two problems. First, warriors do not care where their effects come from. The *space* modifier to *effects* is completely irrelevant to them. As eloquently stated by one current Marine space officer, "No one in the field has ever sent out an urgent call for more space. It's the effects they want."⁷

A quotation currently in vogue among senior space officers cites a young soldier who, when asked if he needed space to fight in today's wars said, "No, all I need is my rifle, my box of ammunition and that little black box over there that tells me where I am."⁸ Space officers proudly cite this soldier to show that space has become so pervasive that people

don't even know they're using it. They appear to have missed the irony that the quotation actually highlights the fact that warriors not only don't *need* to know but also shouldn't *have* to know they're using space. Were the satellite-navigation information that soldier found so important delivered from another source, it would be just as valuable to him. As long as they get reliable, salient information that they need to prosecute the battle, and as long as they can effectively communicate, as well as give and receive orders at will, warriors are happy and effective. Details of the delivery mechanism should be transparent to them.

A second problem with the use of the phrase *space effects* is that many of the effects delivered by space assets aren't unique, and warriors could actually benefit from the synergies of grouping them with other deliverers of similar effects. By combining the strengths of all space and airborne C4ISR assets under one commander, by leveraging global overflight and deep-look capabilities of orbital platforms, together with tactically tailorable timing and localization available from airborne and high-altitude/near-space systems, one could make the effects delivered by the command even more formidable and useful both to commanders in the field and to the national intelligence community (IC) as a whole.

AFSPC has long seen itself as the command that does things in and through the domain of space. As early as the mid-1980s, internal Air Force documents noted the problem that "space continues to be a place, not a mission for the United States Air Force."⁹ Even the much more recent Space Commission Report continued to promulgate that nonproductive notion: "Space is not simply a place from which information is acquired and transmitted or through which objects pass. It is a medium much the same as air, land or sea."¹⁰

AFSPC operates satellites that provide much of the nation's strategic overhead C4ISR.* What if the command

- changed its focus from the domain to the effect?

*The NRO is responsible for a great deal of overhead ISR as well. I discuss its role later in this article.

- decided that *where* it operated mattered less than *what* it delivered?
- became an *effects-based* command?

Could it see its mission areas expand rather than contract? Could it become an even more effective enabling linchpin in our nation's defense organization?

The military's organizational structure must be derived from the large-scale goal of delivering the most effective defense for the nation. Anyone who has spoken to war fighters realizes quickly that they are effects-driven. It appears axiomatic that organization by domain is not necessarily the most efficient method of supporting them. We go to great lengths to ensure that human factors have been taken into account during the design of rifles and aircraft cockpits, assuring that these tools fit the way the warrior will use them. If we organized our support forces in a way that maximized the coherent production of effects and designed them to fit the way warriors use them, it appears equally obvious that their effectiveness in battle would increase.

I contend that AFSPC is on the verge of being marginalized primarily because of its misidentification of its function as a producer of combat-support effects within the larger machinery of national defense, and because of its insistence on limiting itself to Keplerian physics.¹¹ Granted, this focus is not completely internally driven—some of it is budget-driven. Adding further mission areas could cost money that is in short supply. However, to throw up one's hands at this obstacle is to surrender to the bean counter's point of view instead of looking at the bigger picture of improved national defense. US Strategic Command (USSTRATCOM) and the DOD leadership also direct much of AFSPC's focus. Significant internal factions within the command continue to shun anything nonorbital. Many senior space officials and thinkers actively promote

the idea that the space domain is so different and revolutionary that it, not effects production, becomes the primary consideration. This mind-set may be the greatest inhibitor to AFSPC's becoming a more effective contributor to the national fighting force.

Notably, the space doctrines of the DOD and three of the four services¹² also treat the domain as more important than effect.* Like every MAJCOM, AFSPC directly operates under two sets of doctrine: joint and Air Force. Air Force Doctrine Document 2-2, *Space Operations*, deliberately orders the two views of space (i.e. domain and effect) in a way that highlights the platform-based, domain-first view:

First, [emphasis added] space is viewed as a physical domain [emphasis added] where space-centric activities are conducted to achieve objectives. Space is a domain—like the air, land, sea, and cyberspace—within which military operations take place. This view is relevant at the tactical (e.g., operation of specific platforms), operational (e.g., synchronization of military operations to achieve the commander's objectives), and strategic (e.g., space as a domain that must be protected and controlled) levels of war. . . . The second [emphasis added] doctrinal view of space is an effects-centric view, and is particularly relevant at the operational level of war.¹³ [other emphasis in original]

AFSPC is thus both internally and externally driven toward domain as its primary reason for existence and thus appears only peripherally focused on effects. For a major military organization with such huge potential, focusing on the domain leads inexorably down the path of mediocrity.[†] Although such a doctrinal view of space may benefit those who seek a Space Force separate from the other services, it prevents the command from reaching its full potential to serve the higher cause of national defense by relegating effects production to a secondary position. It also endangers the command's continued existence since other organizations understand the bene-

*Joint, Air Force, and Army doctrine treat space as a domain first. Only the Navy discusses effects ("capabilities," in its words) first without mentioning domain or platform.

[†]*Mediocrity* is a relative word. Without question, AFSPC currently controls the greatest, most powerful, most capable space force in history. However, comparing the command with what it could be with the appropriate effects-based focus reveals the appropriateness of the term.

fits of massing similar effects under a single commander and have their eyes on portions of AFSPC's turf.

Filling the Effects-Based Void

In hindsight, the logic behind organizing major military commands by effect is almost self-evident. Assigning responsibility for closely related effects to an organization enables single, very senior commanders to use their "big-picture" views of the need for those effects to guide the organization of subordinate units, training of personnel, and acquisition of their equipment. They can thus ensure that all the intricate parts work together to provide a seamless, interwoven, redundant-where-necessary whole that supports the combatant commanders. It is hard to imagine why it was ever done differently.

Establishing cross-domain dominance practically requires an effects-based orientation. According to Gen T. Michael Moseley, former Air Force chief of staff, "We are transforming our thinking from considering the space and cyber domains as mere enablers of air operations to a holistic approach that factors in their interdependence and leverages their unique characteristics. We must continue to push this conceptual envelope—and expand the boundaries of existing tactics, techniques and procedures—to fully exploit the synergies of cross-domain dominance."¹⁴ To become more than mere enablers, practitioners of air, space, and cyber specialties must be fully integrated into the appropriate effects-related portions of the kill chain in order to maximize those interdependent synergies. As Maj Gen John C. Koziol, commander of the AFISRA, succinctly puts it, "We must focus on how we achieve and assess effects, not where."¹⁵

Conversely, the concept of organizing space as a domain doesn't appear to survive an effects-based investigation. One consistent theme appears throughout the literature and in many speeches delivered by prominent space advocates: a separate Space Force is patiently ges-

tating inside the Air Force, waiting until the proper stage of its development to emerge like Athena, fully armored, from the skull of Zeus. In the view of these domain advocates, a Space Force is the ultimate goal—the proper target at which space professionals should be shooting.

The argument for a separate Space Force, while good for space professionals in that they could finally prevent their budgets from being raided for air-breathing exigencies,* does little else to help the greater cause of national defense. The key defining capability of any war-fighting organization is the ability to apply force to the enemy's territory; air-on-air, ship-on-ship, and other such encounters are merely means to the territorial-conquest end. Until we solve the dollars-per-kilogram-to-orbit problem (i.e., the high cost of space launches), can launch on a few minutes' notice, change orbits at will, and truly solve the energy-dissipation problem during reentry, implementation of a separate Space Force remains an academic exercise because force application where it matters—in the enemy's backyard at a time of our choosing—is impractical. It is hard enough to rationalize the effectiveness of an air occupation, much less one from space.

Note the other side of the coin of these dilemmas preventing effective space-based force application: if we shoot even higher than Space Force advocates are currently aiming, the need for a separate force actually evaporates. Solve the expedient and affordable launch, maneuver, and reentry problems, and the Space Force begins to look a lot like today's Air Force—but with a greatly expanded service ceiling. From a tactical point of view, the artificial distinction between endo- and exoatmospheric regimes disappears when warriors can maneuver in and out of space at will; the fallacious academic argument about an artificial dividing line in the continuous transition between atmosphere and vacuum dissolves. Current nonmaneuverable space-asset manifestations are recognized as functional equivalents of earthly television antennae and sea-based buoys, and the current Air Force air-

*This problem, actually in dire need of a solution at the present time, is perhaps the only existing, rational basis for pushing for a separate Space Force.

and-space mantra becomes reality. We will eventually find solutions to each of these problems, but reasonable expectations of technological progress in the next several decades indicate we will not do so in the short term. Thus, we better serve the greater good by integrating the effects produced by orbital assets with similar ones produced by nonorbital assets instead of segregating space assets through an artificial domain distinction.

While AFSPC has been moving away from effects delivery and toward a Kepler-only paradigm, others within the Air Force have picked up the dropped ball and moved out in a more productive direction. Gen John Jumper, former Air Force chief of staff, attempted to foster a mind-set that integrated air and space ISR operations "so that the space guys were forced to be less platform-centric and more results-oriented."¹⁶ Evidently, he believed that AFSPC was more interested in domain than effect. Apparently reacting to the same perceived proclivity among officers within the space community to favor platform over effect, the Air Force recently announced the formation of the very effects-based AFISRA.¹⁷ This new agency may soon have the mandate to take a large portion of the current AFSPC portfolio—and then morph into a MAJCOM of its own—in order to deliver coordinated space/airborne ISR effects to the war fighter.

Currently, stand-up of the AFISRA essentially involves only renaming the former Air Intelligence Agency, previously located under ACC. However, it does not take a rocket scientist to read between the lines in the briefing presented to Air Force leaders that justified the agency's formation to see where they believe the future lies.¹⁸ In that briefing, General Deptula envisioned "transform[ing] AF [Air Force] Intel[ligence] into a *pre-eminent* military intelligence organization; with the *most respected* personnel; and the *most valued* ISR capability" (emphasis in original).¹⁹ He identified this goal as an approach designed to "manage ISR from a capabilities based perspective, and as a consolidated functional area."²⁰

How does one go about consolidating ISR as a functional area? The designers of this briefing clearly understood that in order to provide the nation the absolutely finest intelligence capability, they needed to own and control not only the intelligence analysts but also the means of producing the data the analysts would use. The National Research Council also recognizes the synergy gained by colocating collection and analysis within the same organization since

the principal function of the intelligence, surveillance, and reconnaissance . . . component of command, control, communications, computers, intelligence, surveillance, and reconnaissance . . . is to find, fix, and track both friendly and hostile forces, as well as to assess damage to hostile targets in an area of interest.* In addition to sensing (collection), the function includes the tasking of sensors and the integration, interpretation, and exploitation of sensed information.²¹

A telling phrase appears on a slide from the AFISRA stand-up briefing that discusses longer-term actions which the nascent command saw as future requirements: "Explore consolidation of related AF space activities into AF intel." That statement stabs right at the heart of the domain-based ethos and appears to be a reaction to AFSPC's apparent lack of emphasis on effects delivery.

The impetus behind creation of the AFISRA—giving a single commander control over both the means of production and the means of analysis for ISR—is a line of thought that logically crosses organizational lines at a higher level than just within the Air Force. The 2001 Space Commission Report touched on this even more politically sensitive thrust when it suggested that the NRO shift a large portion of its responsibilities to the Air Force.²² Such a broad consolidation would significantly enhance the nation's ability to deliver ISR effects.

In its early days, the NRO was an agile acquisitions organization that could quickly field systems vital to the nation's defense. However,

*This F2T2EA reference leaves out "target" and "engage"; these authors definitely understood the break between combat and combat support.

according to the report, "The NRO's capacity to convert leading edge research and technology into innovative operational systems is inhibited by the requirement to maintain its legacy programs."²³ What better way to return to the lean organization of the NRO's glory days than to shed its long-term maintenance requirements by passing them on to an Air Force ISR Command (AFISRC)? With such an organizational shift, AFISRC would assume control of all day-to-day space-based ISR activities, integrating them seamlessly into USSTRATCOM's global operating picture while allowing the NRO to return to a "skunk-works" mentality led by the Central Intelligence Agency's considerable brainstorming and expertise present in its early days.²⁴ Such an organization could quickly deliver cutting-edge technology to meet war-fighter needs without having to devote large amounts of manpower to supporting operations after delivery of the system. Considerable coordination between AFISRC and the NRO would need to take place to make each handoff run smoothly, but such coordination would undoubtedly facilitate a better understanding within both organizations of the requirements from the field that drove the development of each NRO system in the first place.

Some have argued that the real strength of the old NRO was the system-specific end-to-end responsibility and accountability for a single pillar of excellence vested in a single individual.²⁵ However, ship builders do not routinely go on to command ships; aircraft designers are not ultimately the pilots. Even the acquisition arms of the uniformed services are separate from the operational arms. Although all of those groups take input from the end users—and even are manned in part by those who have been or will be end users—the entire organization does not normally become the operator.

The natural break between designer/manufacturer/acquirer and operator takes place after the initial shakedown of the system. There appear to be no fundamental reasons why such a model would not also work for a revamped NRO. Individual accountability could be assessed upon successful delivery of a fully functioning asset to the end user. Once the

newly responsive NRO designed and launched its few-of-a-kind systems, it could transfer day-to-day operations to AFISRC and begin working on the next generation of systems.

Unfortunately, arranging our intelligence infrastructure to achieve that single intelligence capability is easier said than done. While DOD versus IC institutional rivalries play a role in these difficulties, the root cause is actually much higher than the level of the individual agencies and cabinet departments. It lies in the basic structure of Congress itself. Both the House of Representatives and the Senate have separate committees that oversee the DOD and the IC. Each committee fiercely guards its own empire, and none is likely to surrender budgetary or oversight authority to another without momentous political bargaining, even if such actions would result in demonstrably better effects production from assets now separately managed.

Further discussion of the desperately needed consolidation of orbiting and airborne C4ISR functions controlled by the defense and IC divisions of Congress lies beyond the scope of this article. I introduce the subject here to give the reader an idea of the daunting nature of true effects integration. However, in addition to the stand-up of the AFISRA, the Air Force can take a number of actions independently of other services and government agencies to increase significantly the efficacy of C4ISR effects.

Further Consolidation for Better Effectiveness

Action taken by the Air Force to consolidate all of its ISR in one effects-based organization is definitely a move in the right direction. However, it could go just a little further and become even more effective. ISR does not operate in a vacuum, isolated from all other things. ISR information must be communicated across distances near and far, from point of collection to point of analysis to point of use. Most, if not all, of the information generated by our ISR system passes from machine to machine, processed almost exclusively by

computer. ISR information is also one of the primary influencers of the orders that pass through the command and control (C2) networks—networks again almost totally handled by computer. We commonly use the label *C4* to describe the four functions (command, control, communications, and computers) so critical to an effective ISR program. Instead of stopping at AFISRC, consolidating functions so that the command becomes the Air Force C4ISR Command (AFC4ISRC) would make it even more effects-based. With the addition of those functions, its commander could concentrate on *all* interrelated problems associated with being the premier deliverer of C4ISR effects to the entire DOD and the nation as a whole. The command would become, in the words of General Koziol, “an all-source, full-spectrum ISR mission-capable organization.”²⁶

If one uses Col John Boyd’s observe-orient-decide-act (OODA) loop model to see how interrelated these support effects are, the grouping is even more logically effects-based.²⁷ In this model, the “observe” portion is obviously ISR assisted by precision navigation and timing to place the observations accurately. ISR observations are merely data until transformed into information through intensive computer and computer-assisted analysis, the “orient” portion of the model. Some form of communications then transmits ISR information to commanders, who “decide”—the command portion of C2—and send decisions to subordinate units in the field, again using communications, for the control portion of C2. Only after the entire C4ISR process has had its say do warriors execute the “act” portion of the loop. Thus, one can view C4 as a domain of sorts—a virtual, digital medium from which effects can be derived, the domain enabling the entire OODA loop. Consolidation of C4 with ISR would certainly optimize the possibilities for improved delivery of ISR effects.

