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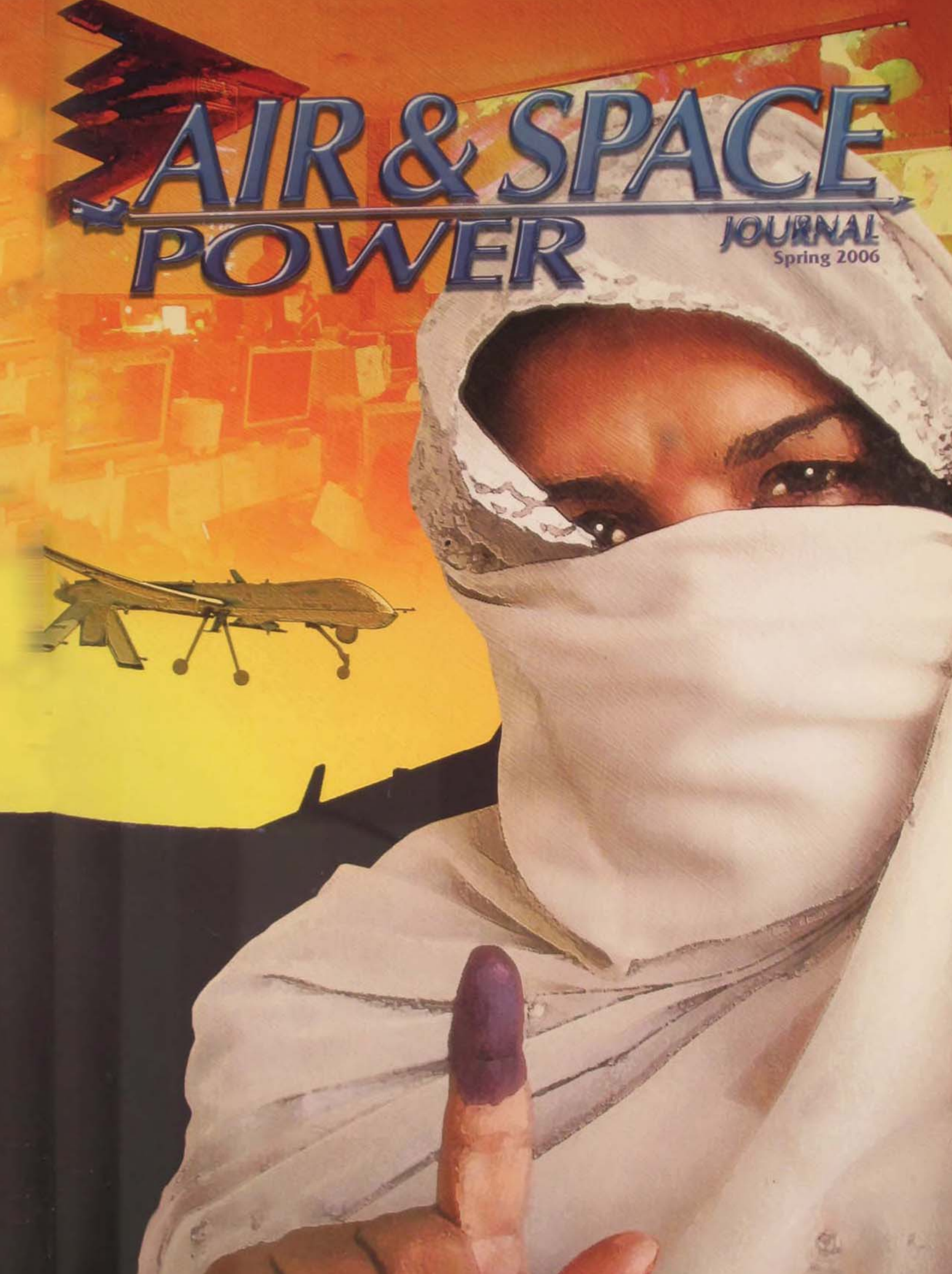
Spring 2006



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Effects-Based Operations

IN 1991 AND 1992, the success of effects-based operations (EBO) in the planning and execution of the first Gulf War drew considerable attention. The basic idea behind this construct—that of causal relationships in conflict—has endured for centuries. However, only in the last decade of the twentieth century did we begin to reach the levels of technology necessary to accelerate an effects-based perspective to its maturity. Capturing the essence of what many past strategists envisioned requires diligent analysis and innovative thinking—technology alone will not provide future victories. Instead, we must examine what new technologies have to offer as a basis for dynamic concepts of operations. So how does EBO apply?

EBO is not a framework, a system, or an organization—it is *not* service specific. Rather, it is a methodology or a way of thinking. Accordingly, it encourages merging all of our national security tools and thus has application across the spectrum of conflict. At its heart is the exploration of *control*—creating the necessary effects so that an adversary operates in accordance with our national security objectives. Ultimately, this mastering of effects will allow us to view the traditional military concepts of annihilation and attrition, which focus on destruction, as only *one* means of achieving control over an enemy rather than *the* operative means of doing so.

Simply put, the goal of war is to have an adversary act according to our strategic interests. Ultimately, at some point in the future, we may wish to do so without the adversary's

even knowing it. Perhaps this feat will become the logical endgame of EBO—the securing of coalition objectives without resorting to destruction or visible disruption. Although this goal may elude us for quite a while, it remains realistic. Certainly, our current inability should not stifle this aspiration.

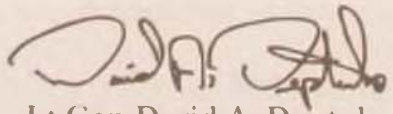
Now within the realm of possibility are significant improvements in the way we as a military and a nation—or as a coalition of nations—attempt to affect our adversaries' decisions. Putting the goal of warfare in that context, we begin to see that desired effects should determine our engagement methods—and that force application becomes only one of a spectrum of options. In fact, EBO is a springboard for the better linking of military, economic, information, and diplomatic instruments of power to conduct security strategy in depth. If we focus on effects (the end of strategy) rather than force-on-force (the traditional means of achieving it), we can consider more effective ways to accomplish the same goal more quickly than in the past—with fewer resources and, most importantly, fewer casualties.

The challenge lies in institutionalizing the potential of an effects-based approach to operations. We find a bit of resistance to this kind of approach, some of it perhaps warranted, when individuals mischaracterize EBO as (1) requiring complete knowledge of an adversary's intentions, (2) discounting the enemy's human dimension, and (3) being overly dependent on centralization to succeed. Under the correct definition of EBO, none of these assertions has any validity.

Modern technologies hold great potential for commanders to extract advantage from an effects-based perspective on their challenges. Reminiscent of the emergence of stealth and precision in the last decade, advances in cyber warfare, information and network-centric operations, and nonlethal weapons promise to enable an even greater level of influence by using an effects-based approach.

Commanders require tools to *anticipate* both the physical and cognitive effects of particular courses of action. Physical effects (easier to model) present a more lucrative near-term target, but cognitive effects (the tougher challenge) may offer the larger payoff. Imagine a future commander anticipating enemy actions and options well before they take place. This ability represents a crucial step toward achieving Sun Tzu's "acme of skill"—subduing the enemy without combat. Perhaps at some point in the future, this will move us a step nearer to imposing our will on the enemy without his realizing we have done so. Clearly, in today's world, we place great value on achieving desired effects with minimal death and destruction since, more often than not, hearts and minds are our targets—not troops and equipment.

The tenets of EBO certainly apply to every medium of warfare, but the speed, range, lethality, and overarching perspective of air and space power make EBO uniquely suited to Airmen. By applying an effects-based approach to all aspects of our profession, we will continue to discover innovative means of realizing our national security objectives. Our capabilities can yield much more than target destruction—they can influence behavior. In the end, that is what warfare is all about.



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Iraq amidst Two Forms of Terrorism

Staff Brig Gen Qaa'id Kerish Mashthoob Al-Khuzaa'i, Iraqi Air Force*

In the Name of God, the Merciful and the Compassionate

THE COUP D'ÉTAT that put the Baath Party in power in Iraq on 17 July 1968 began a new page in the history of the country. The characteristics of this bloody page became clear when some of the party members swooped down on others just 13 days later. The liquidations included all Iraqis whose opinions differed from those of the Baathists. The harm did not stop with the people who opposed those in power but included their family members to the sixth degree of relationship. Nadhim Gzar directed the massacres carried out by his General Security forces, followed by the execution of so-called spies and the extermination of everyone who opposed the regime. In

*Members of General Al-Khuzaa'i's family participated in the 1991 uprising against Saddam and paid a heavy price. His cousin, Captain Imad of the Engineering Corps, was killed by the Special Republican Guard. General Al-Khuzaa'i's younger brother Ra'id was executed at age 16. His cousin Firas was executed at age 20, and his body was never recovered. General Al-Khuzaa'i's uncle Muhsin was also killed. The general himself was discharged from military service for his political views and put under surveillance. He was persecuted by Saddam's regime and was summoned several times to its security and intelligence offices for interrogation. While teaching at the Al-Bakr Military University, he formed a group of dissidents consisting of cadets and military faculty members.

short, Saddam Hussein took power in 1979, after having wielded the real power and influence during the tenure of his predecessor, Gen Ahmed Hassan Al-Bakr.

After Saddam officially became president, he quickly ordered the execution of comrades who had merely whispered their opposition to the methods by which he assumed control. A few months later, he dragged the country into war with Iran, and when Iraq was still licking its wounds following that conflict, he plunged it into war with Kuwait—not to mention the killing of Shiites and Kurds during the 1991 popular uprising after the first Gulf War, and of anyone who even hinted at anything that the regime interpreted as an opposing view. Generations of thugs grew up committing these massacres, violating human rights, and suppressing freedom. In truth, the state conducted terrorism primarily against its own people and secondarily against neighboring nations as well as against humanity.

I do not wish to level accusations at the many nations that reinforced Saddam's regime to carry out this terrorism, but as a matter of fact, France and Russia provided the most support by supplying modern weapons and equipment. They parted with their humanity cheaply when they sold this materiel to Iraq. I also do not wish to write the bloody history of Saddam Hussein. To do so would require lengthy tomes. But I do wish to link the terrorism practiced by Saddam and his Baathist clique with what these same people have done to the Iraqi people since coalition forces led by the United States overthrew Saddam's regime.

At that time the cowardly Baathists, believing that the Iraqi people would literally tear them apart, fled to their dens—some of them to other Arab countries where they embraced the terrorist movements which they found there. Because the Iraqi people have a long tradition of offering forgiveness, they did not pursue the Baathists, leaving them instead to the forces of law and authority. Those forces, however, including the Ruling Council and other bodies, proved weak and did not decisively and firmly hold these criminals accountable for their transgressions. Consequently, these cowards avoided punishment. Those who escaped the wrath of the eagle became insolent and took revenge against the Iraqi people by carrying out car bombings and assassinating honorable members of our great nation, justifying this carnage in the name of resistance.

The ravens of evil screeched in front of them, and the so-called men of religion (the imams of blasphemy), whether in Iraq, Jordan, Saudi Arabia, Afghanistan, or other places, incited Iraqis and others to terrorism—ugly crimes of the worst sort, including the slaughter of children, women, and men, and the random detonation of explosives in the country's streets and marketplaces. Sometimes they justified their actions by claiming to target Shiites or those who work for the government—in addition to other worthless justifications. Having lost their senses, they launched terror attacks that defy description—undefinable and more heinous than any crime or act of discrimination. I wonder why this nation is destined to become victims of killing and intimidation conducted by the Baathists, both previously and now.

Sadly, other Arab and Islamic nations have hesitated to condemn these vicious acts of terrorism. Even worse, Arab countries have scandalously aided and supported terrorism in Iraq. The imams provoke their people, as if religion has now become centered around Saddam and the Baath Party—even though Saddam severely punished and humiliated all Arabs. Furthermore, superpowers such as France and Russia have remained silent in the face of these crimes, uttering not a single word of simple condemnation—as if they yearn for the return of Saddam and the reinstatement of their cozy relationship that helped him commit crimes against humanity.

Some say that America invaded Iraq. I call it liberation of my country from the regime of a tyrant and his accomplices. In fact, Saddam brought America to Iraq by mocking all human values and social relationships and by showing disregard for his people as well as all the other nations of the world. He imagined that nobody would dare call his hand. But he forgot the power of God, who harnessed the strength of the United States to liberate Iraq after Americans died in the terrorist attacks of

11 September 2001. After Saddam's regime fell, we saw the depth of the connection between him and al-Qaeda revealed with the dispatch of Abu Musab al-Zarqawi to Iraq and al-Qaeda's terrorist operations there after the liberation. The strongest justification for liberating Iraq was not that Saddam possessed weapons of mass destruction—even though he would have obtained and used them to destroy the human race, had the United States not applied constant pressure to his regime. Rather, the best justification for liberating Iraq was the terrorist orientation of Saddam's regime on all levels, both domestic and foreign, and its determination to obtain weapons of mass destruction by any means possible.

Simply put, Iraq still lives amidst two forms of terrorism—that of Saddam's regime before liberation and that of the present, which followed as a direct consequence of that regime's destruction of Iraq and the killing of its people. Indeed, many Iraqis still have not found their family members—not even in the mass graves. Additionally, the nation suffers from the destruction of its infrastructure, and backwardness plagues the Iraqi people.

O people of Iraq, may your multitudes all be reunited with God. Whoever has had the patient heart to suffer such tyranny and terrorism has borne something beyond the endurance of even mountains or camels. Keep moving forward on the road of patience, freedom, and democracy built by your altruistic sons. May God watch over you and all of those who are your friends and honorable brothers. May you not be disunited by appeals to falsehood and slander. May you not be swept away by the winds of racism and sectarianism raised by all the malicious, vile people who come from the dunghills of history. Since eternity you have been a people with laws and civilization—a source of radiant light for the world. From your lands the first legal code came forth. O my country—I salute you, as I live in your midst and in your embrace. May God spare you from the deceitful deeds of all those who are grudgeful and backward. ❑

Lt Col Paul D. Berg, USAF, Chief, Professional Journals

Introducing "the Merge" and the Latest *Chronicles Online Journal* Articles

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* (*ASPJ*) is launching a new category of "Merge" articles in which contending ideas meet in the same forum. Readers will see both sides of the argument and draw their own conclusions—or join the intellectual battlespace if they wish.

Vigorous professional debate of contentious issues is important to today's US Air Force because we face many complicated challenges as we adapt to a fast-changing world. We need to make tough choices about how best to organize, train, equip, and employ airpower and space power in pursuit of national goals. Everyone agrees that resources are limited and the stakes are high, but reasonable people can disagree about which choices they should make.

As the Air Force's professional publication, *ASPJ* is a logical place for Airmen to debate these hard choices; therefore, the *ASPJ* staff is soliciting Merge articles that succinctly present opposing viewpoints about controversial topics concerning airpower and space power—especially those related to each issue's focus area. For example, the summer 2006 *ASPJ* will address "Space Power for War Fighters," and the fall 2006 issue will consider "Joint Air and Space Power Perspectives." (See http://www.airpower.maxwell.af.mil/airchronicles/theme.html for a list of upcoming focus areas.) Thus, priority Merge articles for the next two issues would deal with controversial topics pertaining to space or matters of jointness. However, these articles need not always conform to the designated focus areas. We want to hear from any writer who has a strong opinion about how the Air Force should solve important problems and who can responsibly articulate the pros and cons of that opinion. We will match such articles with other ones that advocate divergent solutions. If appropriate, we may put opposing writers in contact so they can design their articles to rebut each other's arguments. We also welcome writers who have the skill to argue alternative solutions to a problem in the same article.

Since we deal with airpower and space power, not even the sky is the limit to selecting potential Merge topics, which might include "Should a Separate Space Force Exist?" or "To What Extent Should We Replace Piloted Aircraft with Unmanned Aerial Vehicles?" We welcome anyone, anywhere in the world to write Merge articles in any *ASPJ* publication language (English, Spanish, Portuguese, Arabic, or French). Authors should e-mail their articles to aspj@maxwell.af.mil.

All of the *Air and Space Power Journal* editions promote professional dialogue among Airmen worldwide so that we can harness the best ideas about airpower and space power. The *Chronicles Online Journal* (*COJ*) complements the printed editions of *ASPJ* but appears only in electronic form. Not subject to any fixed publication schedule, *COJ* can publish timely articles anytime about a broad range of topics, including historical, political, or technical matters. It also includes articles too lengthy for inclusion in the printed journals.

Articles appearing in *COJ* are frequently republished elsewhere. The Spanish, Portuguese, Arabic, and French editions of *ASPJ*, for example, routinely translate and print them. Book editors from around the world select them as book chapters, and college professors use them in the classroom. We are pleased to present the following recent *COJ* articles (available at http://www.airpower.maxwell.af.mil/airchronicles/cc.html):

- Lt Col Michael R. Weeks's "O Critério de Custo-Benefício: aprimorar a segurança nacional e o poder aéreo e espacial" (http://www.airpower.maxwell.af.mil/airchronicles/cc/weeks1.html) (English version: "Cost-Benefit Economics: Enhancing National Security and Air and Space Power," http://www.airpower.maxwell.af.mil/airchronicles/apj/apj03/fal03/weeks.html)
- Dr. Forrest L. Marion's "Building USAF 'Expeditionary Bases' for Operation ENDURING FREEDOM—AFGHANISTAN, 2001–2002" (http://www.airpower.maxwell.af.mil/airchronicles/cc/marion.html)
- العراق وبعد: أخذ الدروس الصحيحة للقضاء على أسلحة الدمار الشامل بقلم: مايكل أيزنستاد (http://www.airpower.maxwell.af.mil/airchronicles/cc/eisenstadtarabic.pdf) (English version: Michael Eisenstadt's "Iraq and After: Taking the Right Lessons for Combating Weapons of Mass Destruction," http://www.airpower.maxwell.af.mil/airchronicles/cc/eisenstadt.pdf)

The *ASPJ* editorial staff always seeks insightful articles and book reviews from anywhere in the world. We offer both hard-copy and electronic-publication opportunities in five languages, as noted above. To submit an article in any of our languages, please refer to the submission guidelines at http://www.airpower.maxwell.af.mil/airchronicles/howto1.html. To write a book review, please see the guidelines at http://www.airpower.maxwell.af.mil/airchronicles/bookrev/bkrevguide.html. ❑

Ricochets and Replies

We encourage you to send us your comments, preferably via e-mail to aspj@maxwell.af.mil. You may also send letters to the Editor, Air and Space Power Journal, *401 Chennault Circle, Maxwell AFB AL 36112-6428. We reserve the right to edit the material for overall length.*

EFFECTS-BASED AIRPOWER FOR SMALL WARS

Kudos to *ASPJ* for publishing Col Robyn Read's "out-of-the-box" article "Effects-Based Airpower for Small Wars: Iraq after Major Combat" (spring 2005, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/spr05/read.html), which focuses on the job at hand and uses historical understanding to make a *great* proposal. As a marine, I am infinitely familiar with the "small-wars manual." Colonel Read uses much of the same logic as this manual in making his argument. Too many folks today (including many in the US Air Force, unfortunately) are obsessed by technology and focus on things like the F-22A, Space-Based Infrared System, and other devices. The proposal for a low-tech, long-dwell OV-10D Bronco with a human (really two) in the loop (unmanned aerial vehicles are terrific, but taking the human out and putting him or her hundreds of miles away as an observer has severe drawbacks) to build and maintain situational awareness is a relearning of history we

shouldn't have to go through, but Colonel Read deserves praise for doing it. I have witnessed the immense force-multiplication capacity of the OV-10D in terms of sensors, radios, and—most importantly—a dedicated battle manager/forward air controller (airborne)/tactical air coordinator (airborne)/recce platform with two sets of eyeballs. When the OV-10D left station, the fight on the ground often came to a halt until another Bronco arrived on station, took a half hour or so to build situational awareness, and then resumed control of the fight. Colonel Read's idea of teaming American and Iraqi crew members in the cockpit and using the OV-10's loudspeaker to talk to people on the ground is absolutely brilliant. By the way, the push toward miniature munitions like the small-diameter bomb and 500-pound Joint Direct Attack Munition could really breathe some new life into an old Bronco!

Lt Col Jeff "Huey" Hewlett, USMC
Ridgefield, Connecticut

MAYAGUEZ INCIDENT: A 30-YEAR RETROSPECTIVE

It pains me greatly to discover a minor flaw in the vignette "The *Mayaguez* Incident, 12–15 May 1975: A 30-Year Retrospective" in your spring 2005 issue (http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/spr05/vignette3.html)—especially so because I have followed the writings of its author, Dr. John Guilmartin, since his days as a cadet. I believe that he is one of the foremost military historians in America, and I have never before found a flaw in his work. It is all the more distressing to me because I well know that former editors (as he is) of your venerable journal seldom, if ever, make a mistake. Dr. Guilmartin said in the vignette, "Perhaps prompted by a retaliatory strike on mainland targets by A-6s based on the USS *Coral Sea*, the Khmer Rouge released the *Mayaguez*'s crew, sending them out in a Thai fishing boat" (80). Yet, according to the crew members themselves, they embarked in the fishing boat at 0620 that day, and the first bomb fell on a mainland target at 0957—making it difficult for the new Khmer Rouge to have been motivated by the bombing. Guilmartin's book *A Very Short War: The* Mayaguez *and the Battle of Koh Tang*, the best there is on the subject, cites the crew as being on board a US Navy vessel at 1005, just eight minutes after the first bomb hit many miles away (114). Too, the *Mayaguez* crew was embarked hardly 15 minutes after the first marines landed on Koh Tang Island, so whatever the Khmer Rouge's motivation, it seems improbable that either the invasion or the bombing had anything to do with it.

Lt Col David R. Mets, USAF, Retired
Niceville, Florida

The Author Replies: Dave Mets is absolutely right! On reflection, his point raises an interesting issue: could US military headquarters have cancelled the retaliatory strike on learning that the crew had been released?

Lt Col John F. Guilmartin Jr., USAF, Retired
Columbus, Ohio

LORENZ ON LEADERSHIP

As we progress through our careers, we notice that the specialization that is so important at the start of our professional lives interferes with the macroview that should enable us to become more effective advisers to our commanders. Once we become conscious of this phenomenon, the importance of *Air and Space Power Journal* (*ASPJ*) as a source of high-quality material that presents ideas related to the application of airpower becomes immediately apparent. My personal experience with *ASPJ* has been one of great anticipation about what each new edition might contain. As I plumb the themes covered in past editions, I always find a good article to cite in my works.

I was pleased to read, among other titles no less relevant, the article "Lorenz on Leadership" by Maj Gen Stephen R. Lorenz (*ASPJ*-English, summer 2005, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/sum05/sum05.html). That article, in particular, addresses in a simple and direct manner a topic of great importance that is seldom discussed or written about within the Brazilian armed forces. The author is at his best when he avails

himself of personal experience to expound on leadership principles and invites us to ponder them. I quickly noticed that I could apply them to my own area of interest. I serve at Headquarters Brazilian Air Force Air Operations, a place undergoing major changes involving new equipment and doctrines for conducting air and joint operations that will certainly require "balancing shortfalls," acquiring "knowledge," making decisions that "pass the sunshine test," and "applying overwhelming combat power to the point that will have the most effect." Furthermore, and in particular, we need to "think and act out of the box" when we plan these changes, just as General Lorenz suggests.

Although the author offers an obviously American perspective of warfare, it is crystal clear that we can tackle our own problems by using the 13 principles he proposes, even if those principles were conceived under different conditions. Congratulations to the editor for selecting such a timely and informative article.

Maj Davi Rogério da Silva Castro, Brazilian Air Force
Brasília, Brazil

Editor's Note: Major Davi read the Portuguese translation of General Lorenz's article, available at http://www.airpower.maxwell.af.mil/apjinternational/apj-p/2005/3tri05/lorenz.html. For a Spanish version, see http://www.airpower.maxwell.af.mil/apjinternational/apj-s/2005/3tri05/lorenz.html. We plan Arabic and French versions for 2006.

BUILDING A WORLD-CLASS NONCOMMISSIONED OFFICER CORPS

I enjoyed Chief Master Sergeant of the Air Force Gerald R. Murray's article "Developing Airmen: Building a World-Class Noncommissioned Officer Corps" (winter 2005, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/win05/murray.html). Chief Murray mentioned the importance of mentoring, and I have been fortunate enough to have had great mentoring over the years. One thing I discovered early on is that learning the next level of responsibility and leadership needs to start before one gets there. Hopefully I can mentor and inspire the next generation of leaders. As a junior noncommissioned officer (NCO) hoping to reach senior NCO leadership at the strategic level, I appreciate what *Air and Space Power Journal* does in allowing me to educate myself and my troops. Thanks!

TSgt James Warrick, USAF
Beale AFB, California

Chief Murray's article contains an excellent figure labeled "development and utilization across a 30-year career." Our unit plans to use it for Enlisted Professional Development purposes and for training our younger troops to give them a guideline on career progression.

SSgt Saundra J. Wilson, USAF
Cheyenne Mountain AF Station, Colorado

AN INTRODUCTION TO THE NEAR-SPACE CONCEPT

Lt Col Ed "Mel" Tomme and Col Sigfred "Ziggy" Dahl's article "Balloons in Today's Military? An Introduction to the Near-Space Concept" (winter 2005, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/win05/tomme.html) made me think that, as with any new development in offensive capabilities such as near-space platforms, we should immediately look in the mirror and start thinking about how we might have those capabilities directed against us and what we would do about it. Based on historical experience, we Oregonians have a heightened sensitivity to the potential threat posed by lighter-than-air weapons delivered against the homeland. In addition to the well-known shelling of the Oregon coast by a Japanese submarine during World War II, Oregon also experienced aerial bombardment by the Japanese. The adversary fixed incendiary devices to balloons and let the jet stream carry them over the forests of the Pacific Northwest. More recently, my concerns were further tweaked by an Iraqi informant's (code name Curveball) report of an al-Qaeda mobile chemical-weapons laboratory project in northeastern Iraq that turned out to be "merely a system for launching weather balloons."

After reading "Balloons in Today's Military?" I would like to see *ASPJ* publish an article that addresses countermeasures the United States might apply if our adversaries choose to use this near-space concept against us. I am concerned that the low price tag of near-space weapons could facilitate a "swarming" sort of attack that would overwhelm any conventional air-defense capability we now have in place. Perhaps we should consider directed-energy countermeasures instead of antiaircraft artillery or air-intercept aircraft. All I know about directed energy is what I read in the newspapers, but I imagine the folks down at Kirtland AFB, New Mexico, could provide plenty of input to an article about the inherent advantages of this sort of defense. The Air Force Research Laboratory's Sensor Directorate might also have some ideas about detecting and targeting lighter-than-air offensive weapons.

MSgt Douglas G. Sauvageau, ANG
Oregon Air National Guard
Rilea Armed Forces Training Center, Oregon

Editor's Note: Air and Space Power Journal *would welcome the chance to review an article like the one Master Sergeant Sauvageau proposes. Prospective authors should read our article-submission guidelines at http://www.airpower.maxwell.af.mil/airchronicles/howto1.html#submissions.*

FIRST RULE OF MODERN WARFARE

Col Richard Szafranski's article "The First Rule of Modern Warfare: Never Bring a Knife to a Gunfight" (winter 2005, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/win05/szafranski.html) implies that the manned fighter is not a viable weapon system for the future—at least for the futures postulated. Although I agree that a human (rather, a pilot) in the cockpit will likely be obsolete in future weapon systems, I do not believe that unmanned aerial vehicles (UAV) or unmanned combat aerial vehicles (UCAV) are the way ahead simply because of implications regarding the Law of Armed Conflict (LOAC) and rules of engagement (ROE).

Ultimately, the LOAC and ROEs give approval for armed-forces personnel to use violence. In the near future, within the decades stated in the article, it is inconceivable that the Western concepts of the LOAC and ROEs will migrate towards giving approval for machines to do the same. Inevitably, a human must be in the loop if one uses violence on a state's behalf. Someone—some armed-forces personnel—must be held accountable for the death and destruction caused by UAVs and UCAVs; a machine cannot be held accountable. Perhaps *uninhabited aerial vehicle* or *uninhabited combat aerial vehicle* would be better terms since they suggest that a human controls the weapon system but is not in the vehicle itself.

Therefore, although I agree that it seems increasingly unlikely that future weapon systems will have a human in the cockpit, I do not agree that UAVs or UCAVs are the way ahead. Instead, the human will be in a safer, more secure place controlling those systems. This place can be on the ground, on or below the oceans, or in space. At the end of the day, however, unless a significant change occurs in the Western interpretation of the LOAC and ROEs, a human responsible for the death and destruction rained from above will be present to some extent in every UAV and UCAV.

Air warriors of future squadrons will likely spend very little time in the air. Very likely they will be "chairbound," looking more like my son and his video games than anything I resembled in my more than 20 years in Canada's air force.

Lt Col John Foster, Canadian Air Force, Retired
Kagawong, Ontario, Canada

MAHAN ON SPACE EDUCATION

In "Mahan on Space Education: A Historical Rebuke of a Modern Error," 1st Lt Brent D. Ziarnick (winter 2005, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj05/win05/ziarnick.html) is absolutely right to point out that the education of a space professional must not necessarily be limited to technical fields, but that the humanities, too, provide a useful source of knowledge and under-

standing for champions of the space medium. He is also on target with his observation that operations in the medium of space will not forever remain free from conflict and that space professionals will soon (in fact, I believe they do today) have a responsibility to control the space medium and deny its advantages to adversaries.

But much of the rest of Ziarnick's argument seems to fall prey to one or more logical traps. The first is a recurring false dilemma, which appears to rest on an assumption that technical and nontechnical skill sets are somehow mutually exclusive. While there may be a functional difference between "engineering" and "operations" in a given mission area or unit, I don't believe we should automatically project the distinction onto individuals, categorically pigeonholing them as either engineers/technicians or operators/managers/nontechnicians. A space professional is indeed that—a professional—and, ideally, should be constantly learning and applying all aspects of his or her business.

Accompanying the recurring false dilemma are occasional non sequiturs, such as the apparent reasoning that (a) if someone has an education in primarily technical areas, then (b) he or she is less equipped to deal with matters of strategy and doctrine than someone with a nontechnical education. Did Napoléon (who studied engineering and received science awards before embarking on a military career) and Robert E. Lee (a West Point engineering student who worked on engineering projects in Georgia, Virginia, and New York before the Mexican War) gain reputations as military geniuses in part because of their technical skills or in spite of them? I would prefer to make the case that the individual with the broadest range of educational background and experience is likely to be the most effective strategist and combat leader, and that no particular skill or lack thereof—technical or nontechnical—should automatically disqualify him or her from being one.

Another non sequitur connects the paraphrased Mahanian quotation "that the knowledge sufficient to run and care for [space systems] can be acquired by men of very little [technical] education is a matter of daily experience" (67) with current space operations, apparently suggesting that very little expertise is required to sustain on-orbit space systems. In the squadron where I serve, nothing could be more different; it takes the fullest possible range of skills and expertise—current operations, system-resource planning, engineering actions and problem solving, communications analysis, logistics, and more—to keep our complex space system flying daily and delivering combat effects. And the most effective individuals in the mission are the ones who gain proficiency in several of these skill areas, demonstrating abilities to think across disciplines and make decisions with a comprehensive understanding of all the factors involved.

In short, Ziarnick's basic thesis is correct—that we must be careful, in the push to increase technical expertise among space professionals, not to assume that the nontechnical disciplines serve little or no purpose. But let that not be a rush to segregate the skill sets and, in so doing, propagate a self-fulfilling mechanism that encourages space professionals to be either "techies" or "nontechies" but not continually strive to be both. I'll end with a recapitulative quotation from a World War II–era general (and an apology to those who know it and might have seen it coming): "There is no type of human endeavor where it is so important that the leader understands all phases of his job as that of the profession of arms."

Lt Col John E. Shaw, USAF
Schriever AFB, Colorado

LEADING = INFLUENCING

Lt Col Russell C. Barnes's article "Leading = Influencing: A Simple Equation: Influence as the Essence and Foundation of Leadership" (*Chronicles Online Journal*, http://www.airpower.maxwell.af.mil/airchronicles/cc/barnes.html) is very appropriate. The author's recommendations about what we have to take into account regarding influence are closely related to the essence of leadership. I share his view that there is a leadership style applicable to each specific situation and circum-

stance. Congratulations to *Air and Space Power Journal* for the marvelous work it is doing and for making available such valuable and beneficial information. Best wishes.

Sanlley Sanchez
Santo Domingo, Dominican Republic

Editor's Note: Mr. Sanchez made these comments after reading the Spanish version of Colonel Barnes's article, available at http://www.airpower.maxwell.af.mil/apjinternational/apj-s/2trimes04/barnes.html.

INTRODUCING THE FRENCH *ASPJ*

I think a French edition (winter 2005, http://www.airpower.maxwell.af.mil/apjinternational/aspj-f/2005/hiver/hiver05.html) is a brilliant innovation because it will help us communicate with our friends, especially in Africa where French is a main language.

Brig Gen Charles J. Dunlap Jr., USAF
Langley AFB, Virginia

It's wonderful to see you publish the inaugural issue of the French-language *ASPJ*! Congrats to you, and thanks for all the hard work. This will become the hallmark publication cementing relations with French-speaking nations in Africa and the rest of the world.

Brig Gen Bobby J. Wilkes, USAF
McGuire AFB, New Jersey

I read with great pleasure the first issue of *Air and Space Power Journal en Français*. I find this new journal an excellent initiative that can only serve to strengthen bonds between the US Air Force and its French-speaking sister services and improve dialogue with French-speaking countries. The articles are highly applicable to the current world context and written in clear, balanced French. It is a first-class journal with an attractive and beautiful cover, just like the other language editions of *Air and Space Power Journal*. My compliments to the editor.

Martine de Blauw
Bruges, Belgium

The first issue of the French-language *Air and Space Power Journal* holds great interest for Europeans concerned with military affairs. The editorial sets the stage, and the articles reinforce it. The whole issue presents thoughts and new, interesting perspectives into the nature of current and future conflicts and how to deal with them. The reader is at once struck not only by the articles' geopolitical analyses but also by the pragmatism and concrete operational aspects that flow from these analyses. I would say they are "action-oriented thoughts." Moreover, reading this first *ASPJ* issue is a refreshing relief from the standard, trendy ideas seen in the conformist popular European press where practically every media outlet presents the same views of military topics.

Benoit Drion
Marne la Coquette, France

Focus Area

LT COL PAUL D. BERG, USAF, CHIEF, PROFESSIONAL JOURNALS

Effects-Based Airpower and Space Power

THE TERM *EFFECTS-BASED OPERATIONS* (EBO) entered the military lexicon during the Gulf War of 1991 and has propagated widely since then. Initially some Air Force members used EBO to help explain that war's dramatically successful outcome. Many EBO pioneers were Air Force members, but the concept has now spread to other US military services and even the militaries of other nations.

This dispersion hints at EBO's potentially profound influence, yet its definitions vary, and its theoretical concepts remain hard to explain and apply. Not a template for action, EBO is instead a mind-set focused on exploiting cause-and-effect relationships. It requires disciplined analysis to plan and elicit effects that contribute to strategic goals as well as constant communication and assessment to track progress towards producing those effects. EBO has a commonsense quality, but efforts to explain it have spawned an array of related terms such as *first-order effects* and *causal linkages*. Even a basic term like *effect* can resist precise definition. Effects-based terminology is popular yet sometimes misapplied to legitimize new operational concepts. Merely insinuating effects-based jargon into a briefing does not make something effects based. The term *effects-based operations* itself has proliferated to include effects-based planning, effects-based assessment, and so forth. Indeed, EBO rivals *transformation*, a very fashionable buzzword in military circles.

Is EBO an important concept or a passing fad? Only time will tell, but one way to gauge its potential involves viewing it through the lens of another influential concept, the revolution in military affairs (RMA). Andrew Marshall, longtime director of the Office of Net Assessment, defined an RMA as "a major change in the nature of warfare brought about by the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organizational concepts, fundamentally alters the character and conduct of military operations" ("Revolution in Military Affairs," Center for Media and Democracy, http://www.sourcewatch.org/index.php?title=Revolution_in_military_affairs).

Key elements of that definition include new technologies applied to warfare, doctrinal change, and organizational change. Armored warfare is a classic example of an RMA. Internal-combustion-engine technology applied to armored vehicles yielded the tank. Thinkers and practitioners such as Gen Heinz Guderian of Germany developed a new doctrine of massing tanks and aircraft at critical points to break through enemy lines and disrupt rear areas. A new organization known as the panzer division implemented that doctrine. When World War II began, many countries had tanks, but German doctrine and organization made the blitzkrieg seem invincible. An RMA's doctrinal and organizational changes translate technology into military power.

When one views current EBO efforts in RMA terms, several points emerge. First, the data-intensive nature of EBO demands powerful sensor, communication, and computer networks to help us understand changing battlespace conditions and produce desired effects. The US military is attempting to apply such technologies in effects-based ways, but incomplete understanding of EBO remains an obstacle. Second, to exploit these technologies within an effects-based framework, we are developing the appropriate doctrine—an embryonic process that nevertheless shows promise. Third (and toughest), if the RMA concept offers valid insight into EBO, then tapping its potential may require organizational changes as yet unclear. Since the Air Force already finds itself embroiled in reorganization driven by the Quadrennial Defense Review, Base Realignment and Closure Commission, concept of the air and space expeditionary force, and so forth, any EBO-driven alteration would occur against a turbulent backdrop. Finally and most importantly, EBO is more concerned with old-fashioned strategic thinking about achieving goals than with advanced technology or slick terminology, the former inherent in both EBO and the RMA but incapable of solving military problems by itself.

Clearly, EBO strongly influences how today's Air Force conceptualizes military operations. The concept holds great promise, but we need to ponder carefully how to exploit whatever advantages it offers. *Air and Space Power Journal* dedicates this issue to advancing the professional dialogue about EBO. ❑

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 can draw their own conclusions or join the intellectual battlespace. Please send comments to aspj@maxwell.af.mil.*

Educating for "Exemplary Conduct"

Dr. James H. Toner*

THE SENIOR OFFICERS in my Air War College ethics class looked at me in mild astonishment. I had just informed them that, by law, they were to be "a good example of virtue," to be "vigilant in inspecting the conduct of all persons who are placed under their command," and to "guard against and suppress all dissolute and immoral practices."

"You look troubled," I said. "What is the problem?"

"What is meant by the phrase *dissolute and immoral practices?*" they asked.

"Well," I replied, "I see we are out of time today."

> All commanding officers and others in authority in the Air Force are required—
> (1) to show in themselves a good example of virtue, honor, patriotism, and subordination;
> (2) to be vigilant in inspecting the conduct of all persons who are placed under their command;
> (3) to guard against and suppress all dissolute and immoral practices, and to correct, according to the laws and regulations of the Air Force, all persons who are guilty of them; and
> (4) to take all necessary and proper measures, under the laws, regulations, and customs of the Air Force, to promote and safeguard the morale, the physical well-being, and the general welfare of the officers and enlisted persons under their command or charge.
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> *Requirement of Exemplary Conduct*, 10 *US Code*, sec. 8583 [Air Force].

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*I must thank a senior USAF officer, some of whose very helpful comments I have incorporated into this article. Although I know the officer, I choose not to reveal the name, relieving the officer of association with the arguments expressed here. This perceptive officer-reviewer raised a critical point: what is an Airman to do if he or she regards as morally wrong national *policies* beyond the orders issued by that Airman's immediate supervisors? One should consider orders legal and binding unless and until one knows—or can fairly and reasonably be expected to know—that such orders are morally evil and, therefore, not binding. Should we therefore expect the vast number of Airmen or soldiers routinely to question national policy or even, say, theater strategy? The practical answer to that question is, of course, no. That is the reason we need political and military leaders of high character—so we can trustingly follow orders *and policies*, the full extent of which (at our daily tactical or operational level) we may not understand. Still, we are not relieved of the moral responsibility of refusing obedience to orders or even to national policies which are clearly evil. Consider the obvious example: could a German soldier in World War II who knew about the holocaust being carried out by the Nazi regime continue to serve in good conscience? Again, the answer must be no. If Airmen know in their minds and hearts that their government is pursuing evil ends—even though their immediate commanders are morally sound—they cannot continue to serve, even in a minor manner, a nefarious end. [The author is professor of international relations and military ethics in the Department of Leadership and Ethics at the Air War College, Maxwell AFB, Alabama.]*

We may have quit class a little early that day, for I did not want to enter into a legal discussion of what this language means. That worry I will happily leave to Air Force lawyers, who tell me that discussions of this language make for lively debates—and not a few headaches. By the way, one finds nearly identical statutes for the Army and Navy/Marine Corps.

The language in this statute reminds a number of people of the roots of the profession of arms, since the code of the soldier arose from the ideal of chivalry. Even today, of course, officers are supposed to be "gentlemen."

> According to "Conduct Unbecoming an Officer and a Gentleman," Article 133 of the *Uniform Code of Military Justice* (*UCMJ*), "any commissioned officer, cadet, or midshipman who is convicted of conduct unbecoming an officer and a gentleman shall be punished as a court-martial may direct."

The article goes on to explain that the word *gentleman* means both males and females and that the kind of offense referred to in this article means behavior "in an official capacity" which dishonors or disgraces the officer or compromises his or her character. It may also refer to behavior "in an unofficial or private capacity" which dishonors or disgraces the officer personally or "seriously compromises the person's standing as an officer."[1]

If that statement sounds vague, the same article then attempts to clarify it:

> "There are certain moral attributes common to the ideal officer and the perfect gentleman, a lack of which is indicated by acts of dishonesty, unfair dealing, indecency, indecorum, lawlessness, injustice, or cruelty."

It then seems to make a concession to human weakness:

> "Not everyone is or can be expected to meet unrealistically high moral standards, but there is a limit of tolerance based on customs of the service and military necessity below which the personal standards of an officer, cadet, or midshipman cannot fall without seriously compromising the person's standing as an officer, cadet, or midshipman or the person's character as a gentleman."

Still, any ethics class would insist upon examples, and the article attempts to oblige by listing a number of flagrant offenses:

> "Knowingly making a false official statement; dishonorable failure to pay a debt; cheating on an exam; opening and reading a letter of another without authority; using insulting or defamatory language to another officer in that officer's presence or about that officer to other military persons; being drunk and disorderly in a public place; public association with known prostitutes; committing or attempting to commit a crime involving moral turpitude; and failing without good cause to support the officer's family."[2]

Preserving "Good Order and Discipline"

The next article in the *UCMJ*—the so-called General Article (134)—explains that certain other undefined actions are punishable, including "all disorders and neglects to the prejudice of good order and discipline in the armed forces, [and] all conduct of a nature to bring discredit upon the armed forces."[3] The General Article has been challenged as "unconstitutionally vague" many times but so far has withstood the assaults.

The Officer Commission on my office wall reminds me that at the time of my graduation from Infantry Officer Candidate School (OCS), the president reposed "special trust and confidence in the patriotism, valor, fidelity, and abilities" I presumably brought to my new role. Officer commissions, therefore, are consistent with the positive requirement of both "exemplary conduct" and with the admonition against conduct "of a nature to bring discredit upon the armed forces."

Worthy of serious analysis and reflection is the fact that the men and women who, among many other missions, fly our combat aircraft, navigate our warships, and operate our tanks—our nation's warriors—are legally and morally required to be gentlemen. At the same time, official language has told us that "not everyone . . . can be expected to meet unrealistically high moral standards." Still, the requirement of exemplary conduct insists that "all" Air Force commanders be "good example[s] of virtue," even though Article 133 concedes that "not everyone" can be "unrealistically" principled. Shall we therefore say, "*All* commanders should be *a little* virtuous"? Or should we rephrase that and say instead, "*A few* commanders should be *very* virtuous"?