Once all this consolidation has occurred, AFC4ISRC would become a much more effective organization supporting USSTRATCOM’s Joint Functional Component Command for ISR. It would work hand in glove with other intelligence organizations such as the National Geospatial-Intelligence Agency and the

National Security Agency to satisfy combatant command and national operational and intelligence requirements. The critical effects for which it has responsibility would even enable much of the work of those other agencies. Having a single person responsible for coordinating delivery of all of the Air Force’s ISR effects—whether derived from satellites or dedicated ISR unmanned aerial vehicles—can only improve the service’s ability to function in the joint arena.

Of course, AFSPC consists of more than just C4ISR. It also has a significant combat-effects component that includes nuclear missiles and organizations devoted to offensive and defensive counterspace. Those components would not belong to AFC4ISRC. I discuss their proposed disposition in a more lengthy publication.²⁸

Conclusion

General Moseley recently articulated three precepts for revolutionizing airpower.²⁹ Two are germane to this discussion: (1) the development of new operational concepts that integrate air, space, and cyberspace, and (2) the transformation of Air Force culture and its organization. An effects-based way of integrating the three existing organizational domains of air, space, and cyberspace involves consolidating all ISR-related tasks, regardless of domain, thereby gaining synergies from organizing, training, and equipping producers of support effects into one organizational location. Organizing by effect is a key enabler to the goal of establishing cross-domain dominance. It “refocus[es] our organization and culture on the warfighting mission [by] implement[ing] advanced operational concepts to fly, fight and win in all domains.”³⁰

Being able to operate in space with personnel who understand that domain in exquisite detail is, without a doubt, one of the key enablers of modern warfare. However, like a hilltop taken by ground forces, having a presence in space is of no inherent value. Troops in combat do not take a hill just to be there. They understand that what they can *do* from the

hilltop makes it valuable. Likewise, it is the effects we produce from space and cyberspace that matter.

The primary goal of all these recommendations is to develop a new structure that supports joint DOD operations, combat operations, and the national IC more effectively than the current organizational structure. At present, disparate organizations are responsible for the delivery of small, isolated bits of C4ISR effects. Focusing on effects instead of domain will solve many of these problems, enabling the even more effective support we all desire. To institute this change, we must consolidate under one command all support functions dealing with C4ISR effects, regardless of whether the platforms delivering those effects reside in air, space, or cyberspace. AFSPC's global positioning system and communications satellites, ACC's U-2 and RC-135 intelligence-gathering aircraft, the NRO's ISR birds, and a plethora of other C4ISR assets—all would be gathered into one effects-based organization. (Air Force Cyber Command, originally intended as a separate MAJCOM, will now become a numbered air force under AFSPC.³¹ This is a positive first step toward a restructuring for coordinated effects delivery because it places cyber intelligence functions under the umbrella of a more general ISR organization.)

The various commands need to embrace an expanded vision of their roles within the greater whole of national defense instead of pushing away and separating missions that logically should be integrated.

It is imperative for national defense to integrate C4ISR effects to move more effectively toward the goal of acquiring a seamless picture of the battlespace, and to significantly improve C2. Completely coordinated intelligence is every bit as important as a properly coordinated attack. The first step toward realization of that goal calls for a revision of service and joint space doctrine to reflect the primacy of effect. Because cyberspace doctrine is in its formative stage, we should build in consideration of these crucial points from the beginning. From these doctrinal changes will logically flow an integration of the producers of C4ISR effects.

Though not previously brought together under one heading (as I have hopefully done in this article), the conclusions presented here are not mine alone. In fact, in the very speech cited above in which he listed "space effects" as a goal for AFSPC, General Chilton later demonstrated a thorough understanding of the fundamental problem when he said, "It's about delivering effects. It's not about just flying satellites."³² □

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The Future of Physician Manpower in the Air Force Reserve

LT COL STEPHEN PODNOS, USAFR*

THE US AIR Force is transforming its medical capabilities to perform as an expeditionary force. This transformation includes reducing large, fixed facilities for health care, as well as training and preparing small, flexible health-care teams for quick, global deployment. In addition, the military in general has been tasked to provide increased capacity for dealing with situations other than war, including response to domestic and international disasters. Because the medical service consists of both an active duty and a reserve component, we need a steady supply of new and retained physicians to staff the US Air Force Reserve (USAFR) for its domestic and global missions. Recent efforts towards recruiting physicians and dentists for the Air Force produced less than 10 percent of the goal.¹ A study of the US Army Medical Reserve's physician supply also predicted a shortfall this decade of nearly 35 percent of desired medical positions.² Recruiting, training, and retaining more physicians to support the efforts of the USAFR's medical tasking are clearly difficult, yet ensuring a reliable supply of volunteer physicians for this role is vital to our nation's security.

Background

The factors that encourage physicians to join the USAFR are crucial to understanding a

successful process of recruiting and retaining a physician corps. Primary motivating elements may include compensation, a sense of meaning and purpose, and a chance for interesting experiences. Many physicians in the Reserve may have received prior benefits via scholarships or matriculation through the military medical school and residency system. Further, the issue of Reserve compensation is likely to be significant only for these and other physicians who have already served on active duty and may therefore qualify for retirement benefits by extending their service.³ In contrast, the level of direct compensation offered by military service (compared to that available in civilian employment) usually deters physicians with no prior service. If they join the Reserve in their late 40s (as I did), they will not be entitled to retirement benefits. An additional issue that may discourage the recruitment of civilian physicians to the Reserve involves the cost of maintaining an office (including malpractice insurance) while serving on active duty. Moreover, the commitment of performing weekend drills, along with at least two weeks of active duty annually, represents a significant amount of time away from a private medical practice. Further, making arrangements for other physicians to cover the reservist's practice during active duty can prove laborious, time consuming, and costly.

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Options for Augmenting the Enrollment of Physicians in the Air Force Reserve

To mitigate the aforementioned concerns, the USAFR has at least three potential options to assure the necessary supply of physician manpower.

Implementing a Physician Draft

This option, last employed during the Vietnam War, was discussed earlier this decade at top government levels.⁴ Though acceptable when nonphysicians were also subject to compulsory service, a draft specific to physicians might cause considerable friction and detract from maintaining a cohesive and cooperative medical force. A significant draft would also disrupt civilian medical systems.

Using Private Contracting

This alternative is occurring at an accelerating rate nationwide, especially for staffing military and Veterans Administration medical centers. The USAFR could obtain physicians via contracts for positions of support in the continental United States, freeing up other active duty and Reserve personnel for overseas deployments. Contract physicians might also fill certain deployment taskings. Limited by availability of physicians at the times needed (since contractors may not be able to supply them quickly), this is probably the most expensive of the options. Other considerations include the inability of the military command structure to enforce discipline with contractors and the potential exposure of noncombatant personnel in battlefield areas.⁵

Enhancing a System of Incentives

The optimal approach to recruiting and retaining physicians with no prior service (as well as those with prior service) must focus on providing a meaningful and rewarding experience.⁶ Because survey data of Reserve physicians identify service to country as a paramount reason for participation, we should emphasize

this feature of recruiting and retention.⁷ Direct financial compensation is unlikely to be a primary, meaningful motivation for many potential USAFR physicians; therefore, both altruistic purposes and the opportunity to gain new skills and experiences would become attractive reasons to join the military effort. For example, the prospect of traveling domestically and internationally as well as offering expeditionary-type care for both personnel and victims of disasters would lure many physicians. Additional incentives and programs to overcome barriers to Reserve duty might include the following:

- Offering “long weekend” active duty programs in interesting medical topics also pertinent to Reserve mission training (e.g., in advanced cardiac life support; advanced trauma life support; and chemical, biological, radiation, nuclear, and high explosives).
- Considering whether a nondeployable physician service with less intense training and physical requirements might fill the domestic needs of the Reserve, leading to a higher percentage of deployable medical personnel.
- Continuing medical education credits for courses during weekend drill service.
- Implementing a “practice care” system to help physicians with the administrative and financial burden of running their civilian practices during deployment.⁸
- Considering retirement benefits for less than 20 years of service for older physicians who enroll in the Reserve.
- Increasing selective bonus and loan-repayment programs for specialties in high demand.
- Considering the recruitment of academic physicians, who earn less than those in private practice and do not have a financial overhead.

The looming national shortage of physician manpower poses a threat to the success of

both incentive programs and private contracting. In the 1980s, a RAND study of the military's medical recruitment foresaw a physician glut, which in fact did not occur.⁹ The supply of physicians is not keeping up with the growing population, and the productivity of doctors is dropping for a variety of reasons. Developing a system of incentives would require leadership at local and higher levels.¹⁰ Indeed, many of the incentives suggested above will require top-level vision and critical discussion. However, each wing commander should consider which local incentives can best support this effort.

Conclusion

Of the three possible solutions mentioned here for ensuring the supply of USAFR physi-

cians, the most desirable calls for increasing the numbers of volunteers through a variety of incentives. Although some of these would require the support of high-level Air Force leadership, local wings can initiate and continue a number of incentives. Successful wing-level efforts to recruit and retain physicians have included emphasizing the aspect of service to country and publicly recognizing outstanding service to the unit. Providing interesting and rewarding training opportunities is also important. Adequate efforts both locally and forcewide would require annual measurement of staffing needs versus fulfillment. Maintaining a motivated and skilled physician component for the USAFR will continue as a major but important challenge for the foreseeable future. □

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Strategy Making for Brown Bars

Fodder for Your Professional Reading

DR. DAVID R. METS*

What Is Military History? by Stephen Morillo and Michael F. Pavkovic. Polity Press (<http://www.polity.co.uk>), 65 Bridge Street, Cambridge, CB2 1UR, United Kingdom, 2006, 160 pages, \$49.95 (hardcover), \$19.95 (softcover).

Louis Johnson and the Arming of America by Keith D. McFarland and David L. Roll. Indiana University Press (<http://iupress.indiana.edu>), 601 North Morton Street, Bloomington, Indiana 47404-3797, 2005, 456 pages, \$35.00 (hardcover).

Strategic Challenges: America's Global Security Agenda edited by Stephen J. Flanagan and James A. Schear. Potomac Books (<http://www.potomacbooksinc.com>), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2008, 432 pages, \$52.00 (hardcover), \$28.00 (softcover).

Strategy making for second lieutenants—no doubt readers will wonder if this reviewer has lost it! Lieutenants have everything they can handle, learning how to survive in the T-6 aircraft or how to avoid electrocution in a laboratory or maintenance shop! Yet military history suggests that, in most cases, waiting until one is a general or even a field-grade officer will usually be too late to develop as a strategic planner. Alfred Thayer Mahan and Carl von Clausewitz both began a lifetime of study at a

very young age. Napoléon himself began his study as an artillery lieutenant. That appears to have been an important motivator in the genesis of the Air Force's Developing Aerospace Leaders initiative of the 1990s. Gen Michael Ryan, chief of staff at the time, was distressed at the dearth of senior Air Force officers with an education broad enough to qualify them to lead a combatant command or a joint force command.¹

As with all the earlier review essays in this "Fodder" series, this article aims to help air warriors/scholars in their development of a lifelong professional reading program. It reviews in depth three new books on the current subject and suggests a dozen works to facilitate one's study: two for an overview, and the rest for what Col Roger Nye called "Depth and Mastery."²

One of those three, Keith D. McFarland and David L. Roll's *Louis Johnson and the Arming of America*, appeared on the chief of staff's reading list in 2008. It discusses national security strategy during the run-up to World War II when Franklin D. Roosevelt was president and Johnson served as an assistant secretary of war, followed by Johnson's stormy time as secretary of defense 10 years later. Another one, Stephen J. Flanagan and James A. Schear's *Strategic Challenges: America's Global Security Agenda*, which had its genesis at the National Defense University,

*Prof. Dennis Drew of the School of Advanced Air and Space Studies and Dr. Daniel Mortensen of the Air Force Research Institute gave valuable assistance in the preparation of this article; its remaining faults are entirely my responsibility.

centers on strategy making in the present and near future. But before we get into an analysis of these books, let's tarry a while with strategy making made easy.

Though perhaps fairly simple in concept, strategy is not easy in practice. Thus, perhaps starting with a graphic view will help (see fig. 1). One can define strategy as the art of relating means available to objectives desired. If the means prove insufficient to achieve the objectives, then strategists must either increase the means or change the objectives. In simple terms, they must first get a grasp of the world as it is and then envision the world as we would like it to be. Then they must put together a scheme that will enable us to move from the world as it is to the ideal world. After implementing the scheme or plan, then the strategists must gather data on how well it is working and make adjustments to improve the implementation. Certainly, it is a fairly simple concept, but as Clausewitz has instructed

us, everything in war is simple, but the implementation in combat is most difficult.³

The first great difficulty involves getting a grasp of the real world. Practically all historians know that no history book completely duplicates what has existed—that it can never do more than approximate reality, no matter how erudite and fair-minded the author. Certainly, some things we really do know: the sun has always risen in the east and set in the west—or so it appears from the movement of the earth. Since we face an adversary who has a mind of his own, is secretive, and tries to mislead us, there are many things we don't know—and we understand that we don't know them. Further, there are things we do not know, but we fail to realize that fact: in 1943 very few people had the least notion that a bomb was on the horizon that would soon level whole cities at a single stroke. Thus the strategist must strive to know as much as possible about the real world and try to fill in the rest with assumptions

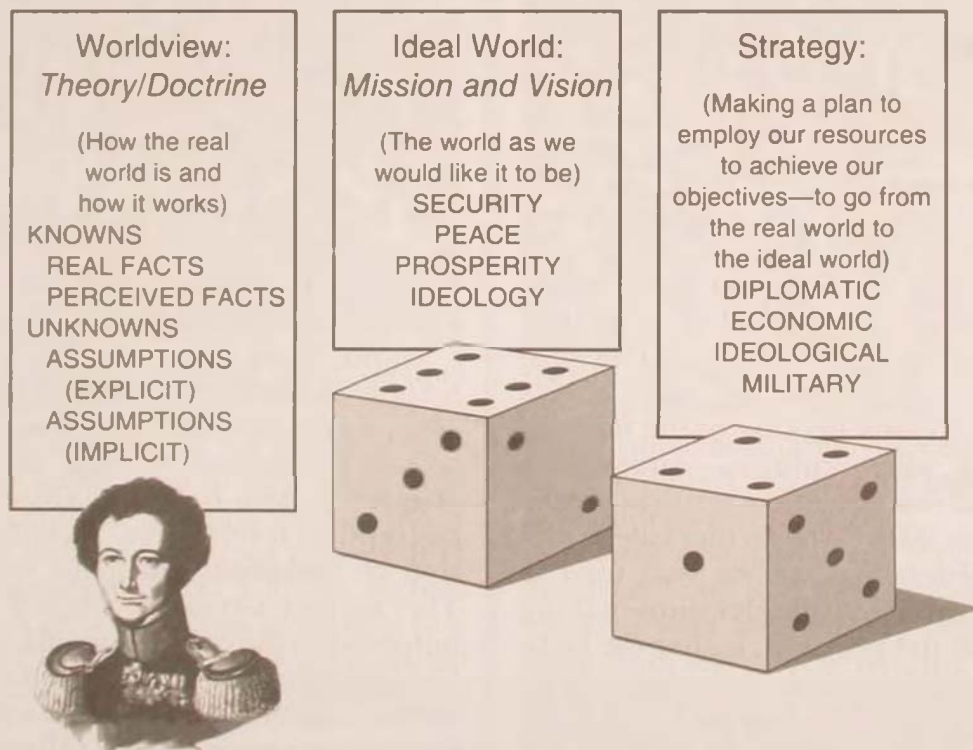


Figure 1. Strategy making for brown bars. (From a concept originally expressed in Kenneth M. Dolbeare and Patricia Dolbeare, *American Ideologies: The Competing Political Beliefs of the 1970s* [Chicago: Markham Publishing Co., 1971].)

(guesses). Most strategists of December 1941 knew that the Japanese were moving but assumed that they would strike the Philippines or elsewhere in Southeast Asia.

One's view of the ideal world is even less certain than that of the real world. In general we usually hope that we can make the world safe, preferably without fighting because war is unpredictable, dangerous, and expensive. Once security and peace are assured, then we would usually like to make the world more prosperous—especially for ourselves but also for the rest of the world, in the hope that prosperity would be conducive to continued peace. Finally, after attaining security, peace, and prosperity, in the American case, we usually declare that we would like the rest of the world to become freer and more democratic. We do so not only because we think ourselves humane but also because we argue that democracies are generally peaceful. But people will make huge sacrifices for other ideologies, such as religion.

Again, in simple terms, the strategy to move the real world toward the ideal world can employ various instruments: persuasion, bribes, coercive threats and actions, and psychological measures. Unhappily, the diplomacy of the League of Nations failed. The use of foreign aid often brings on the "what have you done for me lately" demand and thus sometimes has only limited effect. Our experiences in Vietnam and Iraq teach us that many uncertainties accompany the application of military force. Propaganda and other psychological measures have sometimes had their effects but can easily go awry because of the limits of understanding alien cultures—witness the powerful initial reaction to the terrorist attacks of 11 September 2001: "Why do they hate us so?"

Figure 1 generally describes what used to be known as the scientific decision-making process: define the problem, gather the facts, develop all possible options for action, implement the best one, gather feedback, and make adjustments. Understanding the world as it is involves defining the problem, gathering all the facts available, and making assumptions. Picturing the world as we would like it to be entails conceiving all possible options and se-

lecting the one we deem the best. Strategy has to do with gathering resources to implement that option, applying them, and collecting feedback to judge the outcome. Unhappily, we know that, very often, this process does not work. Why? Figure 1 includes a pair of dice and a depiction of Clausewitz—the godfather of uncertainty, chance, and the fog of war. So in the company-grade years, air warriors/scholars need to gather as many of the concepts and facts as they can, knowing full well that they will never have them all. Thus, they will improve the odds that when the time for decision comes, their guess will more closely approximate reality than that of their adversary—and that their system will adapt to the lessons of combat faster than the enemy's.⁴

Both Clausewitz and Mahan, the great American naval theorist, based their set of ideas on an extensive study of military history. Thus, I recommend acquiring a foundation in military history and the history of airpower if commissioning programs have not included those subjects.

The platter is full to overflowing with volumes on military and airpower history. One could make a good start with a history of military history—for example, the relatively new book *What Is Military History?* by Stephen Morillo and Michael F. Pavkovic. It summarizes the development of the discipline, speaks of conceptual frameworks that historians use to explore the subject, and covers the principal controversies stimulating the field.

As noted, we have often found that no matter how "scientific" our decision process, things often do not turn out the way we planned. For second lieutenants, perhaps the most useful chapter of *What Is Military History?* deals with conceptual frameworks, including a discussion of causation that helps explain things. The ancient Greeks attributed inexplicable outcomes to the competing wills of many gods. Christian Europeans, until the Enlightenment at least, explained them as the will of one God (and many people still do). Afterward, science got the credit—albeit the governing scientific principles sometimes remained undiscovered. Many Americans have felt that technology is the master. Karl Marx held that economics

ruled the world. Still others maintain that pure chance determines what happens in battle and war—as with advocates of the recent chaos theory.⁵ The chapter offers no final answers, but it should stimulate thinking and inspire the formulation of questions to ask in further studies.

Toward the end, Morillo and Pavkovic include a worthy chapter on “Doing Military History” that offers some good hints on methods to facilitate this part of a professional reading program. Readers will also find a good tool in the book’s fairly comprehensive and up-to-date bibliography (though more comprehensive on military rather than airpower history). In such a huge field, singling out an authoritative general military history is difficult. Though a bit dated, perhaps William McNeill’s *The Pursuit of Power: Technology, Armed Force, and Society since A.D. 1000* (Chicago: University of Chicago Press, 1982) would prove suitable.

People often confuse the terms *theory*, *doctrine*, and *strategy*. A theorist is not necessarily a strategist, and vice versa. Theory deals with generic things: war in general or air war in general. Strategy deals with a particular problem, such as the war at hand or the particular campaign to be won. Theory and doctrine are inputs to strategy—along with weather, intelligence, technology, political directives, and even intuitive judgment. In one way of looking at it, theory is a set of general propositions about the way that we organize for war and employ forces in war. We may think of doctrine as theory that has the formal approval of the highest authorities of an organization. Strategy is the application of theory and doctrine to the problem at hand. Mahan was a theorist; Adm Chester Nimitz, of World War II fame, was a strategist. That is to say, Mahan largely dealt in generalizations applicable to a wide variety of cases; Nimitz with a particular case at hand—how to defeat the Japanese in the Pacific.

History tries to approximate the real world and thus is easier to comprehend than either abstract theory or doctrine. It is usually an important input to both of the latter. After acquiring a bit of a background in the histories,

brown bars should review Air Force Doctrine Document 1, *Air Force Basic Doctrine*, 17 November 2003, to relate the concepts there to what they know about the past. Then to deepen their studies, they should look at some biographies of the great strategists of the past and some of the more specialized descriptions of particular wars and campaigns—without limiting their studies to the period following the Wright brothers since many ideas that antedate those pioneers are still relevant. As a recent Air Force white paper suggests, our service seeks to control three interdependent domains—air, space, and cyberspace—and believes that such control is also essential to enabling the Army and Navy to dominate the land and sea domains (thus the need to build up some understanding of fighting in the latter two domains).⁶

Another book under review here, *Louis Johnson and the Arming of America*, will help one’s understanding of the air domain and its heritage—and it will do so in an engaging way. The coauthors seem to have a great combination of historical expertise and effective writing, and their subject is an interesting man indeed. Keith McFarland, now a university president in the Texas A&M system, has extensive scholarly experience and is the author of a biography of pre-World War II secretary of war Harry Woodring, Johnson’s boss for more than three years. David Roll is a partner in the law firm that Johnson founded more than a half century ago. Doubtless, one can partly attribute the excellent writing style evident in the current work to Roll’s experience; furthermore, notwithstanding his employment, the book is remarkably free of hero worship—it does address several warts.⁷

For the company-grade aspirant strategist, McFarland and Roll have provided a splendid place to start the study in depth. Removed some from the present day, the book enables us to understand that there is much more to strategy making than scientific reasoning. Politics, personality, and sheer accident can deflect the creation of grand strategy from a purely rational approach. Almost from the beginning, Louis Johnson was a champion of airpower, especially strategic airpower (fig. 2).



Courtesy of the USAF Historical Research Agency, Maxwell AFB, Alabama

Figure 2. The Boeing B-15 (left) and Boeing B-17. An experimental plane developed during the 1930s for long-range bombing, the B-15 proved too big for the engines then available and did not go into serial production. Also developed in the 1930s, the B-17, a much smaller aircraft than the B-15, came on the line in 1937, serving as one of two mainline, long-range bombers in the US Army Air Forces. In those days, Louis Johnson championed airpower, especially bombers such as these.

However, he was also a very ambitious man and sometimes seemed fearless as well. Thus, both Roosevelt and Truman used Johnson to achieve ends that, in the final analysis, were diametrically opposed.

On the eve of World War II, Roosevelt confronted the problem of beginning rearmament in the face of a powerful isolationist sentiment in the public and Congress (not to mention an isolationist secretary of war). The president did not feel able to fire Secretary Woodring for political reasons, yet he could play Assistant Secretary Johnson against him, succeeding in his effort to start air rearmament long before Pearl Harbor. Then after three-and-a-half years in office, though Roosevelt seemed to have promised Johnson that he would succeed Woodring, he dismissed Johnson—but tried to let him down easy. Instead, the president appointed Henry Stimson, a Republican, again for political reasons, producing a good outcome because it did give the run-up to war a bipartisan flavor, and Stimson turned out to be effective in that role. But Johnson's ego suffered a hard blow.

The problem for President Truman seemed just the opposite. The United States had accumulated a huge national debt to finance

World War II, and Joe Stalin and the rest of the communist world predicted that economic collapse was about to bring down capitalism once and for all. Truman and many other Americans were absolutely dedicated to reducing expenditures and restoring a balanced budget. Meanwhile, the National Security Act of 1947 attempted to unify the services, a process that required a firm hand at the helm to bring soldiers, sailors, and airmen into line. Watching the disintegration of the marvelous military organizations the nation had assembled, and facing a whole array of new technologies that they needed to accommodate, the services were not much inclined to unification and economy. But Truman put a low limit on the military budget and refused to compromise. Now he needed a tough man to succeed Secretary of Defense James Forrestal and bring the recalcitrant military men under control—Johnson seemed tough enough. In effect, *now* Johnson's task was to disarm.

After the close-run election of 1948, American politics was in one of its most virulent phases. The USSR seemed on the rise, and China fell to the communists as well; naturally, the opposition blamed this on the administration. Secretary Forrestal did not seem to be

having much luck in disciplining the service leaders, so Truman selected Johnson to take his place in 1949.

Johnson occupied the office for only a year and a half, but a turbulent time it was indeed. The new Air Force felt entitled to a monopoly of the nuclear mission, and the other services were doing everything they could to grab a piece of the atomic pie. The Navy answered with the new supercarrier USS *United States*, a vessel of about 65,000 tons, compared to the 45,000 of the *Midway* class. The Navy envisioned it as a flush-deck ship to accommodate airplanes with enough wingspan to carry a 10,000-pound atomic bomb out to an appreciable range. At the time, few dreamed that nukes would soon shrink to the point that a standard carrier plane loaded with them could get off the catapult. As one of his first acts as secretary, Johnson cancelled the construction of the ship just after its keel had been laid, setting off a storm of protest in the Navy and among its supporters in Congress. But both the Army and Air Force had been dead set against the ship's construction. These events led to the "Revolt of the Admirals" (fig. 3) and the dismissal of Adm Louis Denfeld, chief of naval operations. Many people in the sea services considered the epi-

sode a precursor to the abolition of the entire US Marine Corps.

Johnson's other great battle—forcing the services to remain within the president's budget cap—was really the same battle. Many military heavyweights opposed that effort, as well as a number of congressmen whose districts would feel the pinch—and many budding Cold Warriors. Thus, when the Korean War began, the former champion of military preparedness found himself at the helm of a Defense Department that seemed utterly unprepared. For the most part, Johnson's strong suit appeared to be loyalty to Roosevelt and Truman and their programs. Unhappily for him, the Democratic Party had enjoyed power for 17 years and now occupied pretty shaky ground. Thus, though it seemed to hurt Truman greatly, he felt he had to let Johnson go and appoint a national icon, Gen George Marshall, in an attempt to calm the waters in wartime. This happened just before the spectacular Inchon landings in Korea, which Johnson long thought might have saved him, but he again had to take the blow to his ego and perhaps to any presidential ambitions he might have had.

Louis Johnson and the Arming of America is a marvelous, readable book. Dealing with national security strategy (grand strategy), from



Courtesy of the National Museum of the USAF



Figure 3. Six- and 10-engine versions of the B-36. The early B-36 occupied the center of the controversy over the USS *United States* and the "Revolt of the Admirals." Secretary Johnson cancelled the carrier, but B-36 production continued. The airplane initially came with six engines. During the revolt, one of the arguments held that the B-36 was too slow to survive in enemy airspace. The Air Force sought to overcome that possibility by equipping the B-36 with two engine pods having two jets each, making it a 10-engine bomber. (Another scheme designed to overcome the speed limitation involved experimenting with the F-84 parasite fighter.)

which military strategy should flow, it is a worthy tome for the personal reading program of company-grade, neophyte strategists. But enough about the past; our third work is more keyed to the present and possible futures.

Dr. Stephen J. Flanagan, a vice president at Washington's Center for Strategic and International Studies, and James A. Schear, director of research at the National Defense University's Institute for National Strategic Studies, have edited the anthology *Strategic Challenges: America's Global Security Agenda*, which includes contributions from a number of other experts. These authors, most of them associated with National Defense University, are impressive scholars with both military and academic experience that well equips them for the work at hand.

Normally, anthologies feature essays of varying quality, often not much related to any discernable pattern. *Strategic Challenges*, however, expertly assembles an excellent survey of current problems facing America's decision makers at the grand-strategy level—and offers insights to possible solutions. Flanagan contributes to the opening and final chapters, and both he and Schear provide a good summary.

This book will quickly bring the lieutenant forward to the present and even the future. A survey of the concerns now facing national strategy makers, it is as comprehensive a treatment as one is likely to find in one volume—and a credible and timely one at that. After discussing the environment that the strategic planner now faces and will likely face in the future, *Strategic Challenges* proceeds to an array of the particular issues ahead. Naturally, in the leadoff spot is a chapter on the global war on terrorism, followed by others on weapons of mass destruction, homeland defense, regional instability, preparation for possible struggles with the other major powers, and management of alliances. At the end come two summarizing chapters, both of them stimulating and informative.

One of the most engaging treatments, an essay by Joseph McMillan and Christopher Cavoli, deals with confronting global terrorism. The authors remind us that terrorism is nothing new—that it has existed since the dawn of human conflict. Some of their ideas

have been with us as far back as Vietnam and earlier, but they are cogently presented and worth reviewing:

- Increasing violence favors the insurgents—so it was with the British in the southern American colonies in the 1770s.
- Victory is hard to define and hard to see—there was no great army to defeat in the Huk Rebellion in the Philippines in the 1940s and 1950s.
- The war on terror is bound to be a long one—precisely Mao's strategy in the late 1940s and Ho Chi Minh's in the Vietnam War.
- We must try to sever the connection between insurgents and population—one reason why violence did not favor the counterinsurgents when we decimated the Vietcong in 1968.
- We must try to reduce the causes of discontent and boredom, factors that partly explain why revolutions are often led by a small elite—not the most oppressed (e.g., the Bolsheviks in the Russian Revolution).
- We must avoid unifying the jihadists' anger against us. At the beginning of the American Revolution, one-third of Americans were Patriots, one-third Loyalists, and one-third waiting to see how it would turn out. As we have seen many times since, excessive violence tends to create more insurgents than it kills.

This chapter, along with the others, well illustrates the problems of uncertainty, the fog of war, and chance, and will help air warriors/scholars reduce some of the unknowns as they grope toward a worldview to support their professional study.

The penultimate chapter, by Christopher Lamb, Charles Lutes, M. Elaine Bunn, and Christopher Cavoli, helps us move from our worldview toward a description of the world as we would like it to be—and toward an understanding of some of the means and strategies we might use to get there. Although a little wordy in places, it is among the most stimulat-

ing in the book. The authors explain that the conclusion of the Cold War marked the end of the long years of having a well-defined and fairly well understood adversary.

The new situation is filled with uncertainty and, apparently, a whole new set of dangers. An early response entailed departing from the Cold War methodology of planning against a well-defined threat in favor of attempting to build our strategies based on capabilities rather than threats. We saw in figure 1 that strategy making has always been shrouded with uncertainties, so leaders have had to depend on guesses and assumptions to some extent. But now the knowns seem to have become much less numerous than heretofore, and the unknowns crowd upon decision makers from all points of the compass. It seems that we know neither the enemy nor his motivation. But trying to base planning on capabilities alone, according to our team, is impossible. Planning against every possible threat will make us weak everywhere. Possibilities are nearly infinite; resources are limited. Therefore, say our authors, we must devise a system of "bounded uncertainty." That is to say, we must limit the number and seriousness of the threats in order to develop enough resources to cover the most likely and most serious ones. The system, therefore, has become one of estimating the level of danger and accepting a certain amount of risk, depending on the dangers that seem most likely and most threatening.

Another rising requirement of the new era has to do with global force planning and global force management. The regional command structure that sufficed for the Cold War has become somewhat dated by the new political situation and changing technology. Problems of the different regional and functional commands interact; capabilities of neighboring commands and different services have a bearing on potential solutions for all of them. Here as elsewhere in the book, the authors recognize that the new strategic world places a higher premium on American instruments of power beyond the military. The new world requires increased emphasis on the diplomatic, economic, and informational instruments of power and the creation of ways of integrating

their actions. Thus, future planning has to take these things into consideration, and that makes the process all the more complex since military commanders need to understand and cooperate ever more with civilian leaders in other government agencies.

Force management on a worldwide basis takes on a new kind of complexity as well. Pulling forces back to the continental United States so that they can redeploy equally well against any new threat anywhere is not that simple. Some forces and bases have to remain in forward areas not only for the sake of deterrence but also to facilitate movement to meet new threats. Basing ground forces is the biggest problem. Naval and air forces are largely self-deploying.

The Army is both slow to prepare for movement and slow in movement. But putting ground units in a place where they can easily move to a scene of trouble and yet be ready for action when they arrive is perhaps even more complicated than it was when the Soviet threat existed. Back then we could more easily predict the locus of the trouble. The threat was so obvious that agreement on its seriousness proved easier to obtain than it is now.