Officers who excel at campaign planning, demonstrating justifiable confidence in themselves and in their professional military abilities and training, often mutter and stumble when confronted with the need to conduct sessions about developing virtue in the troops for whom they have responsibility. Invariably, they mumble something about not being a chaplain. "The chaplain! Yeah, that's the ticket! The chaplain does that kind of thing!"

This forces me to say something difficult, but it's something with which, over many years of teaching military professionals, I have found much agreement—even from chaplains. It is not the principal task of the chaplain to be a command's moral educator. There are a number of reasons for that, including the fact that—as unfair as it may be—many troops will not hear moral instruction from the chaplain just because he or she is a chaplain. Frequently, however, an experienced chaplain, given a little time, is able to take such morally reluctant troops beyond their initial refusal to listen to his or her general moral instruction—which is all to the good.

By themselves, however, chaplains should not and cannot give all the moral instruction in a certain command. Commanders retain the basic responsibility to educate (and to indoctrinate morally) as well as to train their troops, for it is the commander who is responsible for everything his or her

troops do or fail to do. One can justly delegate authority, but one cannot justly delegate responsibility—even to the chaplain.

Moral failures by the troops—think of any recent military scandal—are at heart leadership failures. More often than not, that means someone in command failed to teach moral responsibility, perhaps thinking very mistakenly that such teaching belonged to the chaplain, or to a certain church, or to the troops' parents and high school teachers. Much of that is true, by the way, but it nevertheless does not relieve commanders from setting the right example by deed and by word.

Some years ago, it fell to the commander of a senior professional-military-education institution to conduct a class for everyone there on the core values. Now the core values of the services are not magic bullets which teach moral maturity or even moral reasoning. But they offer a good place to start down those paths. This general officer had a choice: he could have used canned material given him for the instruction, or he could have offered his own testimony. He chose the former, using stock phrases and somewhat silly PowerPoint slides and wasting the time of those assembled. Had he given a from-the-heart talk, perhaps not polished and perhaps—gasp!—not accompanied by color slides, the audience would have received him and his talk much more warmly than it did.

Microscopic and Macroscopic Ethical Standards

If the language of virtue education in the Air Force is confused and confusing, it is very understandable. We live in (and defend) a democratic society with multiple, competing values. Fifty years ago, there was broad understanding of the meaning of moral turpitude. Whether that understanding was morally solid or morally soiled depends upon the perspective one brings to such a conversation. Certainly, however, we cannot easily attain such general moral consensus today. Fifty years ago, to give one inflammatory example, society seemed largely agreed about the immorality of homosexuality. Today, by contrast, one encounters substantial debate, which has spilled over into policies in and affecting the armed forces.

One bedrock standard for moral judgment exists in the armed forces. In examining one moral issue or another, the commander has a right and a duty to ask, Does this conduct increase or decrease my ability to accomplish my mission? Although trained as an infantry officer in the very late 1960s, I am not a Vietnam veteran, but I remember clearly the advice we received in Infantry OCS at Fort Benning, Georgia, about "preaching" to the troops. Instructors taught us that telling soldiers going on patrol about the immorality of drug use would often be a waste of breath. However, telling them that drug use on a patrol could result in combat ineffectiveness, which could cause the deaths of their buddies, hit home. They thus had a utilitarian stake in each other's alertness.

This is not to argue that all effective moral education is practical and utilitarian. It does, however, make the point that the armed forces have a serious and substantial standard to apply in moral education: it is the standard of whatever works to ensure mission accomplishment. Consider this: is adultery wrong? Of course it is—and it should be exposed clearly as a great moral evil. But when troops understand that fraternization (which can include adultery) can destroy a unit's cohesion, diminish combat effectiveness (especially in these days of rapid, worldwide deployment), and result in the deaths of buddies—the point comes across firmly and fairly. Something morally wrong is explained concisely and convincingly—without elaborate theology and philosophy—because it undermines prospects of mission accomplishment.

Again, I do not mean to reduce moral reasoning only to what works militarily. It is, at best, only a starting point—but one which can be developed and enhanced by experience, wide reading, serious conversation, and (for the religious) chapel education. We thus proceed *microscopically* (from the particular derivation of ethics from the demands of military operations [asking what works militarily]) rather than *macroscopically* (from applying an overarching ethical sense to certain military circumstances [asking what ought to be in terms of morality]).

I wish I could leave it there, for my argument so far is easy to make and easy to defend. I cannot leave it there, though. Microscopic ethics alone, although necessary to developing sound moral sense in the military, is not adequate. The big moral picture remains. I have argued that the criterion of military success is a useful moral teaching device for commanders. But something must exist beyond that because successful preparation for or execution of combat operations can never be the ultimate consideration in military ethics. After all, many victorious military operations have advanced evil causes.

What I discussed above, labeling it "microscopic," is a pragmatic, nontheoretical, functional approach to military ethics. In that sense, it has value—but very limited value; it is a place to begin ethical education but, most certainly, not a place to conclude it. This microscopic approach also reduces ethics to whatever advances military purposes. Rooted in the mistaken notion that the end justifies the means, this approach exalts military necessity as the chief or sole moral umpire.

At this juncture, some readers will no doubt say, "I knew it! Here comes the 'fog of philosophy'—all those hopelessly abstract names and nouns that real-world Airmen and soldiers haven't got the time to pore over." But that is not the case. Just as commanders can use the criterion of contributing to military readiness or to combat operations as an introductory means of teaching ethics, so can we still employ a military frame of reference as we enter the world of macroscopic or big-picture ethics.

For years, the Air Force taught in its principal manual about international law that military success, military ends, and military necessity are not ultimate ethical criteria. Suppose a colonel who wants to achieve a certain military objective tells his subordinates that they may do anything (including

deliberate killing of the innocent, wanton destruction of property, and other crimes) to attain that objective. If we apply the microscopic test we have already set forth—morality consists in military effectiveness—as the *sole* arbiter of right from wrong, then it seems the fictional colonel is right.

But we know he isn't right. We know that he is a war criminal. Are his subordinates guilty because they have followed his orders, thinking—however fallaciously—that they were being "moral"? The Air Force says it plainly:

> "The fact that an act was committed pursuant to military orders is an acceptable defense only if the accused did not know or could not reasonably have been expected to know that the act ordered was unlawful. Members of the armed forces are bound to obey only lawful orders."[4]

In the colonel's case, one could reasonably expect his subordinates to know the immorality of committing an atrocity. Just as we can fairly be expected to know some things, so are there other things we cannot not know. According to J. Budziszewski,

> "There are some moral truths that we all really know—truths which a normal human being is unable *not* to know. They are a universal possession, an emblem of rational mind, an heirloom of the family of man. That doesn't mean that we can know them with unfailing perfect clarity. . . . Yet our common moral knowledge is as real as arithmetic, and probably just as plain" (emphasis in original).[5]

Air Force Pamphlet (AFP) 110-31, *International Law: The Conduct of Armed Conflict and Air Operations*, made a strikingly similar point by quoting from the *Manual for Courts-Martial*:

> "An order requiring the performance of a military duty may be inferred to be legal. [*But* an] act performed manifestly beyond the scope of authority, or pursuant to an order that *a man of ordinary sense and understanding* would know to be illegal, or in a wanton manner in the discharge of a lawful duty, is not excusable" (emphasis added).[6]

That tells us we are to assume that orders are legal and binding (following orders may always be considered in mitigation of an offense), but if we receive an order that any reasonable person—anyone of "ordinary sense and understanding"—would know is immoral, we must not follow it. Note that this ethical warning is not, as the saying goes, "rocket science." It is not difficult to understand although it may be difficult to put into practice.

If I do a certain action, will it help my unit prepare for war? If the answer to that question is yes, then we can presume that the action is moral. But now we *must* test again: although this action may advance military preparations or operations, is the action consistent with our deepest moral sense? Is the action in keeping with what reasonable and moral people would conclude about it?

Teaching Military Virtue

I define *virtue* as the habitual practice of thinking wisely and acting justly. Virtue depends upon *macroscopic* perspective—seeing the temporary in light of the timeless and seeing challenge and change in light of the eternal. This suggests, of course, the existence of enduring standards which we can discern through right reason and by which we should judge the problems of the day. What if everything ethical depends only upon time and place? Then everything is relative, and right becomes might, and virtue becomes vice. *But there are standards and authorities which transcend geography and chronology.* As people of ordinary sense and understanding, we can and must discern and defend those standards and authorities.

A disjunction or disconnect occurs between what the law demands from Airmen—virtue—and what the Air Force teaches. (At least I have never talked with people at the Air Force Academy, in the Air Force Reserve Officer Training Corps [AFROTC], or in basic training who contend that their training "inculcates virtue.") So how does the United States Air Force, a secular armed force of a secular government, go about teaching virtue, which, after all, sounds religious?

One answer to that may lie in the language of the core-values booklet, which tells us that the Air Force "attempts no explanation of the origin of the [Core] Values except to say that all of us, regardless of our religious views, must recognize their functional importance and accept them for that reason. Infusing the Core Values is necessary for successful mission accomplishment."[7] That sounds very much like the notion of microscopic moral reasoning already mentioned. Now how do we get to the macroscopic part?

Macroscopic virtue education is rejected out of hand by some who claim that public schools or the military services *can't* really teach virtue; it is rejected equally quickly by others who say that the schools and services *shouldn't* try to teach virtue. The latter group insists that teaching the virtues is probably a religious function and, therefore, should not occur at public or military institutions. The former group says that virtue education is simply not feasible in modern society.

Both are wrong. "To educate a person in mind and not in morals is to educate a menace to society," observed Pres. Theodore Roosevelt. All (or almost all) people of good will can agree upon certain values—although *virtues* is a much better word. For example, for centuries moral educators have customarily prized the four classical, or cardinal, virtues: wisdom; truth or justice; moral and physical courage; and temperance, modesty, and self-control. One can trace them to sources both biblical (Wisdom 8:7) and philosophical (Plato's works). In the cardinal virtues, we find a harmony between practical ethics (what I earlier called microscopic) and overarching principles (what I earlier called macroscopic).

The chief question *seems* to be this: *can the military services teach virtue?* In fact, the *real* question is this: *can the military services* **not** *teach virtue and then expect their Airmen and soldiers to be virtuous, as is demanded by law?* For example,

we of course train military personnel how to fire and clean weapons; should we not provide education about when and where and whether to employ such weapons? Remember the clear teaching of AFP 110-31: "Members of the armed forces are bound to obey only lawful orders." What is a lawful order, and what is an unlawful order? Moreover, is there a point at which a lawful order can become unlawful?

The military does not have a mission to educate all enlisted and officer personnel to become lawyers, philosophers, or theologians. But do any of the suggested items on the official Air Force reading list deal principally with the kinds of moral problems upon which we legally require our leaders to bring to bear virtue and honor? Are there not enduring works of literature and philosophy which could and should be part of this list? Could we not include such books as Albert Camus' *The Stranger*, Joseph Conrad's *Lord Jim*, Viktor Frankl's *Man's Search for Meaning*, William Golding's *Lord of the Flies*, Harper Lee's *To Kill a Mockingbird*, Niccolò Machiavelli's *The Prince*, Reinhold Niebuhr's *Moral Man and Immoral Society*, and Sophocles' *Antigone*, to name just a few? Shakespeare alone offers timeless analyses of, say, indecisiveness (in *Hamlet*), leadership problems (in *King Lear*), excessive ambition (in *Macbeth*), and making principled choices (in *Measure for Measure*), again, to name only a few. Note once more that no one needs advanced degrees in literature, philosophy, or political theory to read and learn from these kinds of works.

For years at the Air War College, I have used such books as Jean Anouilh's *Becket*, Robert Bolt's *A Man for All Seasons*, James Clavell's *The Children's Story*, Robert Heinlein's *Starship Troopers*, Henrik Ibsen's *Enemy of the People*, Herman Melville's *Billy Budd*, and Plato's *Apology* and *Crito* in my courses on Command and Conscience and Core Values. Although I do not refer to macroscopic ethical analysis in these courses, that is the cast of mind I am trying to teach—at least implicitly. For instance, consider the following from Dr. Martin Luther King Jr.'s "Letter from Birmingham Jail":

> "How does one determine whether a law is just or unjust? A just law is a man-made code that squares with the moral law or the law of God. An unjust law is a code that is out of harmony with the moral law. To put it in the terms of St. Thomas Aquinas: An unjust law is a human law that is not rooted in eternal law and natural law. Any law that uplifts human personality is just. Any law that degrades human personality is unjust. All segregation statutes [for example] are unjust because segregation distorts the soul and damages the personality."[8]

Not one of the works I have mentioned appears in the Air Force pamphlet entitled "Make Time for Professional Reading: U.S. Air Force Chief of Staff Reading List."[9] I am not suggesting that Air Force basic-training technical instructors or AFROTC staff become humanities scholars. I *am* suggesting that the armed services develop an educational program which deals seriously with teaching the virtue demanded by law of all who wear the uniform. (By the way, let me strongly recommend reading *The Armed*

Forces Officer, one of the most readable and down-to-earth instruction "manuals" in virtue I have ever seen.[10] It should be prominently featured in every base or post library.) Such a program would contain a number of elements:

- Inclusion on the reading list of some enduring works of literature which provoke thought about moral responsibility.
- Broadening of the list to include some movies which raise perennial questions about moral responsibility.
- Development of seminars and workshops as well as short *and readable* guides for commanders and others in authority to help them present commanders' calls (and the like) which address moral topics without becoming religious exercises or perfunctory, "fill-the-square" annual training drills (accompanied by canned materials and colorful slides).

Too often this goes unsaid in any program concerning moral instruction, so let us put it plainly on the table here: *any program in virtue education depends upon the commander.* If the commander thinks this is just so much drivel, he or she can have hundreds of books, movies, and seminars to consider, but the program he or she finally develops will be worthless. If the commander is inept or incompetent in delivering a serious product to the troops and is unable to speak from his or her own mind and heart about being a gentleman or lady, the program will be useless. The result of such feckless "education" will be more scandal, such as Abu Ghraib.

American troops receive the best military training in the world. But all of us, military and civilian, who teach our troops have too long ignored the need to teach virtue, mistakenly thinking that such education is religious (it need not be) or unworkable (it must not be). At a time when, perhaps more than ever before, the battlefield decisions of our lieutenants, sergeants, and even Airmen or privates can have international significance, we owe them not only good training but also wise education. ❑

Maxwell AFB, Alabama

Notes

1. "Punitive Articles of the UCMJ: Article 133—Conduct Unbecoming an Officer and Gentleman," *About.com*, http://usmilitary.about.com/od/punitivearticles/a/mcm133.htm.
2. Ibid.
3. "Punitive Articles of the UCMJ: Article 134—General Article," *About.com*, http://usmilitary.about.com/od/punitivearticles/a/134.htm.
4. Air Force Pamphlet (AFP) 110-31, *International Law: The Conduct of Armed Conflict and Air Operations*, 19 November 1976, 15-6. The Air Force designated AFP 110-31 obsolete as of 20 December 1995.
5. J. Budziszewski, *What We Can't Not Know* (Dallas: Spence, 2003), 19.
6. AFP 110-31, *International Law*, 15-6(d).
7. *United States Air Force Core Values* (Washington, DC: Department of the Air Force, 1 January 1997), http://atlas.usafa.af.mil/core-value/cv-mastr.html.
8. "Letter from Birmingham Jail" [16 April 1963], *The Martin Luther King, Jr. Papers Project at Stanford University*, http://www.stanford.edu/group/King/frequentdocs/birmingham.pdf.
9. See "CSAF's Reading List" from "The Chief's Sight Picture," 16 April 2004, http://www.af.mil/csafreading/index.asp.
10. DOD GEN-36A, *The Armed Forces Officer*, 1 February 1988, http://www.usapa.army.mil/pdffiles/p600%5F2.pdf.

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 can draw their own conclusions or join the intellectual battlespace. Please send comments to aspj@maxwell.af.mil.*

The Air Force's Missing Doctrine

How the US Air Force Ignores Counterinsurgency

Maj Kenneth Beebe, USAF*

CONSIDERING THAT THE U.S. military has extensive experience in using airpower against insurgents, and that the United States will almost certainly be involved in fighting insurgents and terrorists and will no doubt assist other nations in their own fights against irregular opponents in the future, the lack of attention in military colleges and in doctrine regarding this subject is scandalous. The U.S. Air Force in particular, has tended to ignore and downplay air operations in small wars in its education system and in its doctrine."[1]

Many futurists speculate that the era of major combat against a peer competitor is over, at least for the foreseeable future.[2] They predict more conflicts at the lower end of the spectrum, the doctrinal territory known as *military operations other than war* or *stability and support operations.* After overwhelming the regime of Saddam Hussein during Operation Iraqi Freedom in a fast-paced conventional battle, the Pentagon quickly found itself facing a determined insurgency in Iraq. Indeed, some authors contend that the global war on terrorism is in fact a battle against a global insurgency.[3] If this is the type of warfare the US military can expect to see more of in the future, it should look to counterinsurgency (COIN) doctrine to learn how to fight it.

Unfortunately, even as it appears that COIN will only become more common in the future, the Air Force has no workable doctrine for this emerging mission area. Writing doctrine, as compared to creating new organizations or buying new weapons systems, costs very little even though it could have the greatest impact. According to retired USAF colonel Dennis Drew, "To a large extent, the Air Force has ignored insurgency as much as possible, preferring to think of it as little more than a small version of conventional

*The author, attached to the Joint Information Operations Center, is currently serving as the deputy information officer at II Marine Expeditionary Force (Forward), Camp Fallujah, Iraq.

war."[4] To prepare for the future, the USAF must shift its doctrinal focus and force structure to include COIN, instead of continuing to focus exclusively on increasingly less likely major conventional operations.

This article examines Air Force COIN doctrine, or the lack thereof. First, it reviews current Air Force COIN doctrine. Next, it looks at what types of issues COIN doctrine can help address. Then finally, this article reviews the case of how the Air Force faced an insurgency in the Vietnam conflict but failed to write, or at least keep, the doctrine.

The purpose of doctrine is to help us prepare to fight present and future conflicts by codifying the experiences of the past. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, states, "*Air and space doctrine is a statement of officially sanctioned beliefs, warfighting principles, and terminology that describes and guides the proper use of air and space forces in military operations.* It is what we have come to understand, based on our experience to date. The Air Force promulgates and teaches this doctrine as a common frame of reference on the best way to prepare and employ air and space forces. Subsequently, *doctrine shapes the manner in which the Air Force organizes, trains, equips, and sustains its forces*" (emphasis in original).[5] A military that lacks doctrine for COIN also lacks guidance on how to best prepare and employ its forces or how to organize, train, equip, and sustain its forces in such conflicts. The lack of COIN doctrine suggests that the Air Force deems it unimportant to include—a case of preparing to fight the wars we prefer and not preparing for the wars we are most likely to fight.

Since its early days, the USAF has focused on large-scale conventional doctrine and, later, nuclear doctrine—war at the high end of the spectrum. In the interwar period between World Wars I and II, the focus of emerging Army Air Service and Army Air Corps doctrine was largely on strategic bombardment in an effort to emphasize the need for a separate air service.[6] In the decades after World War II, nuclear warfare dominated airpower doctrine. Colonel Drew's review of Air Force doctrine during the Vietnam period shows a briefly captured COIN doctrine in Army Field Manual 2-5, *Tactical Air Operations, Special Air Warfare*, March 1967. However, by the mid-1970s the COIN doctrine was nearly gone.[7] Unfortunately, as the early days of the Vietnam conflict and present-day Iraq demonstrate, when it is needed the most, doctrine for how air and space forces should be used in COIN is almost nonexistent. The primary role of air and space forces in COIN is to support ground forces or other governments and agencies. It appears that the Air Force tends to neglect situations where it serves primarily in a supporting role.

So, what does Air Force doctrine say about COIN? The current version of AFDD 2, *Organization and Employment of Aerospace Power*, makes no mention of insurgency or COIN at all.[8] The current draft of AFDD 2 includes the definition of *support to counterinsurgency* from Joint Publication (JP) 3-0, *Doctrine for Joint Operations*, 10 September 2001.[9] However, it fails to present an understanding of what role airpower and space power can or should play in such operations. It does not cover appropriate roles for the Air Force in

support of COIN, what relevant effects air and space platforms can create, or how airpower and space power should be organized and employed to support COIN.

Next down the doctrinal chain is AFDD 2-3, *Military Operations other than War* (MOOTW).[10] MOOTW is kind of a catchall phrase in US military jargon which means anything at the low end of the spectrum—in other words not major conventional war or nuclear war.[11] AFDD 2-3 mentions support to COIN in the context of foreign internal defense (FID) rather than as a separate doctrinal area for consideration. Therefore, the Air Force doctrine most closely addressing COIN is AFDD 2-3.1, *Foreign Internal Defense*, 10 May 2004, but even here doctrine only tangentially addresses the issue of COIN.

JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (amended through 31 August 2005), defines *foreign internal defense* as "participation by civilian and military agencies of a government in any of the action programs taken by another government to free and protect its society from subversion, lawlessness, and insurgency." Unfortunately, the term *FID* largely obscures the fact that the mission area addresses COIN. In fact, the once-popular acronym *COIN* has largely disappeared from both joint and Air Force literature and has been replaced with the catchall term *FID*.[12] FID's focus is to provide support to other governments. One problem with this narrow interpretation of COIN is a growing need for US forces to conduct COIN, in their own right, in the fight against global, transnational extremists or in stability operations. In countering a global insurgency, one may find no host nation to support. In Iraq, the government is unable to effectively fight insurgency on its own. Thus, the US military plays a major, direct combat role in COIN rather than a supporting role, as envisioned in FID doctrine. Additionally, in cases like Iraq and Afghanistan, where the supported nation has virtually no air force, the US military may be the only source of air support to indigenous forces. Therefore, doctrine is needed that focuses on airpower's role in COIN rather than on its more limited role in FID. Unfortunately, the Air Force does not have doctrine to support efforts against COIN other than that published in AFDD 2-3.1.

At this point, it is worth asking whether the Air Force really needs COIN doctrine. After all, isn't an insurgency just a scaled-down version of an all-out war? Unfortunately, this attitude is pervasive, and not just in the Air Force. The current battle in Iraq pits determined insurgents against US and coalition ground forces. These forces employ conventional cordon-and-search operations as their primary method of finding and rooting out the insurgents, with armored units patrolling the streets in some areas of Baghdad. But COIN differs from conventional warfare in more than just scale. JP 1-02 defines *counterinsurgency* as "those military, paramilitary, *political, economic, psychological, and civic actions* taken by a government to defeat insurgency" (emphasis added). Military operations must be part of a balanced strategy focused on security and legitimacy. Colonel Drew argues that "insurgencies . . . are fundamentally different from conventional wars in at

least five ways." These differences are time, civilian-military "duality," tactics, logistics, and centers of gravity.[13] As James S. Corum and Wray R. Johnson point out in their book *Airpower in Small Wars*, "Generally speaking, guerrillas and terrorists rarely present lucrative targets for aerial attack, and even more rarely is there ever a chance for airpower to be employed in a strategic bombing campaign or even in attack operations on any large scale. As a result, *it is the* ***indirect*** *application of airpower*—that is, the use of aviation resources for reconnaissance, transportation, psychological operations, and communications—*that proves most useful*"[14] (emphasis added). Thus, many of airpower's most celebrated doctrinal roles, such as counterair, air interdiction, and strategic attack are often of marginal use in COIN. For the roles that are truly useful in COIN, such as close air support (CAS), we cannot just blindly apply the doctrine "written within the scope of major theater warfare."[15] Unfortunately, that is the end result without doctrine written specifically for COIN.

What roles can airpower and space power contribute to COIN, or are they simply irrelevant to COIN?[16] The lack of doctrine has nothing to do with the lack of airpower's and space power's applicability. Some mission areas certainly stand out—surveillance and reconnaissance, battlefield air mobility, communications support, and CAS.[17] These are roles mostly in support of the ground commander, whether a special operations force commander or a conventional force commander. The Air Force also can fulfill primary roles in air control and FID programs to train and equip indigenous air forces.[18] In fact, Airmen are exercising many of these roles in Iraq and Afghanistan today, but without a coherent doctrine defining the role of air forces in COIN.[19] Surely, there is a better way to do business. Now is the time to document the lessons of COIN warfare—in doctrine as well as in tactics, techniques, and procedures (TTP).

One issue that sound doctrine should help clarify is what effects airpower and space power can and should have, leading to the types of people and training needed for COIN. Education and training programs for officers and enlisted need upgrading to include consideration of insurgency and the role of airpower and space power in COIN. Training for our intelligence specialists may need to include specific education about insurgents and their operating methods. We should develop TTPs and related training for our Battlefield Airmen so that they can provide the support required by ground forces conducting COIN.[20] There may be a need to develop new Air Force specialty codes that specialize in COIN and increase the number of personnel whose duties include COIN.

Decisions on the types of weapons systems procured can and should be influenced by COIN doctrine. Clearly, for the roles delineated above, aircraft optimized for air-to-air combat have far less utility than when deployed in conventional operations against a near-peer opponent. Likewise, systems primarily used to suppress enemy air defenses are of little use, as insurgents rarely have air defenses more sophisticated than optically aimed antiaircraft artillery and shoulder-fired infrared-guided missiles. Aircraft and systems

optimized for close support of ground forces are ideal.[21] Helicopters and airlift aircraft that can land on short, unimproved airstrips are more useful than transport aircraft limited to large, fixed bases. Responsive and low-observable intelligence, surveillance, and reconnaissance systems will provide a high degree of persistence and better effects than systems designed to quickly scan the battlefield for large enemy formations. Weapons also need to reflect the nature of the fight. Weapons with large collateral-damage effects have far less utility than small bombs (smaller than the 250-pound small-diameter bombs currently being developed). Currently, the Air Force's only low-yield precision munitions are the AGM-114 Hellfire (from armed RQ-1 Predator unmanned aerial vehicles), 105 mm/40 mm gun rounds (from AC-130s), and the AGM-65 Maverick (only from the A-10). Other weapons and systems may also be developed that are relevant to support COIN efforts.[22] Without a coherent doctrine for airpower and space power support to COIN, the USAF will continue to fund and buy systems more appropriate for other types of conflict.

In addition to identifying relevant effects, doctrine should help determine how best to organize air and space forces for employment. For the types of close support needed in COIN, centralized control of air and space forces may not always be best if it is not responsive enough to the needs of the ground commander. Indeed, to make forces more responsive, one needs a high degree of integration at the tactical level—whether for the movement of troops or for the delivery of airborne fires. Doctrine should help determine the best methods for integrating with supported forces, to include which echelons need liaison officers and planners. As one author points out, "Currently we assign air-liaison elements to relatively high ground-command levels, based on the size of the ground unit rather than the need for air support."[23]

The lack of relevant airpower and space power doctrine is not due to a lack of experience in COIN—there are many examples of how the USAF and other services employed airpower in the past.[24] For example, the US Marines demonstrated the effectiveness of aircraft against insurgents in Nicaragua as early as 1927.[25] US forces assisted the Republic of the Philippines in successfully countering the Huk rebellion from 1946 to 1956.[26] The United States also assisted the government of El Salvador throughout the 1980s and in 1992 during its civil war.[27] Perhaps the most relevant, if not the most recent, example comes from the Vietnam War, where the United States assisted South Vietnam in combating a major insurgency. While care should be taken in trying to draw direct comparisons between the fight in the jungles of Vietnam during the 1960s and the largely urban fighting in Iraq today, the experiences include much to learn.

The United States is unprepared for conducting COIN in Afghanistan and Iraq, despite past experiences in Vietnam.[28] Lt Col David Dean, USAF, describes the development of Air Force COIN forces during the Vietnam era.[29] In the mid-1950s, while the French struggled to overcome the Vietnamese insurgency, the US Air Force vice-chief of staff, concerned about the relevance of airpower, raised the issue of "whether air forces can do any-

thing other than offer massive retaliatory action in the event of major war."[30] It was not until 1961, however, when President Kennedy directly tasked the military services to develop COIN forces, that the Air Force took action, standing up the 4400th Combat Crew Training Squadron (CCTS). After additional pressure from the president, the Air Force stood up the Special Air Warfare Center (SAWC) at Eglin AFB, Florida, in 1962, absorbing the 4400th CCTS. The SAWC conducted operations in Vietnam and surrounding countries until 1968, when it was redesignated as the US Air Force Special Operations Forces (SOF). After the Vietnam War, interest in COIN quickly waned, and the Air Force deactivated the SOF in 1974.[31] Despite its relatively short life, the 4400th CCTS, SAWC, and the USAF SOF made great strides in developing TTPs for COIN warfare. However, because they developed so much of the TTPs "on the fly," the SOF was not able to make as much headway as feasible and operated mostly as a conventional air unit rather than a COIN force. In his analysis of the lessons from SAWC, Colonel Dean says, "The importance of doctrine in this case must be stressed. A lack of doctrine and the short time between SAWC's inception and its first operations are the keys to the problem that resulted in the misuse of this special organization. . . . Entering the counterinsurgency arena without guidance encouraged the use of conventional air power tactics."[32]

Unfortunately, Air Force doctrine continues to virtually ignore COIN. The Air Force has made little effort, especially in the recent past, to recognize COIN as a distinct type of warfare, let alone to write the doctrine. While the Air Force did establish a squadron dedicated to conducting FID in 1994, the 6th Special Operations Squadron (SOS) has been largely hampered in accomplishing its mission by difficulties in getting the aircraft and personnel it needs.[33] Even if the 6th SOS were fully manned and equipped, and although FID and COIN are related, doctrine and TTPs developed from FID may not be adequate. Elsewhere within AF Special Operations, as USAF colonel Kenneth J. Alnwick argued in 1984, the focus has largely been "away from traditional SOF missions in counterinsurgency, nation-building, and psychological warfare toward special operations behind enemy lines—more reminiscent of the World War II experience than the experiences of the past two decades."[34] So even in the Air Force organization most closely linked to the SAWC and past COIN efforts, there has been little focus on the best way to employ airpower and space power in this environment.

Clearly, a lack of doctrine for COIN warfare presented a problem in the past. Even now, with a major insurgency in progress in Iraq, the Air Force has yet to start writing doctrine for COIN. The Air Force continues to focus almost exclusively on major combat operations or situations where it alone can be decisive. Airpower is being used to help fight insurgents in Afghanistan and Iraq. We must capture the lessons learned and write the doctrine that will lead to success in the next fight. Doctrine is essential. It is the blueprint on how to organize and employ airpower and space power—which roles are relevant and which are not, and which effects our Airmen and systems need to deliver. The Air Force has a golden opportunity, while cur-

rently engaged in Iraq and Afghanistan and before memories fade, to publish clear, unambiguous guidance about the role of airpower and space power in COIN. ❑

Camp Fallujah, Iraq

Notes

1. James S. Corum and Wray R. Johnson, *Airpower in Small Wars* (Lawrence, KS: University Press of Kansas, 2003), 4.

2. See for example Thomas P. M. Barnett, *The Pentagon's New Map: War and Peace in the Twenty-first Century* (New York: G. P. Putnam and Sons, 2004); Ralph Peters, *Beyond Terror: Strategy in a Changing World* (Mechanicsburg, PA: Stackpole Books, 2002); or Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order* (New York: Touchstone, 1996).

3. See Grant R. Highland, "New Century, Old Problems: The Global Insurgency within Islam and the Nature of the War on Terror," *Chairman of the Joint Chiefs of Staff Strategy Essay Competition*, 2 (Washington, DC: National Defense University, 2003), 17–30, http://www.au.af.mil/au/awc/awcgate/ndu/highland.htm; and Capt Matthew W. Lacy, USAF, "Al Qaeda's Global Insurgency: Airpower in the Battle for Legitimacy," *Chronicles Online Journal*, 16 July 2003, http://www.airpower.maxwell.af.mil/airchronicles/cc/lacy.html.

4. Dennis M. Drew, "U.S. Airpower Theory and the Insurgent Challenge: A Short Journey to Confusion," *Journal of Military History* 62 (October 1998): 809.

5. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, 17 November 2003, 3.

6. For a good discussion of how the theory of high-altitude precision daylight bombardment was developed as part of a four-part strategy defining the need for a service of coequal status to the Army and Navy, see Lt Col Peter R. Faber, "Interwar US Army Aviation and the Air Corps Tactical School: Incubators of American Airpower," in *The Paths of Heaven, The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, AL: Air University Press, 1997), 183–238.

7. Drew, "U.S. Airpower Theory," 823.

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

9. AFDD 2, "Organization and Employment for Air and Space Operations," topline coordination draft, ver. 8G, 10 January 2006.

10. AFDD 2-3 will be rescinded when the next version of AFDD 2 is published, with no planned replacement. E-mail exchange between the author and Mr. Bob Poyner from the Air Force Doctrine Center, Maxwell AFB, AL, 4 February 2005.

11. MOOTW may be replaced by the US Army terms *stability operations* and *support operations* in future editions of joint and Air Force doctrine. Army Field Manual (FM) 3-07, *Stability Operations and Support Operations*, February 2002, replaced FM 100-20/AF Pamphlet (PAM) 3-20, *Military Operations in Low-Intensity Conflict*, December 1990.

12. COIN finds itself in doctrine addressed as part of FID, which is itself a subset of MOOTW. Could we obscure it any more completely?

13. Drew, "U.S. Airpower Theory," 810–11.

14. Corum and Johnson, *Airpower in Small Wars*, 8.

15. AFDD 2-1.3, *Counterland*, 27 August 1999, for example, states, "Although this document is written within the scope of major theater warfare (MTW), the basics of counterland apply equally as well to the application of aerospace power against surface forces in more limited contingency operations" (v).

16. Thomas R. Searle, "Making Airpower Effective against Guerrillas," *Air and Space Power Journal* 18, no. 3 (Fall 2004): 13–14. Dr. Searle points out that the Army's 3d Infantry Division released its attached air support operations squadron after the fall of Baghdad because neither division leadership nor Airmen knew how airpower and space power could contribute.

17. The mobility mission most certainly includes responsive helicopter lift of troops, a role which the Air Force has almost completely given up.

18. Large parts of Iraq are sparsely populated yet contain vital infrastructure such as oil pipelines and power sources. Aircraft have shown the ability to patrol and control large areas in the past, freeing up ground forces to work in more densely populated areas. See, for example, Corum and Johnson, *Airpower in Small Wars*, chap. 2.

19. The doctrinal shortcomings are compounded because of a dearth of information available at the operational level. Air Force Doctrine Center Handbook (AFDCH) 10-01, *The Air and Space Commander's*

Handbook for the JFACC, 16 January 2003, includes no discussion about the role of airpower in COIN. The focus clearly is on major conventional conflict.

20. For information on Battlefield Airmen, see Air Force Policy Directive (AFPD) 10-35, *Battlefield Airmen*, 4 February 2005.

21. While not necessarily advocating a specific set of weapons systems (effects are the key), aircraft such as the AC-130 and A-10 are highly effective in this role—the psychological effect of these weapons systems in action is also great. The use of bombers and fighter aircraft may certainly also be effective, as well as unmanned armed systems such as the RQ-1 Predator.

22. See, for example, Searle, "Making Airpower Effective against Guerrillas," 5.

23. Ibid., 4.

24. Corum and Johnson, *Airpower in Small Wars*. This book is a fantastic survey of how airpower has been successfully and not so successfully employed in past small conflicts.

25. Max Boot, *The Savage Wars of Peace: Small Wars and the Rise of American Power* (New York: Basic Books, 2002), 238–39.

26. Corum and Johnson, *Airpower in Small Wars*, 110–38.

27. Ibid., 327–49.

28. This is not to say that only the Air Force was unprepared for countering an insurgency in Iraq. The Army has largely had to (re)learn, "the hard way," to conduct COIN.

29. Lt Col David J. Dean, *The Air Force Role in Low-Intensity Conflict* (Maxwell AFB, AL: Air University Press, October 1986).

30. Ibid., 87.

31. Ibid., 87–98.

32. Ibid., 99.

33. Lt Col Wray R. Johnson, "Whither Aviation Foreign Internal Defense?" *Airpower Journal* 11, no. 1 (Spring 1997): 66–85. Granted, since Johnson wrote this article things have improved, but the overall capability remains limited.

34. Col Kenneth J. Alnwick, "Perspectives on Air Power at the Low End of the Conflict Spectrum," *Air University Review* 35, no. 3 (March–April 1984): 17–28.

The fact that effects-based operations are not new, yet require a major shift in thinking, gets to the heart of their importance for modern military operations.

—Lt Gen David Deptula

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 can draw their own conclusions or join the intellectual battlespace. Please send comments to aspj@maxwell.af.mil.*

The American Aircraft Industrial Base

On the Brink

Lt Col David R. King, PhD, USAF*

TODAY'S FIGHTER PILOTS are the modern equivalent of medieval knights. We consider them products of their societies and dependent upon those societies. That is, the warrior class of knights emerged from a feudal system based on land grants required to support them, as well as their horses and squires (just as fighter pilots have their aircraft and crew chiefs). Not self-sufficient, the knight received support from complex relationships involving serfs, merchants, craftsmen, and religion. The fighter pilot receives support from an even more complex system of taxation and budgeting that enables billion-dollar research and development, together with production programs. Just as a knight depended upon a blacksmith for his weapons and armor, so does the fighter pilot rely upon the capability of the supporting industrial base.

America's armed forces in general and aircraft in particular draw their strength from the underlying industrial base. The United States owes its status as an undisputed world power to sustained investments made during the Cold War. Continued military strength will depend upon the health of the defense industrial base since developing, producing, and fielding major weapon systems can take over a decade. Unfortunately, short-term budget decisions imperil the long-term viability of that base. The decision in 2004 to cut $10.5 billion of the funding for the F-22 Raptor, thus terminating production early, represents a situation whereby current fiscal constraints discount future needs.[1] The latest Quadrennial Defense Review, however, reviewed and partially reversed such reductions to F-22 funding.

When considering the current situation, one must remember the past because airpower's achievements tend to overshadow its imperfections.[2] Due to shortsightedness, the United States, despite having pioneered manned flight in 1903, found that by World War I its industrial base lagged that of other nations—a condition which lasted through World War II. In

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World War I, American pilots used foreign aircraft—the US Curtiss JN-4 Jenny never saw combat. Further, American tactical aircraft were inferior to both Japanese and German fighters at the beginning of World War II, and US fighter technology trailed its German counterpart through the end of the war.[3] Indeed, Japan's Zero flew farther and faster than *any* plane in the US arsenal as World War II began.[4] To produce successful aircraft designs, the United States looked to other nations for help. For example, the North American P-51 Mustang, one of the premiere US aircraft in the war, used a British engine manufactured by Rolls-Royce.[5] We see this dependence reflected in the decision by Lockheed Martin, recently selected to provide helicopters for the US president, to use a design by AgustaWestland, a British-Italian joint venture.[6] History shows that a country must invest significant time and funds to restore a competitive aircraft industrial base.[7]

Capabilities of the Industrial Base

An industrial base represents a system of capabilities required to create, produce, operate, and support a commodity. One can view industrial capability as a pyramid whose base is the repairing of technology and whose apex is the generation of new technology and designs (fig. 1). The ability to manufacture and adapt technology falls between these two capabilities; as the capabilities progress, they become scarcer and more ephemeral. Although one can consider these capabilities a continuum, substantial gaps occur between their different levels. For example, one discovers significant distinctions between knowing how to repair or manufacture an aircraft and knowing how to create an integrated aircraft design. Both capabilities, however, remain essential to an industrial base.

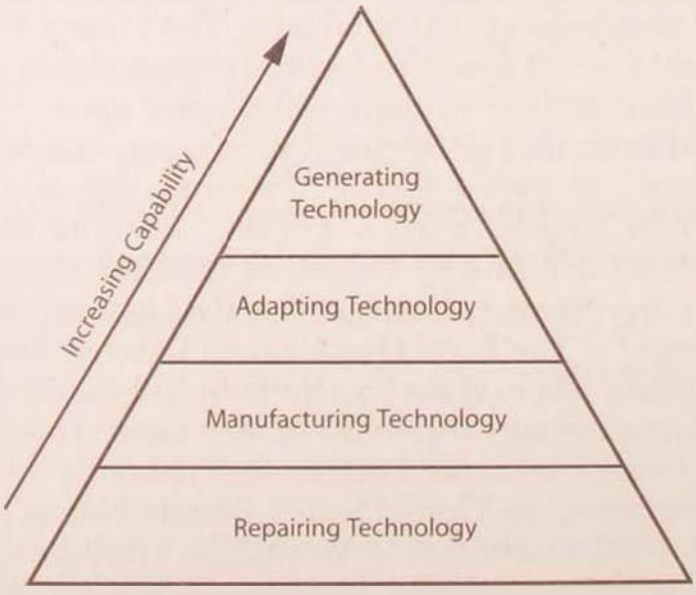

Figure 1. Capabilities of the industrial base. (Adapted from David R. King and Mark L. Nowack, "The Impact of Government Policy on Technology Transfer: An Aircraft Industry Case Study," *Journal of Engineering and Technology Management* 20, no. 4 [2003]: 305.)

Moreover, not all product technology within an industry is equally demanding. In the aircraft business, for instance, fighters require materials, avionics, engines, and systems integration that push the limits of design and manufacturing knowledge. Notably, government funding to develop engines for fighter aircraft often yields advances that subsequently find their way into commercial engines.[8] This significant transfer of experience highlights how industrial capability relies upon learning that transforms knowledge into a sense of order that guides future actions. Maintaining each level of this capability requires continued experience to sustain necessary skills.

A healthy industrial base must have prolonged investment to maintain adequate diversity and thereby enable innovation and workforce renewal. Variety encourages competitiveness in an environment of changing technology, just as multiple firms facilitate efficient operations and adaptation. Additionally, industry needs a workforce large enough so that older, experienced workers train their eventual replacements. A recent decline in the number of firms and experienced workers suggests that the health of the American aircraft industry is deteriorating.

Assessing Capabilities of the Industrial Base

We must be the great arsenal of democracy.

—Franklin Delano Roosevelt

The accomplishments of today's US aircraft industrial base have their origins in investments made during and following World War II. Subsequent declines in the number of aircraft programs pursued by the US government have had a profound impact on both the number of firms and workers in the air and space industry. During the 1940s and 1950s, 40 different jet-fighter designs by nine different defense firms took flight.[9] Consequently, the Air Force, Navy, and Marine Corps procured more fighter and attack aircraft in six years (1951–56) than in the following 34 years (1957–90).[10] To put this in perspective, consider that between 1958 and 1979 the United States and its allies took delivery of a total of 5,195 F-4 Phantom IIs, but between 1990 and 2004, industry produced only 572 fighter aircraft for the Air Force.[11]

The decline in aircraft production has contributed to industry consolidation because smaller procurement quantities and fewer aircraft programs can sustain only a few firms. Since 1990 the aircraft industry has seen significant consolidation (fig. 2), resulting in lower variety, which may adversely affect technological innovation.[12] Innovation does not occur in isolation, and available knowledge that frames the definition and solution of problems constrains the behavior of firms.[13] Thus, insufficient diversity results in a less resilient industry. Meanwhile, policy makers may expect continued innovation without realizing that recent success stems from a more robust industrial base than currently exists.