How can we achieve optimum basing without knowing the locus of the threat? If troops remain in the built-up areas of the world such as Germany and Japan, would they arrive in the conflict area combat ready? As the Soviet threat disappeared, readiness of the allies to dedicate large areas to training ground forces or to permit live-fire ranges in their lands rapidly decreased. Oftentimes, though, moving forces to the more open spaces of Europe and Asia with available ranges and within a shorter distance to trouble spots is not a solution. Without good ports and airfields, loading and off-loading could take more time than the travel from the more distant, built-up nations. Too, because loading and off-loading time is considerably longer than transit time, even by sea, the enormous costs of replacing the bases and ports already at hand may not be worth the small difference in transit time. The Marine Corps has a partial solution of having its own ships and some supplies readily available in pre-positioned vessels. Lighter than those

of the Army, Marine forces require replenishment within a few weeks. An all-seaborne force, the Corps requires no other nation's permission to redeploy to a new trouble spot.

Aircraft carriers are self-deploying and carry along some of their own logistical sustainment. But we don't have many of them, so we cannot risk these concentrated national treasures. They present less of a loading problem than do ground forces, but transit time across the vast oceans is considerable. Carriers have the virtue of leaving a smaller "footprint" than ground forces and therefore are less an irritant to international relations. Land-based fighter aircraft do have some footprint but perhaps not as much as ground forces. Tankers can shorten their transit times, but their logistical tail can be complex. Long-range-strike airpower does not need local logistical support, and its transit time is low—but we have relatively few of these aircraft available, and their

reinforcement would prove expensive. Moreover, the political costs of moving forces are considerable and may be prohibitive, both in the vacating and receiving countries.

All of that merely scratches the surface of the wealth of information and ideas in *Strategic Challenges*. Truly, effective strategy makers really do need a lifetime of study behind them—and a generous measure of good luck as well.

The three books reviewed here are fine fodder for a second lieutenant's professional study. Doubtless, the second one, on Louis Johnson, will prove more engaging reading since *Strategic Challenges* may be a little on the heavy side for the neophyte air warrior/scholar. But, before becoming a first lieutenant, if a brown bar could master these two after studying the two overview books in the dozen listed below, that would be a major achievement—and a running start on a lifetime of strategic studies. □

A Dozen Books for Professional Reading on Strategy*

Two for the Overview

Making Twenty-First-Century Strategy: An Introduction to Modern National Security Processes and Problems by Dennis M. Drew and Donald M. Snow. Maxwell AFB, AL: Air University Press, 2006. The authors have produced an exceedingly well written basic summary of strategy making.

Essence of Decision: Explaining the Cuban Missile Crisis, 2d ed., by Graham T. Allison and Philip Zelikow. New York: Longman, 1999.

Second lieutenants should read this work up front because it will yield insights into the many factors affecting choices in strategy making and will help with further studies.

Ten More for Depth

What Is Military History? by Stephen Morillo and Michael Pavkovic. Cambridge, UK: Polity Press, 2006.

This is a short and persuasive history of military history.

The Campaigns of Napoleon by David G. Chandler. New York: Macmillan, 1966.

Though a formidable book for a young lieutenant, it is authoritative, and Napoléon was one of the greatest—perhaps the greatest—strategist in the history of land warfare.

*Because the literature of military history, theory, and strategy is too vast to read in its entirety, this listing makes no pretense at being authoritative. It is merely a possible starter list for the study of the art and science of strategy making.

Navies in History by Clark G. Reynolds. Annapolis, MD: Naval Institute Press, 1998.
This book would be a good survey of the sea domain to use in conjunction with Buell's case study, below.

Master of Sea Power: A Biography of Fleet Admiral Ernest J. King by Thomas B. Buell. Boston: Little, Brown, 1980.

A masterpiece of military biography, *Master of Sea Power* will at the same time introduce readers to the complexity of strategy making for naval war.

The Influence of Sea Power upon History by Alfred Thayer Mahan. New York: Hill & Wang, 1966.
The author is probably the principal theorist on the sea domain.

John Warden and the Renaissance of American Air Power by John Andreas Olsen. Washington, DC: Potomac Books, 2007.

Written by an articulate Norwegian Air Force officer favorably disposed to John Warden and his "strategic" application of airpower, this book offers the neophyte strategist good insights in one stream of thinking about strategy making for airpower. It deserved its place on the chief of staff's reading list for 2008.

Air Power: The Men, Machines, and Ideas That Revolutionized War, from Kitty Hawk to Gulf War II by Stephen Budiansky. New York: Viking, 2004.

A possible counterbalance to the Olsen book, above, this erudite journalist provides an interpretation that favors the "tactical" applications of airpower.

Powerful and Brutal Weapons: Nixon, Kissinger, and the Easter Offensive by Stephen P. Randolph. Cambridge, MA: Harvard University Press, 2007.

This book represents an excellent case study that will provide the young strategist with an articulate, well-written explanation of the many factors beyond military logic that affect the conduct and outcomes of campaigns.

The Command of the Air by Giulio Douhet, trans. Dino Ferrari. 1942. Reprint, Washington, DC: Office of Air Force History, 1983.

Although Douhet's work is dated by now and doubted by many, air warriors/scholars should read the original so that they know what he *really* said. Many people still assert that airpower still awaits its theorist.

Beyond Horizons: A Half Century of Air Force Space Leadership, rev. ed., by David N. Spires. Peterson AFB, CO: Air Force Space Command in association with Air University Press, 1998.

This book is a solid history on the space domain.

One for Good Measure

On War by Carl von Clausewitz, ed. and trans. Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1989.

For the land-war domain, this book is pretty heavy reading for brown bars, but they are certain to revisit it again and again throughout their careers—and strategists must be familiar with it.

Notes

1. James M. Smith, "Expeditionary Leaders, CINCs, and Chairmen: Shaping Air Force Officers for Leadership Roles in the Twenty-first Century," *Aerospace Power Journal* 14, no. 4 (Winter 2000): 30–44, <http://www.airpower.af.mil/airchronicles/apj/apj00/win00/smith.pdf> (accessed 18 July 2008); Mike Thirtle, "Developing Aerospace Leaders for the Twenty-first Century: A Historical Context for the DAL Concept," *Aerospace Power Journal* 15, no. 2 (Summer 2001): 52–57, <http://www.airpower.af.mil/airchronicles/apj/apj01/sum01/thirtle.pdf> (accessed 18 July 2008); and Rebecca Grant, "Why Airmen Don't Command," *Air Force Magazine* 91, no. 3 (March 2008): 46–49, <http://www.afa.org/magazine/march2008/0308command.pdf> (accessed 18 July 2008).

2. Roger H. Nye, *The Challenge of Command: Reading for Military Excellence* (Wayne, NJ: Avery Publishing Group, 1986).

3. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 577.

4. This idea has many fathers, one of the main ones being Michael Howard. See his "Military Science in an Age of Peace," Chesney Memorial Gold Medal lecture, 3 October 1973, reprinted in *Journal of the Royal United Services Institute* 119 (March 1974): 3–11.

5. Thomas X. Hammes, *The Sling and the Stone: On War in the 21st Century* (Saint Paul, MN: Zenith Press, 2004), 283–87.

6. Gen T. Michael Moseley, *The Nation's Guardians: America's 21st Century Air Force*, CSAF White Paper (Washington, DC: Department of the Air Force, Office of the Chief of Staff, 29 December 2007), <http://www.af.mil/shared/media/document/AFD-080207-048.pdf>.

7. Although the book is well written and highly readable, the copy editing, though very good, is not perfect: "ordnance" and "ordinance" are confused, and one photo caption shows Assistant Secretary Johnson and Maj Gen Oscar Westover in front of a "B-17"; in fact, the aircraft is a B-15. The book also refers to the B-36 as an eight-engine bomber. Until the jets were added, it had "only" six; afterward, 10.

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Book Reviews



Victory at Yorktown: The Campaign That Won the Revolution by Richard M. Ketchum. Henry Holt and Company (<http://www.henryholt.com>), 175 Fifth Avenue, New York, New York 10010, 2004, 368 pages, \$27.50 (hardcover).

Luck, fortuitous circumstances, and British incompetence combined to make possible the American victory in the Revolutionary War. In his latest book, Richard M. Ketchum conveys the harshness of the American War for Independence; the way it dragged on, one step ahead of complete American exhaustion; and the constant good fortune that cast its shadow on the Continental Army.

The indecisiveness and sensitive egos of the three primary British actors—Gen Henry Clinton, Gen Charles Cornwallis, and Adm Marriot Arbuthnot—were particularly helpful to the American cause. Their obstinacy brought effective British joint op-

erations to a halt during the summer of 1781. Vague orders and requests along with the absence of unified command provided the Americans and their French allies an opportunity to surround and compel the surrender of Cornwallis's army. While the British held meetings, the armies of George Washington and Jean Baptiste Donatien de Vimeur, Comte de Rochambeau, moved aggressively toward the goal of pinning down Cornwallis on a peninsula with his back to the sea so that the French Navy might have the opportunity to seal off Cornwallis's only avenue of escape. Because two French admirals were willing to coordinate, take risks, and fight, the Royal Navy lost a battle and gave maritime superiority of the Virginia coast to the French during October. Ketchum is at his best when explaining how all of these pieces fell into place in order for the siege at Yorktown to result in a strategically decisive victory. He also explains how the war limped on for two more years—a good lesson for the reading public, who equates Yorktown with the end of the war.

Ketchum provides examples of how the American war effort had been reeling in the years prior to Yorktown. Congress was bankrupt and unable to pay Continental soldiers; thus, fewer of them stayed in Washington's army each campaigning season. Here, the author should have made his case more boldly. Instead of hammering home how dire conditions were for the Revolution during 1779–80, he interrupts that story with interesting vignettes, weakening the thrust of his narrative. Descriptions of the British Army's scorched-earth policy, Benedict Arnold's treason, and mutinies by veteran soldiers are compelling enough on their own. Stories of "bundling" and the capture of a young Andrew Jackson, while fascinating, detract from two of his more important and powerful themes: America was losing, and atrocities characterized the British conduct of the war. At times Ketchum's narrative is hard to follow because he jumps around chronologically without flagging events sufficiently. He also tends to neglect using much of the recent scholarship on the Revolutionary War. For instance, the Newburgh Conspiracy helps him make his case that the Continental Army was on the verge of collapse just as the country was about to win the peace in 1783, but he does not reference Richard Kohn's standard work on Newburgh. Ketchum also relies on dated interpretations of the strategic influence of the Saratoga Campaign and does not grapple with Jonathan Dull's argument

that Maj Gen Horatio Gates's victory did not convince the French to ally themselves with the United States; rather, they were just waiting until their fleet was ready before going to war. His description of the Battle of Cowpens would have benefited from the work of Lawrence Babits.

When Ketchum finally begins to discuss the Yorktown Campaign in chapter 6, he engagingly recounts how events came together to seal Cornwallis's fate; his writing sweeps the reader through the buildup to the siege. This half of the book shines. Ketchum's narrative takes one into the haughty correspondence among the British flag officers and brings events on the ground to life. He builds images of the siege, bombardment, and surrender that are so evocative that one wishes the book were longer. *Victory at Yorktown* puts the reader into the trenches and paints mental pictures of the battles in which one sees the efforts of daring sappers, charging infantry, and suffering soldiers as if on a walking tour of the battle site. Although the subtitle is misleading—it is not strictly a campaign history—this book still merits a wide readership.

It also contains critical lessons for today's military officers and policy makers. The British generals gave greater priority to protecting their own imperatives than to subordinating their egos to their king's goals, while the French were so focused on winning that General Rochambeau accepted being placed under the command of a revolutionary general. Likewise, because General Washington wanted to win the war, he was willing to accept help from a country he did not fully trust. In pursuit of national objectives, commanders simply have to numb themselves to perceived insults and do whatever is necessary to communicate and coordinate efforts toward the common goal, even with disagreeable colleagues. General Clinton, in particular, refused to take responsibility for the course of the war, and General Cornwallis was defeated as a consequence. These are timeless lessons for war fighters.

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The First Heroes: The Extraordinary Story of the Doolittle Raid—America's First World War II Victory by Craig Nelson. Penguin Group (<http://us.penguin.com>), 375 Hudson Street, New York, New York 10014, 2003, 448 pages, \$16.00 (softcover).

The story of Jimmy Doolittle and the Tokyo raiders is a legend well known to students of Air Force and American history. Craig Nelson's book *The First Heroes* recounts the tale of 16 B-25s and their aircrews, launched from the heaving deck of the USS *Hornet* to deal a psychological blow to the Japanese in the wake of the attack on Pearl Harbor. The American people desperately wished to retaliate, and the Doolittle raid, by all accounts, embodied a risky and desperate effort to strike that blow. In this meticulously researched history, Nelson breaks the story into its elements and focuses on individual stories of the men who flew the mission. Through interviews with surviving raiders, the author reveals the quiet heroism of these pilots, bombardiers, navigators, engineers, and gunners.

Of particular interest is the book's depiction of the decision-making process that led to approval of the extremely hazardous mission. The United States found itself woefully unprepared for war in December 1941 and had few options available to attack the Japanese. In light of all the bad news from the Pacific theater, American morale badly needed a quick victory. Special Aviation Project no. 1, as the Doolittle raid was known, earned approval not because it represented the *best* military option available but because it was the *only* option. Seeing the strategic value of striking the Japanese homeland, Pres. Franklin Roosevelt turned to the Air Corps to find a way to do so with long-range bombers. FDR didn't much care how the Air Corps accomplished the mission—just that it met the objective. He encouraged the chiefs to “let their imaginations run wild” as they planned the attack (p. 107). Only two of the chiefs—Adm Ernest King and Gen Henry “Hap” Arnold—had much enthusiasm for the idea. Admiral King was anxious to avenge the horrendous Navy losses at Pearl Harbor, and General Arnold saw an opportunity to establish the role of airpower in the American way of war. Thus the stage was set for what would become an unprecedented joint operation of historical proportions.

The idea of launching Army Air Corps bombers from the deck of an aircraft carrier came from a US Navy submariner, Capt Francis “Frog” Low. Embarrassed and apprehensive about the absurdity of his idea, Captain Low waited until he was alone with Admiral King to pitch it. The fact that the admiral did not immediately dismiss Low's proposal as impossible testifies to the lack of viable military options. It is also a credit to American ingenuity that such an idea emerged from a naval officer with only rudimentary knowledge of air operations. Perhaps a concept as unorthodox as Special Aviation Project no. 1 could have come only from someone

with little practical knowledge of bombers and carrier aviation. In any case, the US Navy and Army Air Corps would accomplish together what neither could achieve on its own.

General Arnold, who had to choose someone to lead the effort, needed "not exactly a combat leader, but another detail man, an inspiring commander forceful enough to get this done on the very short timetable allowed, a methodical thinker who could anticipate the various problems that might arise and prepare for them, an officer with the guts to go up against the army's slow-moving bureaucratic deadwood and whip this mission right out of it" (p. 110). General Arnold knew of only one man in the entire Army Air Corps who met his criteria: Lt Col Jimmy Doolittle, whose remarkable attention to detail and exacting, uncompromising standards in the training of the bomber crews have become a study in military leadership. The risks he took were measured where possible and mitigated by training and planning, but he understood the mission's extreme importance and realized it might fail despite all of his efforts.

The bomber crews who volunteered for the mission knew nothing about the plan except that it was "dangerous, important, and interesting" (p. 9). They were not handpicked for their skill, prowess, demonstrated bravery, or reputation. A line Army Air Corps B-25 unit, the 17th Bombardment Group included a cross section of the Corps' bomber-crew force, eager to get into the fight. As the dangerous nature of the mission became apparent, the crews had every opportunity to quit. Just prior to takeoff, in fact, Doolittle made clear that there was no shame in backing out. But not a single man walked away. Instead, most of them worried about being cut from the mission and went to great lengths to ensure their place. The unvarnished and human manner in which Nelson tells their individual stories, which make up the backbone of the book, never diminishes their heroism. Capturing a particularly poignant moment, the book includes a grainy snapshot of Doolittle sitting near the wrecked wing of his Mitchell bomber, feeling "lower than a frog's posterior" (p. 216). At that moment, he considered the mission a dismal failure. The author does great credit to the flying crews and their tales by compassionately combining detailed research, historical context, and the voices of the Airmen themselves.

A study in leadership at all levels of war, *The First Heroes* offers an excellent historical record of successful (albeit reluctant) interservice cooperation. Reinforcing the need for creative problem solving in the face of seemingly insurmountable odds, it exemplifies what well-led Airmen can accomplish.

However, the last chapter, entitled "Coda," loses focus, wandering through a laundry list of occasionally interesting, often irrelevant facts that lack coherence. It is an unsatisfying end to an otherwise compelling book. In sum, *The First Heroes* reminds the Air Force of its role as an innovative, risk-taking service with a unique role in the American way of war and a rich heritage of heeding the nation's call to arms.

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Terrorism, the Laws of War, and the Constitution: Debating the Enemy Combatant Cases edited by Peter Berkowitz. Hoover Press (<http://www.hooverpress.org>), Stanford University, Stanford, California 94305-6010, 2005, 196 pages, \$15.00 (softcover).

Few topics today are as relevant as what to do with people our military forces detain in Iraq and Afghanistan or with foreign nationals and US citizens our police forces detain domestically, based on the threat of terrorism. In some cases, disposition of these people is clear and well defined, but in many others, there are questions about what to call these individuals, how to treat them (as criminals, prisoners of war, or "persons of interest"), and, ultimately, what to do with them and when to do it.

For many Americans, terrorism up close and personal is something foreign, something that used to happen to other people in other countries. Our legal systems, both civil/criminal as well as military, appear ill equipped to deal with some of the issues they face. Sadly, rather than look at how other countries with more experience in confronting a terrorist threat deal with competing issues of national security and civil liberties, we doggedly trudge onward, hoping the answers will appear before us.

Three terrorism cases that went before the US Supreme Court in 2004 (*Padilla*, *Hamdi*, and *Rasul*) spurred the legal debate not only about the detainees' status as "combatants" but also about whether or not these individuals have received due process under American law. Additionally, these cases opened a Pandora's box in terms of determining if the writ of habeas corpus actually extends to "enemy combatants" of any nationality detained under American control but not necessarily on American soil (however one defines that).

These three cases clearly illustrate the existence of a gap of coverage among executive direction,

legislation, and judicial decision—not just domestically but internationally. We also encounter debate over the size of the gap or, in some cases, its very existence. Add to the equation the latest variables on civil liberties, and we now face questions for which our US Constitution may not be well prepared.

In *Terrorism, the Laws of War, and the Constitution*, Peter Berkowitz has assembled a very fine collection of legal essays that illustrate many points of view regarding these questions. Although the book's six contributors do not agree on all counts of the US Supreme Court's rulings on these cases, they generally agree on several issues:

- We need a clear definition of the term *terrorist*, what this entails (whether the person is a criminal, combatant, or something else), and how we should treat such an individual.
- This definition would then provide guidance to member nations of the Geneva conventions concerning the handling and eventual release of terrorists and terrorist-like individuals during a greater military campaign, such as America's global war on terrorism.
- Domestically, Congress needs to identify and fill the gap between US criminal law and US military tribunals, based upon the updated definition of *terrorist* as well as an updated Geneva convention. Ultimately, this should include clear guidance on the detention process (where and for how long), handling (questioning versus interrogation), and the rights of potential victims under this new label as well as the preservation of civil liberties for those otherwise uninvolved. The ongoing *Padilla* case illustrates this gap quite well. A recent bill by Senator John McCain (R-AZ) already addresses torture provisions but needs clarification.
- Broader still is the debate over US presidential power—specifically, how far it should extend during a conflict such as the war on terrorism and how long into/after the conflict. Coupled with this is the quandary in which Congress places itself by allowing a presidential “first move” over issues of national security and civil liberties that entail an actual or perceived legislative void.

Why read this book? Quite simply, some service personnel may someday find themselves on a combined/joint staff, wrestling with issues similar to the ones addressed above. They may serve as the presiding officer of a military tribunal or become in some other way connected to the detention and

handling of an “enemy participant” or a bona fide terrorist in the war on terrorism. If the military's domestic role continues to increase, they could also face potential posse comitatus and other civil-liberty issues that bleed directly back to the very questions the essays in this book address.

Terrorism, the Laws of War, and the Constitution makes for interesting reading. The essays are thought provoking; even if I didn't agree with a contentious essay, I found myself pondering the points it made. Some of the essays are full of legal jargon, which makes reading laborious at times. However, I consider the book an especially good read for all military personnel who will in some way deal with terrorism issues during the war on terrorism and similar conflicts in the future.

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Aerospace Power in the Twenty-first Century: A Basic Primer by Clayton K. S. Chun. Air University Press (<http://aupress.au.af.mil>), 131 West Shumacher Avenue, Maxwell AFB, Alabama 36112-5962, 2001, 356 pages, \$29.00 (softcover). Available free from <http://aupress.au.af.mil/Books/Chun/Chun.pdf>.

This well-written and very informative book is a good introduction to air and space power for those not familiar with its genesis, evolution, or functions and capabilities. The author, Dr. Clayton K. S. Chun, currently works at the US Army War College where he serves as chair of the Department of Distance Education. Dr. Chun retired as a colonel from the US Air Force after a military career that culminated with his serving as commander of the 34th Education Squadron at the US Air Force Academy.

The author begins the book with basic definitions and concepts of air and space power. This vital background provides a necessary foundation for the rest of the book. He then launches into the theory of air and space power so the reader can understand its beginnings and ever-changing nature. Chun begins with theories by Italian army general Giulio Douhet and continues with various concepts from different countrymen and services, an approach that provides a very good background on how the use of air and space power came to be and how it is understood today.

Over the next several chapters, Dr. Chun covers different functions and capabilities, including close air support, strategic attack, interdiction, air and

space superiority, rapid mobility, and space and information. He does a good job of explaining the functions of each mission while providing historical examples from different military operations, such as those that occurred in Britain during World War II, Israel in the 1960s and 1970s, and the United States in Kosovo. These succinct, well-shaped examples illustrate the importance of air and space power and its capabilities.

The last two chapters predict the future of air and space power and the ways that military commanders may use this asset. The author covers topics from the use of unmanned aerial vehicles to the future of space operations, discussing whether it needs to be an altogether separate branch of the military. This information allows the layman to understand the importance of using air and space power correctly and appropriately in the future.

The book's only blemish is the fact that a few map legends are difficult to read, which makes it hard to follow some of the author's examples (unless the reader is familiar with the subject matter). An increase in font size would solve this problem and ease the strain on the reader's eyes.

The title and subtitle of Dr. Chun's book are quite apropos for the material he presents and the method of presentation. *Aerospace Power in the Twenty-first Century: A Basic Primer* provides a solid introduction to this topic for readers unfamiliar with its capabilities, limitations, and evolution.

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MacArthur by Richard B. Frank. Palgrave Macmillan (<http://www.palgrave-usa.com>), 175 Fifth Avenue, New York, New York 10010. 2007. 224 pages, \$21.95 (hardcover).

Douglas MacArthur has been one of the more iconic and controversial figures in American military history. In this biography, Richard Frank gives a commendably balanced account of this illustrious general.

MacArthur was born with brains, looks, breeding, a remarkable constitution that kept him strong of body and mind for eight decades, and a belief in his own destiny. From his father, Arthur MacArthur, a Civil War hero who rose to three-star rank, he also inherited a paranoia that made him suspicious of superiors—military and civilian—who he believed envied his abilities and tried to thwart his advancement.

Graduating first in the West Point class of 1903, MacArthur also served as first captain—a rare achievement. In World War I he was an outstanding combat leader with remarkable courage, winning two Distinguished Service Crosses, seven Silver Stars, and a recommendation for the Medal of Honor. ("Jealous enemies" at headquarters denied him this last award.) Following the war, he became superintendent of West Point, where he initiated much-needed reforms that attempted to drag the academy into the twentieth century. In 1930 he was elevated to four-star rank and named Army chief of staff. During his tenure, he advocated airpower and education.

Although leaving his post as chief in 1934, MacArthur remained on active duty as a major general to serve as the military adviser to the Philippine government. Handsomely paid for this additional post, he also carried the somewhat embarrassing rank of field marshal in the Philippine army. When war broke out, he was named commander of US forces in the Philippines as a full general. In this position, he suffered his first and most crushing military defeat. When the Japanese attacked the islands the day following their raid on Pearl Harbor, MacArthur and his forces found themselves ill prepared. Belatedly, he ordered a retreat into the Bataan Peninsula and then to the island fortress of Corregidor. Although this slowed down the Japanese advance, the result was inevitable. Before Corregidor fell, Pres. Franklin Roosevelt personally ordered him to escape to Australia. For the next three years, MacArthur pushed back the Japanese and liberated the Philippines. His "island hopping" campaign was hailed as strategic genius because it covered a great deal of territory in a short time with a generally low casualty toll.

In August 1945, as supreme commander allied powers, MacArthur took the Japanese surrender on board the battleship USS *Missouri*. Frank considers the next five years, when MacArthur ruled as virtual proconsul of Japan, his finest hour. Displaying tact, sensitivity, broad-mindedness, and vision, he prevented starvation and thus won over Emperor Hirohito and his people, imposed a democratic constitution on Japan, insisted on equal rights for women, reformed the educational system, improved the Japanese medical system, and made strides in restarting the economy that had been virtually destroyed by air attacks during the war.

In 1950 he still held his office in Tokyo when the North Koreans invaded across the 38th parallel. With South Korean and American ground forces initially heavily outnumbered and thrown back to the southern tip of the Korean Peninsula, MacArthur then conceived and pushed through—over the initial

objections of the Joint Chiefs of Staff—the Inchon amphibious attack far behind enemy lines. Inchon was the most brilliant military stroke of the general's already long and distinguished career. The shattered North Korean army never again posed a threat.

Then the Chinese communists intervened with unexpected mass attacks, again sending MacArthur's forces hurtling south. At this point, the general began to lose his legendary poise, warning of the annihilation of his forces and the need for evacuation, while simultaneously calling for an expanded war that would take the fight to China itself. His momentary panic, as well as his tendency to speak of his disagreements with Washington too openly and to interpret his orders too liberally, finally resulted in Pres. Harry Truman's relieving him from command in April 1951.

Clearly, Douglas MacArthur was a man of enormous talent and capabilities, but controversy surrounded him because of other, less desirable, traits. His paranoia has already been mentioned, but in addition, he had a massive ego that often clouded his ability to admit mistakes or share the limelight. He was prone to rely on cronies—some sycophants—who told him what he wanted to hear. He also had a tendency to ignore directives from Washington. As Frank points out, this trait began early in his career and grew as the years passed. In truth, it is not totally accurate to call MacArthur "insubordinate" simply because his superiors had tolerated for decades what MacArthur characterized as merely a liberal interpretation of their basic orders. Moreover, his continued success made it difficult for Washington to clamp down on him after the fact. After Inchon, he became virtually unassailable—until Truman decided that enough was enough.

Frank makes an important contribution by highlighting and illustrating the one characteristic that made MacArthur so successful for so long: his adaptability. Despite critics who decry his conservatism, MacArthur was in fact remarkably open to new ideas, regardless of their source. He saw the increasing importance of airpower between the world wars, and he quickly changed strategies for the defense of the Philippines in late 1941—although it was too little, too late. He did not originate the idea of island hopping, but he did have the power—and courage—to implement it. MacArthur grew increasingly enthusiastic regarding the role of airpower, predicating his entire Southwest Pacific strategy specifically on the need for air bases. Only at the end in Korea, when he proved unable to adapt to the exigencies of limited war, did his famed flexibility desert him.

Overall, *MacArthur* is an excellent study—one that would serve as a fine leadership text for any staff or war college. The sources are mostly secondary, but the interpretations and analyses are unusual.

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Space: The Frontiers of Modern Defence by Squadron Leader Kiran Krishan Nair. Knowledge World, 5A/4A Ansari Road, Daryaganj, New Delhi-110002, 2006, 254 pages, \$24.00 (hard-cover).

Most literature on military affairs in outer space is primarily American in character or else so technologically inclined that an average individual finds it difficult to sustain interest beyond the first few pages. Hence a book from the Asian continent on the subject is a welcome change. *Space: The Frontiers of Modern Defence* is authored by Squadron Leader K. K. Nair, a serving officer of the Indian Air Force, under the aegis of the Centre for Airpower Studies in New Delhi.

In spite of the prevailing information deluge, authentic information on military space affairs is extremely scarce. Most available literature on the Internet or elsewhere is either highly speculative or overwhelmingly American. This book simplifies an extremely complicated subject and clarifies perceptions as never before. It addresses a variety of issues on outer space, such as its historical evolution, its impact on commerce, its highly controversial and little-understood military aspects, and its much-misunderstood legal aspects. The outstanding characteristic of this book is the enormity of factual information and data it conveys and the author's dispassionate analysis of the subject.

The first four chapters, which are general in nature, acquaint both the layman and the expert on space. They emphasize its evolution as a realm of military operations and address the "revolution in civilian (and commercial) affairs" brought about by space. The third and fourth chapters deal with the "aerospace aspect," its doctrinal validity, and prevailing theories and doctrines in vogue around the globe. The fifth chapter exhaustively examines space law and its military implications in the context of civil-military dual use. The sixth chapter, on the military space programs of China, Pakistan, Israel, India, Iran, and so forth, is extraordinarily revealing, undertaking for the first time a thorough examination of Asian space-militarization programs. For a change,

one is spared the usual sermonizing on the evils of the United States' weaponization of space. The remaining three chapters are largely devoted to the development of military space capabilities and actually come up with strikingly thought-provoking and workable suggestions and recommendations. Its powerful advocacy of building space capabilities for comprehensive exploitation of air and space forcefully drives home the point that national policy makers can no longer afford to neglect space.

In sum, *Space: The Frontiers of Modern Defence* is a surprisingly fast-paced and well-researched endeavor. It will interest a wide spectrum of readers, ranging from soldiers, lawyers, businessmen, academics, and other laymen to decision makers at the national (and international) levels.

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Executive Intelligence: What All Great Leaders Have by Justin Menkes. HarperBusiness, imprint of HarperCollins (<http://www.harpercollins.com/hc>), 10 East 53d Street, New York, New York 10022, 2005, 336 pages, \$27.95 (hardcover).

Who will be the next Curtis LeMay, Henry "Hap" Arnold, or Hoyt Vandenberg? Is it possible to predict the next "star" general who will guarantee the Air Force success in a complex, challenging, and ever-changing security environment? Similarly, the business world wonders where it will find the next Jim Collins, Jack Welch, or Peter Drucker. The Air Force and corporate America alike have pondered what makes these star generals and executives so effective. At this very moment, Dr. Justin Menkes ascends to the leadership platform with his book *Executive Intelligence: What All Great Leaders Have* prominently displayed on the lectern to answer that question with clarity, courage, and conviction. Menkes challenges business pundits who constantly prescribe, in his words, "mind-numbing inventory" and "costly distractions from identifying what really causes leadership excellence" (p. xx). Since no one has accurately identified the fundamental characteristics of star leaders, Menkes attempts to fill this leadership void by uncovering the essential and individual components of critical thinking and intelligence that make someone a star executive and, perhaps, a star general.

Internationally recognized for his expertise in managerial assessment, Dr. Menkes has consulted global corporations and currently partners with the

world's preeminent executive search firm, which also uses his "executive intelligence evaluation" to identify, develop, and hire effective leaders. After eight years of research and interviews with *Fortune* 500 executives, Menkes, through this book, introduces his concept into the marketplace and highlights the specific cognitive aptitudes that determine success or failure in the business environment. He coins the term *executive intelligence* and explains its main components: accomplishing tasks, working with and through other people, and judging oneself and one's behavior properly. He observes that "the more proficient an individual is in all three areas, the higher his or her level of Executive Intelligence" (p. 4). Menkes further engages his readers' attention with his claim that "success as a skilled executive is totally independent from traditional business training and graduating from a top business school does not guarantee success" (p. 23).