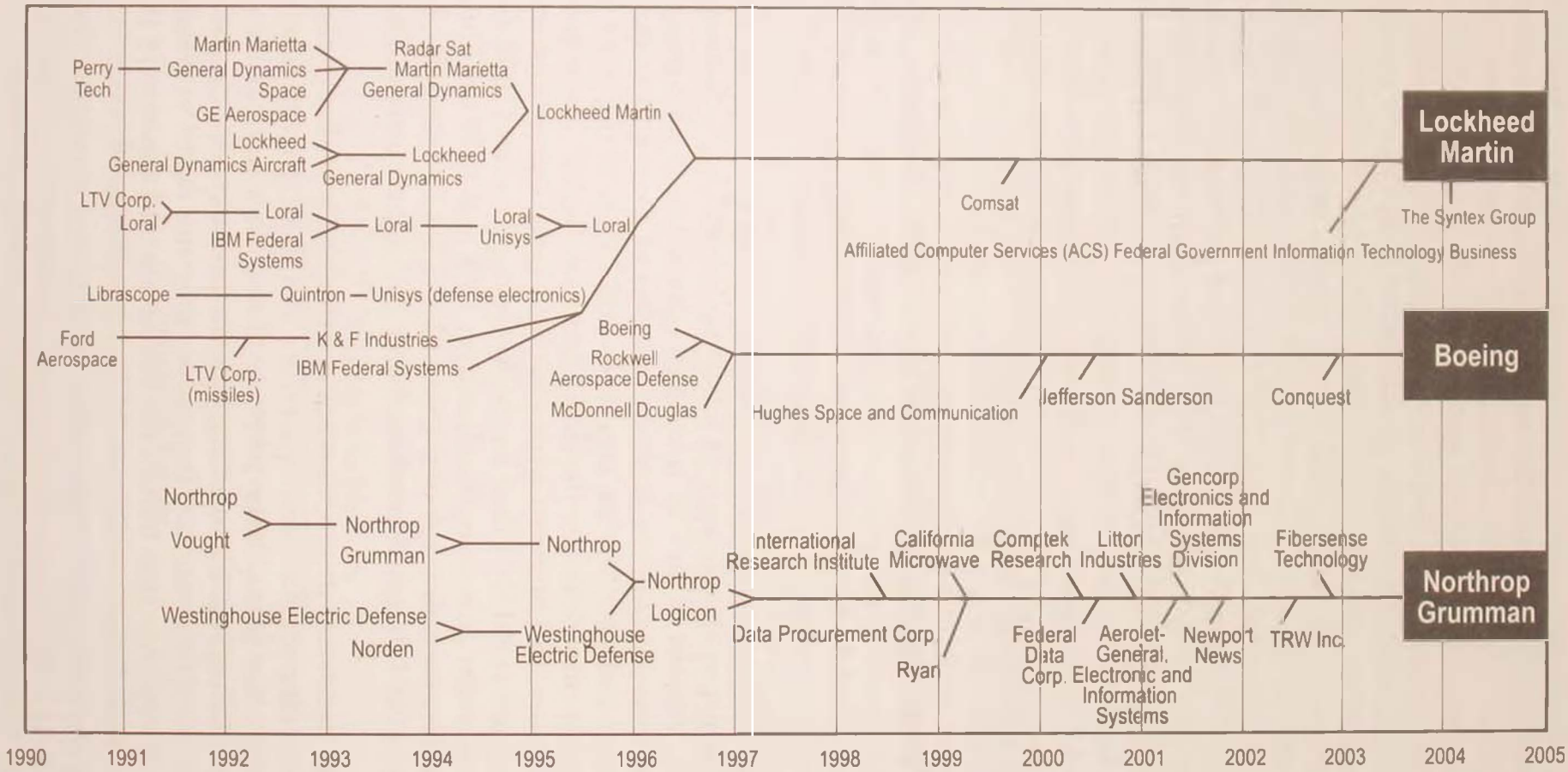

Figure 2. Consolidation of aircraft manufacturers. (From Security Data Corporation Merger Database, 2004.)

One would realistically expect lower levels of innovation from an industrial base with less diversity and correspondingly less competition over ideas and designs. Improved technology that permits fewer, more capable aircraft to replace older aircraft leads to industry consolidation, which coincides with a decline in the number of aircraft designs.[14] For example, the integrated avionics and supercruise engines of the F-22 Raptor allow it to cover two to three times the area of the F-15 Eagle, thus obviating the need for a one-for-one replacement.

Lockheed Martin won the F-22 Raptor and F-35 Joint Strike Fighter contracts—probably the last US manned-aircraft development programs for at least a decade.[15] Those two designs will replace the F-15, F-16, F-117, and A-10 but in significantly lower numbers. Fewer aircraft and improved reliability further decrease demand by reducing requirements for spares and repairs, compounding the difficulty faced by remaining firms. These businesses typically count on cash flows from their support of existing aircraft to help finance research and development that adapts and generates the new technology they need to remain competitive.

Interrelationships among prime aircraft contractors can further heighten concerns about future innovation (fig. 3). The partnering between dominant firms that typifies most recent aircraft programs can have the effect of displacing lower-level suppliers but lowers costs in the short term. For example, BAE, Northrop Grumman, and Lockheed Martin in Palmdale, California, perform work for both the F-22 assembled at Lockheed Martin in Marietta, Georgia, and the F-35 assembled at Lockheed Martin in Fort Worth, Texas, resulting in an estimated 1 to 3 percent decrease in each aircraft's flyaway cost. However, this practice of reducing costs by sharing subcontractors and components on major subsystems may hinder long-term innovation because supporting fewer firms with available procurement dollars limits variety in the industrial base.

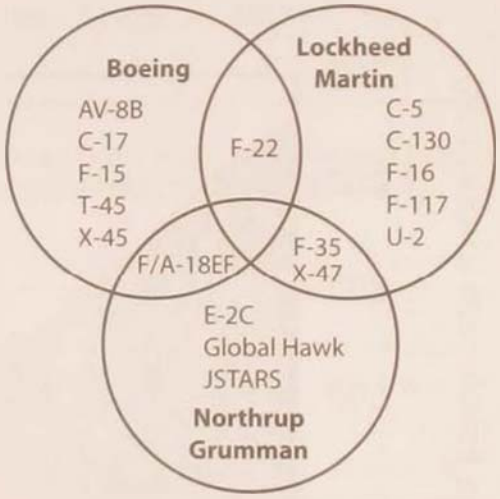

Figure 3. Interrelationships among aircraft manufacturing firms. (Adapted from John Birkler et al., *Competition and Innovation in the U.S. Fixed-Wing Military Aircraft Industry* [Santa Monica, CA: RAND, 2003], 31.)

Development of the Joint Unmanned Combat Air System (J-UCAS) by Boeing and Northrop Grumman seeks to limit risks from concentrating current manned-aircraft development and production with Lockheed Martin, yet Northrop Grumman still teams with Lockheed Martin. Over the next 10 years, the market for unmanned aircraft is expected to experience increased competition from new entrants as that market's value grows to exceed $10 billion.[16] If this projection proves true, the demand for unmanned aerial vehicles may help revitalize the aircraft

industry with increased demand, participating firms, and competition. However, since World War II, no new firms have entered manned-aircraft production, and the early termination of the F-22 increases the cost of and risk associated with the F-35 program.

Inadequate Workforce Renewal

Consolidation in the aircraft industry corresponds to a decline in the total number of workers employed (fig. 4). The availability of a skilled workforce represents a genuine concern about maintaining a viable aircraft industrial base since a steady reduction in employment limits workforce renewal. Production of fighter aircraft, a demanding industrial capability, relies largely on an experienced workforce.[17] Sustaining a viable industrial base requires enough work to maintain and renew such a workforce.

The shrinking number of aircraft programs has also had an adverse effect on workforce experience (fig. 5). Sustaining the labor pool of skilled workers may prove difficult if no one replaces them as they retire. For example, machinists producing the F-22 in Marietta have over 20 years of experience but an average age of 54.[18] Although this workforce focuses for the

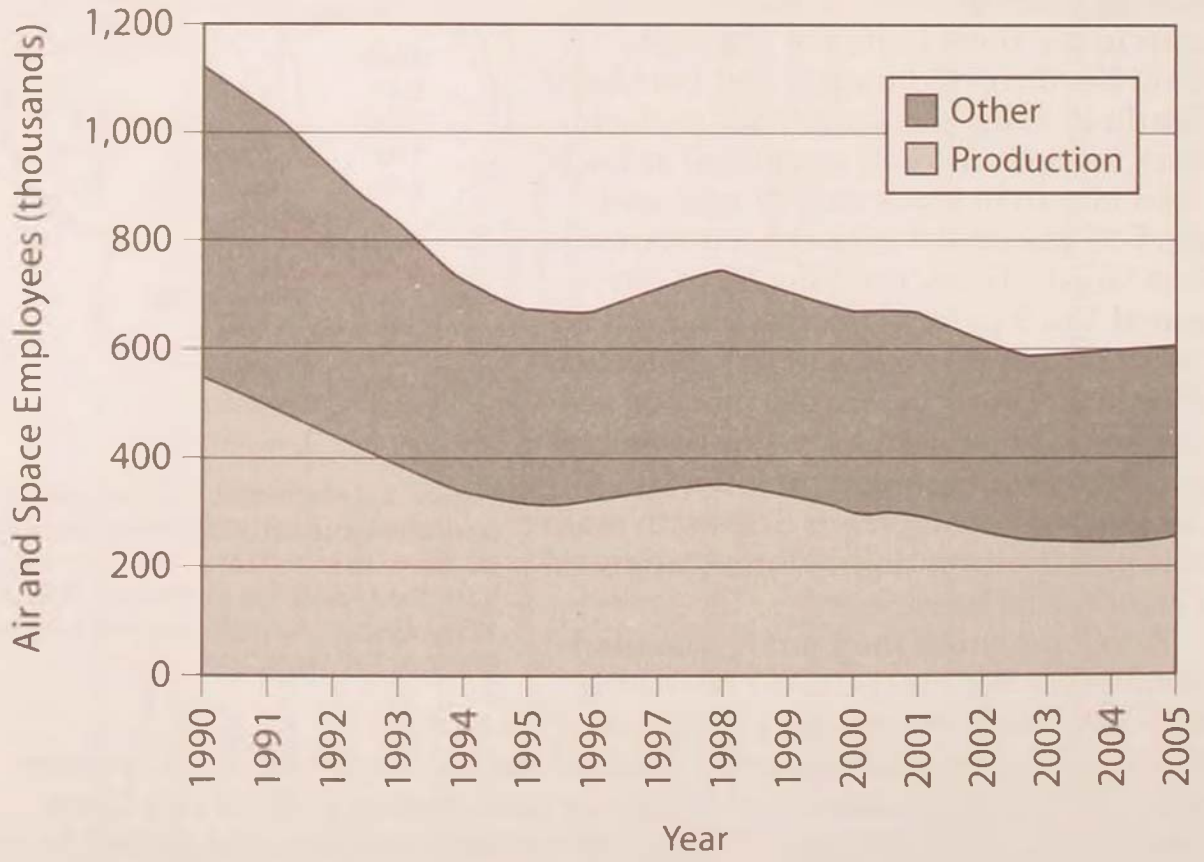

Figure 4. Total employment in the air and space industry. (From "Total and Production Worker Employment in the Aerospace Industry," Aerospace Industries Association, 25 July 2005, http://www.aia-aerospace.org/stats/aero_stats/stat12.pdf.)

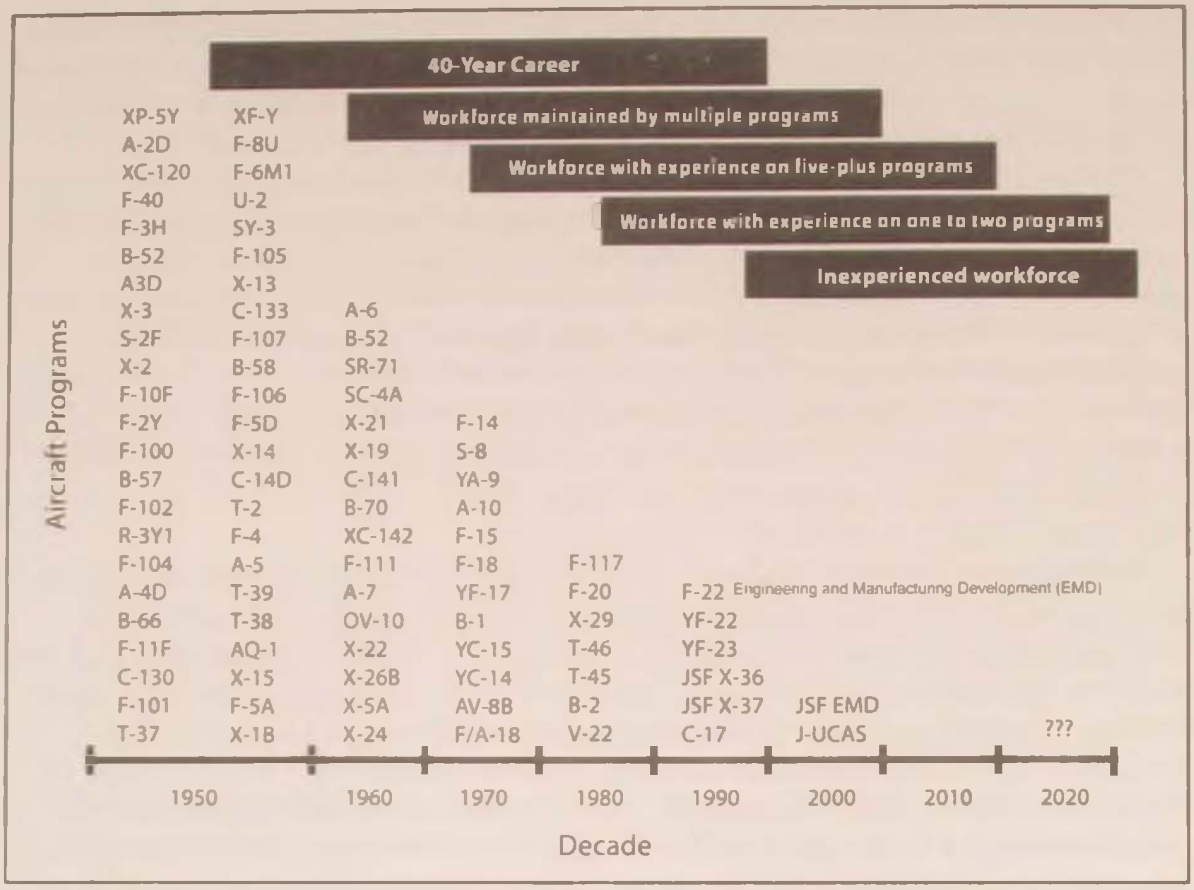

Figure 5. Aircraft programs and workforce experience. (From Mark A. Lorell and Hugh P. Levaux, *The Cutting Edge: A Half Century of U.S. Fighter Aircraft R&D* [Santa Monica, CA: RAND, 1998], 17, 95, 131, 166–99.)

most part on manufacturing, suppliers in over 40 states contribute to the design and manufacture of parts assembled in Marietta. Much of the work performed by these suppliers requires advanced manufacturing techniques to produce assembly components. Structure designs intended to make assembly easier, for instance, have further complicated the already challenging task of machining titanium.[19] However, the age of the manufacturing workforce in Marietta mirrors that of the design engineers working on the F-22 and other aircraft programs. Because the rapidly decreasing experience levels of air and space workers apply equally to manufacturing and engineering personnel, they should be a source of concern.

The cessation of F-22 production also stops the training of another generation of workers needed for future programs. The fact that the F-35 will use Lockheed Martin's facilities in Palmdale and Fort Worth, which will no longer produce the F-22, raises concerns about sustaining an experienced aircraft-industry workforce in these locations. For example, the production gap between F-22 and F-35 aircraft in the current budget jeopardizes the crucial "art" of designing and manufacturing stealthy materials and parts in Lockheed Martin's Palmdale plant. Moreover, the F-22 and F-35 programs

share several suppliers, thus increasing the risk of losing experienced workers in additional facilities. Termination of F-22 production before F-35 production matures will translate into higher costs for the latter program—at the same time the Air Force begins to rely more heavily on the F-35.

The problem of aging aircraft reinforces our need for the aircraft industry and its workforce. No doubt a "procurement holiday" during the 1990s contributed to the increased age of today's operational fighters. Because of obsolescence and structural limitations, the Air Force seeks an average age of 12.5 years for those aircraft. Currently, fighters have an average age of approximately 16 years—projected to grow to 25 years by 2012. The age of these aircraft is important because they typically have a service life of 8,000 hours, and experience shows that the costs of operating and supporting them increase as they approach that limit (fig. 6). Clearly, we need to replace current fighter aircraft.

Maintaining the current force structure for Air Force fighters will probably require production of approximately 120 aircraft per year, starting now; unfortunately, we currently have neither the budget nor production capacity to manufacture that many. Continuing the production of F-22s until F-35s are fielded and their production processes mature would solve this problem—and help maintain needed industrial capability. Due to their advanced capability, 381 F-22 aircraft could replace over 500 legacy aircraft; procurement of those Raptors would allow the Air Force to meet projected requirements at lower cost with acceptable risk.[20] However, current F-22 program funding will procure approximately 180 aircraft and extend pro-

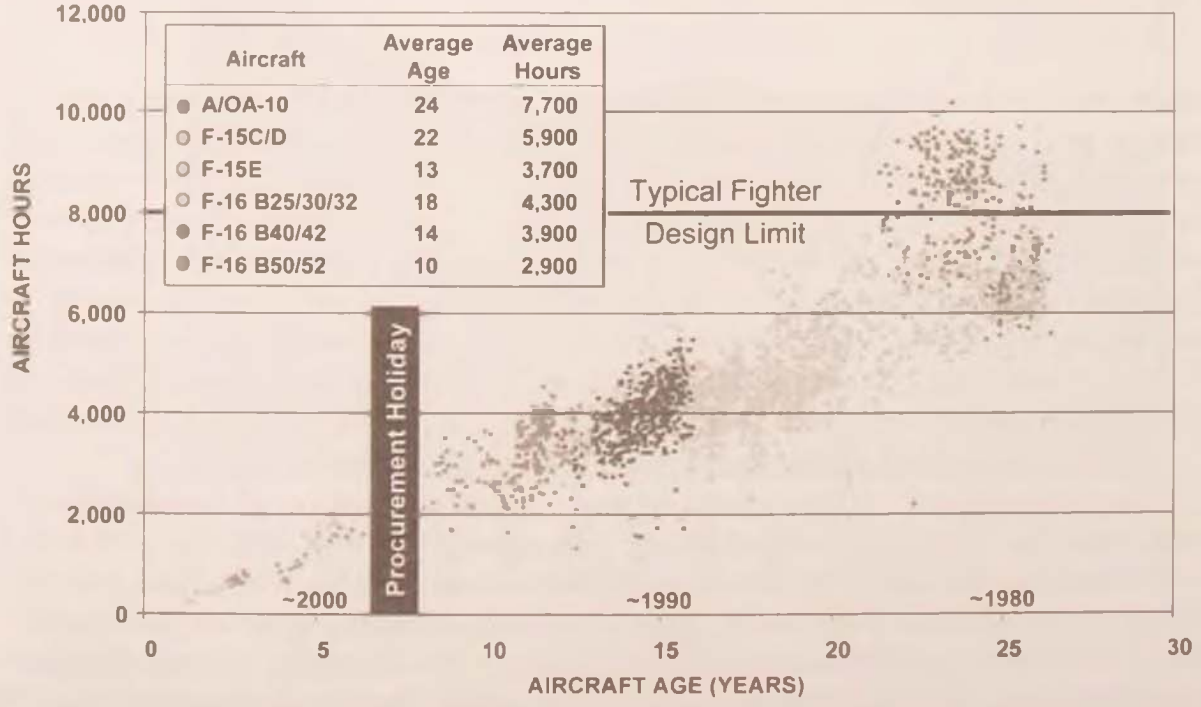

Figure 6. Current age of Air Force fighter aircraft and flight hours. (From PowerPoint chart [Washington, DC: Air Force Studies and Analysis, 2005].)

duction one year but at a lower production rate. Although the reduced rate will increase costs, one can view the higher price as the cost of insurance to maintain active aircraft production in an uncertain world.

The transition from F-22 to F-35 production needs managing to keep aircraft production open and to control the risk and cost of the F-35 program. Although the F-22 entered full production in March 2005 and established initial operational capability (IOC) in December 2005, the F-35A—the Air Force's conventional takeoff-and-landing variant—will probably not reach IOC until 2013. It is imperative to maintain production of advanced aircraft to meet the requirements of national defense. Recapitalization of America's arsenal of fighter aircraft has come at a time when available funding puts the aircraft industrial base at risk of failing to meet immediate and future needs.

Conclusion

> *A vital element in keeping the peace is our military establishment. Our arms must be mighty, ready for instant action, so that no potential aggressor may be tempted to risk his own destruction.*
>
> —Dwight D. Eisenhower

Industrial capability changes gradually, yet people base performance and capacity expectations on recent experience. Successes in Operations Allied Force, Enduring Freedom, and Iraqi Freedom validate the need for air and space power. However, accomplishments in these operations relied largely on an industrial base that no longer exists due to consolidation of the defense industry and a reduction in its workforce. When a condition, such as industrial capability, deteriorates slowly, perceptions gradually shift so that several years or decades may pass before people perceive significant changes in the baseline. Because the American aircraft industry has declined by many measures, available capability may not meet projected needs.

Some individuals argue that information-age warfare, brought about by advances in information technology, will reduce the importance of industrial capacity.[21] After all, the feudal system ended when changing technology and the rise of nationalism replaced knights with mass armies. Although American society is moving its focus from manufacturing to information, this shift belies the fact that people did not stop eating when the economy switched from agriculture to manufacturing. In fact, the ability to concentrate on manufacturing required modern, more efficient agriculture. Today, increased productivity allows a single farmer to feed over 100 people. Similarly, leveraging information-age capabilities calls for a modern and efficient industrial base. We must ask ourselves whether we are making investments—analogous to those we made in agriculture—to ensure that needed aircraft design and manufacturing capability exist. When it comes to the American aircraft industry, we have reason to doubt whether current investment levels will maintain that capability. ❑

Washington, DC

Notes

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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 intend to use this department to let readers know about air and space power items of interest.*

Resultant Fury

Affecting the Strategic Battlespace with Effects-Based Public Affairs

Capt David Faggard, USAF*

OPERATION RESULTANT FURY successfully demonstrated to US citizens, allies, and potential adversaries that the US military has the ability to find, fix, track, target, engage, and destroy a number of moving maritime targets in any type of weather, day or night, across vast distances, using satellite-guided weapons. The operation sought to use available air, space, and ground platforms and then link them together with multiple datalink and command-and-control technologies incorporating Joint Direct Attack Munitions upgraded by the Affordable Moving Surface Target Engagement system to bring precision force to bear rapidly on maritime aggression. Leading other staff elements of Pacific Air Forces (PACAF), the command's director of air and space operations (DO), supported by contractors, assembled a plan to successfully achieve this aviation first in a short period of time. Resultant Fury proved that US bombers could engage surface vessels used by enemy combatants, terrorists, or pirates, thus providing the combatant commander the fastest option to attack a seaborne threat. This article explains how an effects-driven plan served to operationalize the public affairs (PA) function with PACAF's DO and information operations (IO) organizations to influence the information battlespace.

Air Force PA seeks to provide trusted counsel to leaders, strengthen Airmen's morale and readiness, enhance public trust and support, and achieve global influence and deterrence while enhancing the service's credibility.[1] Specifically, when targeting a strategic entity such as the news media for global deterrence, one must examine Air Force PA's core competency of global influence and deterrence: "Public Affairs develops and implements communication strategies targeted toward informing national and international audiences about air and space power's impact on global events. . . . Educating international audiences about Air Force core competencies deters potential adversaries."[2] The application of nonkinetic effects or means to the information battlespace can deter such opponents before hostilities begin. In lieu of using traditional or kinetic-driven operations, one may easily deter and dissuade them by employing the objectives of strategic communications to shape the battlefield.

*The author is chief, Public Affairs, 314th Airlift Wing, Little Rock AFB, Arkansas. He was assigned to Headquarters Pacific Air Forces when he wrote this article.

In order to understand why PA must operationalize and become effects driven, one needs to understand the nature of effects. An effect—typically defined by a dictionary as the way in which something acts on or influences, or something that produces a specific impression or supports a general design or intention—"'may be either kinetic or non-kinetic, and may equally be either physical or psychological/cognitive in nature.'"[3] PA actions, designed to affect or influence something or someone in the information battlespace, aim to exert global influence and deter a potential adversary as directed and sanctioned by the Air Force. In fact, they are building blocks that support traditional Air Force PA doctrine—the core competency of global influence and deterrence.

One encounters ongoing debates in both government and civilian news organizations about integrating PA and IO, the latter defined as the "integrated employment of the capabilities . . . to influence, disrupt, corrupt, or usurp adversarial human and automated decision making while protecting our own."[4] IO does not have sole responsibility for influencing targeted audiences; rather, PA should integrate with IO to ensure the preservation of truth while informing potential adversaries of US missions, weapons platforms, and capabilities—thereby fulfilling Air Force PA's core competency of global influence and deterrence. According to Air Force doctrine, "Public Affairs, while a component of influence operations, is predicated on its ability to project truthful information to a variety of audiences."[5] The interaction of PA and IO is paramount to achieving the commander's intent. For Resultant Fury, a dedicated PA-plans Airman had responsibility for constant coordination among PA, IO, DO, and an information-warfare flight. This individual, who did not interact with the media at all and remained totally separate from the PA media-operations cell, assured the truthfulness of messages and provided overall PA command and control in the planning effort for the demonstration.

Was it in the best interest of the Air Force to integrate with the DO and IO? To answer this question, one needs to consider the effect or outcome required from specific actions, consistent with PA's core competencies of public trust and support, as well as global influence and deterrence. The operation adhered to the DO's intent of "sinking moving ships in all weather, day or night, across vast distances in a short period of time, while telling our enemies we can sink them."[6] It also achieved the primary effect of dissuading and deterring potential enemies from using maritime vessels to attack "friendlies" by fulfilling three goals. First, Resultant Fury made such adversaries aware of this new maritime interdiction (MI) capability, thus dissuading them from planning and/or taking hostile actions on or from the sea. Second, it informed American taxpayers of the Air Force's MI mission, showing them what the service spent their money on—using airpower to defend the nation from seaborne threats. It did so through the media as well as public information briefings to selected key civic and elected officials. Third, the operation implemented nontraditional PA marketing tactics and attained the first two goals by means of a push-pull method of marketing that employed integrated Web design and "blogging." Furthermore, Resultant Fury produced a secondary effect by enhancing US citizens' awareness of potential threats from the sea, as well as the Air Force's ability to counter those threats.

The push-pull tactic of marketing emerged in response to the lack of PA manpower and funding. PA pushed 20 percent of "key" (subscription-based) reporters with information, thereby spurring news-media interest in the remaining 80 percent (pull). In fact, PA's use of subscription-based media such as the Associated Press and Reuters proved crucial to bringing Resultant Fury to the attention of global audiences. Clearly, interviews with these news services, which feed thousands of global newspapers, have greater global impact than individual interviews with local media outlets.

The success of Resultant Fury's communication plan depended upon an integrated Web design that offered more than 22,000 reporters and civilians timely, relevant data. Declassifying the combat-strike footage in one hour and releasing it via a commercially procured wideband video-delivery system on the

Web proved critically important to the demonstration and allowed reporters to include information on their news cycles prior to their deadlines. Developing a detailed section of "Senior Leaders' Comments" also afforded reporters the opportunity to use facts, quotations, comments, and information from key Air Force leaders without having to wait for interviews. The Web site also posted news releases, photos, and other data.[7]

The newest form of Air Force PA marketing occurred via Web logs, also known as blogging—inputting personal or public information on Web sites. Similar to online chat rooms or an online diary, blogs are accessible to Web users. By making them available in US and major Asian cities, especially those with state-sponsored media, Air Force PA provided leaders and citizens in both free-press and nondemocratic societies with accurate information about Resultant Fury. These online rooms also gave the world's media access to credible, truthful information—not the state-sponsored propaganda that exists in some countries. Whenever PA blogged, the message was clear: Resultant Fury is a demonstration to US allies and potential adversaries that we have the capability to strike numerous mobile maritime targets in any weather at any time. Moreover, every blog identified PA as a spokesperson for PACAF, ensuring readers that the information came from a credible, trustworthy source.

During Resultant Fury, Air Force PA's efforts—constituting the most media coverage of a single planned event in the Pacific in recent years—possibly caused a change in an enemy's course of action. Specifically, PA produced 149 balanced international articles and newscasts on the demonstration and garnered more than 26 broadcasts through the world's largest television news agency, with over 169 bureaus supplying news through more than 400 networks, 500,000 subscribers, and affiliate stations to an audience including viewers in Russia, Abu Dhabi, the Sudan, China, and Singapore, just to name a few. Proactive PA planning and integration with other staff agencies, as well as informing target audiences of these capabilities, give the joint force commander another tool for defeating terrorists, enemy naval combatants, and pirates. Although we may never know if Resultant Fury did in fact deter or dissuade potential enemies, no one can deny that they are now aware of the Air Force's MI capability and that indirect effects from the demonstration will continue changing American and enemy battlefield tactics, especially in terms of influence.[8]

Resultant Fury not only demonstrated airpower's ability to sink maritime targets anywhere in a matter of hours but also showcased the importance of effects-driven PA. Although the latter's role in combat will not replace kinetic means of warfare, it does offer the commander a useful tool for realizing his or her military objectives.[9] By influencing and affecting information in the strategic battlespace, PA proved its value as a key element in an operational environment. However, we need a change in culture and doctrine to bring PA capabilities to the forefront of options available to commanders as they determine how best to produce an effect, whether on the kinetic or information battlefield. ❑

Notes

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The First Women Pilots in the Brazilian Air Force

Maj Marco Antonio Cuin, Brazilian Air Force
Lt Alexandre Pereira Reynaldo, Brazilian Air Force*

Aviator cadets of the Brazilian Air Force Academy

THE FORÇA AÉREA Brasileira (Brazilian air force) traces its origins to the second decade of the twentieth century. Established on 23 August 1916, the Naval Aviation School, Brazil's first military-aviation school, became the cradle of our air force. The opening of its doors on Enxadas Island in the state of Rio de Janeiro, then the nation's capital, marked the first steps on the path to airpower for the Brazilian nation. Following these efforts, on 10 July 1919, the Brazilian army established its Military Aviation School, located in Campo dos Afonsos—also in the state of Rio de Janeiro—filling an important gap in our ability to train aviators capable of confronting the new reality

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of aerial combat. After developing separately, consistent with prevailing worldwide trends, the navy and army air arms combined to form the new Brazilian air force on 20 January 1941. Campo dos Afonsos remained the home of the School of Aeronautics and of the fledgling service's future officer-aviators. The service had already become involved in World War II, a conflict that threatened Brazil and ravaged the European continent.

Realizing that busy Rio de Janeiro air traffic would not permit such a large school to conduct flight training without endangering flight safety, studies began in July 1942 for the purpose of choosing a new location for the School of Aeronautics. After careful analysis, the air force selected the city of Pirassununga—situated in the interior of the state of São Paulo. Thus, the 1st Air Force Detachment formed on 17 October 1960 to begin preparing the new site for the school. On 10 July 1969, the School of Aeronautics in Rio de Janeiro was renamed the Academia da Força Aérea (Air Force Academy) and moved in 1971 to Pirassununga, where it began training cadets to become officer-aviators, management officers (acquisition, contracting, budget, etc.), and security-forces personnel (and does so to this day).

On 10 January 2003, the Brazilian Air Force Academy greeted another group of young volunteers determined to join its ranks. From a total of 227 Brazilian cadets, the academy selected 177 for aviation, 35 for management, and 15 for security forces. Moreover, for the first time in the history of Brazilian military aviation, women had an opportunity to demonstrate their worth in this field of endeavor. About 150 female candidates applied for 20 allocated aviation slots, all filled after a tough competitive exam.

Such requirements as the emergency parachuting course and military field exercise came as no surprise to these female cadets because they had performed them since 1996, the year women broke through the academic barrier by entering the management course for officers. Thus, they performed well in the required activities, and these brave warriors, motivated by a strong desire to overcome the obstacles and challenges of military-academy life, advanced as expected through all phases of their freshman year despite some feelings of uneasiness during this historic period. Circumstances were such that the novelty of the female cadets would carry over into the second year of the Aviation Officers' Training Course, when the first phase of basic military flight training began.

The year 2004 presented an opportunity to lift the veil of skepticism present in the minds of some people and to demonstrate, in practice, the skills of Brazilian women. Something previously unthinkable and dismissed out of hand was about to happen. The first women aviation cadets began military flying, giving rise to concerns shared by military and civilian society alike and spurring considerable media attention and questions. How well would the women do? How would they react, comport themselves, perform, relate to instructors, and resist fatigue? Would their menstrual cycles cause problems? Would these and other aspects manifest themselves as they had in other air forces? A number of questions, motivated by a lack of knowledge and by the pioneering nature of women pilots in the Brazilian air force, would become clear only in the light of actual experience.

As the date to begin flight training approached, some cadets decided not to continue. Three women declared themselves unsuited to military life and requested discharge, leaving 17 warriors to begin flight training. As always occurs in such a course, wherein trainees must complete various phases with a high degree of proficiency, some of the cadets (including men) encountered difficulties, eliminating them from the program. Thus, 12 female cadets finished that stage. Among those, one requested discharge after having completed all the flight-training phases conducted by the 2nd Air Training Squadron. As of this writing, the remaining 11 should graduate from the Brazilian Air Force Academy at the end of 2006.

It is important to emphasize the degree of dedication these aviation cadets demonstrated in all the tasks that confronted them. Militarily, they distinguished themselves by their disci-

pline and zealous personal demeanor. Academically, they achieved significant results—witness the high class ranking that most of them achieved. Consequently, the performance of these brave women is gradually dispelling any lingering myths and questions as well as favorably affecting people's expectations of them.

The Brazilian air force intends to use these new aviators to help maintain its combat capability and will treat them the same as their male counterparts. The gradual, deliberate rise of this new component of our operational combat arm will facilitate its successful integration into the current career landscape, historically dominated by men. We must always bear in mind that Brazilian air force members must be imbued with the proper attributes to fulfill their duties, particularly the defense of our airspace and the sovereignty of our nation. Brazil can rest assured that leadership and esprit de corps, combined with the traits of courage, altruism, tenacity, determination, perseverance, and other virtues inherent in good warriors, are deeply ingrained in each woman aviator. ❑

Women pioneers of Brazilian military aviation

Transforming Battle Damage Assessment into Effects-Based Assessment

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AT BEST, BATTLE damage assessment (BDA)—a cumbersome process not conducive to current operations—yields a binary response (target destroyed or target not destroyed) and ignores other facets associated with today's effects-based environment. To be useful, an assessment process must provide the combined force air component commander (CFACC) with facts that translate a sortie's outcome into effects traceable from the tactical through the operational to the strategic level.

To a certain extent, the military has treated BDA as an afterthought rather than as a critical capability. The Department of Defense's (DOD) force-transformation strategy offers an opportunity to change BDA into a network-centric, effects-based assessment (EBA) tool that provides near-real-time information to a CFACC. That information could include weapon-system, target, or socioeconomic status, as well as relative and cumulative changes in desired effects from the tactical through the strategic level.

With the DOD's transformation strategy, information-age military forces will become more network-centric, including improved information sharing that provides "actionable information at all levels of command."[1] A key interoperability requirement levied on the service ensures that new systems—command, control, computers, communications, intelligence, surveillance, and reconnaissance; weapons; and logistics—incorporate network Internet protocol (IP) standards.[2] Establishing an IP standard not only improves interoperability but also facilitates sharing of near-real-time information and gives the assessment process the capability to fuse intelligence, surveillance, and reconnaissance sensors easily.

The jump from current to future processes requires a shift from assessing target destruction to assessing effects and actions performed (e.g., aircraft "presence" missions or neighborhood patrols) during the constructive or war-termination phase of combat. The processes of gathering information for the two assessments will resemble each other; however, those for assessing effects will vary. The primary tactical-assessment technique associated with "bombs on target" sorties entails verifying destruction of the objective, which attains the desired effect. If the target escapes destruction, the assessment process will resemble that of a "constructive" sortie. In both cases, one must identify and evaluate secondary or tertiary effects. For targets not clearly identified as destroyed, one can ascertain military utility in other ways (measuring secondary or tertiary effects), such as employing signals intelligence or human intelligence, to ensure achievement of the effect despite the absence of physical-destruction metrics.

EBA in the war-termination phase of combat is more problematic, primarily because of our lack of experience. Although a direct correlation usually exists between a military target's purpose and its function, the socioeconomic effects stemming from a presence or humani-

tarian mission are not as well defined. This lack of definition for assessment purposes does not mean that effects do not exist. In the United States today, one observes the gathering of many effects as a matter of course (e.g., public-opinion polls, imports, exports, unemployment rates, crime statistics, and power production). Effects monitored during an operation include attacks on US troops, civilian deaths, reconstitution of public-service institutions, and—in Operation Iraqi Freedom—capture of a number of high-value targets (individuals included on the so-called most-wanted playing cards).

Assessing effects should not begin after execution of a mission; rather, the process should start with the development of strategic goals for a campaign. Effects should undergo refinement as one applies greater fidelity to the goals, resulting in a comprehensive assessment plan that translates actions (e.g., destroy, neutralize, support, and enable) into effects (e.g., prevent, deny, protect, and comfort). Understanding the relationship between a strategic goal and its associated effects employs resources more efficiently and reduces the assessment cycle.

Possible courses of action for the near term include (1) integrating effects assessment into every phase of the targeting cycle; (2) expanding intelligence collection and assessment requirements to include socioeconomic effects and linking those effects to actions; (3) developing a curriculum that educates Airmen about effects-based operations, focusing on destructive and constructive areas requiring secondary and tertiary effects; and (4) beginning an initiative to fuse sensors, identifying potential critical shortfalls in the war-termination phase. Long-term courses of action include (1) developing models patterned after simulation and strategy games such as SIMCITY or Civilization that will help forecast (in near-real time) effects from specific actions in the socioeconomic arena and (2) ensuring implementation of the DOD transformation mandate for IP standards in emerging systems, focusing on sensor fusion. ❑

Notes

1. *Transformation Planning Guidance* (Washington, DC: Department of Defense, April 2003), 10, http://www.defenselink.mil/brac/docs/transformationplanningapr03.pdf.

2. Ibid., 30.

EBO deals with creating effects—not with platforms, weapons, or methods.

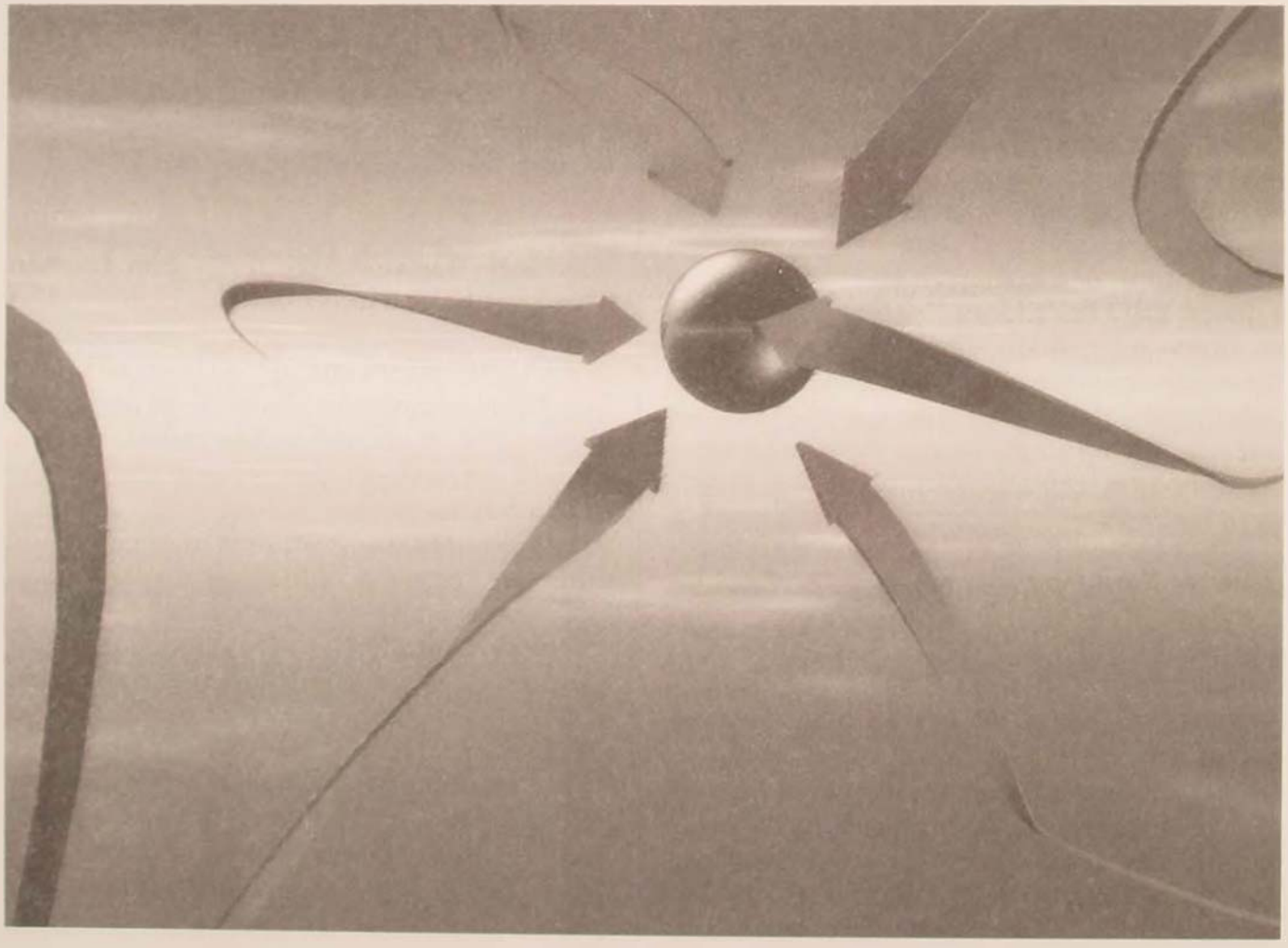
—Lt Col J. P. Hunerwadel

The Effects-Based Approach to Operations

Questions and Answers

Lt Col J. P. Hunerwadel, USAF, Retired

Editorial Abstract: Effects-based operations (EBO) are currently a rapidly expanding area of military discussion, thought, and application. The author posits that despite numerous definitions of EBO, the concept remains largely misunderstood. This article addresses and attempts to answer key questions concerning the nature of EBO, its meaning, and ways of using it to discuss and formulate operational strategy as well as conduct operations.



THE US MILITARY has an amusing and persistent fondness for catchphrases and buzzwords. *Effects-based operations* (EBO) has proven one of the most popular for at least the last 15 years. Some individuals have touted EBO as "a new paradigm for . . . military operations" and as a construct promising "war-winning efficiency."[1] Others have proposed it as an alternative to "destruction-based targeting" and "target-based operations"—one "remarkably different from the traditional military approaches of destruction and attrition."[2] At the same time, many commentators have emphasized that it is not new at all: "Throughout history, capable commanders and planners have tried to plan and execute effects-based campaigns."[3] EBO has been condemned outright as an "unachievable, narrowly focused . . . panacea"; as "trendy 'new speak'"; "a fad term"; and "an ill-conceived idea."[4] Some have warned of EBO's "empty promise" and of "icebergs ahead."[5] A former commander of US Joint Forces Command (JFCOM) has told us that EBO is "not ready to go forward yet" a year *after* the Joint Staff's former vice-director of operations called Operation Iraqi Freedom "an effects-based campaign."[6]

Sadly, there are as many opinions about what EBO actually *is* as there are people who have written on the subject. One finds at least a dozen EBO definitions floating around—all of them somewhat insightful but many of them contradictory. The profusion of EBO definitions, claims, advocates, and foes may put one in mind of George Bernard Shaw's comment on economists: "If all [of them] were laid end to end, they would not reach a conclusion."[7] We talk effects, we teach effects, we claim to "do" effects, but we've come to no definitive conclusions concerning what *effects* and *effects-based* mean.

Does EBO really exist, or is it just another empty buzzword? If it does exist, can we define it meaningfully? Does it add value to discussions of strategy and the conduct of operations? Are there meaningful principles for EBO?

This article seeks to address these questions and introduce some definitional clarity. Believing that the answer to all of the questions is an emphatic yes, this author provides a synthesis of the varied effects-based approaches that have emerged in the last two decades, distills from them a set of principles broadly applicable to any effects-based approach, and discusses current definitions and their underlying logic.

Why Effects-Based Operations?

Much EBO literature correctly points out that effects-based thinking is not new. It coalesced gradually from a number of influences—a fact that helps explain the variation in EBO's definitions over time. Some influences are as old as warfare itself. Others owe a debt to recent scientific thinking and technologies. On the one hand, when Sun Tzu wrote that "to fight and conquer in all your battles is not supreme excellence; supreme excellence consists of breaking the enemy's resistance without fighting," he was articulating an insight that we would consider effects-based today.[8] On the other hand, modern war fighters have technologies that enable collaborative information sharing and the imposition of very precise effects across vast distances; they also benefit from theory that enables better anticipation of some complex system behaviors. Had they lived today, Sun Tzu and a host of history's other brilliant commanders probably would have grasped the implications of such innovations and turned them to similar uses. Great commanders have always known the importance of understanding causal relationships in warfare—ways of relating ultimate desired ends to tactical actions—and of anticipating possible countermoves by enemies and others in a conflict. Military operations today, however—even relatively small ones—can become too complex to rely upon genius for considering factors outside the traditional military understanding of cause and effect that may prove crucial for achieving objectives.

Influences that specifically helped create EBO include the "traditional American way of war": attrition and annihilation of the enemy's fielded military forces, as well as what some call the "input-based approach" to air opera-

tions, which focuses on making targeting decisions based on available resources and ways of attacking particular targets.[9] Attrition/annihilation and input-based decision making still form the bedrock of tactical war fighting. Nonetheless, the cost involved in warfare based purely on these methods has become politically and socially problematical for the United States. From an Airman's point of view, the input-based approach can also prove ineffective in achieving national political goals that drive conflict because it provides no guidance as to *why* targets are struck or how striking them relates to achievement of objectives. The United States relied on both the "American way" and input-based targeting in Vietnam, losing in part because the military's ways and means of fighting the war never matched the political ends for which our forces fought. In the wake of defeat, the military went back to "Clausewitz 101" and once again (as in World War II and before) emphasized the need to link the objectives at all levels of war—from the national political level down to tactical tasks—in a logical, causal chain. This outcome-based or strategy-to-task approach became the de facto basis of planning doctrine for the US military.

As technology and scientific theory advanced in the 1970s and 1980s, many people began to recognize that these advances enabled some nearly exponential increases in the precision of military weapons—and in understanding how we could use this precision to affect complex systems in sophisticated ways. At the same time, political and social pressures to keep the costs of military operations low—especially in terms of lives (often both enemy and friendly)—did not diminish. Some very imaginative weaponry emerged that enabled extremely localized and/or temporary damage and disruption, along with tactics and operational art to employ them (e.g., parallel attack, which strikes a wide array of target systems in a short period of time in order to produce maximum shock and dislocation across one or more systems). This method and others equally new (such as force multiplication through stealth, tools for analyzing collateral damage, and many more) gave military commanders a range of options for effects they had never enjoyed before. It also lessened the causal "distance" between tactical actions and strategic outcomes. That is, it increased the likelihood that one could use military force in some cases to achieve strategic-level outcomes more directly than attrition and input-based targeting have traditionally allowed.

Another major influence—the revolution in information and communication technology—initially made top-down control easier, which hampered military operations as much as it enhanced them (witness the disastrous presidential intervention in target selection during the Vietnam War). But the "info-comm" system-of-systems then evolved in an unanticipated direction: a widely distributed, highly interconnected network of systems emerged, capable of handling high-volume, interactive information exchange between thousands or even millions of system nodes nearly instantaneously across global distances. In some respects, this development increased the threat of what the Air Force rightly disparages as centralized execution, but it also enabled much greater awareness of the operating environment, extensive collaboration among military disciplines, pinpointing and accessing expert information when needed, much faster cycles of decision making, and the potential for true integration of military effort within the battlespace.[10]

In summary, during the 1990s and the first years of this decade, no new theory of warfare materialized, but military thinkers came to realize that a synthesis of many insightful concepts and techniques could offer something permanently useful to war fighters at all levels and from all disciplines. To be useful, this *effects-based approach to operations* (in many ways a better way of expressing what *EBO* really is, but this article uses the two interchangeably for simplicity's sake) should broaden military professionals' understanding of cause and effect beyond destruction, attrition, and annihilation alone as causal mechanisms in battle; beyond the tactical results of battle alone in assessing and anticipating the flow of operations; beyond their specific military disciplines alone when seeking ways to achieve objectives; beyond the military instrument of power alone

when building strategies; and beyond warfare alone as a basis for achieving national security objectives with military power.

Principles of an Effects-Based Approach to Operations

From these broad objectives and from EBO's various threads of influence, it should be possible to assemble a systematic set of principles that can do for effects-based thinking what the Prussian general staff's system did to systematize Napoléon's innovations in command-and-staff functions over a century ago.

The effects-based approach is a comprehensive way of thinking about operations—a thought process.

It is a way of regarding the employment of the military instrument of national power. It is not a new theory of war or a particular strategy such as parallel operations or the indirect approach under a new name (although EBO may certainly suggest and encompass such methods). Neither is it a checklist or a new planning or assessment tool. It provides an overarching intellectual framework—embodied in the principles distilled here—for enhancing the employment of military capabilities. The principles should apply equally well to the tactical battlefield and to the president's strategic deliberations. They should also apply to humanitarian-relief and stability operations (at least) just as much as they do to major combat—to the full range of military operations, from peace to war and back to peace. They should not prescribe a particular strategy or type of mission but should encourage consideration of the widest possible array of options and facilitate unity of effort and integration of capabilities in order to achieve the best strategy possible in light of the ultimate end state.

EBO cuts across all dimensions, disciplines, and levels of war.

This approach must seek to integrate all the instruments of power—political/diplomatic, informational, economic, and even cultural—to the maximum extent possible, emphasizing the important considerations in these realms, even when employing them lies well beyond a given echelon's scope of responsibility. For example, the response of an infantry squad under fire from a holy site or cultural monument might have profound effects upon the ultimate political and cultural end state. This is cross-dimensional thinking. Cross-discipline thinking involves considering that one's own set of skills and tools may not offer all—or the best—options in the given circumstances. Other functional specialties, components, military services, agencies, or nations may have the tool for the job that can best impose the desired effect. Cross-discipline thinking also involves realizing that there is probably more than one way to achieve a desired effect—whatever best supports the end state is best for the operation. Cross-level thinking helps break down the boundaries among the strategic, operational, and tactical arenas, realizing, for instance, that very small tactical actions can have immense strategic effects in certain circumstances—for good or ill.

EBO should focus upon the end state and the objectives.

To achieve the operation's desired end state, one should craft all actions so as to produce effects that attain the objectives and minimize unwanted effects that may hinder their attainment. The end state is a set of conditions that one must achieve to resolve the situation or conflict on satisfactory terms as defined by appropriate authorities. Only *one* end state encompasses conditions for all actors (adversary, friendly, and neutral) and all types of systems (political, military, economic, social, informational, and infrastructural) within the operational environment. Because military commanders must deliver or help deliver certain end-state conditions, they choose clear, decisive, and attainable objectives for their forces. They or their subordinates (at all levels) then determine the effects they must create to achieve the objectives. EBO should also logically tie every action taken to objectives at all levels of war and consider conditions imposed by higher levels of command, even when planning tactical-level actions. In this respect, the

effects-based approach is really an elaboration of the strategy-to-task methodology that has guided US strategy for years.

EBO seeks a seamless melding of planning, execution, and assessment into an adaptive whole.

Planning encompasses all the means through which one develops strategy. Sound, effects-based principles may have the greatest impact through planning since the latter sets the stage for all other actions. Nonetheless, some services maintain that EBO applies solely to the planning realm—that it is "not an operation" but just a means of improving planning methodologies.[11] This is a mistaken notion, especially since it ignores assessment.

Execution encompasses the ongoing operational battle rhythm (in Air Force terms, the *air tasking cycle*) as well as all the individual unit actions that comprise the execution of air and space operations.[12] Execution that is not effects-based can negate sound planning, often because it focuses too narrowly on one or another aspect of the battle rhythm—such as production of the air tasking order. It can devolve into blindly servicing a list of targets, with little or no strategy and little or no anticipation of enemy actions.

Assessment encompasses all efforts to evaluate effects and gauge progress toward accomplishment of objectives. It feeds future planning and lends itself to adapting operations as events unfold. Since effects and objectives should always be measurable, planning for them should always include measures and indicators for evaluating progress. Assessment should be anticipatory—predictive, in a sense—and effects oriented. Rather than relying primarily on the empirical results of tactical actions, it should consider the behavior of systems in a larger context. Not only should it help determine whether one is doing things right, but also it should help decide if one is doing the right thing. Assessment feeds ongoing planning and future execution.

Treating these three aspects of operations as an integral whole rather than as separate disciplines or problems to be solved helps place appropriate emphasis on assessment and properly subordinate the "execution" battle rhythm to the operation's overall plan or strategy. These, in turn, encourage a continuous evaluation of strategy—constantly asking and answering the question "Are we doing the right thing(s)?"—which facilitates *adaptation* to changes in the operational environment. In other words, planning, execution, and assessment should form an adaptive whole.

EBO deals with creating effects—not with platforms, weapons, or methods.

An effects-based approach starts with desired outcomes—the end state, objectives, and subordinate desired effects—and then determines the resources needed to achieve them. It does not start with particular capabilities or resources and then decide what one can accomplish with them. This approach also assigns missions or tasks according to mission-type orders, leaving decisions concerning the most appropriate mix of weapons and platforms to the lowest appropriate levels in the field. It is not principally concerned with technology, but new platforms, weapons, and/or methods can enable new types of effects. These do not become truly useful to the war fighter, however, until they join with appropriate employment doctrine and strategy. The tank by itself did not yield blitzkrieg.

EBO should consider all possible types of effects.

Warfare has traditionally focused on direct, physical effects and certain better-understood indirect effects such as causing failure of enemy units through attrition. Although these still have a significant place in warfare, an effects-based approach must consider the full array of outcomes in order to give decision makers a wider range of options and provide them with a realistic estimation of unintended consequences. Each type of effect can play a valuable role in the right circumstances, and thinking through the full range will encourage a flexible, versatile approach to war fighting. One finds many types of effects and different techniques for analyzing and assessing them. A list of categories and types lies beyond the scope of this article, but many have pro-

found practical and doctrinal implications that commanders and planners must consider as they develop strategy.[13] One type, however, can have overweening importance and thus merits consideration in the principles themselves:

EBO should always consider the "law of unintended consequences."

One will always encounter unintended effects, both good and bad, and those that extend beyond objective accomplishment. Improving awareness can help anticipate many outcomes and mitigate the impact of unintended negative effects, but this can never become a perfect science in a world of complex systems. Planners should think through the most obvious types of damage that unintended effects might cause (such as political and perception-management problems associated with collateral civilian damage) and employ consequence-management techniques when possible.

EBO should seek to achieve objectives most effectively—and then most efficiently.

EBO must always accomplish the mission but should seek to provide as wide a range of options as possible. Thorough evaluation of possible effects should lead to courses of action that achieve objectives in ways that best support the desired end state—but should do so with the least expenditure of lives, treasure, time, opportunities, or other resources. Of course, the chosen effects must first be *effective*. Sometimes this will require strategies based on attrition or annihilation, but one should select these only after careful deliberation has determined that they are the best (or only) choices.

EBO recognizes that war is a clash of complex, adaptive systems.

War is a contest of wills, a collision of living forces that creatively adapt to stimuli in ways scientists today describe in terms of chaos, emergence, and complexity theories. For centuries, scientists and philosophers strove to explain the cosmos in reductionist terms—by dividing what they observed into component elements and explaining the relationships among them with relatively simple rules of cause and effect. Today, scientists realize that even in simple systems, cause and effect are often intangible, indirect, and hard to trace. This fact has important implications that the US approach to war fighting has not always taken into account:

1. *Planning should always consider how the enemy will respond to planned actions.* Any systematic approach to operations—especially warfare—must recognize the fact that all living systems adapt to changes in their environments. An effects-based approach should include processes to account for an adversary's likely courses of action and responses. For the same reason, the nexus of planning, execution, and assessment must form an *adaptive* whole. Put another way, the iterative and cyclical relationship among these three components should form an inseparable whole precisely in order to facilitate adaptation to changes in adversary behavior and the environment.

2. *Warfare is complex and nonlinear.* Things that one often assumes to be true about the physical world in planning models and the like actually are not true, including ideas such as proportionality, additivity, and replicability.[14] According to the principle of proportionality, small inputs lead to small outputs and large inputs to large outputs. In the real world, however, small inputs often lead to disproportionately large outputs. This insight has remained the key to good military practice for millennia: all great commanders have sought ways to achieve the greatest effect with the greatest efficiency. Although the concept of additivity denotes that the whole equals the sum of the parts, that does not apply to living systems, which are always greater than the sum of their components—just as the joint force working as an integrated whole is more effective than its parts if they worked independently. The behavior of complex systems often depends

more on the linkages among system components than on the components themselves. Finally, the notion of replicability holds that the same inputs always yield the same outputs, but intuition alone refutes this assertion. Imperceptible changes in initial conditions always make exact replication of results impossible in the real world. As Helmuth von Moltke (the elder) observed, "No plan survives first contact with the enemy." Systems that behave according to these three assumptions are linear; thus, cause and effect are relatively easy to understand. Complex systems in the real world, however, almost always behave in a nonlinear manner.[15]

3. *Cause and effect often resist tracing.* The planning of military operations frequently assumes that the causal links among actions, effects, and objectives are demonstrable, direct, and deductively traceable (from assumptions established during planning). Many causal linkages in the real world, however, remain indirect, intangible, and only inductively discernable (through observation of real phenomena). In many cases, effects will accumulate to achieve an objective, but progress will not become evident until one either fully or nearly achieves the objective. In other cases, the causal mechanisms will not become readily apparent. Planners and commanders must be aware of this, seeking better ways to anticipate changes and counseling those further up the chain of command to have patience with respect to results. That is, they must allow changes invisible outside the target systems to "percolate" through them and produce desired system behaviors.

EBO focuses primarily upon behavior, not just physical changes.

Traditional warfare made destruction of the enemy's military forces the leading aim. Doing so can certainly accomplish objectives and still remain a vital part of strategy, but an effects-based approach emphasizes alternatives—that the ultimate aim in war is not to overthrow the enemy's power but to compel him to do one's will. Sometimes one can accomplish the latter only by an overthrow, but most of the time other choices exist. Careful examination of all types of effects will suggest them. Another aspect of this principle is that "the moral is to the physical as three is to one."[16] That is, we can often achieve objectives more effectively and efficiently by maximizing the psychological impact of our operations upon an adversary—not just on the battlefield but on enemy leaders and other critical groups as well. We can carefully tailor messages to populations in the operating environment, encouraging cooperation or other desired behavior from them. Finally, affecting the behavior of friendly and neutral actors within the operational environment can often prove as important as affecting the adversary's behavior. When we prohibit strikes on cultural or religious landmarks during operations, for instance, friendly and neutral actors in the operational environment figure just as prominently in our intended target audience as does the adversary.

EBO recognizes that comprehensive knowledge of all actors and the operational environment is important to success, but comes at a price.

Attaining comprehensive knowledge entails taking a view of the adversary that goes well beyond his order of battle and the disposition of his forces. In today's battlespace, gauging changes in the behavior of various actors, anticipating their actions, and finding both the critical and vulnerable portions of an adversary's system require very robust intelligence collection and analysis. They also demand that we learn how various actors think and how they perceive the conflict. Further, we must take a systems-based view of the adversary—that is, we must view him and other actors as complex, adaptive systems-of-systems, analyzing them as whole entities and learning how they interact with systems around them, rather than just examining their component parts in

reductionist fashion. Intelligence and analysis at the unit and even the component level will probably not be sufficient to glean the degree of understanding required. We require intelligence federation and "reach-back" to national-level intelligence agencies and assets that can offer in-depth analysis.[17] Finally, obtaining comprehensive knowledge usually carries a very high information flow and analysis cost, requiring well-thought-out assessment measures and concepts of operations arising from intelligence analysis. Commanders today have access to a virtual flood of data; indeed, they often find it difficult to derive useful information from such an overwhelming amount of material. This situation creates one of the significant drawbacks of the info-comm revolution that has helped make EBO possible in so many other ways. The volume of information itself has become a form of friction, precipitating confusion, lengthening decision times, and diminishing predictive awareness. One can partially mitigate this quandary by conducting comprehensive intelligence and assessment planning before operations begin, but the United States has yet to develop an inclusive solution to the problems created by the information revolution.

The effects-based approach is not new.

When Napoléon said, "If I always appear prepared, it is because before entering on an undertaking, I have meditated long and have foreseen what may occur," he was intuitively applying what we are trying to put a systematic framework to today.[18] Even EBO's foes acknowledge that many of its basic insights have long been part of war well waged.

Effects-Based Operations Defined

The principles laid out above, some of which, at least, one finds in nearly every discussion of EBO, should permit a concise and conceptually consistent definition. The two most widely recognized today come from the two organizations responsible for the bulk of thinking in the last several years on effects and effects-related issues: US Joint Forces Command and the US Air Force.

JFCOM's definition has evolved significantly in a relatively short time. The following definition of EBO enjoys the greatest visibility: "operations that are planned, executed, assessed, and adapted based on a holistic understanding of the operational environment in order to influence or change system behavior or capabilities using integrated application of select instruments of power to achieve directed policy aims." In JFCOM's construct, an effect denotes "the physical, and/or behavioral state of a PMESII [political, military, economic, social, information, and infrastructure] system that results from a military or non-military action or set of actions."[19]

The US Air Force has also wrestled with the definition over time and has influenced and been influenced by JFCOM's thinking. Nonetheless, the Air Force has had by far the most practical experience in conducting EBO and exploring its implications over the last two decades; furthermore, it has collected the greatest amount of subject-matter expertise on effects-based thinking in that time. The consensus of the service's experts is that JFCOM's definition is useful but unnecessarily complicated; moreover, it carries some incorrect implications.

Must someone really have "holistic" understanding in order to change a system's behavior?[20] Attrition can still prove very effective in changing the behavior of enemy fielded forces, and one can apply it effectively with little knowledge outside of immediate force ratios—one of the reasons it has often served as the "default setting" for ground combat throughout much of history. Certainly broad systems knowledge is desirable but not necessary to "think effects." In like manner, is an "integrated application of select instruments of power" necessary to an effects-based approach? Again, such integration is desirable and may even be necessary at the strategic level, but elements of the military instrument alone can apply many effects-based principles in force-on-force engagements, as centuries of maneuver warfare prove. Also, should EBO seek only to attain "directed policy aims"? Even JFCOM

maintains that EBO applies at the operational level—the realm of strategy, not policy. Military commanders attain objectives in order to help bring about a set of end-state conditions through strategy; policy sets boundaries on strategy. The primary focus of EBO should remain on an operation's end state and objectives—the ends of strategy.

The Air Force retains what it believes are the best aspects of JFCOM's definitions but simplifies them and corrects the conceptual errors. *Effects* are simply "the full range of outcomes, events, or consequences of a particular cause. A cause can be an action, a set of actions, or another effect." This definition both broadens and simplifies the concept to make it logical and more easily understood by a general audience. *EBO* denotes "*operations that are planned, executed, assessed, and adapted to influence or change systems or capabilities in order to achieve desired outcomes*" (emphasis added).[21] This definition retains the best features of JFCOM's description: the nexus of planning, execution, and assessment; necessity for adaptation; emphasis upon a systems perspective; and applicability to a wider range of operations than just combat. It removes confusing, unnecessary elements and establishes that EBO may help achieve a wider array of ends—not just "policy." Barring unexpected last-minute changes, this definition will find its way into the next round of the Air Force's capstone doctrine documents.

Conclusion

Fundamentally, EBO is a thought process—a set of concepts and a way of thinking. It may have great potential to enhance military operations, but it does not supplant existing processes (many of which—like the joint estimate process—are fundamentally effects-based, according to many of the principles laid out here). Tools and methodologies may eventually come along to help exploit EBO's potential, enabled by technological changes, and some existing processes may change as we learn more. However, one can use an effects-based approach to operations regardless of the ways and means chosen to implement it. The soul of "doing effects" is and will always remain "thinking effects." ❑

Notes

1. Dr. Maris "Buster" McCrabb and Joseph A. Caroli, *Behavioral Modeling and Wargaming for Effects-Based Operations* (Rome, NY: Air Force Research Laboratories and DMM Ventures, Inc., November 2002), 1; and Lt Col Christopher W. Bowman, *Operational Assessment: The Achilles Heel of Effects-Based Operations?* (Newport, RI: Naval War College, 13 May 2002), ii.

2. Col David A. Deptula, *Firing for Effect: Change in the Nature of Warfare*, Defense and Airpower Series (Arlington, VA: Aerospace Education Foundation, 24 August 1995), 4; Michael Senglaub, *Course of Action Analysis within an Effects-Based Operational Context*, Sandia Report SAND 2001-3497 (Albuquerque, NM: Sandia National Laboratories, November 2001), 7, http://infoserve.sandia.gov/cgi-bin/techlib/access-control.pl/2001/013497.pdf; and Col Gwen Linde et al., "New Perspectives on Effects-Based Operations: Annotated Briefing" (Alexandria, VA: Institute for Defense Studies, June 2001), 13.

3. Linde et al., "New Perspectives," 12.

4. Lt Col Brett T. Williams, *Effects-Based Operations: Theory, Application, and Role of Airpower* (Carlisle, PA: US Army War College, 9 April 2002), 1. Please note that Colonel Williams is characterizing joint opposition to EBO and that the phrase "unachievable, narrowly focused . . . panacea" does not represent his own views on EBO. The other phrases come from Col Art Corbett, USMC, "Why Say No to EBO?" (Quantico, VA: Marine Corps Combat Development Command, 3 November 2002), passim.

5. Maj T. W. Beagle Jr., "Effects-Based Targeting: Another Empty Promise?" (thesis, School of Advanced Airpower Studies, Maxwell AFB, AL, June 2000), 1, https://research.maxwell.af.mil/papers/ay2000/saas/beagle.pdf; and Lt Col Mark E. Steblin, "Targeting for Effect: Is There an Iceberg Ahead?" Research Report (Maxwell AFB, AL: Air War College, April 1997), 1, https://research.maxwell.af.mil/papers/ay1997/awc/97-184.pdf.

6. Gen William F. Kernan, remarks to the *New York Times* following the Millennium Challenge 2002 exercise, as cited in Maj David W. Pendall, "Effects-Based Operations and the Exercise of National Power," *Military Review*, January–February 2004, 22; and Maj Gen Stanley McChrystal, Department of Defense (DOD) news briefing, 22 March 2003, http://www.defenselink.mil/transcripts/2003/t03222003_t0322osdpa.html (accessed 14 October 2005).

7. Compare, for example, *Bartleby.com*, http://www.bartleby.com/66/22/53422.html (accessed 26 October 2005); apparently mentioned in conversation.

8. Sun Tzu, *The Art of War: The Oldest Military Treatise in the World*, trans. Lionel Giles (Harrisburg, PA: Military

Service Publishing Co., 1944), http://www.chinapage.com/sunzi-e.html (accessed 13 October 2005).

9. Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (New York: Macmillan, 1973), xxii; and Maj Steven M. Rinaldi, "Beyond the Industrial Web: Economic Synergies and Targeting Methodologies" (thesis, School of Advanced Airpower Studies, Maxwell AFB, AL, April 1995), 36.

10. Compare Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, 17 November 2003, for a discussion of "centralized control/decentralized execution" as a tenet of air and space power.

11. Briefing, Headquarters Department of the Army, G-3, DAMO-SSP, subject: Developing an Army Doctrinal Position on "Effects-Based Approach to Campaign Planning," Washington, DC, January 2004, slide 3.

12. For a good explanation of the tasking cycle, see Doctrine Watch 20, *ATO Myths* (Maxwell AFB, AL: Air Force Doctrine Center, 15 October 2003), https://www.doctrine.af.mil/Main.asp (accessed 16 October 2005).

13. However, for an extensive discussion of many common categories of effects and examples, see the forthcoming revision of AFDD 2, "Operations and Organization," draft 6.0, 23 August 2005, https://www.doctrine.af.mil/Main.asp (accessed 16 October 2005).

14. This use of the term *proportionality* comes from chaos theory and should be distinguished from the principle of proportionality in the Law of Armed Conflict, which stipulates that the military utility of an act should outweigh the collateral costs (especially in terms of lives) of the endeavor. For more information, compare AFDD 2-4.5, *Legal Support*, 15 May 2003, https://www.doctrine.af.mil/Main.asp (accessed 16 October 2005).

15. The term *linear* comes from mathematics. Equations that graph as lines after one plots different data points can describe linear systems. These systems have repeatable results and are deterministic. Nonlinear or dynamical systems exhibit trends in behavior rather than repeatable outcomes and demonstrate self-organizing emergence: new forms of adaptive behavior are not planned but emerge as a result of system components' interactions with the environment. The weather and a market economy are the classic examples. For a good general description, see "What Are Complex Adaptive Systems?" *trojanmice.com*, http://www.trojanmice.com/articles/complexadaptivesystems.htm (accessed 4 November 2005).

16. Attributed to Napoléon. The following is the actual quotation: "Even in war moral power is to physical as three parts out of four." Compare *Bartleby.com*, http://www.bartleby.com/73/1213.html (accessed 26 October 2005).

17. *Federation*, in this sense, refers to the cooperation between DOD intelligence personnel and intelligence organizations outside the DOD and/or the United States.

18. As quoted in Robert Heinl, *Dictionary of Military and Naval Quotations* (Annapolis, MD: Naval Institute Press, 1966).

19. PMESII refers comprehensively to the components of any system. Both definitions come from USJFCOM, *Operational Implications of Effects-Based Operations (EBO)*, Joint Doctrine Series no. 7 (Fort Monroe, VA: Joint Warfighting Center, 17 November 2004), 32. This definition also appears in drafts of JFCOM's forthcoming *Commander's Handbook* on EBO.

20. Never mind the "alternative medicine" and patchouli vibe that accompanies the term *holistic*. Some may see it and turn "holistically" against EBO.

21. AFDD 2, "Operations and Organization," 13.

We've got to get our way of thinking aligned with the effects-based way that we all plan to fight.

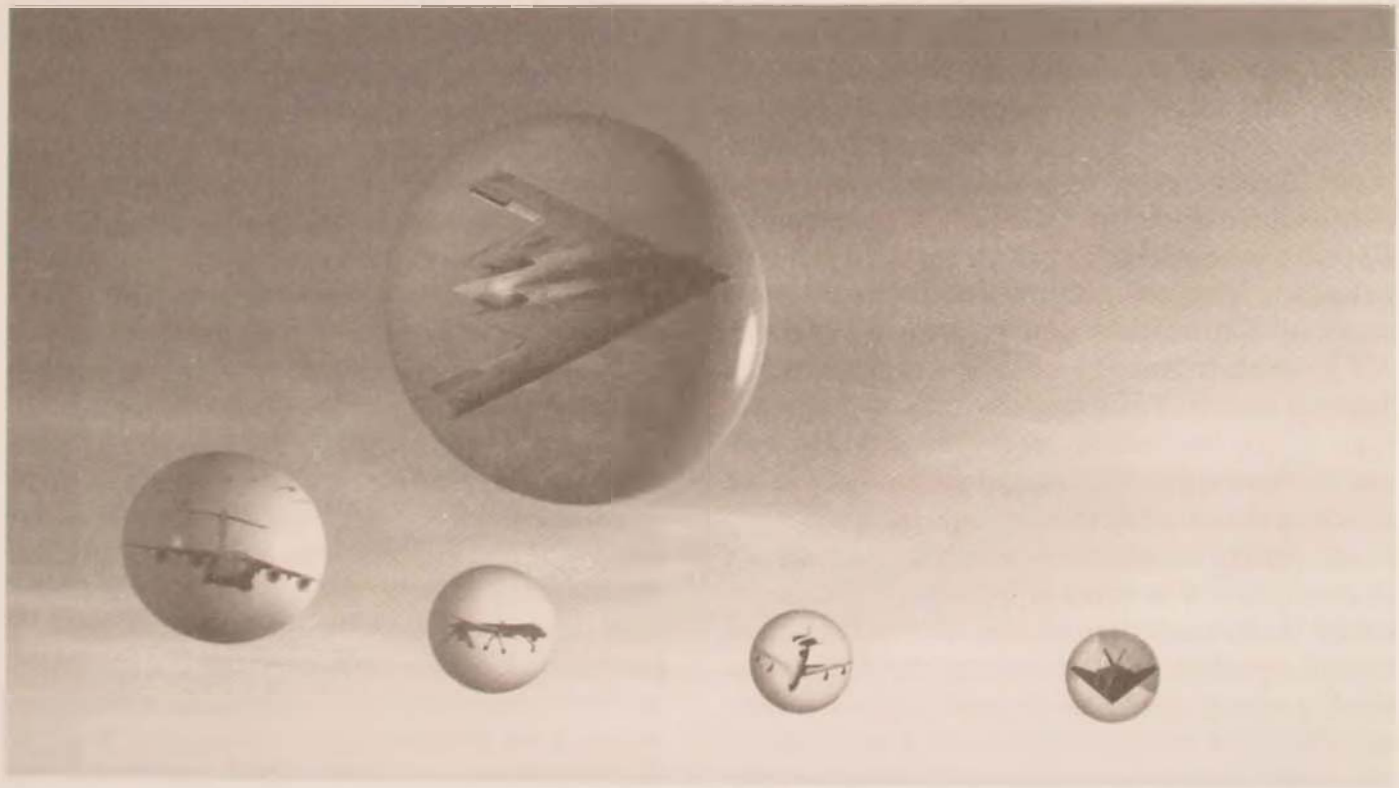
—Gen John P. Jumper

Five Propositions Regarding Effects-Based Operations

Col Steven C. Carey, USAF
Col Robyn S. Read, USAF, Retired

Editor's Note: Colonel Carey and Colonel Read present one perspective of effects-based operations. For an opposing view, see the following article entitled "Overpromising and Underestimating: A Response to 'Five Propositions Regarding Effects-Based Operations.'"

Editorial Abstract: Effects-based operations (EBO) link strategic political vision and day-to-day military operations to ensure that military strategy achieves or contributes to stated political goals. The authors assert that five propositions ultimately will enhance EBO's success in attaining objectives. These propositions help develop the EBO mind-set and conceivably establish some common starting points for accelerating the process into common use.



AFTER LITERALLY THOUSANDS of years of recorded combat, there seems relatively little that could be legitimately novel with regard to warfare. Historians and soldiers have noted most conditions and circumstances, and abundant commentaries exist. However, because there are no validated checklists for victory or universal sets of rules that devolve from these histories, no one can guarantee certainties for success in conflict. Some principles do in fact provide waypoints for consideration, but suf-

ficient exceptions exist to discount claims that a particular set of principles will somehow yield victory on all occasions. Every war is unique and requires a unique solution; indeed, the essence of war is its nonlinearity.[1] Consider the principle of mass. Simple aphorisms such as "never divide your forces in the face of a superior enemy" neatly complement divide-and-conquer scenarios, yet warriors from Hannibal to Robert E. Lee did just the opposite and won major battles. Persistence, vision, audacity, physical courage, and dozens of other factors play in unequal measure in these equations governing warfare, and a balance among competing and complementary principles, each weighted by conditions specific to the environment, is fundamental to any success. History simply does not package its lessons in discrete and convenient cause-effect snippets. In a practical sense, this unpredictability is the basis of what military professionals term *art* in war.

Generalizing for brevity—quite possibly to a fault—one might view science in war as dealing principally with "own" forces; thus, it applies largely to preparing for a military's engagement. Additionally, military science attempts to minimize Carl von Clausewitz's "friction" in war since methodical, systems-focused approaches tend to mitigate the inherent constraints of a military's many moving pieces.[2] Art in warfare, on the other hand, represents attempts to deal with the enemy's adaptive nature in the context of an unpredictable combat environment. Art therefore endeavors to moderate the effects of "fog" in war.[3] One finds similarity between the purpose of art and that of science in war because leverage accrues to the side better able to envision and complete these endeavors. In short, science deals generally with the known or predictable; art delves more into the realms of chance, probability, and the unknown or unknowable. Enter effects-based operations (EBO).

EBO provides a coherent mechanism for addressing both art and science in war. Further, it is a modern concept that embraces the limited nature of objectives prevalent in most conflict scenarios today, including coalition structures. Critically, it enables or reinforces the vertical linkage between strategic political vision and the day-to-day military operation to ensure that military strategy, if successfully completed, will achieve or contribute to the political goals set before it. Historically, this has not always been the case.

The principal shortfall in EBO today lies not in the concept but in the slow pace with which the various military services have embraced and implemented it. The lack of commonly accepted terminology, doctrine, and procedure has led to 10 years of "ad hocracy" for EBO. The results are mixed since the lack of guidance makes each effort largely unique and generally personality-driven. The ideas offered herein as "Five Propositions" seek to help develop an understanding of how EBO fits into joint and coalition operations and how military operations fit into pursuit of a higher strategic end state. Perhaps they can create some momentum toward establishing a more permanent solution for EBO—a concept with tremendous potential. The United States would be well served by prudent acceleration of its employment in the joint arena.

In the twenty-first century, the United States has retained much of the force that made it a dominant factor in the twentieth century. Moreover, the relative demise of peer competitors in a military sense has accentuated the imbalance between the United States and just about everyone else.[4] The results have proven predictable in at least two significant ways. First, in major combat environments, the United States promptly defeated the opposing, organized, and fielded military with which it engaged. Second, fewer opponents choose (or will choose) to meet the US military head-on. One finds no favorable percentages in confronting a US joint task force (or coalition) on its own terms, regardless of which service (or nation) has the lead.

However, even with their traditional options reduced, enemies will continue to seek strategic effects and the resultant political advantages—but now they will more frequently emphasize asymmetric contact in the military realm. Asymmetric strategies can be highly effective in many circumstances but especially so when the United States lacks either the

capability or political will (i.e., national interest) to dominate the battle environment outside of major combat (e.g., in phase two or four).[5] Information operations (IO) will likely serve as a principal "weapon system" in this environment. To date, IO has remained largely isolated from the intensity of effort surrounding traditional kinetic weapon systems, thus remaining somewhat underdeveloped for the task at hand. But attempting to target an enemy system using traditional kinetic means when its principal military elements are either invisible or strategically inconsequential can leave the US military frustrated and on unfamiliar terrain.[6] Once again, enter EBO.

Asymmetric warfare is neither new nor an infrequent occurrence in history. Rather, one could more accurately label symmetric war the historical rarity because commanders at all levels have routinely sought timely, if only temporary, advantage over their enemy. Particularly in an environment of approximate parity, finding or creating an asymmetry can promptly change one side's probability of success. The asymmetric advantage could take the form of better training, a new application of some technology, or a clever deception or flanking maneuver that exposes an enemy's vulnerability. Moreover, it could entail very rapid, unanticipated movement or just the opposite: inaction that holds an enemy in place. Whatever the course of action, the relative novelty and worth of the choice largely depend on the unique local circumstances of each engagement; thus, such action falls into the realm of art in war since it is neither inevitable nor likely to be repeatable in detail. Alternately, the predictable nature of science in war informs both sides and therefore has little value in providing a clear advantage among truly peer competitors.[7] No evidence exists to suggest a radical change to these notions—commanders will continue to seek leverage in position, strength, or perception that will make an enemy's success less likely and their own more so. Enter EBO.

Like asymmetric warfare, EBO is not new—at least in practice. Certainly one could discuss the use of a feint or deception to hide one's own action or prompt an enemy action in terms of direct effects and indirect (cascading) effects. Historically, the same holds true in each medium—land, sea, and everything above. Especially above. The Air Corps Tactical School's mantra for precision daylight bombing in World War II emerged from an unwavering belief that the "industrial fabric" of a nation formed the foundation of its war-fighting capability.[8] Attacks on select critical nodes within this fabric could render entire systems useless. Despite the hoopla about ball bearings, postwar findings show that electricity was probably the critical vulnerability in Germany's industrial system.[9] Although this article makes no claim that some EBO conference or doctrine generated the Combined Bomber Offensive, one can clearly detect that an EBO mind-set of sorts has existed throughout airpower's history. Commanders of that day concerned themselves not with individual aiming points but with attacking and collapsing whole sectors of the industrial system that enabled the Axis war machine. This EBO mind-set—that Airmen could simultaneously affect enemy combat power at all levels of war—has generated much of the debate fundamental to airpower's history.

US airpower pioneers, at the time all Army officers, such as Kenneth Walker, Harold George, Laurence Kuter, Haywood Hansell, and Hap Arnold, well understood these notions. The issue was not about the weapon, aircraft, aiming point, or destruction of the target; it was about the effect of that destruction on an enemy's capability and will to wage war. EBO offers an opportunity to reinvigorate the manner in which one analyzes, attacks, and defeats an enemy. In effect, by streamlining the fight to focus on the most direct path to victory, one can improve US joint and coalition capabilities to achieve operational and strategic objectives, making them more effective and efficient. Today's joint force must cultivate this effects mind-set.

What exactly is EBO? Is it strategic, operational, or tactical? Is it a process? Does it fall into the category of art or science? What operations are EBO candidates? The easy answer, of course, is "it depends." But on what? In truth, the concept remains new in the sense that doctrine and formal classes on EBO are

mostly still "handmade," and perhaps that is not a bad thing. EBO should key on the circumstances unique to every engagement, and different circumstances should engender at least consideration of different solutions. Forcing "approved-solution" doctrine into circulation before its time can only stifle the growth in thinking that comes with EBO. The critical first step involves accepting EBO as a mind-set, a way of thinking.[10] It is specifically not a checklist, and those who would attempt to mechanize EBO as such will miss much of the opportunity that it affords. The following five propositions seek to help develop that EBO mind-set and, perhaps, establish some common starting points for accelerating the process into common use.

Proposition One: All Military Operations Should Be Effects-Based

"You know you never defeated us on the battlefield," said the American colonel. The North Vietnamese colonel pondered this remark a moment. "That may be so," he replied, "but it is also irrelevant."

—Col Harry G. Summers Jr. and Colonel Tu, April 1975

EBO is not solely a horizontal process, nor is it solely a strategic, operational, or tactical prerogative. First and foremost, EBO is the vertical glue that ties tactical actions to strategic outcomes. It is a demonstration of cause-effect linkages that validate an individual bomb, sortie, or patrol in terms of effects that contribute to the objectives or conditions described by national-level policy makers in setting the desired end state. If a tactical mission is not connected in this way, it is likely unnecessary and potentially even counterproductive. One must orient all military operations to support the strategic end state—that is to say, the *political* end state as articulated by the various national and international entities that make up the coalition. Thus, EBO is the mechanism by which commanders at all levels can ensure that their mission objectives remain both relevant and effective.

Routinely, the desired strategic end state should dictate both the effects to be achieved and those to be avoided. Understanding intended and unintended effects allows the joint force commander (JFC) to determine the operational and tactical outcomes necessary to achieve the end state while simultaneously constraining the manner in which these tasks can be accomplished.[11] This maximizes efforts toward the political goals while minimizing the potential for wasted or counterproductive efforts, thereby supporting concepts of both unity of effort and economy of force. Further, for the components, EBO provides a means to understand how multiple actions can combine synergistically to produce direct and indirect effects that contribute to accomplishing the JFC's objectives.[12]

Failure to understand the permanent, vital relationship between war and politics can lead to disjointed national means and a military indifferent to the strategic end state. A military strategy that does not lead to or contribute specifically to a political victory is meaningless at best and can sow the seeds for strategic disaster at worst.[13] The potentially harsh consequences of such a condition should be apparent when focus on a tactical end state, operational end state, or war-termination condition becomes isolated from the strategic (i.e., political) end state that these milestones were intended to deliver.

Predoctrine discussion currently embraces terms such as *tactical end state.* This focus is potentially unwise because it can allow and possibly encourage separation between military and political thinking. Harry Summers's famous exchange with a former North Vietnamese enemy, cited in the epigraph above, is relevant.[14] Winning all the tactical battles does not matter if one loses the strategic fight. The military must not lose sight of the political goal by establishing and focusing on end states at subordinate levels. Operational commanders must design campaigns that aggressively and transparently connect military strategies to the political end state.

The potential for separation of military strategy and political end state is not an academic debate. It might appear as "mission creep," or the entire political agenda may change—as happened to the French in Indochina in 1953 and 1954. During the months-long combat at Dien Bien Phu, the French military strategy focused on victory through decisive engagement with the Vietminh. However, the new French government, turning its attention to issues closer to home, had decided to negotiate an end to the conflict in Indochina. It repeatedly signaled this intent through international contacts and the announcement of a conference in Geneva to resolve the Indochina issue. A poll showed public support for the war at 15 percent.[15] Gen Henri Navarre, senior military commander, "never had any illusions about the fragility of France's political will, but now it was explicit . . . and in later years, General Navarre would always argue that it was the government's announcement of the Geneva conference that had sealed the doom of Dien Bien Phu."[16] But the ongoing military strategy, even if it had achieved a "victory," was not necessary for enabling the political choices that had been made.

Proposition Two: EBO Provides a Comprehensive Framework for Coalition Operations

In war it is not always possible to have everything go exactly as one likes. In working with allies, it sometimes happens they develop opinions of their own.

—Winston Churchill

Since the end of the Cold War, the United Nations (UN) has increasingly assumed roles as the arbiter of state-to-state intervention. Although this stance may seem inconsequential to US interests or even troublesome to the less observant, UN participation has had a decidedly positive effect on the size, composition, and will of most coalitions. Although "leads" clearly exist, UN members typically debate conditions in an area of concern to determine specific requirements for multinational action. Ultimately, the UN may pass a resolution that sanctions a particular action, assigns a lead nation or regional organization, or otherwise guides the endeavor. The result is a UN stamp of approval—a heavyweight power in this century.[17] Military and diplomatic officers must consider UN and coalition interests as a critical foundation in planning any operation.