However, Dr. Menkes begins to lose his target audience—those who are curious about what all great leaders have—halfway through the book when he becomes entangled in an academic discourse on his methodology with crafting an assessment tool to directly predict and measure performance. Although his approach to dissecting the problem and offering a solution is academically appropriate and truly brilliant, he sheds his role of leadership consultant and transforms into an academician. *Executive Intelligence* sandblasts the three most prevailing and current management theories because their assessment tools are indirect and overemphasize skills not germane to business performance. According to Menkes, these theories "blind us from what really drives executive success" (p. 173). However, his selected case studies and examples do not take a panoramic view of the entire situation. Instead, they conclude with this thought: past executives who failed lacked executive intelligence, whereas those who succeeded had critical-thinking skills.

Notwithstanding, *Executive Intelligence* has chartered a new course in executive assessment. However, the highly acclaimed "What Makes a Top Executive?" by Morgan W. McCall Jr. and Michael M. Lombardo offers a different perspective to Menkes's theory. The Center of Creative Leadership (CCL) conducted that study in 1983 by comparing 41 executives (21 derailed and 20 "arrivers"), finding that the two groups were amazingly similar—incredibly bright, remarkably strong yet flawed by one or more weaknesses, having outstanding track records, and ambitious. If both groups have the same intelligence, then we have now come full circle, back to the question that remains unanswered:

what makes these star executives and generals so effective while others fail?

Dr. Menkes's findings provide a simple answer by suggesting that executive intelligence is a "very strong predictor of executive success" (p. 258). But does a person's performance on a measure of executive intelligence accurately allow us to predict his or her leadership ability in real life? Menkes confidently says yes. However, the major limitation in his assertion is time—we never know if his respondents will ever become derailed or continue to rise to greatness. Therefore, Menkes must address and/or incorporate the CCL's time-tested results from 23 years ago into his current theory, results, and answers.

Dr. Menkes's recommendations on how to develop and grow leaders with executive intelligence are perfect and timely. They will resonate with professionals who are passionate about becoming, identifying, or cultivating the next star general or executive. Over time, *Executive Intelligence* could become the holy grail of identifying leadership and predicting executive success. Right now, it's too early to predict—unless someone develops an assessment tool to apply to leadership and management books that will determine which ones will succeed or fail.

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Germany and the Axis Powers: From Coalition to Collapse by Richard L. DiNardo. University Press of Kansas (<http://www.kansaspress.ku.edu>), 2502 Westbrooke Circle, Lawrence, Kansas 66045-4444, 2005, 320 pages, \$34.95 (hardcover).

In this excellent book, Dr. Richard DiNardo, a professor of national security affairs at the US Marine Corps Command and Staff College, examines at the strategic and operational levels Germany's conduct of World War II as a coalition war. Even the most successful coalitions, such as the Allied coalition in that same war, experience problems and must work to overcome differences between national objectives and those of the coalition. DiNardo concludes that Nazi Germany's coalition of European Axis partners—truly an alliance and coalition in name only—was dysfunctional and doomed from the start. He masterfully illustrates this in a clear, readable style backed by meticulous research and incisive analysis.

Germany and the Axis Powers is primarily a military history, though in addressing coalition warfare at the strategic level, DiNardo examines Axis diplomacy, such as it was, where appropriate. At the outset, the author notes that he does not consider at any great length either Germany's relationship with Japan or its dealings with the minor players and puppet states within its orbit. Instead, he focuses on Germany's military relationship with Italy, Finland, Hungary, and Romania—fully independent countries that contributed materially to the Axis war effort, particularly against the Soviet Union. In so doing, DiNardo examines the uneven and unequal relationship between Adolph Hitler and his counterparts in Rome, Helsinki, Budapest, and Bucharest. Axis leadership held no wartime conferences equivalent in substance to those the Allies held at Casablanca, Tehran, or Yalta. This lack of coalition cohesion at the strategic level had a deleterious effect at the operational level as well. The Axis powers did not form an effective combined military command, and, with the exception of a brief period in North Africa, the combined Axis military command structures that did exist were cumbersome and generally ineffective.

DiNardo clearly lays at Germany's doorstep the bulk of the blame for the ultimate failure of the Axis to function successfully as a true coalition. Considering the tremendous difference in wealth and power between Berlin and the other European Axis countries, DiNardo correctly points out that Germany failed in the role of senior partner. He notes Germany's reluctance to share technology and its failure to fulfill the promised delivery of even modest amounts of modern equipment that might have enhanced the performance of its allies' armed forces. As is well known, the Germans not only failed to make the most of their own economic potential but also squandered the opportunity to leverage the not inconsiderable industrial resources of their allies. Germany offered patents and manufacturing licenses only reluctantly, and often at exorbitant costs. The marriage of Italian airframes and German engines produced some of the war's best fighters for Italy's Regia Aeronautica and served as an example of what might have been accomplished within a properly functioning coalition. As with all of Italy's best weapons, however, the relative handful of such aircraft produced proved too little, too late. Considering how Italian failures in the Balkans and North Africa negatively affected Germany's own conduct of the war, an approach that sought to strengthen its allies' military capabilities would have brought Berlin a sizeable return on its investment.

Still, DiNardo does not resort to the facile argument that "it was all Hitler's fault." He notes that Germany's military leadership failed to appreciate the painful lessons regarding coalition warfare that emerged from World War I. Moreover, the author amply demonstrates that Germany's partners share some of the blame for the failure of the Axis coalition. While it is certainly true that member states of the anti-Hitler Allied coalition pursued national goals and ambitions during the war, they did not do so in a fashion that undermined their combined struggle against the Axis. As DiNardo points out, however, the same could not be said for the Axis. Italy's ill-advised "parallel war" in the Mediterranean forced the diversion of limited German air and armored assets to that theater. DiNardo also levels well-deserved criticism against Benito Mussolini and his decision to send a large Italian army to fight alongside the Germans in Russia. Although lavishly equipped by Italian standards, this huge force was nevertheless ill suited for the brutal conditions it faced in the Soviet Union. At the same time, DiNardo argues, a fraction of that same force, together with its equipment, might have made a real difference in the fighting in North Africa. This was but one result of the lack of shared goals and a coherent coalition strategy among the Axis nations.

DiNardo's work, like that of a growing number of historians, does not resort to trite stereotypes when describing the war efforts of Germany's allies. For example, the reader can appreciate the exertion and sacrifice of the large numbers of Romanian troops committed on the Eastern Front. Likewise, he credits the Italians with fighting on in the face of the enormous handicaps imposed upon them by poor strategic leadership and a dearth of modern equipment. Considering the large and powerfully equipped armies they faced, the armed forces of Germany's European allies performed heroically in the service of a cause many of their soldiers and civilians did not understand or support.

Germany and the Axis Powers is superbly written and richly researched. Those specializing in military and diplomatic history as well as serving officers will find much of interest and value in this volume. DiNardo's study highlights the challenges US military officers will continue to confront during coalition operations. Coalition warfare is never easy; each member of a coalition faces different domestic, political, and technological limitations. Still, the United States and its partners have proven that they can successfully operate in the face of these limitations. This excellent book will be a valuable addition to the reading list of all military pro-

fessionals seeking to better understand the challenges of coalition warfare.

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Seeing the Elephant: The U.S. Role in Global Security by Hans Binnendijk and Richard L. Kugler. National Defense University Press and Potomac Books (<http://www.potomacbooksinc.com>), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2007, 336 pages, \$48.00 (hardcover), \$24.00 (softcover).

Essentially a book of book reviews from the mid-1990s through 2005, *Seeing the Elephant* offers a fantastic starting point for any student of US security and the role the United States has played in world affairs since the downfall of the Soviet Union. Detailing and synthesizing over 60 books written since that event, the authors attempt to capture the development of US global strategic thought in the post-cold-war environment. Using the analogy of an elephant as described by blind men, each one "seeing" only that part he can touch, the reviews reveal a different approach to the US role in global security.

The authors further classify the books by using a Kantian or Hobbesian position regarding their optimistic or pessimistic outlooks. For the uninitiated, the authors provide a quick description of both philosophers. On the optimistic side, Immanuel Kant, a Prussian philosopher who lived in the 1700s, focused on the spread of the rule of law and constitutional republics as key components leading to a peaceful world. On the pessimistic side, Thomas Hobbes, a British philosopher of the 1600s, believed in strong central governments, whether democratic or not, as the key to ensuring security of the state and, thus, peace through strength when dealing with other states.

Each chapter reviews books with a common theme or bent. *Seeing the Elephant* opens with reviews of books written shortly after the downfall of communism, when it was easy to envision a new international society based on the ideas of democracy and globalization. It follows with the pessimistic reaction of writers to this initial surge of optimism, covering books written primarily since the late 1990s and dealing with such topics as the rise of terrorism and the uneven tensions produced by globalization. Other chapters address writings concerning the effect of technology on the world economy and secu-

rity, US grand strategy in both a neo-Kantian and neo-Hobbesian world, and US defense strategies.

As the authors state in the preface, "the primary audience for this book is the students of America's war colleges." Essentially the CliffsNotes or "dirty purples" for a great list of books regarding strategic thought and the US role in global security, *Seeing the Elephant* should be mandatory reading at the beginning of each new class. Hopefully the authors will update it periodically to keep pace with developing ideas.

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Deadly Connections: States That Sponsor Terrorism by Daniel Byman. Cambridge University Press (<http://us.cambridge.org>), 32 Avenue of the Americas, New York, New York 10013-2473, 2005, 380 pages, \$30.00 (hardcover); 2007, \$18.99 (softcover).

It is not surprising that one of the nation's most thoughtful writers on the use of coercion as a foreign-policy tool would write a book on terrorism that shifts the focus away from the terrorist and toward the state. This shift is a welcomed change in a field of study that overflows with analyses of nonstate actors while seemingly forgetting that the nation-state remains the primary actor in the international-security environment. *Deadly Connections* by Daniel Byman, a RAND veteran and Georgetown University professor, is aimed at educating policy makers and strategists on *why* states support terrorism so that those individuals can develop more effective strategies to halt support. Undoubtedly, this book is a must-read for those interested in deterring terrorism.

Byman's examination of state-sponsored terrorism flows logically from his definitions and analysis of the nature of state sponsorship, through his detailed post-cold-war case studies, to his recommendations on tools for halting state-supported terrorism. Perhaps his most important addition to the terrorism literature is the taxonomy he develops for examining the wide spectrum of state sponsorship and his subsequent analysis of terrorist motivations and types of support. Readers will gain a new appreciation of the nuances and complex interactions between terrorists and states.

Building on the work of US counterterrorism expert Paul Pillar, Byman classifies state sponsors on a scale that ranges from "strong supporters," such as Iran's support of Hizballah, to "passive sup-

porters" and "unwilling hosts," such as Saudi Arabia and Somalia (p. 15). His schema illustrates the broad spectrum of support that states provide terrorist organizations and serves as the basis for his analysis of why states support terrorism and the types of support they provide.

Given the recent emphasis on ties between political Islam and terrorism, some readers might be surprised that ideology is not necessarily the leading motivator for states to support terrorist activities. Noting that there is no "one" reason, Byman uses a weighted quantitative analysis to illustrate that strategic motivations, such as destabilizing a neighboring state and projecting power, tend to be the most common reasons. He details the impact of the various types of support on terrorist groups' strength, organization, and operations and then explains how this support impedes counterterrorism efforts against those groups. Calling state support a "devil's bargain," Byman explains how state support can actually weaken the terrorist organization when the supporting state's needs become incongruent with the terrorists' (p. 78). Consequently, terrorist organizations do not always desire strong state support.

With the exception of one chapter on passive supporters, *Deadly Connections* focuses on those states that fall into the active-supporter categories. His in-depth case studies on Iran, Syria, Pakistan, and the Taliban's Afghanistan illustrate the various motivations behind state support along with the consequences. The case studies make it clear how state support changes over time and the important role it plays in realpolitik. These case studies, along with the appendix, which provides a brief summary of major terrorist groups, will prove particularly useful to students studying terrorism.

Byman ends *Deadly Connections* with recommendations on halting state support and makes it clear that there is no "universal policy or simple response that the United States . . . can take to get state sponsors out of the terrorism business" (pp. 273-74). He examines various instruments of coercion and analyzes the Libyan case to illustrate the multifaceted, long, and arduous road to success. His advice for developing successful strategy is first to understand the motivations and then capitalize on them by using coercive tools such as engagement, political and economic pressure, and force. He cautions that strategies which work with one state might backfire with another, especially when their motivations and type of sponsorship are different.

All readers will find *Deadly Connections* interesting and informative. I highly recommend this book to anyone interested in learning more about terror-

ism—especially those involved in developing counterterrorism policy.

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The Last Crusade: Americanism and the Islamic Reformation by Michael A. Palmer. Potomac Books (<http://www.potomacbooksinc.com>), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2006, 284 pages, \$21.56 (hardcover), \$14.36 (softcover).

Potomac Books lists *The Last Crusade* as history / public affairs—and correctly so because it begins as straightforward history but then moves into a political rationale for the war in Iraq. The book first addresses the history of the development of Islam from the seventh century to the present, tracing the rise and decline of Islamic civilization from the founding, through the Ottoman Empire, to the current backwardness of the Middle East. As necessary, the work compares Muslim state-centered developments with the freer approaches of Europe. In addition, it compares an Islamic civilization to one developed under Christianity. More often than not, it finds that Islam falls short of Christianity as a producer of vibrant and progressive civilization. It is almost foreordained.

According to author Michael Palmer, the Muslim world has shot itself in the face three times. It rejected the printing press, failed to separate church from state, and segregated the progressive elements—the Christians and Jews who engaged in trade and dealt with money. Repeatedly, when faced with a choice of progress or tradition, Islamists chose tradition. Their once vibrant civilization stagnated.

While the Islamic world was sticking its head into the sand, the primitive European world chose different answers to the same questions. Rather than tradition, it chose progress. Soon the West was moving into capitalist growth and expansion that would eventually take it throughout the world—including into the Middle East.

Turning from history, which seems mostly a warm-up for a political statement, Palmer moves into contemporary affairs. He reads Osama bin Laden as the leader of one legitimate strain of Islam. Admittedly, his is a virulent one, but still it is not the hijacking of Islam that Pres. George Bush mentioned occasionally. Palmer rejects those who would argue that bin Laden is fighting against the

Western presence in the Middle East. Rather, he says that bin Laden is fighting the whole of Western history, particularly the development of a secular state. He wants—in fact demands and will die to achieve—a Muslim world and will stop at nothing. To reiterate, his approach is one of the three mainstream variations of Islam.

Palmer cautions that the United States has a history of going beyond its nature and doing the unthinkable. Should the Islamists attack with a nuclear weapon (and Palmer thinks they probably will, eventually), then the United States will undoubtedly unleash its full nuclear fury.

Samuel Huntington, who sees a “clash of civilizations” in today’s world, exerts a noticeable influence on this work. Specifically, Palmer observes a division in today’s world between the American Christian and Middle Eastern Muslim views of the world and their civilizations, seeing no way for the two to merge. He rejects even the neoconservatives who would Americanize or bring about a reformation in the Middle East, contending that Osama bin Laden is leading the only reformation that Islam will have. To Palmer, then, the Christian West and the Islamic Middle East are incompatible, locked in a death struggle with only one victor possible.

The Last Crusade is not really a work of scholarship, at least not of the academic sort. It has a bibliography, and the author is a degreed historian, but it is history in the Newt Gingrich style—history with a purpose. Palmer does not seem to be cherry picking, but he does not identify his sources consistently, does not footnote, and makes it hard to verify that he is reading his sources accurately and completely. I would not reject the work, but I would approach it with caution and find something by Juan Cole to balance it.

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The E-Bomb: How America’s New Directed Energy Weapons Will Change the Way Future Wars Will Be Fought by Doug Beason. Da Capo Press (<http://www.perseusbooksgroup.com/dacapo/home.jsp>), Eleven Cambridge Center, Cambridge, Massachusetts 02142, 2005, 258 pages, \$26.00 (hardcover); 2006, \$15.95 (softcover).

Author J. Douglas Beason, a retired Air Force colonel, has assembled a technical but readable text on directed-energy weapons and their impact on modern warfare. Lasers, high-power microwaves, and

particle beams play a significant part in the development of current and future weapons. Only time will tell if these revolutionary weapons will have the huge effect that some people predict. The text explains directed energy, its development, and the ways that service laboratories such as the Air Force Research Laboratory at Kirtland AFB, New Mexico, turned academic research into practical applications.

Dr. Beason, who served as a guinea pig during an active experiment involving a laser used in a non-lethal way to control hostile crowds, also discusses the US Air Force's airborne-laser program from inception to its current research-and-development status. This includes information about the NKC-135 aircraft and its CO₂ laser as well as tactical applications under development by the US Army. The most interesting chapter describes an attempt to use relay mirrors placed around the globe to achieve laser domination by allowing laser beams to travel worldwide.

Students of future weapons will enjoy the final sections of *The E-Bomb*, which examine such developments as fiber-optic lasers and terahertz usage of the spectrum. Although serious students would do better by reading engineering and physics texts on this subject, this useful, easy book fills a niche as a general overview.

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Warheads: Cable News and the Fog of War by Kenneth Allard. Naval Institute Press (<http://www.usni.org/naivalinstitutepress/index.asp>), 291 Wood Road, Annapolis, Maryland 21402-5034, 2006, 256 pages, \$26.95 (hardcover).

Retired US Army colonel Kenneth Allard is a familiar face to millions who regularly channel surf to MSNBC as their cable news network (and its companion Internet Web site) of choice for their daily news fix. He served as MSNBC's principal military analyst for nine of the 11 years MSNBC has been on the air, and he has appeared as a guest analyst on a number of other news broadcasts. He is perhaps best known for his MSNBC on-air commentary about and expert analysis of virtually every US military engagement since 1998, including the air war over Kosovo and our subsequent engagements in Afghanistan and Iraq. A soldier-scholar, he holds impressive credentials—a master's degree from Harvard, a doctorate from Tufts University's Fletcher School of Law and Diplomacy, and exten-

sive teaching experience at the US Military Academy at West Point.

I read this book twice. The initial reading left me questioning why I wasn't quite as impressed with its narrative as was Tom Brokaw, Senator John McCain, and Gen Anthony C. Zinni, USMC, all of whom wrote testimonials heralding Allard's "provocative look at combat in the age of instant communication" (quotation attributed to Senator McCain, printed on the back of the book's dust jacket). I initially found the work not much more than Allard's attempt at self-aggrandizement. The narrative, peppered with personal anecdotes and opinions, tends to ramble off into unpredictable directions that are hard to follow at times. The work just didn't seem as polished as I would have anticipated from an individual with Colonel Allard's credentials. But first impressions are often clouded by the reader's inherent biases; therefore, I believed I owed it to Colonel Allard to give his work a second look. And I'm glad I did. On a second reading, parsing out all of the author's personal anecdotes and opinions, I recognized that Allard surfaces a number of excellent points. He provides historical context to some significantly prescient comments concerning the present and immediate future that military leaders should examine regarding how America's military and its current operations are covered by the 24/7 media machines. He brings together what appear to be a number of disparate themes regarding the military, its role in society, society's role in the military, and ways the media (both traditional and new) attempt to package understanding of large issues into three-minute segments. Taken as a whole, his arguments, supported by robust research, come together to paint an intriguing, thought-provoking, and, at times, entertaining picture of American society, its military, and the media that attempt to cover both accurately.

The term *Warheads* was coined to describe those retired senior officers and enlisted personnel who found second careers in broadcast news as "color casters" and "talking heads" for military operations, providing "expert" commentary regarding any number of military-related situations. According to Allard, well before the terrorist attacks of 11 September 2001, the cable-TV business saw a need to provide more dynamic context and depth to its reporting of evolving world situations, especially those circumstances that involved military intervention; in that regard, the broadcast business "inadvertently conjured the Warheads into existence" (p. 14).

The necessity of assembling a group of retired military experts that became the Warheads was driven by the needs of broadcast-news organiza-

tions (and their burgeoning companion Internet sites) to better explain military operations to audiences that were/are military “illiterates.” In the opening sentence of his prologue, Allard makes a simple but significant point that the majority of Americans very much overlook today: “Despite living in a nation at war, we Americans are as likely to know a resident of North Dakota—by population, our 48th smallest state—as a soldier [sailor, marine, and/or airman for that matter] serving on active duty” (p. 1). What’s more, “as a society, we are increasingly separated by the inequality of sacrifice into an electronic form of the Great Divide, with Citizen-Soldiers on one side and Armchair Warriors on the other” (p. 1).

Essentially Colonel Allard’s book is an indictment of sorts. He uses the convention of Warheads as the basis for highlighting a darker problem—the potentially debilitating circumstances on the horizon of a nation predominantly unfamiliar with the institutions necessary to fight its wars and protect its citizens because of its quickly diminishing experience with those institutions. The evolving circumstances that generated a need for broadcast-news Warheads to “put matters plainly for all the amateurs, those distant relatives who had never served a day in their lives” (p. 27) portend a more serious situation in the future.

Warheads is well written, though the nonchronological approach and use of flag-officer names sans rank may prove a bit uncomfortable for some military readers. Nevertheless, Allard provides an insightful, firsthand account regarding the frenetic world of broadcast news and the military’s engagement in that realm.

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Beyond al-Qaeda: Part 1, The Global Jihadist Movement and Beyond al-Qaeda: Part 2, The Outer Rings of the Terrorist Universe by Angel Rabasa et al. RAND Corporation (<http://www.rand.org/publications/index.html>), 1776 Main Street, P.O. Box 2138, Santa Monica, California 90407-2138, 2006. Part 1: 226 pages, \$30.00 (softcover), available free at http://www.rand.org/pubs/monographs/2006/RAND_MG429.pdf. Part 2: 214 pages, \$25.00 (softcover), available free at http://www.rand.org/pubs/monographs/2006/RAND_MG430.pdf.

Parts 1 and 2 of *Beyond al-Qaeda* comprise a study led by RAND senior policy analyst Dr. Angel Rabasa and developed under the auspices of Project Air Force, a RAND–US Air Force partnership focused on studies and analysis. The first volume, which deals with the global jihadist movement formally known as al-Qaeda, considers the group’s ideology and operational strategies; part 2 examines organizations outside al-Qaeda that pose a threat to the United States.

In part 1, Rabasa delineates the ideological orientation of al-Qaeda, which stems from the work of Egyptian theorist Sayyid Qutb, regarded as the father of Islamism. Rabasa asserts that Qutb’s ideas are no more than a juxtaposition of Marxist-Leninist thought merged with Islamic ideals. However, this interpretation is but a shadow of the whole picture. It is from the ideological framework of al-Qaeda that Rabasa devotes a great deal of consideration to the insurgency under Abu Musab al-Zarqawi, who, Rabasa notes, died just as the text went to print in 2006.

With respect to the strategy to defeat al-Qaeda both as a group and as a movement, Rabasa proposes a four-pronged assault: attack the ideology, break the links between the global and local jihads, deny sanctuaries, and strengthen the capabilities of frontline states to confront local jihadist threats. Operationally, we have been successful in the last two elements of Rabasa’s strategy. However, with respect to the lines between the global and local jihads, our performance has thus far been lacking. To effectively break the deluge of bodies willing to commit to global jihad, we must address the impetus behind the local jihads. The text’s sole deficiency is its minimal coverage of the apocalyptic orientation of al-Qaeda found in ancillary literature such as the *Day of Wrath* by Safar al-Hawali, an ideological influence of bin Laden. If we truly wish to attack the ideology of al-Qaeda and soundly defeat it, as suggested by Dr. Rabasa, we must address its apocalyptic undertones.

In part 2, Rabasa outlines the ideological and operational frameworks of both Hamas and Hezbollah. One point of criticism (albeit trivial) with respect to this volume involves the fact that Rabasa spends considerable time on the militant Islamist movement al-Gama’a al-Islamiyya, one of whose members was Sheikh Omar Abdul Rahman, the “blind sheikh,” who serves as a spiritual leader of the cell behind the first bombing of the World Trade Center. However, Rabasa does not delineate the nature of the relationships that Rahman mentioned—relationships critical to understanding the ideological foundation of al-Qaeda. Rahman worked closely with Ramzi Yousef—the nephew of 9/11

mastermind Khalid Sheikh Mohammad—and spent time with Ayman al-Zawahiri during their incarceration after the assassination of Egyptian president Anwar Sadat. After their release, al-Zawahiri and Rahman went to Pakistan and became involved with Abdullah Azzam, a disciple of Sayyid Qutb, and Azzam's protégé, Osama bin Laden. Azzam received credit as a cofounder of Hamas, and the Abdullah Azzam Martyrs' Brigade bears his name.

Rabasa and his team devote considerable analysis to implications for the US Air Force, particularly emphasizing the use of unmanned aerial vehicles and special operations forces. One criticism worthy of further examination concerns the need for appropriate training of allied forces. To successfully fight the global war on terrorism, we must provide war fighters the necessary skills to take on the jihadists in a tactical capacity. Rabasa lucidly addresses the fact that Airmen in combat-support roles with non-US ground forces need to maintain a sense of operational flexibility to accomplish the mission. Analysts trained in the culture and languages of the jihadists will help solidify the strategy to divide the global jihad from the local one.

Overall, both volumes of *Beyond al-Qaeda* are valuable. Rabasa's lucid and timely analysis has implications for the defense community and nation as a whole. This exceptional scholarly work clearly spells out the threat posed by al-Qaeda and the strategies necessary to defeat it not only as a group but also as an ideological movement.

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Shadow and Stinger: Developing the AC-119G/K Gunships in the Vietnam War by William Head. Texas A&M University Press Consortium (<http://www.tamu.edu/upress>), John H. Lindsey Building, Lewis Street, 4354 TAMU, College Station, Texas 77843-4354, 2007, 352 pages, \$49.95 (hardcover).

Readers love conflict, and author William Head has provided it at every level and turn in this history of the AC-119 gunship's development, deployment, and combat in the Second Indochina War. Not a droning historical narrative, the book dives into the billowing controversy, political indecision, inter-service turbulence, and stormy resistance of senior officers to adding high-tech sensors and side-firing guns to an "old piece of junk" (p. 48) cargo plane. From takeoff, the author punches through Gen

William Momyer's "myopic" (p. 48) dream of an all-jet Air Force and the machinations of several well-intended general officers that delayed deployment of the AC-119, which eventually did prove effective. Irony is a dominant feature of the story.

Head points out that advocates of an all-jet Air Force claimed they were fighting for a fair share of resources for the newest military service. They disdained reciprocating engines, special operations, and slow-moving aircraft that were perfectly suited for survivability, lethality, and cost-effectiveness in the jungle counterinsurgency.

Detailed and documented, *Shadow and Stinger* offers delicious history. In providing background for the concept of the fixed-wing gunship, Head serves up the "originator" (Lt Col Gilmour McDonald), the "catalyst" (Maj Ralph Flexman), the "tester" (Capt John C. Simons), and the "seller" (Capt Ronald W. Terry) (p. 19). The original FC-47 (changed to AC-47 after the fighter community heard about this designation) needed an interim replacement by 1968 while C-130s were located for a long-range modification program. The AC-119G and K (with added jet engines, bigger guns, and better sensors) emerged in shifting political winds that required frequent contract modification. Head shows how one could call completion of the project "a miracle" (p. 76).

Geopolitics play a key role in the drama. The Tet offensive in early 1968 ended President Johnson's political career, and President Nixon's Vietnamization policy caused the AC-119 to become a weapon that would cover American retreat from Southeast Asia rather than fight for victory. The author recognizes Tet as a huge defeat for the communists, but brief enemy successes in urban areas and bases (areas that gunships were ideally suited to defend) added priority to the development programs. Tet also showed the massive logistic success the enemy enjoyed along the Ho Chi Minh Trail, where the AC-119K, armed with 20 mm cannon, could have an effect. Ironically, headspace problems created by Nixon's drawdown of troop levels in Vietnam delayed deployment.

Contracting details and jargon slow the pace some, but the "tempestuous marriage" (p. 120) of the Warner Robins Air Materials Area and Fairchild-Hiller Company, original builder of the C-119, keeps conflict alive. Add "senior level indecision and waffling" (p. 92), the interaction of five depots and numerous subcontractors, bureaucratic roadblocks, legitimate aircraft-modification problems that had to be resolved, and the story of "changing the C-119 pumpkin into Cinderella's coach" (p. 85) moves noisily along. The author's comparison of these actors to the contemporaneous movie *Who's*

Afraid of Virginia Woolf? is valid. Looking closely at political micromanagement and the delay of a priority program took this Vietnam veteran back to the era!

Head throws harsh white light on congressional shenanigans, as Senator William Proxmire assailed the program with wrong information for his "Golden Fleece" award. Head observes that "throughout the Vietnam conflict, far too many Washington leaders acted in a publicly derisive manner even though the safety of young soldiers, sailors, airmen, and marines was hanging in the balance," a practice symptomatic of the "haphazard method of formulating defense policy" (p. 183).

Finally finding quarters and ramp space, the 71st Special Operations Squadron, an activated Reserve unit, became operational in the AC-119G at Na Trang on 10 March 1969 under the call sign "Creep," which changed, after complaining ensued, to "Shadow." The AC-119K became combat ready as the 18th Special Operations Squadron at Na Trang on 4 February 1970. These were the "Stingers." Head provides some combat details, but he is clearly moving toward the "so what?" question. Was it all worth it?

The author reaches an affirmative answer in a rather sweeping characterization of the war in a political context. I think that the combat record of the AC-119G and K speaks for itself. I personally worked with these crews as a forward air controller over the Ho Chi Minh Trail and found them to be professional, fearless, and every bit as effective at truck killing as the author contends. I would have enjoyed learning more about the colorful individuals in this proud Reserve unit that found itself jerked into combat at a time the tide was turning hard against the war.

I recommend *Shadow and Stinger* as a great story well told. There is something for everyone here, and reviewing problems in the past is appropriate for planners today.

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Dunkirk: Fight to the Last Man by Hugh Sebag-Montefiore. Harvard University Press (<http://www.hup.harvard.edu>), 79 Garden Street, Cambridge, Massachusetts 02138, 2006, 720 pages, \$35.00 (hardcover).

Do you want good maps of a short land battle? If so, this is your book, for the appendix includes 21

of them. Do you want a blow-by-blow account of a short land battle, apparently down to experiences of the last private? Here it is. Do you want documentation? *Dunkirk* has 95 pages of footnotes—in small print, many of them citing primary sources in several languages. Do you want stories of heroism and sometimes cowardice? Here they are. Do you want new explanations of why the Wehrmacht halted long enough to permit the evacuation of close to 300,000 Allied soldiers who lived to fight another day? They are here—the gallant last stands of a few brave British men who held up the German advance. (As opposed to Hitler's delaying to give Hermann Göring a chance to do it with airpower alone or the plain exhaustion of German armored units from their long charge to the coast.) But if your reading list is focused on air warriorship and too crowded to permit tedious study of an obsessive, blow-by-blow account of an emergency evacuation that happened more than a half century ago (and one hardly likely to be repeated), you had better move on to other works. This book contains 204 pages of back matter alone!

British author Hugh Sebag-Montefiore trained as a barrister but has taken up historical writing. His previous book dealt with the Enigma machine and the breaking of German codes in World War II. The author's legal background is apparent in his careful documentation and great attention to detail. He organizes the book chronologically, with less than the usual attention to the naval aspect of the operation—a topic well covered elsewhere, in any event. Too, Sebag-Montefiore does not dwell on the airpower dimension.

As Churchill lamented at the time, wars are not won with evacuations. Yet the experience did have a positive dimension in that the rescue served as a bright light in a sea of darkness—a morale booster in an otherwise dark landscape. Furthermore it saved some important human resources to fight another day. If you have a special interest in the subject, be prepared to spend a lot of time on *Dunkirk*. The maps, collected at the end, are quite competent. Yet you will find the process of following the story by referring to the appendix for the maps rather tedious. Otherwise move on to other works on your list. Airmen would gain more from the relevant passages of *The Narrow Margin: The Battle of Britain and the Rise of Air Power, 1930-1940* (London: Hutchinson & Co., 1961) by Derek Wood with Derek Dempster.

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Complexity Theory and Network Centric Warfare. Information Age Transformation Series, by James Moffat. Command and Control Research Program (<http://www.dodccrp.org>), Pentagon, Washington, DC 20301, 2003, 161 pages (softcover). Available free from http://www.dodccrp.org/files/Moffat_Complexity.pdf.