Forming a coalition is fundamentally a diplomatic function, but the military must conduct its campaign in a manner consistent with its unified goals. As Michael Dominguez, former acting secretary of the Air Force, stated in an address at the Air War College, "The future is a future of coalitions."[18] The process for enabling US participation in these coalition efforts should begin with organizing a multinational staff and must persist throughout planning and execution to achieve the cohesion essential for longevity and unity of effort. Maintaining coalition relationships, operational integrity, and the inherent legitimacy of group action—key factors at every level—can prove challenging as each coalition member attempts to shape plans to conform to its specific national interests (see fig.). According to Gen Anthony Zinni, USMC, retired, the US-only approach is no longer adequate for serving US interests: "It takes international authority and not the U.S. stamp on it, because that's not acceptable anymore."[19]

Thomas Donnelly, an analyst at the American Enterprise Institute, observes that "Iraq has been the crucible that has shown us how limited our cold-war alliances were. It took us 50 years to build NATO; the challenge we have now is that we've got to come up with something new."[20] EBO can provide an excellent framework for the type of discussions needed in creating those new coalition-centric environments. One technique, discussed at a Multinational Planning Augmentation Team (MPAT) meeting, for sustaining coalitions and avoiding misunderstandings calls for adopting a planning step for "formulating the course of action" (COA) before actually developing options for each campaign phase.[21] The intent is to ensure that all coalition members fully

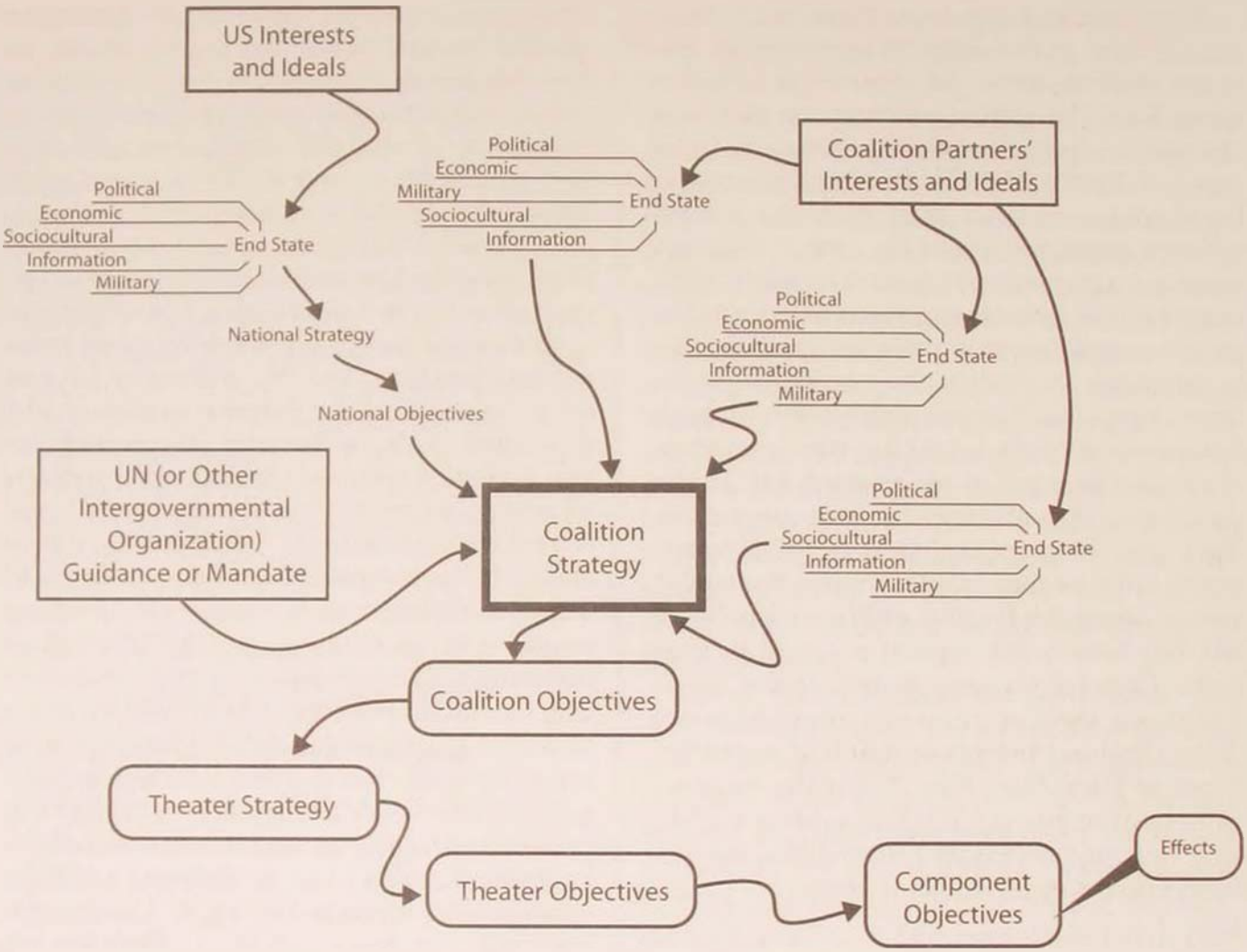


Figure. Coalition end states. From the perspective of individual interests and political risk, interplay of the several collaborating states in a coalition will typically generate a compromise solution.

understand and have input into the JFC's and component's objectives and that the solution appropriately represents each nation's interests. Consequently, each participant has a stake and a voice in the planning process as well as the outcome.

This method may not be the most efficient one in any traditional sense, but it informs planners to a greater degree on how to shape the operational and tactical COAs to meet the coalition end state without unacceptable consequences in other venues. EBO offers an excellent platform for this technique since it clearly focuses the agenda on necessary accomplishments—and consequences to avoid—before developing ways to pursue those accomplishments. Understanding both the objectives and constraints from the earliest possible moments affords coalition commanders the greatest practical flexibility while avoiding actions detrimental to coalition unity and, ultimately, to mission success. By its very nature, effects-centric thinking is critical thinking that encourages the creation of options for the coalition or joint force.

Proposition Three: Intelligence Preparation Is the Critical Foundation of Effects-Based Planning

War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of uncertainty. A sensitive and discriminating judgment is called for; a skilled intelligence to scent out the truth.

—Carl von Clausewitz

Knowledge in combination with critical analysis and thinking enables the sort of anticipation so necessary for EBO. But attaining perfect knowledge in combat is no more likely than finding gasoline for a dollar a gallon at pumps nationwide—the latter could happen, but most drivers would not consider it as their fundamental planning assumption. The impact of this historic perfect-knowledge problem is rapidly accelerating during the post–Cold War, information-centric age of the twenty-first century. Technology and the sole-superpower status of the United States have encouraged planners to view any large, traditionally organized enemy force as a large, traditionally organized target set—perhaps not the most relevant construct in today's environment.[22]

US sovereignty remains a given for the foreseeable future, thereby placing practical limits on the risk and cost that the United States is willing to assume in any endeavor. To remain in concert with administration strategies for constructive postconflict relationships, military operations must be similarly focused. However, this also opens the door for enemies to work at levels or seams well below the conditions that might earn an unconstrained response from the United States. Working to lower levels of contact with the enemy or operating transparently in a public domain can present a different problem set to intelligence professionals who must provide not only supporting data for developing COAs, but also credible, timely progress reports as the operation proceeds. For example, asymmetric force-on-force contact in this environment may encourage small, tactically agile units that can "swarm" for effect and then disappear into obscure terrain, populations, or other sanctuaries. This situation can become a problem in EBO if the supporting intelligence structure and protocols are ponderous (i.e., slow to respond or detect change) or if the organizational focus has remained solely on databases for the large, traditionally organized targets. Adversaries have also increased their use of IO, nonkinetic means, and other forms of coercion—all samples of potentially effective attacks that do not specifically lend themselves to solutions provided by Joint Direct Attack Munitions.[23] The targeting quandary thus becomes much broader than simply identifying the designated (or desired) mean point of impact. In addition to data basing, effects-based intelligence must be capable of adaptive collection-and-analysis techniques to keep pace with increasingly complex engagement zones. Further, for this data to remain relevant, it must be passed to the appropriate operators and acted upon before the enemy system hardens or hides a particular asset or vulnerability. Supporting a shooter's tactical situation awareness can be fundamentally different from supporting a long-term deliberate-planning process; today's intelligence community must be capable of doing both well.

In the abstract, effects are neither good nor bad but simply the consequences of an action. In reality, however, planners need to understand a system well enough not only to recognize effects but also to forecast them. Adding interest to the problem, identical consequences colored by different circumstances may be good at one point and bad at another. To anticipate consequences and enable commanders to take full advantage of effects methods, planners must have a comprehensive and current understanding of the enemy. Further, to achieve maximum value, planning, validating, and measuring effects demand prioritizing and focusing knowledge on the effects sought. If this is not practical, the commander must have an intelligence system that compensates for imperfect knowledge by maintaining a high degree of flexibility and speed of action, enabling the commander to engage

effectively in near-real time on breaking news. This inverse proportion (low perfect knowledge requires high flexibility and responsiveness) can present organizational and doctrinal challenges—but improper balance cedes initiative to the enemy.

As if this were not enough, entire sets of consequences can devolve from an initial EBO action—events simply not foreseen by planners as likely products of their plan. Imperfect knowledge of the enemy system or the temporal nature of many linkages in a multifaceted enemy system can create unanticipated "paths" and thus produce unintended consequences. Some of the latter may in fact have quite favorable effects, but operational commanders generally do not view surprise effects as desirable outcomes. The JFC and supporting intelligence infrastructure must remain flexible enough to adapt campaign strategies to the new conditions that derive from unintended consequences, whether positive or negative.

In the operational environment of the twenty-first century, the nonhierarchical command-and-control structures of nonstate enemies and the lack of significant enemy infrastructure highlight the need for speed in operational planning's decision cycles. Since EBO is sensitive to the quality and timeliness of information, the temporary nature of associations (cause-effect linkages) routinely raises situational awareness to something much higher than a tactical survival or success advantage. Preplanned target databases may simply not prove effective in the twenty-first century's operational environment unless one can identify or associate them with specific triggers that validate their temporal utility. In other words, confirming the vertical linkage to operational and strategic objectives in a rapidly evolving environment requires a focus on anticipating desired effects. Building the necessary picture of the campaign in such a fluid environment demands an invigorated analytical effort.

An example of the degree of sophistication and broad knowledge needed in EBO comes from Operation Allied Force. Airmen often perceive systems warfare as attacks on a unique enemy confederation of interrelated subsystems. But no enemy system is ever truly isolated in the way that reductionists choose to present their case. For example, in Allied Force, air planners targeted a number of bridges to intimidate the enemy and to increase pressure on the Serbian leadership to capitulate. In two instances, "successful" bridge attacks created strongly negative consequences. In the first, a passenger train not intended as a target entered the bridge area just as aircraft bombed the bridge, destroying the train as well. In the second, attacks dropped a Belgrade bridge into the Danube River, effectively blocking its use by Hungary—a landlocked nation and steadfast ally dependent on the river for much of its import/export trade. The failure or inability to anticipate these undesirable effects complicated the military problem and momentarily undermined progress toward the political end state.

Proposition Four: EBO Should Include Specific Mechanisms to Identify, Measure, and Assess Consequences of Each Action Taken

However beautiful the strategy, you should occasionally look at the results.

—Winston Churchill

One principal difference between attrition-based warfare and EBO often lies in the supporting intelligence scheme necessary to validate that the initial action has had the desired effect—that, in fact, the attack on a particular target or target set has created the chain of related effects that culminate in (or contribute to) some higher goal or objective. In the attrition case, a simple image of a destroyed tank may suffice for counting purposes if the assigned task, for example, calls for reducing the number of enemy tanks by 50 percent. Alternately, because EBO is set against desired effects rather than attrition-style metrics, the method for achieving a significant reduction in enemy combat capability *may* focus on other

enemy vulnerabilities: command-and-control sites or links, deception planning aimed at diffusing enemy strengths, fuel quality and availability, or some form of area or resource denial, to name but a few options. An effective IO attack might simply order the tanks away from the specific area of interest. By its very nature, EBO is a coercive construct that allows the JFC to consider a range of alternatives to direct attack. Intelligence requirements for this sort of campaign, however, can be complex.

Just as one must validate the effectiveness of the initial attack—kinetic or nonkinetic—so must one register all subsequent reactions. The armor unit in question above must be monitored throughout the time block of interest to ensure that it does not reengage at some subsequent point. Attrition warfare, while offering fewer sophisticated options at the operational and strategic levels, does have a seductive tactical finality that eases the intelligence question. In the air-superiority fight, one might say the same for destruction of enemy air defenses (DEAD) over suppression of enemy air defenses (SEAD).[24]

For example, if the desired effect at the operational level requires containing a particular enemy surface formation for seven days within the confines of an area bounded by water and four bridges, getting imagery of the four dropped bridges neither completes the mission nor necessarily achieves the effect. Assessment in this instance requires a source of data to confirm that the enemy does not/cannot use some alternate means (e.g., underwater fords, river bridging, ferries, or airlift) to escape the confinement area within the seven-day period. Certainly, attrition remains an option in this scenario, but, again, the "tactical finality" and potential unintended consequences of attrition would preclude this particular unit from ever being available. In this fictional scenario, that result could run counter to a desired political end state in which the enemy would comply with coalition demands but retain capability to defend itself against some regional threat.

If one accepts coalition warfare as the norm for the twenty-first century, one also has to accept that modern coalitions rarely pursue strategies of annihilation against combatant societies and the militaries that support them. Even the US call for regime change in Iraq never carried the implication that war aims included destruction of the society that sustained the former regime. EBO, because of its sensitivity to a defined end state, offers the opportunity for a carefully bounded success—a critical capability in this century. Such a success is fundamentally tied to understanding the enemy system and maintaining the capability to measure the effects of the JFC's actions accurately as each unfolds within that system.

Proposition Five: Military Forces Should Be Specifically Organized and Trained to Conduct EBO

No institution can possibly survive if it needs geniuses or supermen to manage it.

—Peter Drucker

There is little probability that any US service will conduct major operations in the future without forming as a joint force. Moreover, the same could be said about coalitions. Thus, barring some unique conditions, the United States will enter future conflicts and major combat scenarios as part of a joint, combined, or coalition force—most likely a coalition formed of liberal, democratic states. It only makes sense then that one should structure the war-fighting organization to accommodate and exploit both the coalition construct and the advantages inherent in EBO. However, despite the rhetoric of senior Department of Defense and joint officials regarding EBO, this was largely not the case in Operation Iraqi Freedom.[25] EBO existed in many venues—but as a product of personalities more than of structure or doctrine. In truth, one finds very little agreed-upon EBO-related doctrine (beyond establishing EBO as an effective mind-set for conducting a campaign) at either the joint or service level. As a result, in Iraqi Freedom EBO lacked both transparency and persistence as individual personnel

and whole units rotated in or out of the area of operations. Without the framework of doctrine, enforced by appropriate command relationships and organizational structures, initial attempts to implement EBO tended to produce more style than substance. This should not come as a surprise because wholly dissimilar processes in any set of organizations can cause significant friction whenever contact or some form of interaction occurs. For the Air Force, that means EBO can fully work only if it is a joint process accepted by the other services, supported by doctrine, and then implemented within an appropriate organizational structure.

However, such a structure has not seen much coordinated development. In predoctrine EBO pamphlets, Joint Forces Command (JFCOM) has discussed this challenge, using its joint-doctrine series, but there is still no validated working model on which to base change. Commenting on EBO integration with the current system, JFCOM states that "effects-based processes to date—particularly planning activities—are based on (and in some cases additive to) current joint planning procedures."[26] This sort of strap-on approach to legacy planning elements ensures a bias against achieving the full measure of this concept. Additionally, it can encourage a business-as-usual attitude within the joint community, using a thin coating of EBO jargon to give it that luster of newness. Is it any wonder that many people do not see EBO as anything different?

The answer is not to throw everything out and start over, but to create a model for evolutionary change that focuses joint and service organizations on a more efficient use of scarce resources, perhaps at the component level or in some matrixed core element specialized for joint planning. The effects mind-set itself could serve as the starting point for finding such an appropriate organizational structure. The line of attack could prove as simple as using EBO as an organizing construct rather than a targeting construct. The logical follow-on step would then be an effects-centric training template appropriate to each tasked organization.

Summary

The ultimate substance of enemy strength must be traced back to the fewest possible sources, and ideally to one alone.

—Carl von Clausewitz

First and foremost, EBO is a mind-set—and that mind-set should be inherent in all military operations (Proposition One). It is a way of thinking that pushes planners to identify and exploit direct or cascading links between the activities, persons, and infrastructure that can be affected and those activities, persons, and infrastructure that must be affected in order to achieve the stated political goals of the operation. By focusing on these links, planners ensure that daily tactical actions vertically integrate with and support both the operational objectives and strategic end state. Operating in this manner supports unity-of-effort and economy-of-force initiatives. EBO provides for synchronization of multiple actions to achieve a desired effect, and it encourages constraint in the application of power that could be wasteful or counterproductive. EBO does not guarantee success any more than do the principles of war. But EBO does offer a framework for efficient planning and assessment since it focuses planners on output more than on process or input (i.e., it alters a planner's focus from alternatives [weapon systems] to objectives [desired effects]) (Proposition Two). In today's dynamic environment, this is a good change.

> Perhaps the most important feature of EBO is that it offers an organizing construct and a planning approach that allows operational commanders to communicate to subordinate commanders how best to achieve operational and strategic objectives. That is, EBO provides the language for activating operational capabilities at the joint and coalition level. This is what distinguishes it from strategy-to-task-type planning because strategy-to-task ultimately produces a targeting solution while EBO produces a coordinated joint and combined campaign.[27]

Intelligence preparation is the cornerstone of EBO (Proposition Three). Databases should include kinetic and nonkinetic strengths and

vulnerabilities of enemy systems as well as those strengths and weaknesses within the human dynamic of the enemy system. The more complete and accurate the data, the greater the flexibility that joint or coalition commanders will have in constructing their courses of action. If preplanned operations from mature databases prove ineffective in a changed or changing environment, then the intelligence apparatus must be flexible and responsive enough to enable near-real-time exploitation of emerging opportunities. Further, the intelligence system must be able to observe and report progress in a timely fashion in order to affect ongoing and future operations. Assessment must begin with initial planning and continue until one can observe and validate the final desired effect (Proposition Four). Measuring effects requires tailoring specific collection capabilities to specific execution tasks in much the same way that kinetic targeting requires matching weapon systems to targets. For example, dropping a bridge span may require collection-and-assessment tasks far beyond a single image.

It is a well-known standard that military forces should train as they will fight. The same is true for effects-centric organizations and processes—forces must be team-trained if they are to reach their fullest potential during actual operations (Proposition Five). This most especially includes coalition warfare and EBO. EBO can offer a scientific approach to coalition engagements that both opens the planner's perspective to the wide-angle view of a coalition and streamlines the path to victory by specifying the en route conditions necessary for winning. This has the collateral effect of focusing efforts on the common ground that supported formation of the coalition while constraining those efforts that might lead to its undoing.

EBO is simple but not easy. It offers a process by which the JFC can ensure the continued relevance of his or her campaign to the changing political environment that surrounds warfare in this century. Further, it encourages leaders at all levels to avoid a focus or overreliance on first-order or direct effects, which can ultimately push the campaign to tactical, attrition-based operations and thus obviate the value of EBO. Metrics such as hours flown, bombs dropped, number of targets destroyed, and enemies killed by air generally reflect measurements about fighting, but they serve no useful purpose in reporting progress toward the strategic end state. For EBO planners, though, the end state and progress toward it should be clear since they benefit from a campaign-based integrating mechanism that identifies the desired effects linked to operational and strategic objectives, assigns those effects to joint or coalition components based on service or national capabilities, and then assesses the degree to which campaign actions achieve or contribute to the stated objectives and end states. Enter EBO. ❑

Notes

1. For additional discussion, see Alan Beyerchen, "Clausewitz, Nonlinearity and the Unpredictability of War," *International Security* 17, no. 3 (Winter 1992): 59–90.

2. "Everything is very simple in war, but the simplest thing is difficult. These difficulties accumulate and produce a friction, which no man can imagine exactly who has not seen war." Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 119–21.

3. "Fog" is a useful metaphor for describing factors outside a commander's finite grasp. Using the term illustratively, Clausewitz explains that commanders must operate without full and perfect knowledge of the enemy or the environment. For a contrary view on the origins and utility of this concept, see Eugenia C. Kiesling, "*On War* without the Fog," *Combined Arms Center Military Review*, September–October 2001, http://usacac.leavenworth.army.mil/CAC/milreview/English/SepOct01/keisling.htm.

4. For a discussion of American preferences for strategies of annihilation, see Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (New York: Macmillan, 1973).

5. The military term *asymmetric warfare* describes warfare featuring two belligerents mismatched in their military capabilities or their accustomed methods of engagement. "Asymmetric Warfare," *Wikipedia: The Free Encyclopedia*, http://en.wikipedia.org/wiki/Asymmetric_warfare. Writers are updating US joint-doctrine publications to reflect operational planning in six phases: phase zero: shape; phase one: deter; phase two: seize the initiative; phase three: dominate; phase four: stabilize; and phase five: enable civil authority.

6. For a discussion of the interaction of airpower and asymmetric strategies, see Maj Anthony Christopher Cain et al., "Stopping U.S. Air Power," Research Paper (Maxwell AFB, AL: Air Command and Staff College, May 1995).

7. In this article, the term *science* refers to a methodical or scientific approach or process; it does not refer to the science of a new technology that might result in a new capability or otherwise improved military strength.

8. For a clear explanation of how the Air Corps Tactical School's industrial-web theory evolved and played out against Germany and Japan, see Haywood S. Hansell Jr., *The Air Plan That Defeated Hitler* (Atlanta: Higgins-McArthur/Longino and Porter, 1972).

9. Dr. Joseph Strange of the US Marine Corps War College developed a center-of-gravity analysis model based on identifying the critical capabilities, requirements, and vulnerabilities of each center of gravity. For a discussion of the model and its use in today's environment, see Col Dale C. Eikmeier, USA, "Center of Gravity Analysis," *Military Review*, July–August 2004, 2–5, http://www.au.af.mil/au/awc/awcgate/milreview/eikmeier.pdf. See Air War Plans Division—Plan 1 (AWPD-1) for the finding about electricity. Operational commanders, however, made the decision to lower the priority of electricity, based on poor assumptions regarding Germany's ability to reconstitute or shift electrical power.

10. Brig Gen David A. Deptula, "Effects-Based Operations: Change in the Nature of Warfare" (presentation, National Press Club, 22 April 2001).

11. For example, establishing restricted airspace such as a buffer zone to avoid triggering participation by a third-party nation.

12. From discussions with Maj Gen Robert J. Elder, commandant of the Air War College and formerly the D/JFACC of US Central Command. Printed with permission.

13. For additional discussion on assessing strategy, see Philip A. Crowl, *The Strategist's Short Catechism: Six Questions without Answers*, Harmon Memorial Lectures in Military History no. 20 (Colorado Springs, CO: US Air Force Academy, 1977).

14. For an excellent summary of issues in this conflict, see Jeffrey Record, "Vietnam in Retrospect: Could We Have Won?" *Parameters*, Winter 1996–97, 51–65, http://carlisle-www.army.mil/usawc/Parameters/96winter/record.htm. According to Record, "The United States, to repeat, was not militarily beaten in Vietnam. Indeed, by 1973 the United States and its South Vietnamese ally had stalemated the North Vietnamese conventional military threat and were decisively defeating the indigenous southern insurgent component of the communist threat."

15. Martin Windrow, *The Last Valley: Dien Bien Phu and the French Defeat in Vietnam* (Cambridge, MA: Da Capo Press, 2004), 206.

16. Ibid., 290.

17. Based on the authors' discussions with representatives from over 40 nations over the last three years, a UN resolution supporting military action is—or will likely become—the "norm" for most nations to participate in military coalitions involving a hostile environment. The exception would be self-defense—in NATO parlance, a chapter 5 action.

18. Michael L. Dominguez, acting secretary of the Air Force (presentation, Air War College, Maxwell AFB, AL, 27 May 2005). Printed with permission.

19. Gen Anthony Zinni, USMC, retired (remarks, Center for Defense Information Board of Directors dinner, Washington, DC, 12 May 2004), Center for Defense Information, http://www.cdi.org/friendlyversion/printversion.cfm?documentID=2208&from_page=../program/document.cfm.

20. Mark Sappenfield, "US Allies in Iraq: Valuable but Dwindling," *Christian Science Monitor*, 4 January 2006, 1.

21. "The [MPAT] Program is a cooperative multinational effort to facilitate the rapid and effective establishment and/or augmentation of a multinational task force headquarters. The MPAT provides responsive coalition/combined expertise in crisis action planning." MPAT/GPOI Multinational Planning Augmentation Team, http://www2.apan-info.net/mpat. MPAT was an early and key contributor to relief efforts following the tsunami of December 2004.

22. For additional discussion, see Col Phillip S. Meilinger, "Ten Propositions Regarding Airpower," *Airpower Journal* 10, no. 1 (Spring 1996): 50, 52–72, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj96/spr96/meil.pdf. His proposition number four reads, "In essence, airpower is targeting; targeting is intelligence; and intelligence is analyzing the effects of air operations" (53).

23. The Joint Direct Attack Munition is a guidance tail kit that converts existing, unguided free-fall bombs into accurate, adverse-weather "smart" munitions.

24. In some ways, SEAD delivers initiative in combat to the enemy, whereas DEAD permanently removes a particular component from the enemy system.

25. Observations of the authors during research and interviews, both stateside and in the area of operations.

26. Joint Warfighting Center (JWFC) Pamphlet 7, *Operational Implications of Effects-Based Operations*, 17 November 2004, 21, http://www.dtic.mil/doctrine/jel/other_pubs/jwfcpam7.pdf.

27. From discussions with Dr. Chris Cain, a retired USAF colonel and dean of research at Air Command and Staff College, Maxwell AFB, AL. Printed with permission.

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 can draw their own conclusions or join the intellectual battlespace. Please send comments to aspj@maxwell.af.mil.*

Editor's Note: Colonel Carey and Colonel Read circulated drafts of their article "Five Propositions Regarding Effects-Based Operations" to noted military experts. Both authors thought that ASPJ *readers would be interested in seeing the comments below.*

Overpromising and Underestimating

A Response to "Five Propositions Regarding Effects-Based Operations"

Lt Col J. P. Hunerwadel, USAF, Retired

DO NOT LET the title of this article fool you: Col Steven Carey and Col Robyn Read have added a sterling contribution to the professional literature on effects-based operations (EBO). The opening paragraphs alone offer one of the best, most concise statements of the difference between art and science in warfare—and between fog and friction—that I have ever read. The authors are also quite right to say that the worst shortfall in EBO today lies in the "ad hocracy" (64) that has prevailed in the development of concepts and doctrine over the last decade, which until lately has inhibited the usefulness of effects-based thinking to war fighters.

Really, the title is as much a ploy to catch the reader's eye as it is an objection based on content. That stated, I do believe that "Five Propositions" promises more than EBO can currently deliver and underestimates the degree to which existing processes and force structures *are* effects-based already, overstating the degree of confusion and disarray within the community of individuals who are developing effects-based concepts. Let me explain.

In several places, "Five Propositions" makes statements like "EBO *provides* a coherent mechanism for addressing both art and science in war" (64) (emphasis added). Proposition two states that "EBO *provides* a comprehensive framework for coalition operations" (67) (emphasis added). In point of fact, EBO holds considerable potential to do just these things. Simply instilling broad, effects-based principles, as their article offers, encourages creation

of more specific applications that will help war fighters below the level of the joint force commander employ these principles in planning, executing, and assessing operations. However, to imply, as the article does, that EBO offers robust methodologies *today* contradicts one of the basic points of their article (and of mine): that EBO has lacked definitional clarity, has been misrepresented in many joint and service venues (especially by US Joint Forces Command [JFCOM], but that is another article), and has been represented in some venues as all things to all people at all times. Saying that a construct is intellectually useful and saying that it provides "a robust methodology" (as earlier versions of "Five Propositions" did and as some people in JFCOM now claim it does) are very different things. For example, the joint-estimate/military decision-making process that is being elevated to the military's overarching planning model in the latest revision of Joint Publication 5-0, *Doctrine for Planning Joint Operations*, 13 April 1995, is already usefully effects-based in one very crucial respect: it forces planners to adapt iteratively to likely enemy courses of action by virtue of the way it is structured. It does not by itself, however, provide a robust effects-based methodology just because of this.

A robust methodology in the mathematical or more general scientific sense—one that will work repeatedly in many different planning environments, regardless of system stresses—would improve upon existing methods to offer effects-based insights at every step. It would do so in a manner that would allow tailoring and scaling without becoming too complicated for users at the tactical or low operational levels but would accommodate planning up to and including the integration of all instruments of national power at the strategic level. The Air Warfare Center at Nellis AFB, Nevada, and the 505th Command and Control Wing at Hurlburt Field, Florida, are working now on just such methodologies, and they will undergo testing in upcoming joint experiments as well as in the field, but they have not yet been implemented.

Automated tools that support effects-based decision making have also promised much but delivered little. Some people involved in creating such tools have seemed to promise a cybernetic deus ex machina that will take all relevant data and produce "the answer" for commanders—a patent impossibility but one that appeals to the linearly and deterministically minded. Thus far, the tools community has yet to produce an automated strategy-and-decision aid that fully supports the existing estimate process, much less any EBO-related elaboration of it. All of the tools this author has examined (most of those offered, from the now-ancient Joint Force Air Component Commander Planning Tool onward) are cranky, brittle, and incapable of integration or collaboration with other tools (many of them similarly cranky) that run related processes within air and space operations centers. And we are dealing now only with the planning aspect of EBO: the problems inherent in tool integration may grow exponentially when we try to implement a truly "streaming" air tasking process, integrate collaborative tools across the

entire joint force (and/or with federated or coalition analysis organizations), and incorporate assessment measures in appropriate and robust ways.

"Five Propositions" also offers more than may be deliverable in the realm of coalition operations, stating that "the United Nations (UN) has increasingly assumed roles as the arbiter of state-to-state intervention" (67) and trying to demonstrate how effects-based thinking should influence coalition operations by giving all coalition partners "a stake and a voice in the planning process" (68). First of all, the authors' statements regarding the UN are highly questionable. The last decade's history seems to me to show a diminishment of the UN's role as arbiter among nations, not an increase. Its credibility has been damaged by scandal, bureaucratic inertia, and pure incompetence during numerous humanitarian crises, from Somalia in 1993; through standing mute witness to the genocide in Rwanda; through tsunami and earthquake relief that it handled poorly, save for US and Australian contributions; to current—as yet unsuccessful—attempts to stop the genocide in the Darfur region of Sudan. Despite the best efforts of the current US administration to force it to become relevant and engaged regarding crucial international disputes (such as Iraq), the UN remains resolutely hostile to the US worldview and interests, and its intransigence has forced the United States into increasing reliance on unilateral action, the forming of ad hoc coalitions of the willing, and a rise in the global military presence of the "Anglosphere."[1] If any aspect of the UN's current functioning is a model for the practice of EBO, no wonder some services ardently and emotionally reject it.[2]

Second, it is not clear that subjecting the planning process to veto by committee in any way improves it. Committees can be fine tools if one already has a course of action in mind and is simply trying to obtain multilateral buy-in for it. By and large, however, they are a hindrance—not a help—to military operations (precisely the reason that military organizations have commanders rather than committees running them). To say that encouraging international committee-forming is one of the integral elements of effects-based thinking is, once again, to risk seeing EBO rejected out of hand by the world's (overwhelmingly Anglospheric) war fighters.

Fortunately, this overpromising based on internationalist wishful thinking does not reflect any part of EBO's fundamental nature. It certainly *can* facilitate consideration of coalition options but does not require coalition participation. One can still employ effects-based thinking down to the tactical level solely within the realm of the military instrument of power. It should encourage consideration of all actors within the operational environment, even at the tactical level, but does not require coalition buy-in. For example, whether a platoon sergeant allows members of his or her unit to shoot into a religious shrine from which they are receiving fire may have profound consequences upon the ultimate cultural-political end state in a conflict and thus may require the attention of higher-level commanders (not to mention planners and commanders responsible for rules of engagement). At the platoon level, however, a committee's buy-in would be worse than

useless. Among other things, robustness implies useful scalability: it must work as seamlessly as possible up and down the chain and add higher-level considerations or processes where and when they are most needed. Again, we're not there yet with an effects-based approach to coalition operations.

As mentioned earlier, "Five Propositions" also errs in underestimating the degree to which existing programs and processes are already effects-based. Proposition five states that "military forces should be specifically organized and trained to conduct EBO" (71), maintaining that joint forces failed to conduct true EBO during Operation Iraqi Freedom and other operations because they lacked a coherent conception of what EBO is and how to implement it. The authors object to tacking on effects-based principles or techniques to existing processes: "this . . . strap-on approach to legacy planning elements ensures a bias against achieving the full measure of this concept. Additionally, it can encourage a business-as-usual attitude within the joint community, using a thin coating of EBO jargon to give it that luster of newness. Is it any wonder that many people do not see EBO as anything different?" (72)

Well, no, since in many ways EBO is no different from the way we've done business for quite a while, as the authors themselves point out toward the beginning of the article. Ardent advocates of a new idea typically overstate its newness and emphasize how it differs from the run of the mill. Indeed, some people in the effects-based community have done precisely what Colonel Read and Colonel Carey warn against: adding the word *effects* to an existing process and thus calling it effects-based. Doing so is wrong, but so is overlooking those aspects of current processes that *are* fundamentally effects-based. I mentioned one earlier: the war-gaming and course-of-analysis comparison steps of the current joint-estimate process force a partial effects-based approach upon planners. The entire structure is not inherently effects-based; one of its major failings is that it does not require planners to choose means to evaluate plan success—to choose assessment measures. It should explicitly include an assessment stage and should emphasize that this must start with initial planning efforts. Likewise, the existing air tasking and targeting processes *do* contain steps that call for assessment, making them at least partially effects-based according to the principles established in "Five Propositions." The fact that they are not as "EBOish" as they could be, however, does not invalidate them as processes, nor does it provide a justification for throwing the baby out with the bathwater. Such a desire to reinvent the wheel is another common tendency among innovators, but it inevitably creates resistance and friction. This can be a good thing if the process or thing to be replaced is fundamentally flawed and must be entirely overthrown. However, if the processes are just incomplete, it is better to subvert and co-opt them precisely by adding or changing a bit at a time, as necessary robust improvements become available.

The development of airpower theory is instructive here. Some visionaries realized something of airpower's full potential early on, but the lack of technology limited its applicability and led to overzealous promises, which hurt

airpower's credibility and prevented it in some cases from functioning as usefully as it could have as part of the military instrument of power. Overpromising also led to open hostility on the part of some members of the surface forces who developed maneuver-warfare theory, which represents in three dimensions (two horizontal and time) what fully realized airpower theory is in four (two horizontal, the vertical, and time).[3] These two communities could and should have worked together—if they had, we might today have a more robust conception of EBO with buy-in from all the services.

As it is, many of the processes and organizations within US joint forces are effects-based or operate according to EBO principles now. It should be possible to incorporate effects-based insights in other areas without fundamentally changing the way we do business. US Air Force Air Combat Command sponsors an EBO integrated process team (IPT), which includes members from all the combatant commands as well as the Air Staff; the team works with many organizations to develop a consistent and coherent basis on which to build effects-based applications. For example, it helps ensure that the tools now being built as decision aids for planning and assessment are consistent with emerging doctrine and terminology on EBO. This represents a considerable improvement over past methods of tool development. Furthermore, an assessment task force sponsored by the Air Staff Operations Directorate works closely with the EBO IPT (and has many members in common), which is developing supportable and consistent assessment methods and is monitoring tool development as well. All of them work with the Air Force Experimentation Office to ensure that experiments and war games use and evaluate the tools and techniques that are developed.

The authors of "Five Propositions" have been somewhat isolated from efforts to improve and advance effects-based thinking outside the academic realm. This unfortunate situation needs rectifying because they rightly see the biggest danger looming on the horizon: "Forcing 'approved-solution' doctrine into circulation before its time can only stifle the growth in thinking that comes with EBO" (66). Indeed, an "approved solution" is forming that threatens just such an end. JFCOM is working on a conception of an effects-based approach to operations that is immature and misguided in several respects. The limitations of JFCOM's approach lie beyond the scope of this article, but in terms of overpromising, the command goes far beyond anything Colonel Carey and Colonel Read boast of. This has led to significant and understandable resistance from services and combatant commands that do not have the depth and breadth of practical experience the Air Force has in conducting EBO. Because the Air Force has the most experience, it has the best shot at getting EBO right, and because it does, the Air Force owes it to the entire joint force to promise only what EBO can deliver, to advance it intelligently as new techniques and tools become available, and to refrain from reinventing the wheel when it isn't necessary. ❑

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Notes

1. Novelist Neal Stephenson coined the term *Anglosphere*, which refers to the community of nations that share not only the English language, but also the cultural heritage of liberty under the rule of law, honoring democratic forms of government, capitalism, individualism, willing delay of gratification, and adhering to covenants and contracts regardless of clan or community ties. See "Neal Stephenson," *Wikepedia: The Free Encyclopedia*, http://en.wikipedia.org/wiki/Neal_Stephenson (accessed 21 December 2005); James C. Bennett, *An Anglosphere Primer*, 2002, http://www.pattern.com/bennettj-anglosphereprimer.html (accessed 20 December 2005); and "Anglosphere," *Wikepedia: The Free Encyclopedia*, http://en.wikipedia.org/wiki/Anglosphere. In keeping with the spirit of the phrase's author, the Anglosphere is as much a global, virtual, distributed network joined by certain cultural and political ideas as it is a description of geographic or ethnic enclaves. For instance, Hong Kong and India may be part of it, while Quebec and Eire may not.

2. Most recently, for example, see Lt Gen Paul K. Van Riper, USMC, retired, *Planning for and Applying Military Force: An Examination of Terms* (Washington, DC: Hicks & Associates, Inc., 2005).

3. See, for example, ibid.; and works of great minds like Brig Gen Huba Wass de Czege, USA, retired.

Defining the "Precision Weapon" in Effects-Based Terms

MAJ JACK SINE, USAF*

Editorial Abstract: According to Major Sine, as technology evolves, war fighters and planners need to expand the concept of weapons effects beyond merely destructive results and develop an inclusive definition of precision weapons tailored to effects-based operations. He proposes a definition that focuses specifically on the preciseness of the weapon's effect rather than on the meaning of "precision" as it relates to the accuracy of a weapon's guidance system.

DURING A RECENT Pentagon discussion of weapons programs and future requirements, an Air Force flag officer asked for clarification of the term *precision weapon*: "Is precision three-meter accuracy, or ten-meter, . . . or is that accurate?" The question initiated a long debate that was never resolved but did draw attention, not only to the confusion generated by the current use of the term, but also its inadequacy in light of emerging technologies.

Today conventional wisdom considers a weapon "precise" if it possesses the capability to guide to a specific aim point. However, as technology evolves the concept of weapons effects beyond merely destructive results, war fighters and planners require a more inclusive definition tailored to effects-based operations

*I would like to acknowledge the contributions of all the members of AF/XORW, Air Staff Weapons Requirements, for their assistance in developing this definition. In particular, guidance and input from Mr. Dave Detore were invaluable in providing coherence to this definition in the context of the future of USAF weapons.

(EBO). A doctrinal definition for precision weapons must be applicable to the wide range of force-application capabilities available today and in the future. In addition, the preciseness of the weapon must be calculated considering all variables associated with weapons employment, including navigation accuracy, weapons effects, undesired effects, and potential unintended effects.

This article proposes that a *precision weapon* be defined as a tactical capability providing measurable and quantifiable first-order effects and minimal unintended or undesirable effects. The intent is to focus specifically on the preciseness of the effect the weapon achieves and not the precision that relates to its guidance-system accuracy. This article will not explore the more abstract concepts of precision engagement and precision attack.

Defining the Problem

Historically, weapons employment tied bomb quantities to target destruction. During World War II, airmen applied the term *precision* to weapons aimed with the Norden bombsight. In 1943 this definition of precision equated to a circular error probable (CEP) of approximately 1,000 meters, which required more than 1,500 sorties and 9,000 bombs to achieve a single objective.[1]

Currently, the USAF Weapons School focuses its definition of precision on the accuracy of the guidance system by teaching that a *precision weapon* impacts within a three-meter CEP as compared to an *accurate weapon*, which hits within a 10-meter CEP.[2] These are not, however, official USAF definitions. Rather, the Joint Direct Attack Munition (JDAM) operational requirements document coined these terms for its two JDAM guidance-kit variants. It stated that the "results of the Precision Strike Capability/JDAM PIP [Performance Incentive Program] Accuracy Requirements Study, 15 November 1994, support the 3 meter and 13 meter CEP for the *precision* and *accurate* guidance kits, respectively" (emphasis added).[3] Although originally stated as a 13-meter CEP, *accurate* has acquired a more nominal 10-meter CEP in its usage at the weapons school.

However, associating precision with guidance accuracy addresses only one aspect of weapons targeting and employment. After Operation Desert Storm, airpower advocates trumpeted the evolution of weapons technology that could produce a one-to-one ratio of bombs dropped to targets destroyed. The relationship of precision-guided munitions (PGM) to operational planning implied precision in terms of economy of force. In simple terms, a precision-guided weapon provided more than just destructive results; it ensured a tactical effect with just one or two weapons.

New weapons used later in Bosnia, Afghanistan, and Iraq, however, produced effects that went well beyond the one-to-one target-to-bomb ratio. The Air Force used several weapons without terminal guidance that produced precise effects. For example, a carbon-fiber munition used in Bosnia accomplished exact, desired effects and little collateral damage without any form of self-guidance.[4] Likewise, six unguided, sensor-fused weapons released multiple precisely fused submunitions in Operation Iraqi Freedom that killed 45 vehicles.[5] These cases demonstrate the limitations of relating precision to either guidance accuracy or target-to-bomb ratios.

As the concept of EBO matures, destructive effects become just one of many potential weapons effects. Directed-energy, nonlethal weapons, and even virtual-world weapons such as computer viruses open the aperture of weapons effects. In light of these rapidly advancing technologies, we must provide the term *precision weapon* with a consistent definition that will be relevant and accurate as weapons continue to evolve.

Effects and Precision

The Gulf War ushered in a new paradigm for the application of airpower: operational planners targeted the key nodes of a system to achieve desired objectives rather than target an entire system for destruction. For example, in targeting the Iraqi Integrated Air Defense

System (IADS), planners designated desired mean points of impact (DMPI) that, when struck, would disable the command and control functions of the sector operations centers (SOC). As a result, war fighters met the operational objective of disabling the sector IADS without having to destroy an entire SOC. The planners were able to reduce from eight to two the number of 2,000-pound PGMs directed at each SOC on the first night of the war. Not only did this achieve the desired effect, but it released an enormous amount of firepower to concentrate on other critical systems.[6]

Air Force Doctrine Document (AFDD) 1 defines this as effects-based operations, "actions taken against enemy systems designed to achieve specific effects that contribute directly to desired military and political outcomes."[7] More specifically, "Effects-based actions or operations are those designed to produce distinct, desired effects while avoiding unintended or undesired effects."[8] Through EBO, Gulf War planners endeavored to accomplish multiple high-level results: create the effect of mass through precise application of force, economize force through a reduction of required sorties per objective, and reduce unintended and undesired effects.

Effects, rather than destruction, have become the template for war planning. Col Timothy Sakulich, in his paper *Precision Engagement at the Strategic Level of War*, describes four classes of effects outlined in the Institute for Defense Analysis' Joint Advanced Warfighting Project (JAWP): desired effects on enemy capabilities, desired effects on enemy assessments and actions, undesired effects, and unexpected effects.[9]

Desired effects on enemy capabilities equates to the obvious, intended effect. In their article "Dominant Effects: Effects-Based Joint Operations," Edward Mann, Gary Endersby, and Tom Searle break this definition out further into direct effects, or first-order effects, and indirect effects, or second-order and third-order effects. Desired, direct effects are measurable and tend to be obvious immediately, such as destroying a power generator. Desired, indirect effects occur through a linked system of cause and effect, such as disabling water pumps and purifiers by destroying the supporting power generator.[10] *Desired effects on enemy assessments and actions* refers to second- and third-order effects on the enemy's decision-making process. For example, repeated attacks against operating power plants in Baghdad led power-plant managers to shut down operating generators to avoid further attack.[11] These effects do not necessarily occur through a formal, structured system and may or may not be measurable or predictable. *Undesired effects* equate to collateral damage and may be first-, second-, or third-order effects directly or indirectly related to the desired effect. *Unexpected effects* may be first-, second-, or third-order effects related to the desired effect but not predicted in relation to the desired effect. For example, Desert Storm critics attributed 40,000–100,000 civilian deaths to water-supply interruptions caused by destruction of Iraqi electrical production.[12] These deaths were both undesired and unexpected.