Complexity Theory and Network Centric Warfare is a concise but technical text on the emerging study of complexity in warfare. No pun intended, but “complex” does indeed convey one’s first impression of this offering from the Command and Control Research Program (CCRP). Not light reading but rather strongly based on advanced calculus and physics, the book speaks to the engineering and scientific community concerned with command and control; however, the concepts apply to all military thinkers who have their eyes on the future of warfare. Ultimately, *Complexity Theory* serves as a superb reference of computer-modeling data and statistical proof, a catalogue of relevant equations, and, most importantly, a repository of insight into human behavior in warfare. Author James Moffat, a highly regarded Senior Fellow of the Defence Science and Technology Laboratory (United Kingdom), has 20 years’ experience as a scholar of applied mathematics and operational research. Dedicated to understanding the relationship between command and control and network-centric warfare, the CCRP includes human behavior in its scientific modeling of future warfare.

Dr. Moffat’s contribution continues his previous work on “captur[ing] the key effects of human decisionmaking” in relation to command, control, communications, computers, intelligence, surveillance, and reconnaissance (p. 161). He uses complexity theory liberally to define the interaction of complex systems and their environment. Herein, “complex systems” means modern armies (system) and warfare (environment). Dr. Moffat proposes a nonlinear approach to warfare—that is, events in battle happen simultaneously and chaotically—and tidily summarizes his intent by noting that “capturing the process of intelligent agents in conflict, set within a widely divergent set of possible futures, leads to a rich set of possible trajectories of system evolution for analysis to consider. . . . This is the domain of Complexity Theory” (p. 48).

His approach is both intellectually stimulating and philosophically intriguing. Opening the text with an explanation of complexity theory by using the relatively common language of thermodynamics, Dr. Moffat presents an easily understood thesis: no system is closed but is acted upon by many external

factors. He cleverly uses an ecosystem as a thorough example of his theory (p. 17). Internally, an ecosystem is codependent on its inhabitants to create and continue life. Externally, the ways that the ecosystem goes about creating and maintaining life are directly proportional to how the outside environment affects it. The rain forest maintains itself as an ecosystem, but its survival depends equally upon its reaction and adaptation to external pressures (i.e., changing weather patterns, human deforestation, etc.).

After each mathematical statement, the author immediately cites a real-world example to model his mathematical imagery for the reader—a refreshing visualization device for individuals unable to grasp the math quickly. Therefore, the middle portion of *Complexity Theory* uses these various, naturally occurring examples (trees in a forest or cell biology) to relate similarities with human interaction in warfare. This allows the reader to form an abstract, multilevel understanding of how chaos becomes orderly.

Although Dr. Moffat pursues an impressive range of discussion and topics throughout the book, it is not comprehensive. Nevertheless, it represents a major inroad to this evolving methodology of warfare by stressing the nonlinearity of conflict, networking at every level, and the trend from chaos to order in relation to time as battlefield events progress. A diligent complement to the CCRP’s growing canon of work, *Complexity Theory* offers readers, especially strategic thinkers, a glimpse into the future and an outstanding reference for mathematical models relating to complexity.

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The Reconstruction of Warriors: Archibald McIndoe, the Royal Air Force and the Guinea Pig Club by E. R. Mayhew. Greenhill Books/Lionel Leventhal Limited (<http://www.greenhillbooks.com>), Park House, 1 Russell Gardens, London NW11 9NN, 2004, 240 pages, \$39.95 (hardcover).

When I first received this book for review, I immediately recalled a grisly scene from the film *The Battle of Britain* in which a British fighter’s plane was hit and his cockpit filled with flames. The image of a flaming cockpit conveys a basic idea of what this book is about.

Dr. E. R. Mayhew provides us with a brief history of a special group of bomber and fighter pilots—the Guinea Pig Club—during World War II. One

finds dark humor in the club's name because one had to have suffered wounds requiring plastic surgery to qualify for membership; more precisely, one had to have suffered burns. Internationally in scope, the Guinea Pig Club offered the best possible treatment for burns, no matter the country for which one flew. The group's leader, Dr. Archibald McIndoe, a pioneer in plastic surgery, earned a worldwide reputation in the treatment of burn victims and the consequent reconstructive procedure. Mayhew, who obtained her PhD from Imperial College London, has a special link to the Guinea Pig Club in that her grandmother worked for McIndoe at East Grinstead, England. How's that for connecting with the past?

The Reconstruction of Warriors reminds the reader of the dangers of flying, even in noncombat situations (e.g., takeoffs and landings), because the aircraft's fuel essentially transforms it into a flying bomb. It also reminds us that the wounded represent more than statistics; they need extensive time, energy, and resources not only to heal but also to regain acceptance into society—an important consideration when one deals with burn victims. Dr. Mayhew drives home the point that, especially after the Battle of Britain, bomber crews rather than fighter pilots comprised the majority of the Guinea Pig Club's members; further, she suggests that other events have perhaps overshadowed the bomber's war and that overemphasizing the Battle of Britain itself has skewed our perceptions.

Mayhew begins with a brief description of the creation of a specialized medical service in the Royal Air Force (RAF), one dedicated to rehabilitating its fliers and experimenting to find less flammable and more durable fuel tanks. The book offers a generous selection of firsthand reports of aircrew members who suffered burns and injuries due to combat and noncombat operations; the ghastly details of these grisly accounts sober the reader to the realities of war.

The author rightly credits the remarkable achievements of Archibald McIndoe as central to the successful reconstruction of the injured warriors. Relatively new at the time, plastic surgery and the methods of treating these victims' facial and other burns now seem primitive at best. Due to McIndoe's work, that changed—not only in the RAF but also throughout the world. McIndoe was also adamant about the importance of the victim's social recovery—a point not lost on the author.

It is one thing to treat these victims, but what of the effects of their injuries? Despite the exceptional work of McIndoe and his staff, noticeable facial disfigurements remained. Realizing that the healing

process would encompass the time the Guinea Pigs reentered normal life and returned to their families, work, and society at large, McIndoe went to great lengths to make sure that businesses and townspeople did all they could to help the wounded airmen feel welcome and “normal.” The book details the efforts and kindnesses of the British people as an integral part of the healing process.

This last point makes *The Reconstruction of Warriors* valuable to today's military. From it, one can draw lessons on how we should treat both the physical and psychological wounds of warfare. We would do well to follow the British example not only for treating wounds but also for receiving veterans back into civilian life. Only then can true “healing” occur.

Overall Mayhew has produced a fast and easy read. Despite occasionally straying from her aim of “connect[ing] the story of [McIndoe's] work and its results to broader histories of Britain in the Second World War” (pp. 74–75), for the most part she supports her thesis. I did, however, wonder about the intricacies of the reconstructive process. Although I didn't seek an overly technical medical explanation, I would have appreciated a greater level of detail, which would have made the work more interesting.

Readers who want a fuller understanding of the home front in Britain and its relationship to the air war of World War II will find that *The Reconstruction of Warriors* fills a gap in knowledge about a subject that has received too little attention or has been pushed aside. By the way, the “reconstructed warrior” who appears in a scene in the film *The Battle of Britain* was a real member of the Guinea Pig Club.

Chad Carter
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Space Power Integration: Perspectives from Space Weapons Officers edited by Lt Col Kendall K. Brown, USAFR, PhD. Air University Press (<http://www.maxwell.af.mil/au/aul/aupress>), 131 West Shumacher Avenue, Maxwell AFB, Alabama 36112-5962, 2006, 234 pages, \$19.00 (softcover). Available free from <http://www.maxwell.af.mil/au/aul/aupress/Books/Brown/brown.pdf>.

If any one individual deserves credit for advancing thoughtful debate about the development of space power, it is Gen Lance W. Lord, commander of Air Force Space Command between 2002 and 2006. Among many other actions, in March 2005 he presided over the first Space Weapons Officer Air

and Space Integration Conference, cosponsored by Air Force Space Command and Air Education and Training Command. Held at Maxwell AFB, Alabama, home of the Air Force's intellectual enterprise, the conference sought to bring together thoughtful space-operations officers and others to discuss issues associated with more effectively incorporating space power into the war-fighting capability of the service. General Lord believed that the Air Force had much to learn about this field from those who actually did the day-to-day work in the operations centers, situation rooms, and mission-control facilities of the nation's defense establishment. He intended this as the first of a regular series of conferences in which the best minds in the field could present their ideas, discuss points of space-power doctrine, hone their arguments, and perhaps spawn new concepts. By encouraging broad thinking, divergent ideas, and rigorous conceptualization, General Lord hoped to advance the theories of space power beyond its dialectical equilibrium.

Space Power Integration: Perspectives from Space Weapons Officers is the tangible result of that conference. It consists of nine substantive chapters, all drawn from that earlier meeting. Written by active duty Air Force officers, these essays plumb the varieties of operations, concepts, missions, and organizational and other structures swirling in the superheated field of military space activities. Organized in a topical manner from broad conceptualizations to more in-depth explorations, they focus on several challenges for current space-warfare officers. Central themes in virtually all of the essays concern more effective amalgamation of space power into the current doctrine of the Air Force, more effective institutional and command relationships, better integration of space warfare into the larger national-security enterprise, and a rationalized approach to organization and management. The authors explore these themes in a variety of contexts, advocating a range of processes and models for consideration. All of these approaches offer useful grist for the policy mill, and the authors are to be commended for bringing them forward.

At some fundamental level, all of the contributors to this volume express the concern that space operations are something of a stepchild of airpower, neither as respected nor as valued as other integral missions of the Air Force. In essence, space assets have been used thus far as force enhancements. We use them to gather intelligence anywhere without putting people at risk; to navigate, position, and communicate for all manner of military

missions; and to direct ground-based assets for war, rescue, or relief. We use them to protect America and its allies. In this context, space capabilities are a high-leverage asset that enables our armed forces to be the most effective on this planet. These are indispensable resources, but they do not, in and of themselves, rain destruction on an enemy from the vacuum of space.

As Maj Stuart Pettis outlines in his chapter, "Applying Air Mobility Lessons Learned to Space C2," the closest comparison with space power in the Air Force experience is the tortured story of airlift—recognized early on as an indispensable capability. Most Air Force officers were slow to accept airlift as coequal with missions performed by fighter and bomber aircraft. In essence, they too often viewed it as an auxiliary force that did not contribute directly to the quest for air superiority or strategic bombardment. Space power suffers from a similar set of issues. If one accepts that position, space warfare will forever remain an auxiliary capability. The authors in this book do not accept that premise, however, and discuss ways in which space power might move to center stage in the debate over roles and missions of the Air Force. They offer not only prescriptions for how best to operate in the current climate but also strategies for achieving more significant roles in the national-security arena. Several essays present models that would expand significantly the mission and, therefore, the stature of space-control efforts, including counterspace operations of all varieties. All of these possibilities point up the need for more effective organization and integration of air and space capabilities in the future, potential structures for fulfilling this objective, and reorientation of space assets in the vital trajectory of national security.

Space Power Integration does not represent the final word on any of the issues raised, but it is a significant early step among the Air Force's leading lights in considering this new, powerful, and flexible space capability. The rise of space power has already transformed the nature of warfare, and there is no end in sight. More effectively harnessing military space resources remains an important challenge for the future. These essays should provoke additional discussion. It is a journey well worth starting but not one quickly completed. General Lord, no doubt, is pleased with the results of this effort, for it has admirably served its purpose of sparking debate in the emerging field of space power.

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Washington, DC



Mission Debrief

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The Editor

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VADM Robert R. Monroe, USN, Retired (BS, US Naval Academy; MA, Stanford University), is a self-employed national security consultant. Admiral Monroe enlisted in the Navy during World War II, and in 1946 he entered the Naval Academy from the fleet. Commissioned in 1950, he served in destroyers, minesweepers, cruisers, and amphibious assault ships, including three commands at sea. He subsequently served in flag rank for 11 years, including (as vice admiral) positions as director of the Defense Nuclear Agency and director of Navy Research, Development, Test, and Evaluation. His Navy career spanned the Cold War as well as the Korean and Vietnam conflicts. Retiring from the Navy after 38 years, he joined Bechtel, a large, worldwide, high-technology engineering, construction, and management firm, serving successively as business line manager, vice president, senior vice president, partner, and senior counselor for 22 years. He currently serves or has recently served as a member of numerous advisory boards for the Department of Defense, Department of State, Department of Energy, National Aeronautics and Space Administration, and other government and private organizations. Admiral Monroe frequently authors papers on nuclear-weapons issues.



Staff Maj Gen Qaa'id K. M. Al-Khuzaa'i, Iraqi Air Force (IqAF) (Iraqi Air Force Academy; Iraqi Staff Academy), is director of air operations in the IqAF Command. Having earned his flight instructor and Staff Academy diplomas, General Al-Khuzaa'i enrolled in a training course at the US Army War College's Strategic Studies Institute in the United States. His professional career includes teaching at the Al-Bakr Military University, serving as an IqAF wing commander, and completing eight years of service in various other leadership positions in the IqAF. In 1999 he was discharged from military service for political reasons but returned after the liberation of Iraq in 2003 as assistant commander of the Al-Diwanva Province Public Safety Directorate, working with the US Marine Corps to maintain civil peace and order. General Al-Khuzaa'i then assumed his current IqAF post.



Col John E. Shaw (BS, Astronautical Engineering, USAFA; MS, Astronautics, University of Washington; MA, Organizational Management, George Washington University; MS, National Security Strategy, National Defense University) is director of the Commander's Action Group at Headquarters US Strategic Command, Offutt AFB, Nebraska. He has served in a variety of air and space operations and staff positions, including tours in the 50th Space Wing (where he commanded a space operations squadron), the National Reconnaissance Office, the 32nd Air Operations Group (US Air Forces in Europe), the Space Warfare Center, and the Pentagon. He has written a book and numerous articles on space and cyberspace operations and policy issues. Colonel Shaw is a graduate of Squadron Officer School, Air Command and Staff College, and the National War College.



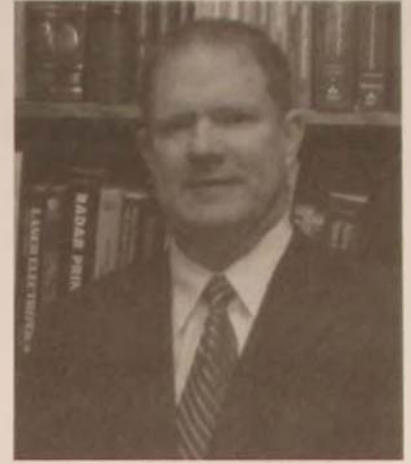
Trevor Brown (BA, Indiana University; MSc, S. Rajaramam School of International Studies, Nanyang Technological University [Singapore]) is a new author interested in political, economic, and military strategy for the medium of space.



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Maj Scott A. Weston (USFA, MS, Troy University; MA, Naval Postgraduate School) is attending Joint Military Attache School en route to serve as the assistant air attache to the Republic of the Philippines. He has served as an instructor and evaluator pilot and holds a senior pilot rating with over 3,300 hours in the C-130 Hercules and T-37 Tweet. He has led combat and combat-support missions in both Iraq and Afghanistan, including many as the Air Force exchange pilot with the Spanish Air Force. Major Weston is a graduate of Squadron Officer School and Air Command and Staff College.



Dr. Edward B. "Mel" Tomme, Lieutenant Colonel, USAF, Retired (USFA, MA, University of Texas-Austin; DPhil, Oxford University, UK), is a defense industry consultant. He retired in February 2006 as the only combat pilot in the Air Force with a doctorate in physics. A 1985 distinguished graduate of the United States Air Force Academy (USFA), he has flown and instructed in the T-37 Tweet, F-4G Wild Weasel, T-3 Firefly, and TG-7 Motorglider. He taught physics at the USFA, where he became the only officer ever recognized as both the outstanding academy educator by the dean and the outstanding associate air officer commanding by the commandant. He finished his career as the deputy director of Air Force Tactical Exploitation of National Capabilities at Schriever AFB, Colorado.

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Maj Gen Dr. Saud S. Abid, chief of curriculum development at the Saudi Arabian Armed Forces War College, exchanges welcoming gifts with Lt Gen Allen G. Peck, commander of Air University (Maxwell AFB; Alabama, 12 November 2008).



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