Weapons employment produces first-order effects and relies on a system of cause and effect for second- and third-order effects. Target development includes responsibility for ensuring second- and third-order effects by determining enemy-system characteristics and targeting appropriate points within the system to achieve desired effects. Therefore, the target developer becomes responsible for predicting desired and undesirable effects associated with a given weapon-target pairing as well as reducing unexpected effects as much as possible. This describes EBO in accordance with AFDD 1: "EBO requires airmen to think through the full range of outcomes, choose those that will best achieve objectives, and find ways to mitigate those that will impede achieving them."[13]

Collateral damage plays a significant role in this process. Protocol I of the Geneva conventions directs forces to "refrain from deciding to launch any attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civil objects, or a combination there of, which would be excessive in relation to the concrete and direct military advantage anticipated."[14] While there is much

room for interpretation in the protocol, it essentially ties, or at least shares, the responsibility for unintended or undesired effects to the attacking force.

Michael Lewis offers his personal account as a USAF judge advocate general (JAG) scrubbing target lists during Desert Storm to ensure coalition compliance with the laws of armed conflict. He describes a "proportionality analysis" performed for each target that accounted for "accuracy of weapons, the aim[ing] points that had been selected by the aircrew, the proximity of civilians, and the military value of the target."[15] Precision-guided weapons simplified this analysis by producing more predictable results: "Individual [command, control, communications, and logistics] set attacks might be judged, in retrospect, to have failed the proportionality test, particularly where no precision-guided munitions were used against high civilian targets that were not time critical."[16] For Lewis, PGMs produced a predictable and measurable effect, which facilitated targeting and alleviated legal and operational concerns by producing consistent, predictable, first-order effects and minimizing undesired effects.

Undesired effects play an increasingly critical role in war planning. Desert Storm analysts coined the phrase "CNN effect" to describe the sometimes disproportionate degree of attention given to undesired or unexpected effects. In their article "The Evolving Battlefield," John Foster and Larry Welch state that "every incident of unintended destruction against noncombatants became an object of press, public, and political attention."[17] The CNN effect not only highlighted undesired effects but arguably added second- and third-order undesired effects that would not have existed otherwise.

The CNN effect forced mission planners to understand enemy-system characteristics to anticipate and minimize the undesired effects or risk having those undesired effects magnified by near-real-time media coverage. Precision weapons, of whatever type, provide planners the ability to predict second- and third-order effects more reliably while reducing undesired and unexpected effects.

Analysis performed by JAGs in combat as a part of the targeting process highlights the influence of scenario on weapons employment. During Operation Allied Force in Kosovo, pilots often had difficulty identifying vehicles on the ground as enemy or noncombatant. The issue had become so serious and sensitive that coalition participants involved in the targeting process vetoed missions for collateral-damage concerns. Gen Wesley Clark commented, "We needed to know what was inside of the trucks. When we couldn't find out, we stopped bombing trucks."[18] The weapons available could not achieve desired tactical objectives without an unacceptable level of collateral-damage risk—killing civilians and/or destroying their vehicles. Interdiction efforts against enemy truck supply were then further restricted by severe rules of engagement because of the lack of intelligence and lack of weapons precise enough to produce the effect without a corresponding unacceptable risk.

One argument contends that the coalition forces had kinetic-kill PGMs available but that intelligence was not sufficient to employ the weapons without risking undesired effects. However, in the fog and friction of war, users often lack the fidelity of intelligence required for the available weapons. If, on the other hand, the coalition had possessed a precision weapon capable of incapacitating a truck without injuring personnel inside or in the vicinity of the truck, planners would have been able to continue the interdiction campaign. For example, a nonlethal weapon, such as an electromagnetic pulse weapon, might have been capable of producing the tactical effect without the undesired effects associated with explosive weapons. In this scenario, the operational effectiveness of a laser-guided bomb (LGB) approaches zero, since rules of engagement generally did not allow operators to employ it. A nonlethal weapon, on the other hand, might have provided war fighters with the capability to meet their tactical objectives without risking undesired effects.

What Do Precision Weapons Deliver?

How does a tactical-level planner determine the most precise weapons for employment in the EBO construct? Based on the current use of the term *precision weapon*, war fighters make a comparison of guidance accuracies—the weapon with the smallest CEP is considered to be the most precise. In that discussion the term *PGM* is more appropriate because that acronym points to the attribute that is being described as precise—weapon-guidance capability. As in the interdiction efforts of Allied Force described above, LGBs and other PGMs may rightly be viewed as imprecise weapons.

Gen Ronald Fogleman, former USAF chief of staff, observed, "It is easy to quantify the effects of air power at the tactical level; for example, how many trucks and how many tanks are destroyed. These are results we can measure and compare with results from other weapons."[19] So at the tactical level, a more precisely guided munition possesses the attribute of being more likely to accomplish the tactical objective than a less precise weapon. One metric for determining the preciseness of a weapon is the number of tanks and trucks destroyed per weapon.

However, collateral damage affects the assessment of precision as well. During Desert Storm, tactical planners used PGMs to attack the Al Firdos bunker in Baghdad. Planners set a tactical objective of neutralizing the command and control functions that had moved into the facility. Unbeknownst to intelligence, JAG, or planning personnel, the Iraqi military members working in the bunker moved their families into the facility as well. The weapons employed achieved the tactical, first-order effect as planned. However, the first-order undesired effect was staggering: women and children killed by the same bombs.[20] Had it been known that civilians were present deep inside the bunker, the tactical planners may not have chosen to use those precision-guided bunker penetrators for their attack, or the JAG may have recommended against the bunker attack altogether so as not to put the civilians at risk.

In this case, precision-guided weapons produced direct, desired effects as planned but did not offer enough *precision* to prevent civilian deaths. Again, critics may attribute unexpected effects to deficient intelligence. However, had a weapon been available to isolate the command and control functions from the battlefield without damaging or lethal effects, intelligence on potential undesired effects would not have been necessary.

Undesired effects reduce the precision of a weapon by reducing the overall tactical effectiveness. A 500-pound, laser-guided weapon may be considered precise against a static artillery piece sitting in the open desert—it has a high probability of killing the target, eliminating the possibility of its future use against friendly forces, and has little probability of causing an undesired effect. However, that same static artillery piece parked in a crowded market reduces the *precision* of the same 500-pound, laser-guided weapon due to the potential for undesired effects. In an abstract sense, the probability of successfully achieving the effect of neutralizing the artillery piece becomes zero for this weapon-target pairing since collateral-damage risks will most likely prevent the use of this weapon in this scenario.

While precision weapons should be thought of in relation to their first-order, tactical-level effects, their use also creates implications and expectations at the operational and strategic levels of war. PGMs in an operational context offer high probabilities of delivering tactical effects, thereby reducing sorties required per objective. As a result, more objectives may be met in the same amount of time while simultaneously shrinking undesired effects. *The U.S. Air Force Transformation Flight Plan* (2003 edition) states that because of PGMs, "the U.S. doesn't need to deploy as many forces (air, sea, and ground) to achieve the same capability and, thus can deploy more rapidly. . . . The same number of forces . . . can strike many more targets successfully than a force without precision-guided munitions, enabling orders of magnitude improvement in overall firepower."[21]

The level of precision, however, is scenario-dependent. Both LGBs and carbon-fiber munitions are capable of meeting the tactical ob-

jective of degrading the Serbian electrical supply. The latter may require more revisits to ensure lasting effects—a negative at the operational level. However, the former may produce intolerable, undesired effects by destroying Serbian infrastructure—a greater negative at the strategic and policy levels. The target planner weighs the relevant variables and chooses a solution, the most precise solution, for the scenario.

Precision weapons seldom produce direct, strategic effects, but their impact at the strategic level contributes to the definition of a precision weapon. Likewise, at the operational level, a precise weapon offers the capability to deliver a strategic effect simultaneous to the tactical effect. A single bomber delivering a weapon directly into Saddam Hussein's hiding place might have ended Iraqi Freedom before it started. The *Gulf War Air Power Survey* claimed, "Precision weapons [PGMs] that had heretofore primarily provided tactical advantage were used in the Gulf conflict to pursue operational and strategic effects throughout a theater of war."[22]

However, PGMs only provided the tactical first-order effect. The predictability and consistency—the technical exactness—of precision weapons allowed operational planners to simplify the characterization of the system of cause and effect and undesired effect by eliminating many of the variables that less precise weapons present. Sun Tzu professed, "The general rule for the military is that it is better to keep a nation intact than to destroy it. . . . Therefore, those who win every battle are not really skillful—those who render the others' armies helpless without fighting are the best of all."[23] A precision weapon, which may or may not be a PGM, provides a tool within the EBO construct to render the enemy army helpless without destroying the nation supporting it.

The Definition

A doctrinal definition of *precision weapon* must ensure clarity in the use of the term while preventing an oversimplification of the concept. Sakulich argues that current use of the terms *precision engagement* and *precision strategic application* misrepresents the capability of the military planner to predict strategic effects from tactical effects. He recommends that "doctrine clearly differentiate technical exactness from strategic correctness."[24]

A standard dictionary defines *precision* as "EXACTNESS . . . the degree of refinement with which an operation is performed or a measurement stated." In the context of weapons employment, this definition implies two qualities. First, precision accomplishes the exact, desired effect with minimum undesired or unintended effects. Second, precision provides for measurability. To compare preciseness among weapons solutions, the degree of preciseness must be measurable.

The definition of precision weapon must include technical exactness, including weapons that deliver effects by other than kinetic means. Technical exactness implies a predictability of effect, assuming correct functioning of the weapon. Compare the effects of a 500-pound bomb versus a canister of flyers urging enemy combatants to surrender. Planners can be very certain of the effects caused by the blast and fragmentation of a bomb; however, they cannot be as certain of the number of enemy combatants that will surrender as a result of the flyers dropped over a battlefield.

Technical exactness also implies a measurability of effect. Joint Publication 3-60, *Joint Doctrine for Targeting*, states that "the art of targeting seeks to achieve desired effects with the least risk, time and expenditure of resources."[25] The preciseness of a weapon can be determined by comparing its contribution to reducing these factors for the planner. And to compare the preciseness of one weapon to another, the impact on each of these factors must be measurable.

Implicit in the measurability of the effect of a precision weapon is the ability to assess the effects of the weapons. Defense Intelligence Agency (DIA) analysis of the results of 2,000-pound LGBs dropped by F-117s and F-111Fs during Desert Storm determined that, despite the accuracy of the deliveries, each of the DMPIs targeted by these weapons had been struck by multiple LGBs. The analysis found

that in the absence of timely battle damage assessment, planners targeted DMPIs multiple times despite the accuracy and predictability of the weapons used. While the function of the weapon did not contribute to the lack of assessment in this case, the end results are analogous: more weapons were employed than were required. The point is not that intelligence is required to determine preciseness; rather, the effects of the weapon have to provide for assessment. As in the flyer-bomb example above, the preciseness of a weapon cannot be determined if the effect of the weapon cannot be assessed.

A myriad of situational variables makes a weapon more or less effective. Target vulnerability, effect desired, weather, intelligence, environment, and proximity to sensitive areas may make the same weapon suited or not suited for a target. These observations lead to the conclusion that for a weapon, precision depends on the scenario. For example, the lack of a capability to identify the status of vehicles in Kosovo created a requirement for precision beyond the capability to guide a kinetic weapon to a specific point.

The effects produced by a precision weapon provide for a quantifiable assessment of undesired effects. Again, limiting the concept of a weapon to tactical, first-order effects, the planner must be able to compare the potential undesired effects as well as the desired. In the case of kinetic weapons, the blast and fragmentation patterns are measurable and predictable. The planner understands that personnel and objects within that pattern will experience the same effects as the desired aim point. In the case of nonlethal weapons, the weapon may produce a wider field of effect than a kinetic weapon, but since the effect is nonlethal or perhaps even nondamaging, it may be the more precise weapon for that particular application.

The inconsistent and ambiguous nature of the battlespace prevents us from defining any particular weapon as universally precise. The proper use of the term *precision weapon* must include the context within which the weapon will be employed to include the target, its environment, the desired and undesired effects, and the rules of engagement. A weapon becomes a precision weapon when it provides the means of causing a specific, measurable tactical effect while minimizing undesired effects. Dependent on scenario, this effect must be quantifiable, assessable, and predictable.

Conclusion

This article does not propose any change in the targeting process. Rather, it proposes a doctrinal definition for the term *precision weapon*. The misuse of this term leads to incorrect categorization of weapons and oversimplistic comparisons of weapons capabilities. To combat this, war fighters and decision makers must first recognize that PGMs and precision weapons are not synonymous. Second, breaking the direct relationship between guidance accuracy and precision will help prevent those unfamiliar with these more complex targeting subtleties from incorrectly categorizing weapons or simplifying employment decisions based on oversimplistic comparisons.

Operational and tactical planners should thoroughly understand the desired effects and undesired effects associated with each of the weapons available for use. Tactical planners do not require a separate term to distinguish between a weapon with three-meter CEP and one with 10-meter CEP. Operational and tactical planners, however, do require the ability to associate a level of effectiveness to a particular weapon in a particular scenario.

At the strategic and force-planner level, this definition of *precision weapon* will help to prevent confusion and misinterpretation among decision makers who may not be as experienced or familiar with weapons or military effects. Ideally, this definition will prevent the decision makers with budgetary balance sheets in front of them from striking through a weapons system merely because it does not include the word *precision* in its nomenclature.

As a doctrinal term, *precision weapon* may be applied across the wide range of military applications but must reference the tactical, first-order-of-effect level. This term used con-

sistently in proper context will reinforce the concept of effects-based planning. Joint Publication 3-60 quotes Polybius: "It is not the object of war to annihilate those who have given provocation for it, but to cause them to mend their ways."[26] Precision weapons provide the consistent, predictable, first-order effects required for the future of effects-based operations. ❑

Notes

1. *CEP* is defined as the distance from the aim point within which 50 percent of the weapons will impact. See Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001. *The U.S. Air Force Transformation Flight Plan* (Washington, DC: HQ USAF, Future Concepts and Transformation Division, November 2003), 61, http://www.af.mil/library/posture/AF_TRANS_FLIGHT_PLAN-2003.pdf.

2. Maj Brian "Hack" Jackson, USAF Weapons School instructor, telephone interview by the author, 19 November 2004.

3. *JOINT CAF and USN Operational Requirements Document (ORD) for Joint Direct Attack Munition (JDAM) Program* (U) (Langley AFB, VA: Headquarters Air Combat Command/DRPW, 1995).

4. The USAF employed a cluster munition that released carbon fibers to shut down electrical power plants during Operation Allied Force. See Michael W. Lewis, "The Law of Aerial Bombardment in the 1991 Gulf War," *American Journal of International Law* 97, no. 3 (July 2003): 507.

5. Briefing, Mr. Bob Allison, ACC/DRZW, USAF Munitions Working Group, Langley AFB, VA, subject: Area Attack Munitions, 15 September 2004.

6. See Edward Mann, Gary Endersby, and Tom Searle, "Dominant Effects: Effects-Based Joint Operations," *Aerospace Power Journal*, Fall 2001, 92–100, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj01/fal01/vorfal01.html (accessed 19 July 2004).

7. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, 17 November 2003, 98.

8. Ibid., 18.

9. Timothy J. Sakulich, *Precision Engagement at the Strategic Level of War: Guiding Promise or Wishful Thinking* Occasional Paper no. 25 (Maxwell AFB, AL: Air War College, December 2001), 11.

10. Mann, Endersby, and Searle, "Dominant Effects," 99–100.

11. Lewis, "Law of Aerial Bombardment," 486.

12. Ibid., 504.

13. AFDD 1, *Air Force Basic Doctrine*, 18.

14. Lewis quotes Protocol I of the Geneva conventions, art. 57 (2) (c) (iii) in his article "Law of Aerial Bombardment," 487.

15. Ibid., 501.

16. Ibid., 493.

17. John S. Foster and Larry D. Welch, "The Evolving Battlefield," *Physics Today* 53, no. 12 (December 2000): 31, http://www.physicstoday.org/pt/vol-53/iss-12/p31.html.

18. Sakulich, *Precision Engagement*, 15.

19. Ibid., 14.

20. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary* (Washington, DC: GPO, 1993), 543.

21. *U.S. Air Force Transformation Flight Plan*, 61.

22. Keaney and Cohen, *Gulf War Air Power Survey*, 530.

23. Chester W. Richards, *A Swift, Elusive Sword: What If Sun Tzu and John Boyd Did a National Defense Review?* 2d ed. (Washington, DC: Center for Defense Review, 2003), 51.

24. Sakulich, *Precision Engagement*, iv.

25. Joint Publication 3-60, *Joint Doctrine for Targeting*, 17 January 2002, I-4.

26. Ibid., I-1.

One Step Back, Two Steps Forward

An Analytical Framework for Airpower in Small Wars

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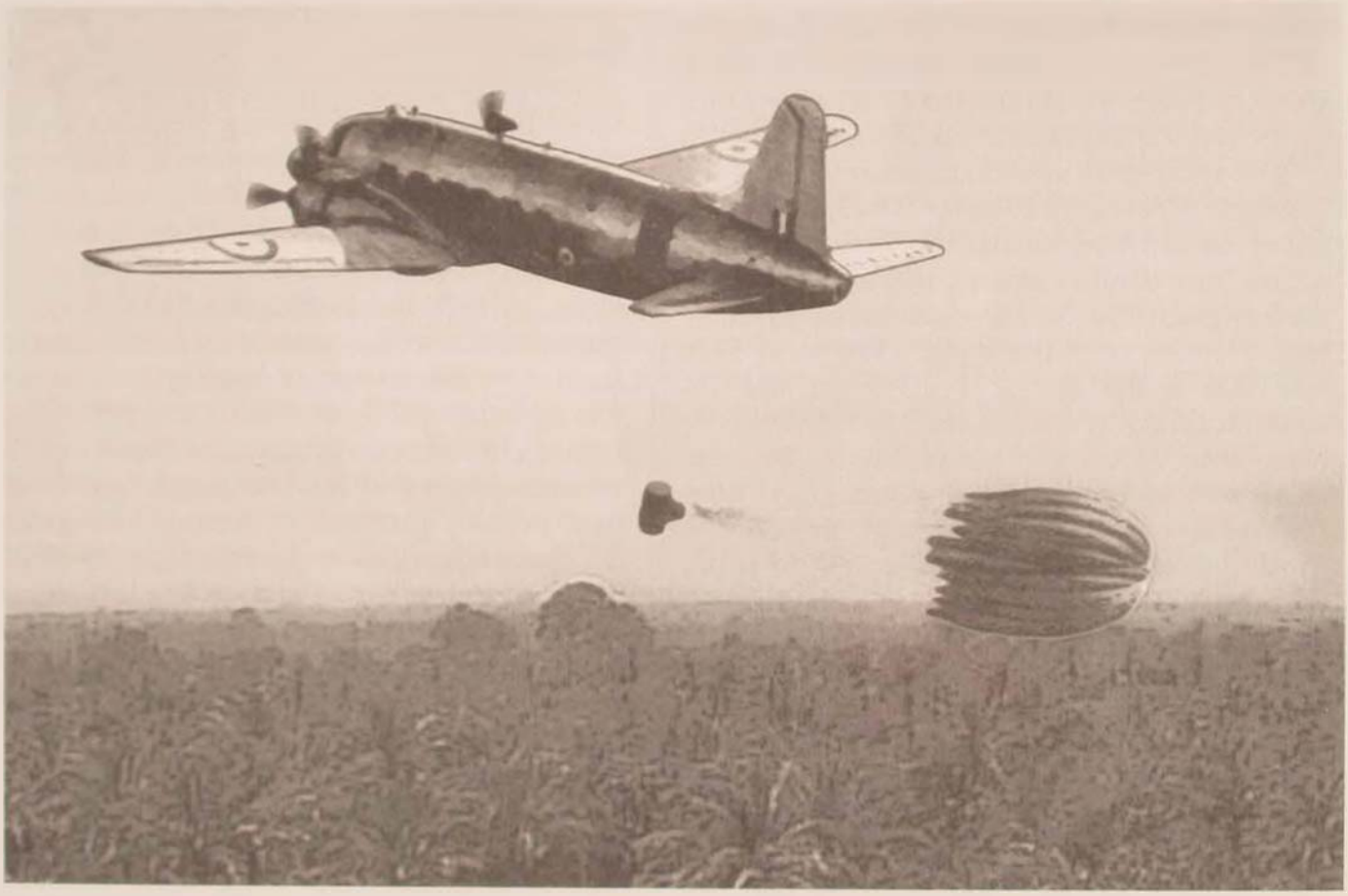
Editorial Abstract: Despite its undeniable power, today's US Air Force is not optimized for "small wars"—those involving nonstate entities or nonregular forces as enemy combatants. In this article, Major Stuewe analyzes a historical example of Great Britain's involvement in the Malayan Emergency of 1948–60 within the conceptual framework of an insurgent-conflict model. Given this example, he revisits the Air Force's current distinctive capabilities for improved conduct of small-war operations.



THE *U.S. AIR FORCE Transformation Flight Plan* (*AFTFP*), first published by the Air Force's Future Concepts and Transformation Division in November 2003 and updated in late 2004, documents the ongoing transformational efforts of the service, a process "by which the military achieves and maintains asymmetric advantage through changes in operational concepts, organizational structure, and/or technologies that significantly improve warfighting capabilities or ability to meet the demands of a

changing security environment."[1] According to this definition, the Air Force has engaged in the transformational process for decades, and its current activities are merely a continuation of this transformation.[2]

Continued reliance on the asymmetric technological advantage of the Air Force has a pernicious side as well. Danger manifests itself in competent adversaries who realize "they cannot survive in the environment our technical capabilities have created. Ironically, the interplay of our superior military capabilities with the recognition of this fact by our adversaries will ensure the character of future wars will be such that our 'asymmetric' technological advantages will be substantially diminished."[3] This danger, coupled with the Air Force's parochial desire to claim hegemonic rights as the technology service, is rapidly diminishing its efficacy to conduct operations successfully in what will likely become the dominant form of conflict in the immediate future: small wars.

The term *small wars* does not reflect recent attempts to categorize warfare. Rather, it originated in the late nineteenth century to describe "any conflict against nonregular forces such as guerrillas, bandits, rebellious tribes, or insurgents of various stripes."[4] The term does not refer to the size or scope of the war; instead, it refers to the political and diplomatic context in which the war is fought. Because small wars involve nonstate entities and nonregular forces, one must distinguish between those conflicts and wars, regardless of scale, waged against a state's regular armed forces.[5] The danger to the Air Force of the future lies in the fact that developing a technology-centered force designed to fight large, interstate conflicts, by definition, creates a suboptimal force for waging small wars.

This is certainly not to say that the Air Force of the future cannot successfully wage small wars. This article attempts to prove that the key to improving the *effectiveness* of the Air Force in this arena lies in understanding the true nature of small wars. It begins by taking one step back to analyze the small-war context through the lens of Nathan Leites and Charles Wolf's classic model of insurgencies. The second section applies this model to the famous counterinsurgency effort undertaken by Great Britain during the Malayan Emergency by focusing specifically on the successes and failures of airpower as they relate to that model. Finally, it broadly organizes and retools the Air Force's current distinctive capabilities within this framework to provide the service the means of taking two steps forward, having acquired an understanding of the operational necessities to engage successfully in both small and large wars.

Leites and Wolf's System Model

In 1970 researchers Leites and Wolf of the RAND Corporation published *Rebellion and Authority: An Analytic Essay on Insurgent Conflicts*, which aimed to provide generalization and theory on the concept of insurgency and counterinsurgency. The most enlightening of these theories was the development of a model to depict an insurgent movement as a system (see fig.). Although specifically dealing with insurgencies, this system model aptly falls under the rubric of small wars as defined previously. Indeed, the protracted and combined sociopolitical-military nature of insurgencies represents the version of small wars most vexing to airpower.[6] This model also provides a strategy to defeat insurgencies based on their implicit vulnerabilities. Leites and Wolf derive four primary methods of counterinsurgency. Before analyzing them, however, one must understand the system model itself.

To attain overall effectiveness, insurgent movements "require that certain inputs—obtained from either internal or external sources—be converted into certain outputs, or activities."[7] These inputs most often come from the internal (endogenous) environment, examples of which include raw recruits from the population and foodstuffs. External (exogenous) inputs can range from financing to weapons and publicity. Insurgents obtain these inputs by using a combination of persuasive and coercive measures.

The raw inputs then enter a conversion mechanism that entails production functions such as training, equipping, and supplying the

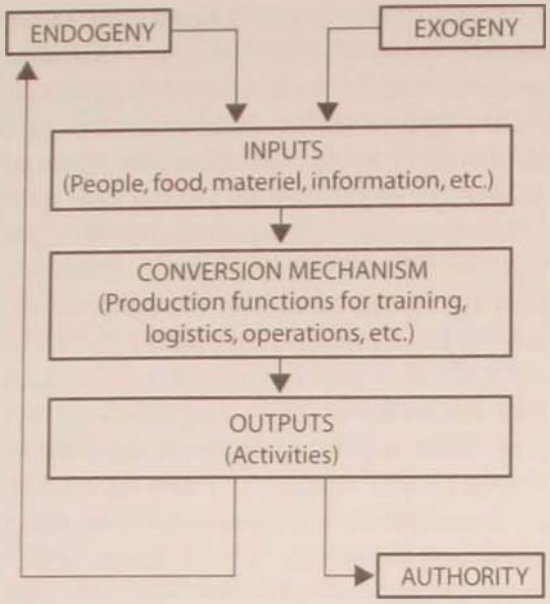


Figure. Leites and Wolf's insurgency as a system. (Reprinted from Nathan Leites and Charles Wolf Jr., *Rebellion and Authority: An Analytic Essay on Insurgent Conflicts* [Santa Monica, CA: RAND, 1970], 35.)

insurgency. The effectiveness of the system oftentimes depends on the degree of organization at this level. Developed systems, highlighted in the discussion of Malaya, may have individual branches dedicated to "personnel, financial, and logistic matters, as well as intelligence, communications, and operations."[8] Ultimately, the conversion mechanism produces the outputs of the system.

Outputs from nonregular forces may be as familiar as sabotage, terrorist activities, public demonstrations, and small-scale military attacks. Less obvious outputs include administrative and governmental jurisdiction functions such as village-aid projects, education, training, and formation of other organizational programs.[9] Importantly, the Leites and Wolf framework reveals four methods to counter the advance of the insurgent system. It is possible to influence each of these methods, to some degree, by the use of airpower.

The first method reduces available resources by controlling the number of both exogenous and endogenous inputs and the cost of acquiring them. Controlling this logistical aspect ostensibly should reside with police or ground forces, but the interdiction capability of airpower may prove appropriate for input denial. The second reduces the efficiency of the production processes. Nonregular training camps—traditional static targets—obviously represent a potential target for airpower. Many other targets in small wars, however, are not suitable for "attacking" with conventional weapons and crosshairs. Examples of nonlethal production denial include defoliation, food denial or destruction, and harassing fires.

The traditional counterforce role of military action, Leites and Wolf's third method of countering the system, targets opposing "forces . . . directly. This is the traditional military task; it is best understood, most familiar, and most typically preferred by the military."[10] As such, it is the method most apropos for airpower. Again, however, it does not necessarily require tritonal or depleted uranium. Instead, indirect means of reducing nonregular forces will likely become more important in small wars than in larger ones.[11] Indirect counterforce means such as psychological operations (PSYOP), surveillance, and intelligence fall into such a category.

Finally, the fourth method involves increasing the capacity to absorb the actions of nonregulars. This includes passive measures such as population evacuation and relocation as well as active defense measures. Perhaps even more than in the direct counterforce role, airpower can prove most beneficial in the active defense role. Leites and Wolf explain that

> this active defensive role may be enhanced, in addition, through aerial patrols that maintain round-the-clock surveillance and can apply a heavy concentration of ready firepower in the event of a guerrilla attack. Small aircraft with long loiter times and enough weaponry to counter a light or moderately heavy guerrilla attack effectively may be an important component in this type of active defense system. The main purpose of such an aerial police would be to provide both the symbol and the reality of [the authority's] presence and protection.[12]

The Leites and Wolf model of insurgency provides a general framework for understanding the nature of small wars. The system presented here forms the "engine" that drives

production of the organization's outputs. Although Leites and Wolf provide several possible applications of airpower to affect this engine, one can profitably analyze the framework within the context of a historical example of a small war in which airpower played an important, albeit supporting, role in the overall success of the campaign.

The Malayan Emergency

Great Britain waged the Malayan Emergency from 1948 until 1960 in response to an uprising by the Malayan Communist Party (MCP). After initial setbacks, the British implemented a vast array of civil and military programs tied together in an overall strategic plan, part of which included the Briggs Plan—a massive undertaking to separate the MCP from the population, highlighted by the resettlement of 400,000–500,000 Chinese squatters into "new villages."[13] Despite strong advancements early in the emergency, the MCP saw the momentum shift away from its favor under the pressure of the Briggs Plan until July 1960, when the emergency officially concluded.

The British experience in Malaya stands as a modern example of a successful counterinsurgency effort in small wars. As such, it has undergone extensive analysis to determine how another Western power effectively dealt with a potent insurgency. Understandably, the experience of the British has become more relevant following our own experiences in Vietnam.[14]

This is certainly not to say that the British solution represents the textbook answer to counterinsurgencies in small wars; nor does it represent the only example of airpower in small wars.[15] In fact the Malayan Emergency was a unique insurgency for several reasons. First, it was "confined to the Chinese residents of Malaya, a minority of the population which was easily separated from the ethnic Malays who constituted the majority."[16] Second, the British enjoyed a political-administrative structure that allowed the combining of military and civilian units within the same organization. Finally, and perhaps most significantly, the Chinese insurgents lacked any external support. Within the context of this article, however, the Malayan Emergency provides insight into the possible imaginative uses of a small but flexible air component to support the larger political-military effort in a small war.[17] More specifically, the efforts of airpower in Malaya fall within the four methods of countering Leites and Wolf's system model.

The Malay Peninsula spanned over 50,000 square miles—roughly the size of the state of Florida—two-thirds of it engulfed by nearly impenetrable triple-canopy jungle. The Royal Air Force (RAF) operated from six major airfields, only one of them suitable for supporting medium bombers. The RAF aircraft represented a mix of World War II–vintage propeller-driven aircraft such as Spitfires and Lincoln bombers, modern jet aircraft such as de Havilland Vampires and Canberra jet bombers, rotary-wing aircraft, and light and medium transport aircraft. Despite the vast array of types, there were never more than 15 RAF squadrons in Malaya.[18]

Many factors concerning the Malayan Emergency reduced the RAF's ability to conduct input denial—Leites and Wolf's first method of limiting the advance of insurgents. Adverse weather, terrain, and the Malay Peninsula's dense foliage limited the effectiveness of airpower in the classic interdiction role. The most limiting factor for interdiction, however, was the elusiveness of the MCP guerrillas—if one could find them at all. Witness, for example, the futile attempts by the British to interdict the Tens Fook Loong and Number 3 Independent Platoon. Despite accurate intelligence of the enemy location, over 709,000 pounds of ordnance dropped by RAF aircraft over the course of multiple missions in 1956 produced only four enemy casualties.[19]

Attacking the production process of the Leites and Wolf system proved more effective than interdiction, primarily due to airpower's contribution to defoliation during the massive food-denial campaign of the Briggs Plan. Even without aerial spraying, airpower contributed to these efforts by observing clearings in the jungle that served as telltale signs of the guerrillas' cultivation sites. Harassing fires also dis-

rupted the production process but came at the expense of the traditional counterforce method of airpower—Leites and Wolf's third component. Evidence suggests that "air strikes were responsible for less than 10 percent of all enemy dead. . . . But air attacks did keep the enemy moving and unsettled and increased the number of successful contacts with ground forces." According to Lt Gen Sir Harold Briggs, "Offensive air support play[ed] a very vital role in the main object of the Security Forces, namely the destruction of bandit morale and the increasing of the morale of the civil population."[20]

The direct means of counterforce operations met with limited success for airpower in Malaya, but the indirect means were vital. The British conducted PSYOP by employing leaflets as well as voice recordings broadcast from airplanes. Upwards of 70 percent of surrendering MCP guerrillas claimed that these "voice flights" played some role in shaping their decision.[21] Aerial reconnaissance also proved effective: "It found 155 confirmed and 77 possible guerrilla camps as well as 313 cultivated sites, 31 recultivations, 194 clearings of probably terrorist origin, and 21 [friendly] farms under enemy control over a six-month period in 1955."[22]

The fourth and final method of countering the system involved using airpower for active defense. Leites and Wolf's idea of "extending the presence and protection" of aerial police constituted perhaps the most instrumental offering of airpower in Malaya. Dr. James S. Corum and Col Wray R. Johnson, USAF, retired, explain: "Thus, by extending the presence and protection of the government to remote areas, the military quickly made the Malayan countryside an inhospitable place for the [enemy]. It was in support of this effort, rather than by direct offensive action, that the RAF proved invaluable."[23] The aerial police force in Malaya manifested itself not only in Leites and Wolf's vision of a small attack plane, but also in the ubiquitous tactical light and medium cargo aircraft of the air-transport units. With supporting roles of transport, supply drops, medical evacuations, and even command and control, air supply became indispensable.[24]

Thus, airpower played a supporting but vital role in the overall success of the British in the Malayan Emergency. Key to this success was the imaginative and oftentimes unorthodox operational and tactical application of airpower to support the political and military aims of the overall strategy. Although one can explain these operations within Leites and Wolf's system model, one can also do so in terms of the contemporary roles of airpower. Thus, "the order of importance of RAF operations overall was generally assessed to be air supply and transport, photoreconnaissance, close air support, long-range strikes against targets beyond the reach of units on the ground, and communications."[25] Looking at airpower in terms of these historic roles, rooted in the analytical system model, now allows us to take two steps forward to help develop the Air Force of the future. We can do so not simply by relying on individual technologies but by reevaluating the transformational capabilities listed in the *AFTFP* of 2004 under the six distinctive capabilities defined in the Air Force vision.

The Air Force's Distinctive Capabilities

The six Air Force distinctive capabilities—air and space superiority, rapid global mobility, information superiority, precision engagement, global attack, and agile combat support—do not necessarily represent doctrine per se; rather, they act as enablers of doctrine. They are the basic areas of expertise that the Air Force brings to any activity across the spectrum of military operations, whether acting as a single service or in conjunction with other services in joint operations.[26] The *AFTFP* of 2004 utilizes these distinctive capabilities to organize 16 transformational capabilities that the Air Force either cannot attain today or must significantly improve in the future.

The *AFTFP* further quantifies these transformational capabilities within the Air Force's contemporary core competency of "technology-to-warfighter," defined as "translating vision into operational capabilities in order to pre-

vail in conflict and avert technological surprise."[27] The *AFTFP* attempts to structure this flow correctly from vision to strategy and effects, and then down to concept and capabilities, but the Air Force may have an institutional proclivity to reverse this flow, based on technological advances. As historian Richard P. Hallion once warned, "Because the Air Force as a service is wedded . . . to technology, there is always the danger that technology will make one's doctrine obsolete [and] will replace doctrine as the determinant of the future course of the Air Force."[28]

The remaining portion of this section applies these six distinctive capabilities as a general framework, using the Leites and Wolf system in tandem with the successful British involvement in Malaya. This analysis shows on a broad scale how the operational level of airpower in general, and the Air Force in particular, can support overall strategy within the political, diplomatic, and military context of small wars. The capabilities appear in rough order of importance relative to small wars.

Most often regarded as freedom to attack, *air and space superiority*—defined as the ability to control what moves through the air and space to ensure freedom of action—also involves freedom from attack. This distinctive capability is an overarching principle in that it allows successful conduct of the remaining five capabilities. Most technological advances within air superiority predominantly apply to large wars. The most significant threat to air superiority in small wars, however, comes from the ubiquitous ground threats of relatively inexpensive small arms and shoulder-fired missiles. Defeating, or at least diminishing, the pervasiveness of these weapons remains perhaps the paramount issue for airpower. Without some relative measure of air superiority *from* these weapons, the remaining five distinctive capabilities of the Air Force in small wars are greatly diminished.

Air Force doctrine defines *rapid global mobility* as "the timely movement, positioning, and sustainment of military forces and capabilities through air and space, across the range of military operations."[29] Although the definition remains accurate, in the setting of small wars, the function of mobility will often seem less global and increasingly regional. Regarding the supporting role of the Air Force in small wars, as exemplified in Malaya, the regional-mobility aspect of supplying, resupplying, and supporting fielded forces—whether military or political—can become the determining factor in the campaign's overall strategy.

Information superiority refers to the ability to collect, control, exploit, and defend information while denying an adversary the ability to do the same.[30] Simply stated, small wars are—first and foremost—information wars.[31] Similar to air superiority, information superiority deals with gaining control of its specific realm and fully exploiting its informational capabilities to full advantage. As such, information superiority specifically deals with the indirect application of the traditional counterforce role of the military in Leites and Wolf's system. Advantages in PSYOP, surveillance, and intelligence fall within this rubric and will essentially serve as the dominant aspect of the counterforce application of airpower. Maintaining informational advantages will even surpass direct application of traditional firepower.

When firepower becomes necessary, however, the Air Force must fully utilize *precision engagement*. Most often associated with accurate kinetic weapons, precision engagement must nevertheless embody multiple aspects within the political and diplomatic context of small wars. In the traditional sense, precision engagement utilizes the most technologically advanced weapon system in the application of military force. In small wars, however, this capability could entail the close analysis of political or military initiatives or even traditional airlift. To use a Malay example, the British often made pinpoint, low-technology tactical-airlift drops through holes as small as 10 yards across in a triple-canopy jungle consisting of trees over 200 feet high.[32] Perhaps more than any other Air Force distinctive capability, precision engagement exemplifies the necessity to decouple capability from technology.

Up to this juncture, the distinctive capabilities of the Air Force generally adapt to the framework of small wars. The capability of *global attack*, however, embodies the line of de-

parture from the transformational Air Force, dedicated to high-intensity war, to the necessities of small war. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, explains this departure by describing global attack operations: "The Air Force, with its growing space forces, its intercontinental ballistic missiles, and its fleet of multirole bombers and attack aircraft supported by a large tanker fleet, is ideally suited to such operations. Our service is able to rapidly project power over global distances and maintain a virtually indefinite 'presence' over an adversary."[33] Such a capability is likely vital in prosecuting large wars, but high-budget items such as ballistic missiles, transcontinental bombers, and supporting tanker fleets represent, at best, an adverse cost-to-benefit ratio, given the protracted and politically sensitive nature of small wars.

The transformational concept of global attack, much like the concept of global mobility, needs to be regionalized in the context of small wars. The term *global* is somewhat misleading since it aggrandizes the distance traveled by the implement of airpower. In small wars, however, the imperative distance one must consider with regard to attacks is that of the desired target relative to the political and military situation on the ground. Given the diplomatic and asymmetric context of small wars, any negative effects of an attack mission conducted by airpower can have strategic-level impact. Simply put, "There is a political price to pay when airpower in the form of air strikes is used."[34] Thus, one must weigh any attack mission, whether conducted by the most technologically advanced or most antiquated airpower platform, in terms of the potential negative strategic effects it may induce.

The final distinctive capability, *agile combat support*, traditionally deals with the elements of forward base support, infrastructure, and mobility for deployments. Regardless of the conflict's scale, successfully supporting fielded forces remains a critical enabling necessity. In terms of Air Force support in small wars, however, the phrase *agile combat support* best exemplifies the supporting role that airpower plays. Although many Air Force people truly believe that airpower alone can defeat or stalemate enemy ground forces, in the political and diplomatic context of small wars, employing airpower exclusively is ineffective at best and—as the British learned from their *air control* doctrine during the interwar years prior to Malaya—can prove extremely detrimental.[35]

Conclusion

Technological advance is certainly nothing to shy away from. The establishment of the Air Force as an independent branch of the military testifies to the fundamental importance of technology to the service. Revolutionary shifts in technology involving jet engines, radar, and space technology have kept the Air Force in a nearly perpetual state of transformation. The danger, however, resides in the voracious desire to embrace technology—an embracement that should neither outstretch capability nor supplant doctrine. Similarly, technological advances do not, in and of themselves, necessitate compatibility with all manner of warfare.

Small wars are conflicts in which the political and diplomatic context—not the military disposition of the combatants—acts as the determining factor. From a technological standpoint, the paradox of small wars is that the more asymmetric our military capabilities become, the less advantage they afford us against an adversary disposed to use his asymmetric strengths. Such is the conundrum facing the contemporary transformational Air Force: does embracing technological advances specifically optimized for large-scale war necessarily limit the effectiveness of airpower in supporting small wars? Most likely the answer is yes—but to a degree. The solution, however, is not to inhibit technological advances but to understand how such capabilities do and do not fit within the analytical framework as well as the political and diplomatic milieu of small wars. Only by taking one step back to fully understand the contextual basis of this form of conflict can the Air Force of the future take two steps forward to become the most effective fighting force possible, regardless of the nature of the conflict. ❑

Notes

1. US Department of the Air Force, *The U.S. Air Force Transformation Flight Plan* (Washington, DC: Headquarters USAF/XPXC, Future Concepts and Transformation Division, November 2003), ii, http://www.af.mil/library/posture/AF_TRANS_FLIGHT_PLAN-2003.pdf.

2. Christopher Bolkcom, *Air Force Transformation*, CRS Report for Congress (Washington, DC: Congressional Research Service, 25 January 2005), 2, http://www.fas.org/sgp/crs/natsec/RS20859.pdf.

3. US Marine Corps, "Small Wars," draft (Washington, DC: Department of the Navy, n.d.), 10.

4. James S. Corum and Wray R. Johnson, *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Lawrence: University Press of Kansas, 2003), 6.

5. Ibid., 7.

6. Airpower has supported both sides of the insurgency coin. Examples of airpower support to insurgents include the insertion and resupply of Jedburg teams from the World War II Office of Strategic Services in occupied France; the 1045th Observation, Training, and Evaluation Group's covert missions into Tibet for insertion and resupply of guerrillas trained by the Central Intelligence Agency; and the support rendered by Operation 32, Air Studies Branch to Military Assistance Command Vietnam Studies and Observations Group's long-range infiltration of agents and propaganda operations during the Vietnam War. Larry E. Cable accurately recounts the need of external support, such as air support: "The American guerrilla was all too much like the astronaut, who, whether in his capsule or walking in his moon suit, was dependent completely upon a complicated life support system for viability." *Conflict of Myths: The Development of American Counterinsurgency Doctrine and the Vietnam War* (New York: New York University Press, 1986), 147.

7. Nathan Leites and Charles Wolf Jr., *Rebellion and Authority: An Analytic Essay on Insurgent Conflicts* (Santa Monica, CA: RAND, 1970), 32.

8. David Willard Parsons, "Towards the Proper Application of Air Power in Low-Intensity Conflict" (master's thesis, Naval Postgraduate School, 1993), 63.

9. Leites and Wolf, *Rebellion and Authority*, 34.

10. Ibid., 81.

11. Ibid., 82.

12. Ibid., 83.

13. R. W. Komer, *The Malayan Emergency in Retrospect: Organization of a Successful Counterinsurgency Effort* (Santa Monica, CA: RAND, 1972), 19.

14. Ibid., iii.

15. The Marine Corps Small Wars Center of Excellence currently lists 407 current and previous small wars. See the center's Web site at http://www.smallwars.quantico.usmc.mil/sw_today.asp (accessed 23 May 2005).

16. Cable, *Conflict of Myths*, 71.

17. Komer, *Malayan Emergency in Retrospect*, 52.

18. Corum and Johnson, *Airpower in Small Wars*, 193.

19. Jay Gordon Simpson, "Not by Bombs Alone: Lessons from Malaya," *Joint Forces Quarterly*, Summer 1999, 95.

20. Ibid.

21. Komer, *Malayan Emergency in Retrospect*, 75.

22. Simpson, "Not by Bombs Alone," 97.

23. Corum and Johnson, *Airpower in Small Wars*, 191.

24. Komer, *Malayan Emergency in Retrospect*, 52

25. Corum and Johnson, *Airpower in Small Wars*, 195.

26. AFDD 1, *Air Force Basic Doctrine*, 17 November 2003, 76, https://www.doctrine.af.mil.

27. US Department of the Air Force, *U.S. Air Force Transformation Flight Plan*, 49.

28. Richard P. Hallion, "Doctrine, Technology, and Air Warfare: A Late Twentieth-Century Perspective," *Airpower Journal* 1, no. 2 (Fall 1987): 16–17, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj87/hallion.html.

29. AFDD 1, *Air Force Basic Doctrine*, 80.

30. Ibid., 78.

31. US Marine Corps, "Small Wars," 53.

32. Simpson, "Not by Bombs Alone," 96.

33. AFDD 1, *Air Force Basic Doctrine*, 79.

34. Corum and Johnson, *Airpower in Small Wars*, 430.

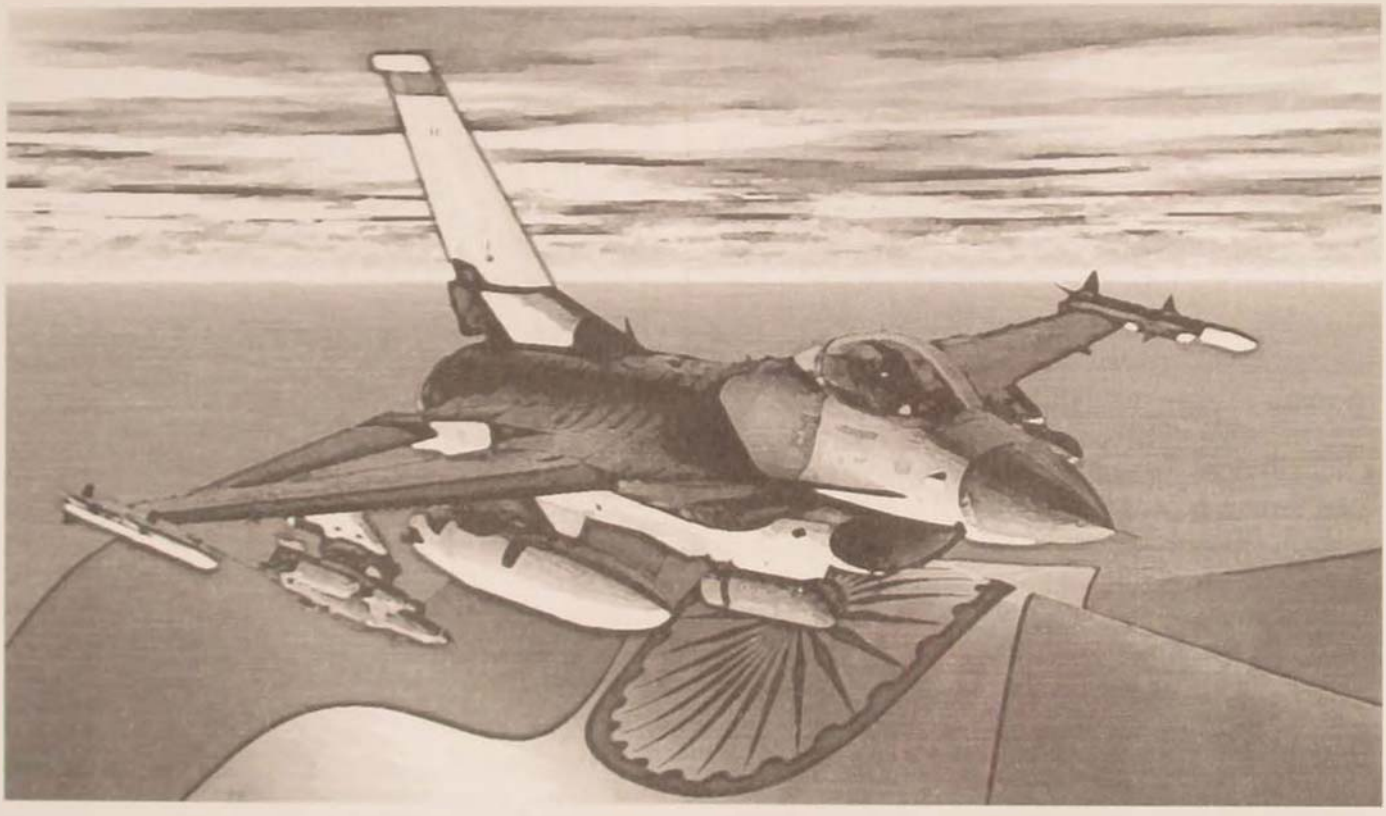
35. See ibid., especially chap. 2, "Colonial Air Control," 51–86. The authors make an effective case that although the idea of controlling a country by airpower is attractive to Airmen and those who are casualty averse, the history of air control reveals little to support the idea of police or peacekeeping by airpower alone. The few cases in which it proved effective were "the most minor kinds of tribal police operations" (85). Otherwise, some contingent of ground troops was necessary for peacekeeping operations. See also Capt David W. Parsons, "British Air Control: A Model for the Application of Air Power in Low-Intensity Conflict?" *Aerospace Power Journal* 8, no. 2 (Summer 1994): 28–39, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj94/parsons.html.

Fighter Diplomacy

A "Passage to India"?

MANOHAR THYAGARAJ*

Editorial Abstract: Many nations are competing to sell advanced fighters to India. Despite historically difficult US-Indian relations, highly bureaucratic acquisition policies of the Indian government, and lingering US trade restrictions against emerging nuclear powers, a large sale of US fighter planes and technology to India remains a distinct possibility. The author contends that now is the time to transcend past concerns and missteps, find common ground, and foster a burgeoning politico-military relationship.



IN THE SUMMER of 2005, the United States and India signed a landmark agreement intended to energize strategic relations between the two countries. The 10-year defense-cooperation pact envisages a broad range of joint activities, including multinational operations in their common interest, collaboration to promote security and defeat terrorism, and enhancement of capabilities to combat the proliferation of weapons of mass destruction.[1] It also calls on the United States and India to explore opportunities in

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joint research and development as well as technology transfer and coproduction, with special emphasis on technologies relating to missile defense.

Called the New Framework for the US-India Defense Relationship, the agreement seeks to wash away legacies of past missteps in building a collaborative security relationship between the two countries. Despite being a large democracy, India remained peripheral to US security policy for the better part of 50 years, and its nuclear program outside the Nuclear Non-Proliferation Treaty made the country a focus of nonproliferation and arms-control initiatives. Active engagement by the administration of Pres. George W. Bush led to multiple efforts by the US government after 2001 to change this course, in recognition of India's importance to long-term US interests in Asia. National Security Advisor (now Secretary of State) Condoleeza Rice and Secretary of Defense Donald Rumsfeld led this new focus on a strategic relationship.

Despite the new tone of the bilateral discussions, India has never made a major purchase of defense technology from the United States. Rather than viewing arms sales as mere commercial "deals," the United States tends to consider them as means to cement interdependence with other countries as tools of state policy.[2] Based on interaction between the Pentagon and the Indian military services during the previous few years, the United States has focused on possible sales to India of aircraft such as the E-2C Hawkeye, C-130 Hercules, and P-3 Orion.[3] India also has a pending requirement for 126 multirole combat aircraft (MRCA) to replace aging MiG-21s and serve as cover for the delayed induction of the indigenous light combat aircraft (LCA).

However, the Mirage 2000-V was expected to become the front-runner because India already operated older versions of that platform. In March 2005, the Bush administration changed the pace of dialogue by announcing that it would offer India coproduction rights for both the F-16 and F-18E/F to compete for that requirement, while offering Pakistan the option to purchase F-16s. In April of that year, the US Defense Security Cooperation Agency sent representatives to Delhi to brief the Bharatiya Vayu Sena (Indian air force [IAF]) on both aircraft, offering to "fast-track" the sale.[4] To the United States, the fighter program in India, different from Pakistan's because of coproduction, could serve as a key component in developing the content of the 10-year defense pact.

Background

One must understand any major transfer of American defense technology to India within the broader context of evolving bilateral strategic relations. Upon gaining independence in 1947, India adopted a nonaligned stance in the Cold War that prompted Washington to view the country with suspicion as a Soviet proxy. One man—Jawaharlal Nehru, India's first prime minister—dictated and drove the foreign policy of the fledgling nation, treating the Foreign Office as little more than a research bureau.[5] Nehru regarded treaties and alliances with suspicion, believing they would diminish India's ability to maintain independent control of its foreign affairs. Since US foreign policy at the time was driven by the singular need to counter the spread of communism, the democratic Indian government seemed a possible ally. For America at that time, Nehru's open embrace of American foreign-policy goals would have been immensely helpful to US interests in Asia.[6] However, India chose to maintain its distance from any formal commitment, and in the quest for allies against the Soviets, the United States started to develop a relationship with India's regional rival—Pakistan.[7]

The United States still saw India as the dominant power in the region, as well as a desirable partner and force for regional stability. Before the second Indo-Pakistani war of 1965, the United States had provided a measure of assistance to India, such as training Indian pilots on the F-86F Sabre, which it had supplied to Pakistan. India also received American arms and financial support during its war with China in 1962. However, growing tensions on the subcontinent made engaging both India and Pakistan impossible since they began to

see US support as a zero-sum game—that is, one country's gain was the other's loss. So India and the United States began to drift apart. In 1971 Pres. Richard Nixon moved the USS *Enterprise* carrier battle group into the Bay of Bengal to caution the Indian army from moving too far into Pakistani territory during India's convincing victory in the third Indo-Pakistani war. This episode remained the nadir in US-India security discussions for a decade.

Driven by its perception of surrounding threats from China as well as Pakistan and believing that the United States itself might pose a threat, India demonstrated a nuclear capability in 1974 with the detonation of a "peaceful nuclear device."[8] This action prompted a flurry of nonproliferation initiatives by the US Congress, resulting in the Nuclear Non-Proliferation Act and the Glenn and Symington Amendments to the Foreign Assistance Act.[9] In 1981 Pres. Ronald Reagan signed National Security Decision Directive (NSDD) 70, *Nuclear Capable Missile Technology Transfer Policy*, in response to the appearance of India's Satellite Launch Vehicle III, presumed to have technologies that could enhance India's nuclear-delivery capability. NSDD 70 directly spawned the Missile Technology Control Regime. One may reasonably suggest that US participation in global export-control regimes stems from India's nuclear and missile programs. These changes to US law left room for interpretation by licensing officials to extend restrictions on technology transfer to India to any assistance one might construe as aiding these programs. Technology-licensing procedures for India became among the most restrictive in the United States for recipient countries.

President Reagan was pleasantly surprised by the efforts of Prime Minister Indira Gandhi, Nehru's daughter, to develop a personal rapport with him. This rapport, carried on by the government of her son Rajiv Gandhi, led to renewed efforts at bilateral engagement. Both countries realized the constructive role the United States could play in India's development and the favorable ramifications for America. Despite India's refusal to sign either the Nuclear Non-Proliferation Treaty or the Missile Technology Control Regime, both countries made an effort to come to a consensus on technology transfer in 1984, when they signed an umbrella memorandum of understanding. In exchange for alterations to India's own export-control regulations, the United States would begin allowing access to civilian and dual-use technologies as well as some military assistance, subject to previous restrictions imposed by US law.

Under this agreement, India was able to procure General Electric F-404 engines for the LCA program. US companies also assisted in development of the LCA's flight-control system. However, India refused to permit post-shipment verification of technology end-use by US officials. In response to this limitation, the Defense Technology Security Administration began to interpret the memorandum of understanding as applying only to dual-use items and not to defense-related technology.[10] The end of the Cold War freed US-India security relations to develop their own arc. In 1995 both countries signed an Agreed Minute on Defense Relations, which allowed their militaries to work on cooperation and joint exercises. Eventually, when India tested a series of nuclear devices in 1998, sanctions mandated by the Glenn Amendment terminated all forms of assistance, seriously setting back the LCA. Export control and nonproliferation issues again dominated US discourse with India.

After the nuclear tests, the administration of Pres. Bill Clinton sought to establish benchmarks for India (and Pakistan, which also tested six nuclear weapons in 1998), including the following: signing and ratifying the Comprehensive Test Ban Treaty; halting production of fissile material for weapons; exercising strategic restraint, particularly to stop flight-testing ballistic missiles; enacting stricter export controls; and establishing closer dialogue between the two countries.[11] None of these took place by the end of President Clinton's term. Realizing the limited utility of sanctions to force India to abandon nuclear weapons, both governments searched for ways to break the impasse. In 1999 the Senate voted to reject US ratification of the Comprehensive Test Ban Treaty, which weakened the US tack with India on that count. Eventually, when President

Clinton went to India in 2000, the State Department established joint working groups with India on counterterrorism as well as international peacekeeping and concluded agreements on several other bilateral issues.[12]

The administration of Pres. George W. Bush took a different approach to security relations with India from the start of its tenure. In 2001, under authority granted by Congress in 1999, nuclear-related sanctions on both India and Pakistan were waived by executive order. In 2002 the administration's first formal national-security-strategy document specifically called for a relationship with India built on common democratic interests.[13] Input on the future direction of US-India relations came directly from Rice and Rumsfeld. Consequently, one saw special efforts made toward resolving contentious issues regarding the status of India's nuclear and missile programs. Aiding the US efforts was the fact that the security-strategy document's unilateralist approach to security brought the United States closer to India's right-wing Bharatiya Janata Party government, responsible for the nuclear tests of 1998 and willing to assume a pragmatic, utilitarian stance regarding the US relationship.

In January 2004, an initiative called Next Steps in Strategic Partnership proclaimed the two nations at the threshold of a new understanding, pending a final series of "reciprocal steps."[14] The United States would begin loosening technology-transfer restrictions in exchange for specific steps by India to strengthen its export-control laws. Because of the commitment shown by both countries, no one expected any of the miscommunication that characterized the 1984 memorandum of understanding and the postnuclear test era. One assumed that vestiges of suspicion in India over the US engagement with Pakistan would be cast aside. In the meantime, both militaries stepped up joint exercises and training. In 2001 the Indian government signed a General Security of Military Information Agreement, which mandated that India treat US classified information it received as if it were its own. In the past, the United States had experienced trouble getting India to sign such an agreement, which had limited the scope of joint operations.

In May 2004, Indians voted the Bharatiya Janata Party out of office, but relations had improved to the extent that this change in government caused only a temporary pause. In a departure from previous policy and as part of the Next Steps in Strategic Partnership process, India agreed to the posting of an export-control attaché at the US Embassy in Delhi. The Indian parliament then passed a new law aimed at addressing some of the gaps in domestic export-control regulations.[15] When Prime Minister Manmohan Singh of India visited Washington at the end of July 2005, both countries announced that the United States would support India's receiving civilian nuclear technology and fuel.[16] India would in turn make an effort to separate its civilian and military nuclear programs and place all civilian facilities under International Atomic Energy Agency safeguards.

Considering that the Indian nuclear program had caused such chagrin in Washington's nonproliferation circles, this action reversed decades of US policy, amounting to a de facto acknowledgement of India's status as a nuclear-weapons state. Because of a perception of common security threats, the Bush administration and the Indian government had made a concerted effort to arrive at a compromise that moved the United States away from dealing with India as a nonproliferation challenge. America had articulated its clear intent to help India become a major world power in the twenty-first century.[17] The United States now courts this large and stable democracy not only as a new strategic partner in the fight against terrorism, but also as a factor in America's long-term policy vis-à-vis China. Indian security analyst K. Subrahmanyam suggests that India has become very important to the United States because the major power centers in the world will compete for power and influence in Asia in the twenty-first century and that India should understand the new US policy in this context.[18]

Thus, one must consider this mercurial history of security relations between the two countries when attempting to understand any transfer of defense technology to India under the impetus that both governments have pro-

vided. By offering India the option to coproduce F-16s or F-18E/Fs, the United States implicitly acknowledges that India has made strides in its ability to guarantee the end use of technology it receives. It also means that the US arms-control apparatus has put aside past concerns about providing India capabilities that could enhance its ability to deliver nuclear weapons and that the US president and his administration intend to continue expending efforts to shake up bureaucratic inertia.

The Fighter Program

In trying to appreciate the importance of the MRCA program in developing a strategic relationship with India, one must understand two key factors. First, the IAF has performed well in joint and combined exercises at the leading edge of bilateral military cooperation. At the Cope India exercise in Gwalior in 2004, for example, Indian Su-30Ks reportedly won nine of 10 engagements with US Air Force National Guard F-15Cs.[19] Cope India 2005 in November pitted the F-16CJ against many different IAF aircraft, leading Lt Gen Dave Deptula, vice-commander of US Pacific Air Forces, to comment that he had "never seen a better executed exercise in [his] 29 years with the USAF."[20] Second, the IAF suffers a high rate of attrition among its 400 or so MiG-21s, scheduled for phaseout by 2007, but the Tejas (the operational name for the LCA) probably will not enter service until 2010. One analyst has noted that "the Tejas has been marked by developmental delays, the lack of an indigenous engine, and now concerns about successfully integrating modern weapons with the plane's avionics."[21] Moreover, an overseas purchase of 126 fighters would cripple the budget available to buy the indigenous plane—a point of concern since India has made a major effort to develop the domestic industrial base. In addition, the IAF will have to make sure it can operate the platform it purchases for at least the next 30 years.

One can see the pertinence of the US offer of fighters along these fronts. In India's procurement process for overseas purchases, decisions depend primarily upon price when technology is comparable—not upon establishing a defined and lasting security relationship.[22] Cost favors the F-16, a mature platform with production in the thousands, over any of its anticipated competitors—the Mirage 2000-V, Gripen, and MiG-29M. Furthermore, a gap in the anticipated force structure urgently dictates the need to induct new fighters, more so than any of the other possible procurements. India expects to issue global tenders for the naval airborne early warning (Hawkeye) and maritime surveillance (P-3) programs, wherein cost may become an issue in competitive situations. In addition, the Su-30MKI—the 30-ton flagship of the IAF—is expensive and fuel-hungry.[23] It is possible that the Indian government may abandon future local production of this platform in favor of a workhorse fighter like the MRCA, which would make more money available for the program.

In the case of either the F-16 or the F-18E/F, buying into the program would allow India to participate in joint development of subsystems—and in scheduled upgrade cycles—for aircraft that will remain in US Air Force or Navy service for a long time, as well as in the service of numerous other countries. India may also then find itself in line to participate in the F-35 program when an export version becomes available after 2010. None of the competing platforms would offer the same level of scalability in bilateral collaboration: Dassault is closing its production of Mirage 2000s, and only a few countries are buying the Gripen. Further, Lockheed may use India for a production base for future foreign sales of the F-16 once the main line in Fort Worth shuts down in 2008. If the United States and India escalated joint operations, say to provide cover for US shipping in the Indian Ocean, then having India operate US platforms with the related data-sharing capability would become a major plus. Assuming that US-India strategic relations are now irreversible, the two key factors mentioned here—closer bilateral operations and decision-making constraints in the Indian government's procurement procedure—will remain true regardless of which fighter wins the bid.

Several questions exist that will control the level of both US and Indian interest in pursuing a fighter deal. For example, based on the history of technology denial, India has previously expressed concern that it cannot rely on the United States for unfettered support. According to one news article, "At the moment, New Delhi is not comfortable that the United States is a reliable defense supplier and partner, senior Defence Ministry policy planners said. Despite the lifting of US sanctions in 2001, policymakers of the United Progressive Alliance government worry that Washington might someday re-impose them."[24]

Offering India the option to coproduce fighters in-country should alleviate this concern because it would make local Indian industry responsible for first-line support. By the same token, the offer of coproduction to India and not Pakistan makes a qualitative differentiation between the two regional rivals. Stephen Cohen of the Brookings Institution notes that the total package for India rates as an "A-" while the offer of F-16s to Pakistan was more "symbolic than lethal."[25]

One can relate the legacy of technology denial directly to restrictions mandated by US law because of India's nuclear program. The Bush administration has declared that it intends to change US policy, but Congress must approve such changes before they can come into force. If Congress proves unable or unwilling to change the law, India could revert to seeing the United States as an unreliable partner, an eventuality that could substantively prejudice existing procurement discussions: "The greatest risk to the new Bush strategy, therefore, is that the administration may be unable to realize the policy changes needed to make increased Indian access to such technologies possible. . . . If that happens, the United States and India will not only have lost a golden opportunity to forge a durable strategic partnership, but the cynics within the Indian polity will have been proven right."[26]

India had previously expressed a desire to use its external defense purchases as leverage to achieve foreign-policy goals. According to Prime Minister Singh, "As our defense purchases are large and substantial, we must leverage them to serve the largest political and diplomatic ends."[27] Essentially, India will seek to use its buying power to secure diplomatic or nonmilitary gains, the most relevant of which include access to civilian nuclear and other high technologies. Indian leaders do not see military technology as the principal means of fulfilling their country's desire for greatness. Rather, they seek more liberal access to technologies that hold the promise of helping India attain higher levels of economic growth.[28] To serve its security goals, India believes that its negotiating strength comes from access to most defense technologies from the international market. In the United States, if the regulations driven by current law stay in place, technology licensing for India could remain as troublesome an issue as in the past, without executive intervention in every case.

If the US Congress does not pass the nuclear deal reached with Prime Minister Singh in July 2005, a major arms acquisition from the United States may become politically risky for the current Indian government, which has expended some capital to make concessions on separating India's civilian and military nuclear programs that the United States would accept. Such a development might also affect defense procurement and relations. Indian domestic opposition has criticized the dual offer of F-16s to both Pakistan and India, even though India could have coproduction rights. Former foreign minister Jaswant Singh suggested that the proposed sale to both countries would start an arms race in the subcontinent.[29] The left-of-center parties, whose outside support is critical to the survival of the Indian coalition government, have urged rejection of this offer and actively protested the Cope India exercises for moving India too close to the United States.[30]

If India picks the F-16, the United States would prefer that it select the Block 50/52, not the Block 60. America might not offer coproduction for the Block 60 because it developed this version in conjunction with the United Arab Emirates, and the aircraft's incorporated state-of-the-art technologies would likely raise some issues on releasability within the Pentagon's technology-security hierarchy.

The Block 50/52, however, offers a standard US Air Force platform that India can attempt to indigenize. For instance, given its close defense relationship with Israel, India could consider integrating some Israeli avionics and electronic-warfare gear, as it did on the Su-30 MKI.[31] But an offer of only the standard Block 50/52 might raise some unintended political issues because the United States is offering this version to Pakistan, mentioned above. More than likely, India will not settle for the same version that Pakistan will operate. India might wish to consider the F-16I, built for Israel. Based on the Block 50/52, this version incorporates a number of Israeli subsystems.[32]

In a quest for indigenization, India might ask about acquiring the source code for the fighter platform's software. But the United States will not release portions of the code to any recipient country. If for maintenance reasons or because of concerns about unfettered US support, India insists on receiving source code as part of a technology transfer, the program could come to a halt. India could overcome this issue by making requests for only essential and required code modules, which Washington could then review on a case-by-case basis.

India's defense-procurement process is lengthy, disconnected, and opaque, with decisions frequently made by politicians and bureaucrats.[33] As one news story explained, "Acquisition decisions are made by the [Ministry of Defence], where programs often are stalled by bureaucratic wrangling over cost, contract terms and shifting procurement priorities. . . . So slow is the acquisition machinery that it took almost 20 years for the contract to be signed for the purchase of 66 Hawk Advanced Jet Trainers . . . despite repeated pleas by the Indian Air Force for the program to move forward."[34]

As a further example, the Indian navy was optimistic in early 2005 that the government would clear the purchase of Scorpene submarines from France, a deal that had remained in limbo for years. Instead, aggressive sales efforts by the German firm HDW stalled the process. "The government takes ages to make up its mind, without any transparency, leaving ample scope for rival armament firms to scupper each other's bid."[35] After much deliberation, the Scorpene sale finally cleared in September 2005. In such an uncertain environment, US defense companies would have reservations about the amount of effort to invest in business development.

On the one hand, although India would like a major portion of the fighter program based on local coproduction, such an arrangement would inevitably add cost since off-the-shelf procurement has built-in efficiencies that cannot be realized by moving a production line. Additionally, if the F-16 is the fighter of choice, add-on costs—including those for customization with third-country avionics—may negate the cost advantage. On the other hand, coproduction of an advanced US fighter in India will streamline the process of sensitive technology transfer between the two governments.

On a related note, the defense-business environment in India can also condition any fighter deal. In June 2005, the Indian Ministry of Defence released a new offset policy that mandates 30 percent offsets for major defense purchases.[36] However, there are no multipliers for technology transfer, no provisions for indirect offsets, and no incentives for dealing with the Indian private sector.[37] Coproduction of fighters will necessitate technology transfer, but Indian policy will not award offset credits for what is likely to be a large percentage of the program. In addition, the policy places Indian state-run defense companies in conflict-of-interest positions as administrators of offset programs in which they are expected to participate. Should efforts to change this policy fail, these factors would complicate any bid by a US defense company by increasing its financial risk.

The Indian government will mandate that Hindustan Aeronautics Limited, India's large public-sector air-and-space company, serve as the coproduction agency for the fighter program. However, that company cannot be an adequate teaming partner for any US company in the precontract phase because, as a public concern, it will get its share of the work regardless of which fighter wins the program. Instead, US companies need to form teaming arrangements with private Indian companies

that can become their advocates in a competitive bid process. Without a change in India's offset policy, though, no private company would have much of an incentive to participate in the program.

Fleet diversification represents another major concern for the IAF, which already operates aircraft from the United Kingdom, Russia, and France, with existing depot facilities to service all of them. Adding a new type would create a need for additional support infrastructure and complicate the spares-and-maintenance chain. The IAF has also expressed an unequivocal preference for the Mirage 2000-V, having flown the older Mirage 2000H in anger over India's Kargil region in 1999.[38] During this episode, the Indian army engaged Pakistani regulars who had crossed over the line of control that serves as the de facto border in Kashmir. Mirage 2000Hs equipped with Thomson-CSF ATLIS laser-designator pods and laser-guided munitions flew low-altitude attack missions in support of ground operations.[39]

Finally, India will have to balance any negative reaction from Russia, which currently holds the major share of the Indian defense market. Russia could react to a major fighter purchase by India by opening its defense technology to Pakistan. India will likely want to prevent its rival from acquiring any of the current Russian technology.

Conclusion

The program to supply the IAF with 126 fighters has several attributes that make it attractive to both the United States and India. The IAF has an urgent need for the program, and it gives US entrants cost and scalability advantages that none of the competing platforms can offer. Coproduction of the F-16 currently occurs in several key countries allied with the United States: Turkey, Belgium, the Netherlands, and South Korea. Because the United States has not offered the F-18E/F for overseas coproduction to date, this proposal exemplifies America's seriousness about developing a long-overdue security relationship. India would like to leverage the program to serve larger strategic goals. Regardless of the US platform chosen, a successful aircraft deal would mean that India has accepted the basic realist tenets of balance-of-power politics that it had considered anathema during the Nehruvian years. As an opportunity to transcend past concerns about regional rivalries, export control, and disagreements over India's nuclear policy, it would fit squarely in the continuum of US-India security relations as testimony to the commitment of both countries to find common ground and make up for past missteps.

For the United States, challenges to the program are not trivial. India's defense-procurement process does not easily allow for the strategic leverage that the government seems to want in its defense purchases. The package offered and accepted must be attractive enough to give the Indian government ammunition to overcome domestic political and institutional opposition to the US-India relationship. Dassault, manufacturer of the Mirage 2000, has a presence and record with the IAF, which already has an infrastructure to support that aircraft. India's offset policy could increase the financial risk for US companies, which, unlike their European competitors, do not enjoy government backing and must answer primarily to shareholders. Ultimately, given the history of technology denial and considering the emphasis that India has placed on this deal with the United States for civilian nuclear cooperation, congressional action on it could become the leading edge in fighter diplomacy in South Asia. ❑

Notes

1. Chidanand Rajghatta, "India, US Sign Defense Pact," *Times of India*, 29 June 2005.

2. In 1995 the Clinton administration clarified US criteria on arms-export decision making, one of the points being "the degree to which the transfer supports U.S. strategic and foreign policy interests through increased access and influence, allied burden sharing, and interoperability." See "Criteria for Decisionmaking on U.S. Arms Exports," fact sheet (Washington, DC: White House, Office of the Press Secretary, 17 February 1995), http://www.fas.org/asmp/resources/govern/whcrit.html.

3. Discussions are ongoing with the Indian navy for possible operation of Northrop Grumman's E-2C Hawkeye carrier-based airborne early warning platform off the Indian carrier *Vikramaditya* (formerly the Russian *Admiral Gorshkov*). India's air force is considering the purchase of at least 12 Lockheed Martin C-130J Hercules transport aircraft for special-operations use. The Indian navy has expressed interest in Lockheed Martin's P-3 Orion maritime surveillance and antisubmarine-warfare platform.

4. "For US, F-16 Means Business Too," Times of India News Network, 22 April 2005.

5. A. G. Noorani, "Indian Thinking on Foreign Policy," *Frontline* 18, no. 1 (6–19 January 2001), http://www.frontlineonnet.com/fl1801/18010950.htm.

6. "Establishing Bilateral Relations," from Robert J. McMahon, *The Cold War on the Periphery* (New York: Columbia University Press, 1994), http://www.ciaonet.org/book/mcmahon/McMahon02.html (subscription service).

7. Pakistan offered the United States the use of a base at Peshawar from which to operate U-2 aircraft. In 1962 the mission that led to the downing of Francis Gary Powers launched from Peshawar.

8. Pakistan and China had begun to develop a relationship independent of the United States in the mid-1960s.

9. The Nuclear Non-Proliferation Act mandates sanctions on any country attempting to acquire nuclear technology without International Atomic Energy Agency (IAEA) full-scope safeguards; it also prohibits the export of nuclear technology to nonnuclear states, as defined by the Nuclear Non-Proliferation Treaty. The Glenn Amendment prohibits US assistance to any non-nuclear-weapon state (as defined by the Non-Proliferation Treaty) that conducts a nuclear explosion. The Symington Amendment prohibits most US economic and military assistance to any country delivering or receiving nuclear-enrichment equipment, material, or technology not safeguarded by the IAEA.

10. Richard T. Cupitt and Seema Gahlaut, "Non-Proliferation Export Controls: US and Indian Perspectives," in *Engaging India: US Strategic Relations with the World's Largest Democracy*, ed. Gary K. Bertsch, Seema Gahlaut, and Anupam Srivastava (New York: Routledge, 1999), 172.

11. Michael Krepon, review of *Engaging India: Diplomacy, Democracy and the Bomb* by Strobe Talbott, Arms Control Association, September 2004, http://www.armscontrol.org/act/2004_09/BookReview.asp.

12. "History of the Department of State during the Clinton Presidency (1993–2001)," US Department of State, http://www.state.gov/r/pa/ho/pubs/8529.htm.

13. *The National Security Strategy of the United States of America* (Washington, DC: President of the United States, September 2002), 30, http://www.whitehouse.gov/nsc/nss.html.

14. "Next Steps in Strategic Partnership with India," Statement by the President on India, White House, 12 January 2004, http://www.whitehouse.gov/news/releases/2004/01/20040112-1.html.

15. *Nonproliferation Export Controls in India: Update 2005* (Athens: Center for International Trade and Security, University of Georgia, June 2005), http://www.uga.edu/cits/documents/pdf/CITS%20India%20WV.pdf.

16. "Joint Statement between President George W. Bush and Prime Minister Manmohan Singh," White House, 18 July 2005, http://www.whitehouse.gov/news/releases/2005/07/20050718-6.html.

17. David C. Mulford, US ambassador to India, "U.S.-India Relationship to Reach New Heights," Consulate General of the United States, March 2005, http://chennai.usconsulate.gov/prind050331.html.

18. K. Subrahmanyam, "Not Just about F-16s!" Rediff.com, 31 March 2005, http://www.rediff.com/news/2005/mar/31guest1.htm.

19. "Dogfight Upset," Techwatch, *Popular Mechanics*, November 2004, 24.

20. Shiv Aroor, "IAF Show Leaves US Forces Spellbound," *Express India*, 18 November 2005, http://www.expressindia.com/fullstory.php?newsid=58513.

21. Amit Gupta, "An Interim Fighter: The F-16 and Other Options," *Observer Research Foundation Strategic Trends* 3, no. 11 (14 March 2005), http://www.observerindia.com/strategic/st050314.htm.

22. Recent updates to India's defense-procurement process affirm this intent by steering away from single-vendor situations as much as possible. See *Defence Procurement Procedure—2005 (Capital Procurements)*, Ministry of Defence, Government of India, June 2005, http://mod.nic.in/dpm/welcome.html.

23. The Su-30 MKI is a version of the Su-30 Flanker built to Indian specifications that incorporates avionics and inertial navigation by Sextant Avionique of France, electronic-warfare capabilities and countermeasures from Elta of Israel, and AL-31FP thrust-vectoring engines.

24. Vivek Raghuvanshi, "India Awaits US Commitments," *Defense News*, 22 November 2004.

25. Quoted in V. Sudarshan, "The Love-Hate Triangle," *Outlook India*, 11 April 2005.

26. Ashley J. Tellis, *India as a New Global Power: An Action Agenda for the United States* (Washington, DC: Carnegie Endowment for International Peace, 2005), 50, http://carnegieendowment.org/files/Tellis.India.Global.Power.FINAL4.pdf.

27. Rajat Pandit and Indrani Bagchi, "India Has a Lot Riding on F-16s: Govt. Wants Deal to Serve Political, Diplomatic Ends," *Times of India*, 4 April 2005.

28. Tellis, *India as a New Global Power*, 50.

29. R. Prasannan, "Who Wants F-16?" *Week*, 10 April 2005, http://www.the-week.com/25apr10/currentevents_article10.htm.

30. "Spurn US F-16 Offer, CPI to Centre," Rediff.com, 29 March 2005, http://in.rediff.com/news/2005/mar/29cpi.htm; and "Protest at India-US Air Exercise," BBC News, 4 November 2005, http://news.bbc.co.uk/2/hi/south_asia/4406348.stm.

31. Israel is now India's second-largest defense supplier, with annual sales in excess of $1 billion. See "Israeli Promise on India Radar," BBC News, 11 February 2004, http://news.bbc.co.uk/1/hi/world/south_asia/3471387.stm; and "Sukhoi-30 MKI *Flanker*," Bharat Rakshak, http://www.bharat-rakshak.com/IAF/Aircraft/Specs/Su-30.html.

32. See "F-16I," *Israeli Weapons*, http://www.israeli-weapons.com/weapons/aircraft/f-16i/F-16I.html.

33. For an earlier study of IAF procurement, see Raju G. C. Thomas, "Aircraft for the Indian Air Force: The Context and Implications of the Jaguar Decision," *Orbis* 24, no. 1 (Spring 1980): 85–102.

34. Vivek Raghuvanshi, "Indian MoD Panel: Expand Role for Private Industry," *Defense News*, 18 April 2005.

35. Rajat Pandit, "Navy Wary of Efforts to Scupper Scorpene Deal," *Times of India*, 22 April 2005.

36. An offset transaction is an incentive for a client government to buy. Essentially, it means that the offset percentage is carried as debt on the defense company's books, which the company can relieve by purchasing or arranging to purchase goods and services from that country to stimulate sections of its economy—or by providing technology. See *Defence Procurement Procedure—2005 (Capital Procurements)*.

37. Frequently, offset credits are issued with multipliers. That is, if one must transfer technology to a local firm to enable coproduction, then offset credits are issued at a multiplier X of the value of the production ordered from the local firm, with X determined by the client government.

38. Josy Joseph, "IAF 'Curious,' Not Keen on F-16s," *Times of India*, 15 March 2005.

39. Philip Camp, "The Kargil Operations: The Mirage-2000 at Kargil," Bharat Rakshak, http://www.bharat-rakshak.com/IAF/History/Kargil/PCamp.html.

Revised Air Force Doctrine Document 2-5.3, *Public Affairs Operations*

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Public sentiment is everything. With public sentiment, nothing can fail; without it, nothing can succeed.

—Abraham Lincoln

EVERY AIRMAN IS a spokesperson for our Air Force, and those who aspire to become the most effective communicators need to examine the recently revised Air Force Doctrine Document (AFDD) 2-5.3, *Public Affairs Operations*, 24 June 2005. Communicating for effect is as important an Air Force mission as delivering bombs on target. Therefore, understanding the doctrinal foundations of communication is essential.

The national agenda can change in the flash of one headline, broadcast, or photograph. Airmen must realize that information—and the fluid information environment—are crucial to national power. That environment is as much a battlespace as land, air, sea, and space. In that information environment, it is critical that every Airman understand the art and science of communicating for effect in order to mitigate information threats to our national security. The newest edition of AFDD 2-5.3 serves as an excellent primer for preparing Airmen to communicate for effect in the evolving information environment.

Most welcome in the latest iteration of this doctrine document is the shift away from parochialism and the idea of public affairs (PA) as the sole mouthpiece of a particular organization, to a greater reliance on all Airmen as credible sources of truthful (and effects-generating) information about the Air Force and its missions, equipment, and people. This adjustment in emphasis recognizes PA as a means to an end and not an end in itself. In this regard, it "flattens" the communication process, recognizes the overlap between pure PA and the evolving information-operations practice, and pushes PA practitioners to think of effects rather than pure "messaging" as the primary function of all communication efforts. Such a shift should make it easier for PA planners to apply an effects-based model to communication planning and implementation. The following points summarize the relevant changes in the doctrine:

- "Through technology and a complex web of formal and informal support and integration relationships, today's mass media outlets possess global reach with capabilities and tactics that mirror those of the modern US military" (p. 4). However, "the 24-hour news cycle results in more analysis and editorial commentary that may or may not present an accurate account of military operations" (p. 5). Thus, "all Airmen should be trained to have a basic ability to engage members of the news media with general Air Force and individual professional information. They may become spokespersons for the Service and, in some cases, may be considered by the media to be more credible sources than commanders or senior officials" (p. 9).
- "The growing access to the internet, web logs, cell phones, and e-mail by deployed Airmen is difficult to control and may make Airmen 'official' Air Force spokespersons

in the public information environment whether or not they are aware of that status. **The global information environment is so pervasive that every Airman is considered by the general public as a reliable source of information, and whose views, whether personal or professional, are sought by the media, posted to web sites, or relayed by family and friends as Air Force statements**" (emphasis in original) (p. 5). Therefore, "*education in public affairs operations equips Airmen to represent the Air Force to the public and achieve desired information effects*" (emphasis added) (p. vii).

- "Public information elements can . . . directly affect the success or failure of military operations" (p. 3). Thus, "**positive and/or balanced media coverage at the outset of military action can rapidly influence public . . . opinion and affect strategic decision making**" (emphasis in original) (p. 30).
- "PA operations are an important military capability of information operations . . . , providing public information to defend against adversary propaganda and misinformation directed at domestic and international audiences" (pp. 1–2). These operations can "achieve decisive effects in support of influence operations and . . . other military capabilities of influence operations, such as counterpropaganda operations" (p. 19).
- "**PA operations are a force multiplier by analyzing and influencing the information environment's effect on military operations** and delivering increased battlespace awareness to the commander through analysis of the information environment. PA capabilities are most effective when planned and executed as an integral part of an overall operation" (emphasis in original) (p. 2).
- When "properly planned, executed, and assessed, PA operations are fundamentally effects-based operations [EBO] that create an 'effect' by disseminating timely, truthful, and accurate information to achieve a particular objective. However, the success of PA operations is contingent upon the desired effects of PA operations being related to appropriate objectives" (p. 3). Additionally, "assessment of PA operations is fundamental to the EBO plan/execute/assess cycle" (p. 31). "Employing PA operations within the construct of EBO provides flexibility to adjust PA efforts, as effects and effectiveness are measured and operational situations change" (p. 29).
- "PA operations are most effective when their capabilities are integrated into strategic, operational, and tactical plans and employed by commanders at all levels to achieve desired effects" (p. 11) [and when] "backed by the authority and credibility of the [commander, Air Force forces] or [joint force air and space component commander]" (p. 25). "Failure to integrate PA operations in the strategy development and planning phases can result in a reduced ability to affect the public information environment and increased likelihood of conflicting with other objectives" (p. 11).
- "**Truth is the foundation of all public affairs operations**" (emphasis in original) (p. 1). "PA operations are truth-based, and will not intentionally misinform the US Congress, public, or media" (p. 22). "Truth enables credibility; credibility allows US military personnel to be believed or heard over an adversary or competing message" (p. 7).
- "The synergy between PA operations, which uses [*sic*] open-source information, and operations, which primarily uses [*sic*] classified information, is crucial to gaining and maintaining information dominance" (p. 28).
- "PA operations are a commander's responsibility because of the asymmetrical effects associated with, and achieved by, PA operations. Even those PA operations conducted at the operational and tactical level may generate strategic effects. Commanders are ultimately responsible for successful integration of PA capabilities into operations. Commanders require a clear understanding of PA's role in operations to help achieve their desired effects" (p. 1). ❑

Book Reviews

Effects Based Warfare edited by Christopher Finn. Defense Studies Joint Doctrine and Concepts Centre (http://www.mod.uk/jdcc), Shrivenham, Swindon, Wiltshire SN6 8RF, Great Britain, 2004, 122 pages.

This book is a compilation of short articles presented at a conference ostensibly held on the topic of effects-based warfare (EBW). It includes a historical perspective and a contemporary perspective (one article each) on EBW from maritime, land, and air warriors, as well as separate articles on strategic decision making/command and control, the future, and a concluding article. Although all of the articles are worthwhile, the ones by the air warriors are particularly interesting and easy to read; they also offer new perspectives on what recently has been a fairly well-traveled road amongst military students and practitioners. Readers can easily choose only those articles germane to their areas of interest; once again, airpower enthusiasts should review the section on that subject.

Although the introduction alludes to a "conference" on EBW held in May 2002, for the sake of better understanding, one would prefer that the book specifically name the conference and detail when, where, and what it was about. Also, readers unfamiliar with British military vernacular may find the language slightly imposing.

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The Great Escape by Paul Brickhill. W. W. Norton & Co. (http://www.wwnorton.com), 500 Fifth Avenue, New York, New York 10110, 2004, 304 pages, $13.95 (softcover).

Fifty-five years after its initial publication, Paul Brickhill's personal account of the mass breakout from the Stalag Luft III prisoner of war (POW) camp in 1944 retains its appeal, both as a gripping narrative of Allied air officers' daring and as a chilling reminder of the Nazi regime's brutality. Most students of World War II, however, are more familiar with the classic 1963 film of the same name, which features Steve McQueen at the head of an ensemble cast that includes James Garner, Charles Bronson, and James Coburn. Given the freshness and directness of Brickhill's prose, the book deserves a wide audience among new generations of readers.

The Nazis built Stalag Luft III outside of Sagan in eastern Germany (now Zagan, Poland) to detain officers of the Royal Air Force and other Allied air forces. The Germans hoped that the remote camp would better hold serial escapees such as the book's leading character, Squadron Leader Roger Bushell, whom the camp's denizens called "Big X" for his role as the leader of the mass-escape effort. Under Bushell's direction, dozens of American, British, Polish, and Commonwealth sappers tunneled out from their prison barracks toward the Silesian woods beyond the camp fences. The conspirators' methods, especially in concealing the trapdoors that led down to their tunnels, involved many feats of ingenuity. Once construction of the tunnels was under way, Bushell and his subordinates faced the larger problem of disposing of the tons of sandy yellow subsoil they had excavated. Meanwhile, other teams fabricated disguises and false travel documents. Brickhill, himself a Stalag Luft III inmate and participant in the effort, provides many engrossing details about the planning, organizational discipline, physical bravery, and intense labor of the Allied tunnelers, forgers, tailors, and lookouts. The book's detailed diagrams, maps, and photos heighten the reader's understanding of the complex engineering-and-intelligence organization that supported the breakout.

During their years in the camp, the Allied air officers faced many setbacks, some of them logistical (e.g., tunnels collapsing) and others at the hands of camp guards and "ferrets," individuals charged

with foiling attempts to escape. In Brickhill's telling, the prisoners come across not as supermen but as committed fighters governed both by their emotions and by thorough dedication to boosting Allied war aims from deep within the heart of the Third Reich.

POWs have a duty to try to escape. When the big breakout finally came, the Allied prisoners made the most they could of that duty. The Reich reacted brutally and illegally. The most somber part of *The Great Escape* is the "Aftermath" chapter, in which Brickhill describes postwar efforts of Allied investigators and prosecutors to find and punish murderers among the German soldiers who hunted down Stalag Luft III escapees. The chapter serves as a chilling reminder of the Nazi regime's contempt for the humanity of its victims. Not even Hermann Göring's longstanding solicitude for his fellow pilots could spare the escapees from Hitler's personal wrath. *The Great Escape*, although carefully researched and written, does not presume to be a substantial work of scholarship. Yet it stands as a durable marker of the depths to which the Third Reich had sunk in its quest for domination.

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Defense Strategy for the Post-Saddam Era by Michael E. O'Hanlon. Brookings Institution Press (http://bookstore.brookings.edu), 1775 Massachusetts Avenue, NW, Washington, DC 20036-2188, 2005, 148 pages, $18.95 (softcover).

This volume is the eighth in a series of analyses of US national security policy by Michael E. O'Hanlon and his fourth regarding the defense budget. He parses out the situation as he sees it, both in terms of ongoing security operations and possible threat scenarios, all within budget projections and constraints. O'Hanlon's analysis generally supports current administration policy; that is, he likely would not have supported the Iraq intervention as it unfolded but works from where we are presently rather than from where he might want to be at a particular point in time when making policy recommendations. His analysis is interesting because one traditionally links the Brookings Institution to the Democrats as a policy workshop, in contrast to the American Enterprise Institute with its Republican linkages. Civilian national security leadership often comes from institutes such as these, so reading their analyses often provides a glimpse of the future, depending on presidential politics.

O'Hanlon opens with an overview of the Afghanistan and Iraq conflicts, emphasizing the fact that the new method of war much touted in the former arose almost on the fly, with the great successes unanticipated. Regarding Iraq, his view is that one could clearly foresee the US military victory, given the tattered Iraqi military, while postwar planning proved seriously deficient. In fact, O'Hanlon indicates that "shock and awe" had very little impact on the Iraqis, who were punchy from a decade or more of constant air attacks over maintenance of the no-fly zones. Building from that new reality, O'Hanlon argues that the Army needs to add 40,000 personnel to its base force in order to handle the insurgency in Iraq. Interestingly, his rationale for this increase is one that John Kerry had been unable to articulate in the 2004 election. O'Hanlon's view is that the present situation risks "breaking" the all-volunteer force (p. 50), a concept which he supports. Temporary growth is the price paid to get by a problem that risks the existing force structure and keeps any possible military draft in abeyance indefinitely. O'Hanlon does not support a return to the draft although it might become necessary without a remedy for the present overstretching of regular forces. Whether the Army can increase by 40,000 troops becomes a significant question, given the present difficulties of maintaining current strength through voluntary enlistments.

For the Air Force and Navy, he holds out a future that will present challenges as equipment ages, especially aircraft, with substantial issues arising in terms of future procurement. In order for the Air Force to continue to maintain air superiority, O'Hanlon favors keeping the F-22A, but possibly fewer of them, and buying the Joint Strike Fighter (JSF), but reducing the number to around 1,000—sufficient to keep the Marine Corps and international versions of the JSF. As a gap measure, he argues for continued production of the F-16 since it would remain useful in combat against most of the world's air forces. In his view, the Navy should also continue to buy F/A-18E/F Super Hornets. Both services should add unmanned aerial vehicles to fill the gaps created by buying fewer of each manned-aircraft type.

O'Hanlon bases these numbers on the ongoing revision of the traditional two-war scenario that has dominated US defense planning for the past generation. He observes that this scenario was fine as a planning exercise but that the concept actually morphed into a "1-4-2-1" scenario. That is, "the United States prepared to defend the homeland,

maintain strong forward deployments in four main theaters (Europe, the Persian Gulf, northeast Asia, and other parts of the Pacific Rim), defeat two regional aggressors at once if necessary, and overthrow one of them" (p. 97). O'Hanlon argues that the new scenario in reality should be a "1-4-1-1-1," which refers to defending the homeland ("1") and including forward deployments as well as limited counterterrorism strikes ("4"). The "1-1-1" refers to "one large-scale stabilization mission (presently in Iraq, of course, but perhaps someday in South or Southeast Asia, the Middle East, or Africa), one high intensity air-ground war (for example, in Korea), and one major naval-air engagement (such as in the Taiwan Strait or Persian Gulf)" (p. 98). If accurate, his analysis foresees a very active future for the Air Force and the need for quick response and a flexible organization.

From O'Hanlon's perspective, the concept of the air and space expeditionary force will be greatly stretched, especially if deferment of procurement purchases continues while new and more expensive systems are brought online, increasing the pressures on existing aircraft inventory. The US military has a well-deserved reputation for its "can do" approach to solving problems, but that attitude will encounter severe obstacles over the next two decades, regardless of who is elected president in 2008. The United States has achieved a position of unparalleled military effectiveness relative to possible state foes, but sustaining that edge remains a challenge, given the growing turbulence in the world. *Defense Strategy for the Post-Saddam Era* should be of interest to most Air Force professionals because the author presents a view of the situation that differs from what one might hear through official channels but supports the directions the military has taken in pursuing the next stage in the revolution in military affairs.

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Jimmy Stewart: Bomber Pilot by Starr Smith. Zenith Press (http://www.zenithpress.com/Store/default.aspx), 729 Prospect Avenue, P.O. Box 1, Osceola, Wisconsin 54020, 2005, 288 pages, $21.95 (hardcover).*

In *Jimmy Stewart: Bomber Pilot*, Starr Smith has written a fine book about a fine human being. It is a delightful yet troubling read. It is delightful in the sense that Smith is a gifted writer. Through the collection of insights and asides that accrue throughout the book, one gets a deep sense of Stewart as well as of wartime England with its bomber bases, aircrews, and their combat missions. It is troubling in the sense that the Hollywood of today suffers so in comparison to that of yesteryear. Few stars today have the personal qualities and accomplishments of a man such as Stewart—a degree in architecture from Princeton; a military career ranging from private to brigadier general in the Air Force Reserve in World War II, to a voluntary combat mission in Vietnam; a marriage that lasted 45 years; and the gift of an endowed scholarship to the US Air Force Academy.

Smith, himself a member of Tom Brokaw's "greatest generation," gives us a rare glimpse into one of its well-known personages and his little-known contribution to the war effort. His is a study in character and integrity we would do well to emulate. In this sense, we could all profit from this book—as could our children and grandchildren.

Jimmy Stewart: Bomber Pilot is an easy and compelling read, sprinkled liberally with passages from people who flew with and knew Stewart in his military career. His "aw shucks" demeanor and easygoing manner with "the fellas" portrayed on screen were hallmarks in Stewart's relations with his combat aircrews as a B-24 pilot, a squadron commander, an operations officer, a chief of staff, and a commander. A leader who exuded quiet confidence backed by meticulous preparation and detailed training, he was a good pilot, both as an instructor in B-17 Flying Fortresses and a combat pilot in B-24 Liberators. Just as important, he had a reputation as a "lucky" pilot who hit his targets and brought his unit back safely. Stewart sought combat, volunteering for dangerous missions and spurning the chance to use his fame to avoid danger.

This book pays homage to a man's character and his patriotic ethic, both of which are rare. Stewart sacrificed a life of privilege that paid him thousands of dollars a month to earn $21 a month as a buck private in the Army. He interrupted a glowing film career to go to war and do what he thought an American ought to do. Even this humble man's family was unaware of his combat exploits. In fact, his daughter thanked Smith for letting her in on this part of her father's life.

Like every book, this one has a few infelicities. Kirtland AFB in Albuquerque, New Mexico, is referred to as "Kirkland"; there are a few punctuation errors; and some of the vignettes seem to end abruptly. All that aside, Smith tells an important

*This review reprinted courtesy of the *Montgomery Advertiser*.

story and tells it extremely well. He knows how to read people and share his insights. He is neither pedantic nor pedestrian, but a raconteur of the first rank. Smith does an exemplary job of telling the other side of Jimmy Stewart's remarkable life and his devotion to "duty, honor, and country." Far more than writing a tribute to Jimmy Stewart, Starr Smith gives us a window on what patriotism is all about. *Jimmy Stewart: Bomber Pilot* is a timely chronicle.

Dr. Grant T. Hammond
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The Pentagon and the Presidency: Civil-Military Relations from FDR to George W. Bush by Dale R. Herspring. University Press of Kansas (http://www.kansaspress.ku.edu), 2502 Westbrooke Circle, Lawrence, Kansas 66045-4444, 2005, 512 pages, $45.00 (hardcover).

In this timely book, Dale Herspring—professor of political science at Kansas State University and a 32-year veteran of the US Navy—attempts to redress what he considers an imbalance in past scholarship on civil-military relations in the United States. As Herspring notes, he intends to examine those relations from the vantage point of individuals who are putatively "controlled"—senior military officers—versus the more common scholarly focus on the "controllers"—civilian policy makers. He offers a relatively simple thesis: "The greater the degree to which presidential leadership style coincides with and respects prevailing service/military culture, the less will be the degree of conflict. Similarly, the greater the degree to which presidential leadership style does not provide leadership and clashes with the prevailing military culture, the greater will be the probability and intensity of conflict" (p. 2). Herspring further proposes that the military prefers a certain type of presidential leadership style, which consists of "strong political leadership" but in consultation with military leaders. He contends that the military will evaluate a president's leadership based on its concurrence with military culture on four key issues: use of force; roles, missions, and resources; personnel policies; and responsibility and honor (pp. 15–17).

In chapters 2–13, Herspring surveys every presidential administration from that of Franklin Delano Roosevelt to the current incumbent, George W. Bush. He devotes a chapter to summarizing and assessing each president's leadership style (spending considerable time on key officials like the secretary of defense) and then details relevant cases in that administration focusing on conflict, or the lack of it, between the civilian and military leadership. He concludes each of the 12 chapters by noting what "violations" of service/military culture transpired and what changes in service/military culture may have occurred. The last is an important point for the author as he contends that the military has evolved from an apolitical actor prior to World War II to a "bureaucratic interest group" (p. 1), with increasingly important links to Congress and other groups. Nevertheless, Herspring still concludes that the military is a profession with important cultural viewpoints that presidents ignore or insult at their peril. That is a central theme, to which he returns in his concluding chapter where he ranks each administration's relations comparatively, from "high" to "moderate" to "minimal" levels of conflict (p. 409).

How well does Herspring succeed in establishing his thesis? On the whole, he does an admirable job of encapsulating each administration's relationship with senior military officers through use of a wide variety of sources, all of which are extensively footnoted. (However, one might question why Herspring relies essentially on secondary sources when personal interviews would seem entirely appropriate and valuable for a book of this scope.) Case studies detailed for each administration logically demonstrate why conflict occurred between civilian and military leaders. In fact, there are really no unusual findings here for anyone familiar with this recent history, from the high-conflict administration of Lyndon Johnson to the minimal conflict found in the Ronald Reagan administration. That senior military leaders would resent civilian interference in perceived internal military matters, or would resent being shown a lack of respect or being lied to, is not surprising.

Since Herspring deals with such a long period of time and so many different administrations and personalities, he is often sketchy and may generalize unfairly at points, such as his labeling Harry Truman an "indecisive" president (p. 52). More troubling, however, is the impression that the author may be conflating his own perspective with that of senior military leaders. To be fair, Herspring does explicitly note that he was inspired to write this book partly because he felt that the perspective of those in uniform, like himself, would be useful (p. xii) and that he derived his thesis from both his own military career and academic studies (p. 432, footnote 24). The question is how much this may color his objectivity—as the chapter on the Johnson administration reveals, with its clear contempt and scorn not

only for "an elitist like the know-it-all [Robert] McNamara" (p. 192), but also the civilian "Whiz Kids," a term Herspring employs deliberately and repeatedly. One also wonders whether his personal views could have blinded him to the logical inconsistencies of castigating Bill Clinton for his failure to accept responsibility and remaining detached from military operations (pp. 344–75), whereas he praises George W. Bush for "remaining above the fray" (p. 404), blaming postinvasion problems in Iraq and the "upheaval" in civil-military relations (p. 378) specifically on Secretary of Defense Donald Rumsfeld (p. 405).

In a policy-and-process-centered work such as this one, probably the most important contribution concerns the implications for US military and civilian leaders. In fact, one finds few for the military, as Herspring is determined to provide lessons specifically for the civilian leadership. The book's conclusion neatly captures those lessons: "By leaving as much responsibility as possible to the Chiefs, listening to them, and showing them as much respect as possible, the president will minimize conflict and improve his relationship with the Chiefs" (p. 426). Yet as Herspring's own cases demonstrate, the question of what is legitimately a military versus a civilian responsibility is often precisely the issue in dispute. Where is that distinct dividing line between strategic (civilian) and operational (military) levels, particularly in today's complex environment of terrorism, insurgency, and counterinsurgency? This problem is all too familiar to Airmen, as air operations in the post–Cold War period have demonstrated. Unhappily, it promises to remain a central problem for our times.

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American Raiders: The Race to Capture the Luftwaffe's Secrets by Wolfgang W. E. Samuel. University Press of Mississippi (http://www.upress.state.ms.us), 3825 Ridgewood Road, Jackson, Mississippi 39211-6492, 2004, 384 pages, $35.00 (hardcover).

At the end of World War II, the US Army Air Forces (AAF) knew it had to exploit superior German technology in order to maintain its leadership in the postwar world order. Gen Hap Arnold in Washington, DC, and Gen Carl Spaatz at US Strategic Air Forces in Europe had the foresight to set up units to obtain captured materiel and, in the case of Luftwaffe aircraft, actually obtain flyable examples to return to Wright Field in Ohio so that the AAF could fly, test, copy, and employ these weapons. The Luftwaffe had developed a variety of weapons that the AAF did not have: jet fighters, gliding bombs, TV-guided bombs, rockets, surface-to-air missile systems, and ballistic missiles. General Arnold realized that not only weapons but also development and testing undertaken by the Luftwaffe and its weapons designers would allow the AAF to move into the next phase of modern warfare.

A good portion of this interesting and very readable account is devoted to the AAF's attempts to obtain Me 262 fighters at Lechfeld in Bavaria and an Arado Ar 234 jet bomber from Denmark, then located in the British zone. At Lechfeld the AAF found Messerschmitt pilots, designers, and mechanics. Damaged and surrendered Me 262s were repaired and then flown by 10 P-47 pilots chosen upon deactivation of the 1st Tactical Air Force in 1945. These 10 fighters, along with other important Luftwaffe aircraft and parts, were shipped on a British carrier to the United States and then transported to Wright Field. Generals Arnold and Spaatz were well served by the officers they chose to pick up this valuable materiel and fly it to America.

Considering the number of teams involved—from the Army, AAF, Navy, and State Department, not to mention Gen Leslie Groves's (Manhattan Division) team, which sought to find Nazi uranium scientists—it is a wonder that anything got accomplished. Samuel paints a very detailed picture of the conditions inside Germany's occupation zones in the summer and fall of 1945. Furthermore, from intercepted decryptions, the United States knew about the collaboration between Germany and Japan but not the exact extent. The AAF feared that the Japanese air force would soon have the same weaponry that the Luftwaffe had employed in the closing days of World War II. Although Japan never used what it had obtained, AAF intelligence teams located documents and Luftwaffe staff who knew what had taken place and shipped them to Washington, DC, for analysis and questioning.

Of equal interest to the AAF was the large Ju 290 transport aircraft, three damaged examples of which had been captured in North Africa. The ability to load cargo via a small ramp had fascinated American aircraft designers and test pilots for some time. The crew of another of these aircraft surrendered to the Americans in Germany on 8 May 1945; with the help of the German pilot and mechanics, AAF personnel flew it back to Wright Field.

The book concludes with a lengthy account of how the AAF, despite problems from the US defense

establishment, obtained the services of German scientists who helped develop some of America's most important Cold War weapons, including the B-47. Drawing on the experiences of its intelligence teams, the AAF established technical-intelligence offices in embassies and began to train officers to exploit such intelligence on the battlefield so that combat forces could take advantage of enemy weaknesses. In an afterword, Samuel reveals what happened to all of the AAF officers and German personnel mentioned in the book, making for a useful and satisfying conclusion.

The book does have a few shortcomings. Maps would be useful, as would good pictures of all of the German aircraft types acquired by the AAF; the ones offered here are small and dark. *American Raiders* is the first book to talk in detail about post-conflict technical intelligence, especially as a lead-in to Operation Paperclip (the transfer of Nazi scientists to Germany under the nose of the State Department). A useful contribution to airpower history, it also clearly discusses the incorporation of German technology into weapons developments following the Korean War.

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A Need to Know: The Role of Air Force Reconnaissance in War Planning, 1945–1953 by John T. Farquhar. Air University Press (http://www.maxwell.af.mil/au/aul/aupress), 131 West Shumacher Avenue, Maxwell AFB, Alabama 36112, 2005, 210 pages, $21.00 (softcover).

John T. Farquhar's *Need to Know* fills an important gap in airpower history and, more particularly, in the history of air-war planning. Farquhar maintains that limitations in US reconnaissance capabilities shaped war planning immediately following World War II. Since the Air Staff was unable to collect sufficient targeting information due to limited strategic reconnaissance, emergency war plans called for dropping atomic bombs on Soviet urban centers. "Therefore," Farquhar argues, "aerial reconnaissance was more than a tool of the war planners; the limits of strategic aerial reconnaissance shaped doctrine" (p. xxi).

The importance of tactical surprise in warfare warranted the need for better information on important enemy target systems. During World War II, precision-bombing doctrine required detailed information on target systems. Army Air Forces Ferrets—heavy bombers modified for reconnaissance—identified German early-warning, coastal-surveillance, and ground-controlled intercept radar, thereby influencing Fifteenth Air Force war plans.

Following World War II, US military planners failed to understand the importance of photographic reconnaissance in preparing emergency war plans. Photoreconnaissance aircrews surveyed potential targets and provided analysts with information necessary to identify specific industries, plot air routes, and create target folders for bomber crews. According to Farquhar, inadequate strategic reconnaissance dictated that emergency war plans, such as Pincher, Broiler, and Offtackle, include atomic bombing against vital centers. He states that "whereas precision bombing doctrine targeted a specific industry within a city, [these emergency war plans] targeted a city to destroy a specific industry" (p. 72). Since these war plans depended upon a continuing US nuclear-weapons monopoly, the foremost intelligence concern was the Soviet nuclear-weapons program. Consequently, electronic evidence of a Soviet nuclear test in 1949 undermined confidence in US intelligence capabilities.

During the opening stages of the Korean War, enemy air defenses rendered existing strategic-reconnaissance aircraft obsolete. This concerned Strategic Air Command commander Gen Curtis LeMay. Existing war plans against the Soviet Union demanded visual, prestrike reconnaissance. Improved Soviet air defenses coupled with the low survivability of reconnaissance aircraft in Korea provided LeMay with another reason to rely upon the atomic bombing of Soviet cities to destroy Soviet industry. In Korea, Far East Air Forces command lacked necessary intelligence personnel to plan, collect, and analyze information. RF-80 and RB-29 crews provided essential tactical reconnaissance to field commanders; however, inadequacies in night photography limited them to daytime missions. Despite mapping over 12,000 miles of the Korean Peninsula and Chinese coast, RB-29 crews failed to identify the Chinese intervention in October 1950. Deficiencies discovered in Korea influenced changes in reconnaissance of the Soviet Union.

Clearly, John Farquhar is qualified to make these statements. He has logged 4,600 hours as a navigator in RC-135s with the 38th Strategic Reconnaissance Wing, directed wing plans for the 55th Wing, and served as deputy head of military history at the US Air Force Academy. His arguments carry the weight of an experienced Airman and scholar. At some points in his book, however, he seems to veer off his topic into other areas of airpower history with only tangential importance to his thesis. I also think that

Farquhar assumes a fair amount of technical understanding, which might be second nature for the Air Force officer, but for the scholar, much less so. Regardless, Farquhar's thesis that "the limits of aerial reconnaissance shaped strategic doctrine" (p. 172) is well argued and well supported. Furthermore, he satisfies his stated purpose for writing this book, which was to fill a gap in the history of the Air Force. We might wonder, however, that, if the Air Force had sufficient strategic reconnaissance prior to finalizing the emergency war plans, whether that information would have altered strategic air doctrine in the early Cold War. I realize this is counterfactual, but I think Farquhar assumes a fair amount of causality here. Would having sufficient targeting information change the priority of targets listed or, more importantly, sustain nonnuclear precision bombing as a primary option? In 1945, XXI Bomber Command successfully undertook nighttime area attacks against Japan. Perhaps, instead of background history on the development of reconnaissance technologies in the European theater, a review of how reconnaissance influenced area bombing against Japan might strengthen Farquhar's thesis. Either way, *Need to Know* is a wonderfully thought-provoking book for both the airpower historian and the Air Force professional.

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Mémoires: Les Champs de Braises by Hélie de Saint Marc with Laurent Beccaria. Editions Perrin (http://www.editions-perrin.fr), 76, Rue Bonaparte, 75006 Paris, France, 1995, 348 pages, 19,67 Euros.

Les Champs de Braises is a subtle and moving French-language memoir of a tumultuous military career spent fighting insurgencies and injustice in wild corners of the world. Saint Marc's counterinsurgency experiences proved disappointing, but his moral strength helped him weather misfortunes with dignity. The book offers today's military professional useful insights into the nexus between counterinsurgency operations and military ethics.

Saint Marc began his military career as a teenager when he joined the French Resistance in 1941 during World War II. Unfortunately, the Nazis captured him in 1943, interning him in the notorious Buchenwald and Langenstein concentration camps. He survived extreme privation until US forces liberated his camp in 1945. Dissatisfied with postwar French civilian life, he attended the famed Saint Cyr military school and in 1947 joined the Foreign Legion, whose members were known as "the men without names." He served three (almost continuous) combat tours in Vietnam from 1948 to 1954 as France struggled unsuccessfully to retain its Southeast Asian colonies. After the Communists drove the French from Vietnam, Saint Marc continued his Foreign Legion career in Algeria, where he fought another unsuccessful counterinsurgency from 1954 to 1961, during which time he saw combat in the ill-starred Suez Crisis of 1956. In 1957 he served on Gen Jacques Massu's personal staff during the Battle of Algiers, a landmark urban-combat operation against Islamic insurgents. Finally, disillusioned with what he deemed misguided French policy in Algeria, Saint Marc participated in the failed "putsch" of 1961, when some French military units briefly revolted against their government. Imprisoned in France until 1966, he thereafter dedicated his life to calmer pursuits.

Saint Marc's story might seem a jeremiad, but it is actually more complex. Although he describes beautiful jungle and desert scenery, exotic people, and delicious cuisine, these elements serve as mere backdrops for terrible suffering and loss. After developing a profound affection for Vietnam, where he recruited partisan fighters to oppose the Communists, he received orders to desert these people, who had boldly sided with France. The knowledge of their massacre after betrayal at the hands of French forces torments Saint Marc. Faced with what he deemed a similar tragedy in Algeria, he resolves to mutiny against his own country and face imprisonment. The author laments his many Legionnaire friends who died bravely for lost causes, yet, remarkably, he manages to grow philosophical rather than embittered about such traumatic events.

Among Saint Marc's varied experiences in counterinsurgency, modern readers will find his tenure on General Massu's staff in Algeria particularly instructive. Shot while fighting in the Vietnamese jungle, he suffered even deeper wounds to his spirit during the Battle of Algiers. Militarily, the French temporarily won in Algiers by resorting to torture of suspected insurgents, but the resulting international outcry cost them much-needed political support. Saint Marc decries the corrosive moral effect that torture had on the French military but finds some cause for optimism during that war. His analysis of what we would call General Massu's information-operations philosophy will sound familiar to individuals who seek to dominate the informational domain in the current global war on terror.

The implications that the book has for military ethics also call for careful reflection. Saint Marc's strong sense of humanity and integrity is clear; however, his willingness to follow his conscience whatever the personal consequences cost him dearly after his failed mutiny. The profound camaraderie he found in the Foreign Legion gave him strength to endure hardships, but his decision to stand with his fellow Legionnaires against his own government makes one wonder how today's military members might respond in a similar situation. Perhaps only Legionnaires and individuals in special operations forces can truly understand such fraternal bonding.

Les Champs de Braises offers the important lesson that counterinsurgencies demand firm, consistent national policy. French political instability and weakness led to vacillating, ultimately craven, policies that undermined military morale and condemned to death many Vietnamese and Algerian people who had sided with the French. American policy makers would do well to heed this lesson as the United States confronts a protracted struggle against terror networks in Afghanistan, Iraq, and elsewhere.

Since the book contains many photographs but no maps, readers unfamiliar with remote parts of Vietnam and Algeria may want to keep an atlas handy. Furthermore, the author's chronological arrangement of events helps readers find passages despite the lack of an index, and an appendix that lists milestones in Saint Marc's life also proves useful. In sum, military professionals interested in counterinsurgency can profit from reading *Les Champs de Braises.*

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Battle of the Bulge: Hitler's Alternate Scenarios edited by Peter Tsouras. Greenhill Books (http://www.greenhillbooks.com), Park House, 1 Russell Gardens, London NW11 9NN, 2004, 256 pages, $34.95 (hardcover).

What would have happened if Field Marshal Bernard Montgomery had captured Caen, France, on 7 June 1944 instead of on 9 July? If British paratroopers had held "the bridge too far" in Operation Market Garden? If Patton's Third Army had failed to relieve the 82nd and 101st Airborne paratroopers in besieged Bastogne in late December 1944? To answer these questions, *Battle of the Bulge* provides alternate versions of some of the major battles of Northwest Europe, 6 June 1944 to 7 May 1945.

Peter Tsouras, a distinguished military historian, and some well-known colleagues offer interesting and imaginative accounts of major battles of Northwest Europe from D-day to VE-day. Each author slightly alters a critical decision or event of the historical record to produce an alternate outcome. Using actual battles, actions, and characters, they show how a different choice or minor incident at points of decision could have produced an entirely new sequence of events, thus altering history forever. I found myself looking hard for the changed decision/event because the authors so successfully and smoothly integrate it into the historical narrative. Additionally, they provide not only easy-to-read maps so the reader can readily follow the battle but also bibliographies—including fictional sources to account for the altered decisions, actions, and comments of participants.

The only scenario that appears spurious is the one written by the editor himself. Tsouras has President Roosevelt dying in January rather than April 1945, so Vice Pres. Henry Wallace, a leftist if not a communist, becomes president and delays the inauguration of Vice Pres.–elect Harry Truman as president. (Remember that presidential elections were held in November and that the inauguration occurred the following March.) As a result, Wallace appoints leftists as his advisers, and Stalin sees a chance to gain control of the US government. Lavrenty Beria, Stalin's security chief, has Gen George C. Marshall, the chief of staff, dying (murdered) in an airplane explosion on his way to Europe, and Generals Patton and MacArthur launch a military coup in Washington, DC, to save the government and war effort. This reads more like fiction than alternative history!

Alternative ("counterfactual") history has its critics, who argue that, after all, this genre by its very nature is not "real" history. However, in many ways, those who write alternate history, especially of the high quality one finds in *Battle of the Bulge,* are just taking historians' speculations a step further. Understanding Clausewitz's "fog of war," they take a different look at the historical record and demonstrate that every problem always has alternatives. Why does a historical actor behave one way over another or make one decision instead of another? Good alternative history can provide insight into the results of the decision—the way not taken—as a means of understanding the very nature of history and decision making.

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God, Country and Self-Interest: A Social History of the World War II Rank and File by Toby Terrar. CWPublishers (http://www.angelfire.com/un/cwp), 15405 Short Ridge Court, Silver Spring, Maryland 20906, 2004, 420 pages, $16.95 (hardcover), $9.95 (softcover).

God, Country and Self-Interest could be an especially good exploration of the motivations of people in combat and those on the home front. Toby Terrar makes a noble effort toward this end by trying to link the wartime experiences of his parents to the unfolding of the war in the Pacific. The result is a book that is both military and family history. Therein lies the rub: the two elements do not mesh, at least not in this case.

Terrar's father was a Navy pilot, and his mother a Navy nurse who resigned to become a stay-at-home wife after they married. They wrote each other often during the war. The letters, however, deal with mundane matters such as how much they want to move on to postwar life and what they have for dinner, so Terrar uses diaries and manuscripts by other veterans to cover his parents' lack of war talk. When dealing with the campaigns of the war—particularly the war in the Pacific—he cites appropriate secondary sources and various manuscripts in his possession.

A good genealogist better known for his work in Catholic and family history, Terrar tries to put in every date and name for every person his parents encountered during their formative years and their wartime experiences. This practice becomes distracting sometimes and definitely interferes with the flow of the narrative. (If it's pertinent that Smiley and Sara were broadsided in Fresno [p. 51], then logically the text should include a date of their deaths as well; if not, then some editing is in order.) Also, the footnotes sometimes intrude themselves on half the page and may include such extraneous material as a high-school essay or poem or whatever else. The book pretends to be about the human dimension of war, both in-theater and at home, but the discussion of the war itself stresses strategy, tactics, and technology rather than the human element.

Despite the flaws, it is possible to find in this book a reasonable argument that self-interest and advantage, rather than patriotism or any of that nonsense, motivated these two people—and millions more like them. If self-interest includes watching out for one's buddy and doing things to keep from being embarrassed, then self-interest makes people endure war. Another strength of the work is Terrar's occasional step onto his soapbox for a good, old-fashioned Midwestern isolationist moment of the sort not seen since the 1920s' disgust with merchants of death who profiteered World War I into American history. Unfortunately, there is too little of that.

Overall the book falls short because it tries to do too much. Terrar should not have attempted to tie a personal story to a broad narrative of the Pacific theater. Because his father almost never wrote about the war, even in the middle of it, the campaigns prove irrelevant. The publisher's packaging of the book only adds to the disappointment. The use of photocopies of photos, for instance, makes the book look cheap. More important, *God, Country and Self-Defense* doesn't work because it is not really social history, and the Navy officer and his wife are not really rank and file. Bill Mauldin and Ernie Pyle did a much better job with that aspect of the war. More recently, so did Paul Fussell (*Wartime*, 1989; *Doing Battle*, 1996; and *The Boys' Crusade*, 2003.)

Dr. John Barnhill
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Ordeal by Exocet: HMS *Glamorgan* and the Falklands War, 1982 by Ian Inskip. Chatham Publishing (http://www.chathampublishing.com/index.html), Park House, 1 Russell Gardens, London NW11 9NN, 2002, 320 pages, $14.95 (softcover).

Although the Falklands War has been eclipsed in the public eye by larger and more recent operations in the Balkans and Middle East, one can still learn lessons from it. This is immediately evident from a reading of Ian Inskip's *Ordeal by Exocet*. On 12 June 1982, as she returned from a bombardment in support of the last major battle of the Falklands War, county-class destroyer HMS *Glamorgan* was struck by an Exocet missile launched from a mobile launcher near Stanley, capital of the Falkland Islands. Unlike the *Sheffield* and *Atlantic Conveyor*, sunk during the previous month by air-launched Exocets, *Glamorgan* remained afloat, making her the first ship in history to survive an Exocet hit. *Ordeal by Exocet* is her story.

Ian Inskip, then a lieutenant commander, is well qualified to tell that story. As the ship's navigating officer, he was on the bridge not only for the missile attack but also during *Glamorgan*'s numerous shore bombardments and replenishments. Using his own detailed diary and those of four shipmates, along with verbal and written contributions from numerous other participants, he chronicles the

previously untold story of *Glamorgan*'s role in the Falklands War.

Undoubtedly, one finds the highlight of the book in the two chapters dealing with the missile attack and subsequent damage-control efforts, discussed in terms of lessons learned from the sinking of the *Sheffield* and *Atlantic Conveyor* as well as the evolution of tactics to combat the Exocet threat. However, despite the book's provocative title, it is not only, or even primarily, about the Exocet strike and the destroyer's subsequent struggle for survival. Rather, it covers *Glamorgan*'s entire cruise, from the exercise in which she participated before the Argentine invasion to her return to Portsmouth following the war. Thus, Inskip affords the reader a day-by-day view of life aboard a Royal Navy ship at war, including the normal routine of sailors and operations such as replenishment at sea, escort duty, and naval gunfire support. In addition to military operations, he provides detailed insight into how families of the ship's crew dealt with the deployment, a topic rarely mentioned in writings on the war, as well as extensive discussions of post-traumatic stress disorder—a condition mostly ignored by military historians (with the exception of Hugh McManners' *Falklands Commando*), despite its effect on numerous Falklands veterans.

As a whole, *Ordeal by Exocet* is well written though somewhat uneven. Because it progresses chronologically, portions of the narrative dealing with relatively slow times such as the transit to Ascension Island are somewhat disconnected. On the other hand, the account of the Exocet attack is engaging and difficult to put down. Inskip includes enough background information to make the book as accessible to general readers as it is to serious students of the Falklands War—and each group would likely benefit from the perspective he offers. Overall, *Ordeal by Exocet* is a worthwhile and relevant contribution to students of both military history and the effects of war on society.

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The All-Volunteer Force: Thirty Years of Service edited by Barbara A. Bicksler, Curtis L. Gilroy, and John T. Warner. Potomac Books, Inc. (formerly Brassey's, Inc.) (http://www.potomacbooksinc.com/Books/Features.aspx), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2004, 352 pages, $44.00 (hardcover), $21.60 (softcover).

I've never been a fan of personnel (faces) or manpower (spaces) issues. I find these subjects about as exciting as watching the grass grow on a hot Kansas afternoon—they are best left to the classic Pattonesque staff officer. In fact, I am still unsure why I decided to review a book on such subject matter. But I'm glad I did.

The All-Volunteer Force is more than just a happy, pat-on-the-back book on the virtues and successes of this force. Almost all of its articles declare the virtues, successes, and hurdles overcome by the all-volunteer force, which President Nixon signed into law in 1973. But many of them also criticize the present course and make recommendations for changes to manpower policies, recruiting practices, end strengths, use of the Reserve and Guard forces, and the structure of the active duty ranks.

The editors have collected papers presented on 16–17 September 2003 at the National Defense University in Washington, DC, adding both introductory commentaries and summaries. Divided into five sections—the all-volunteer force in perspective, recruiting and retention, contributions of the Reserve component, transformation in military manpower and personnel policy, and the next decade—the book focuses on the past 30 years' experience and explores the question "Why will more young people continue to volunteer for and remain in the US military?"

The list of contributors spans current and former government officials, military officers, business executives, professors and university presidents, and members of Congress, who provide the reader with many perspectives, often from outside the Department of Defense (DOD). Several writers, citing "better business practices," have recommendations regarding several of the DOD's "pet rocks," including the time-honored military pay scale and the retirement system. Others poke at recruiting policies that affect just Reserve forces, basing, and murky issues which in some obscure way relate to manpower or personnel.

I found Martin Anderson's retelling of how the 1973 drive for an all-volunteer force began (p. 15) both enlightening and compelling. Several contributors mention that the force directly reflects the society from which it comes. However, today's force skims a large proportion of qualified and highly qualified candidates from the total pool of applicants, most of them possessing a high school diploma. Similarly, today's force disproportionately reflects America's growing Hispanic population (which, demographically, is neither as likely to finish high school with a diploma nor to score as well on the aptitude tests). Recruiter challenges today

include keeping the pool top-notch while expanding opportunities for more Hispanics to enter the service (p. 155).

Vice Adm Patricia A. Tracey sums up a DOD "to do" list that reaches across several broad areas, covers all services, and looks to the future (p. 321):

- An increased probability of hostile action—preemptive and preventive action, as well as defensive action (as described in an essay by Arthur Cebrowski)—requires a change in terms of service.
- A higher percentage of the force probably needs to be in combat support or combat service-support specialties in order to sustain a higher level of real-world activity (Cebrowski calls these people system administrators).
- The active/Reserve mix needs to change, as do the rules for active/Reserve assignment and utilization.
- The DOD needs new policies to better manage operation tempo—policies that go beyond paying people who stay away from home longer than they would otherwise want to, but that ensure the regeneration of troops as well as equipment.
- Services must better anticipate market effects on recruiting and retention.
- Policy makers and force planners must recognize that military personnel are not free goods. Acquisition, force planning, doctrine, tactics, techniques, and procedures all need examining with an eye toward economy regarding requirements for people.

The "personnel triad" of Ed Dorn, former undersecretary of defense for personnel and readiness, offers an effective summary: recruit them, train them, and treat them right (p. 344). His bottom line is even simpler, albeit blunter: the DOD needs either a bigger force or a smaller empire. "Bigger force" speaks for itself; "smaller empire" means that the DOD needs to find "new, and perhaps more humble, ways to engage the rest of the international community" (p. 347).

Cong. Heather Wilson counts herself among the many individuals who point out that the country's armed forces are approaching the limit of their ability to continue to perform missions associated with the global war on terrorism (GWOT). To date, no one outside the administration has argued that the nation can maintain its present commitments, over the long run, with current personnel levels. Specifically, she recommends expanding special forces and Special Operations Command (p. 327). Additionally, she adds her voice to those calling on the DOD not only to increase its authorized strength by as much as 90,000 to 150,000 positions, but also to look outside the military ranks to fulfill some of its requirements for specialized skills.

The contributors also forecast recruiting and retention problems if the DOD maintains the status quo on its personnel and manpower policies while the administration stays the course with the GWOT. Some of these dire predictions have already come to pass. Ed Dorn states that the Defense Department faces an even more basic issue: could it recruit 20,000 to 50,000 additional personnel if authorized to do so, given current recruiting practices, the slowly eroding public support for the war in Iraq, and an economy that continues to generate jobs (p. 346)? Deputy Secretary of Defense Paul Wolfowitz succinctly observes,

> Today, more than 1.4 million men and women choose to serve on active duty in the armed forces, along with another 1.2 million who serve in the National Guard and reserves. It is a diverse force that reflects the rich culture, tradition, and values of America. Our all-volunteer force is high quality, well trained, and highly skilled. The men and women who serve in our armed forces are motivated, experienced, and compassionate. They are professionals in every sense of the word. They have defended America's interests and security for three decades and they are clearly prepared to meet the challenges of the war on terrorism (p. 333).

I am a product of the all-volunteer force, as is virtually everyone who wears the uniform today; together, we carry on a more than 200-year-old tradition of the American experience. Only three times did conscription interrupt this stretch—for the Civil War, World War I, and World War II (conscription ending in 1973)—but that didn't stop people from continuing to volunteer. All of us—active, Guard, or Reserve—joined for our own particular reasons. What's kept us in is what continues to draw young people into the military ranks and keep them there: a desire to serve the country. *The All-Volunteer Force* does a fantastic job of keeping this message alive. But other messages are just as clear. America has the best force it has ever had; quality isn't cheap. Policy decisions in accessions, pay, and retirement will continue to drive that quality. Perhaps the DOD does need to look outside itself occasionally for some specialized, part-time help. Certainly, Guard and Reserve issues need examining with an eye toward redefining what it means to be a member of those forces. We've come a long way, but a long road lies ahead.

Much to my relief, *The All-Volunteer Force* does not read like a book intended for manpower and personnel staffers, although these people would receive the most obvious benefit of its insight. Every military officer and senior noncommissioned officer of any Air Force specialty code or military occupational specialty as well as any DOD civilian with decision authority would do well to read this book, digest its essays, and do what they can to make the most out of the next 30 years of our all-volunteer force. Clearly, we cannot stay the course we set during the 1990s and early 2000s. *The All-Volunteer Force* has some answers and road maps that, in the hands of the right people, can and will make a difference for the next 30 years.

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Sierra Hotel: Flying Air Force Fighters in the Decade after Vietnam by C. R. Anderegg. Air Force History and Museums Program (https://www.airforcehistory.hq.af.mil/publications.htm), 200 McChord Street, Box 94, Bolling AFB, Washington, DC 20332-1111, 2001, 228 pages (softcover). Free download at https://www.airforcehistory.hq.af.mil/Publications/fulltext/SierraHotel.pdf.

With the enthusiasm and credibility of a fighter pilot who actually rolled down the chute in Southeast Asia, C. R. "Lucky" Anderegg provides a "sierra hotel" account of how a small corps of dedicated fighter pilots capitalized on their combat experience and a vision of what should have occurred in Vietnam to sow the seeds of transformation that took root in the Tactical Air Force (TAF) during the decade that followed. Detailing significant advances in combat capability that sprang forth from fertile minds cultivated in the crucible of combat, Anderegg argues that the creation of the Aggressors and Red Flag marked the Fighter Mafia's crowning achievements since both served to ensure that the fruit of their many innovations fell upon Allied fighter crews in the following decades.

Anderegg begins his work by examining the performance of Air Force fighter pilots in Vietnam's "school of hard knocks." Flying fighters designed for a nuclear confrontation with the Warsaw Pact, fighter crews went to Southeast Asia with inadequate training for the machines they flew and the conventional air war they faced. Highlighting numerous contributing factors, Anderegg astutely points to poor instructional methodology as the principal reason new fighter pilots arrived in-theater largely unprepared. Institutionalized by an entrenched fighter culture, training entailed upgrading pilots to learn by watching and copying the "old heads" rather than teaching them a logical method for tactical problem solving. These difficulties notwithstanding, the pragmatic fighter force of Vietnam did find better ways to get the job done by war's end.

With that setting, Anderegg demonstrates how the fighter force experienced a grassroots transformation in the post-Vietnam years. As the old guard of senior veterans retired, a new corps emerged in its place comprised of less experienced yet more highly educated officers. Additionally, a changing of the guard occurred at the USAF Fighter Weapons School (FWS), long recognized as the temple of fighter-tactics training. Led by one operations officer and his cadre of instructors, the movement shed the old way in favor of a new building-block approach whereby the final objective of combat capability drove every aspect of training. The FWS codified this new methodology and disseminated it to the TAF along with several other innovations in two watershed issues of its *Fighter Weapons Review*, and the march was on.

In the chapter "Let's Get Serious about Dive Toss," Anderegg metaphorically explains how the change in fighter culture pushed a bottom-up review of everything in the Air Force. As FWS instructors attempted to shift F-4E tactics away from manual dive-bombing towards more survivable and accurate dive toss using computed system deliveries, one FWS instructor wrote his famous "Dear Boss" letter to the commander of Tactical Air Command, highlighting root causes of a fighter-pilot exodus to the airlines. While the FWS cadre worked overtime to convert an entrenched fighter force to adopt a better tactic, one outspoken fighter pilot provided honest feedback to the top brass to do the same on a much grander scale. Of course, the rest is history, and so is the Dear Boss letter, which Anderegg thoughtfully includes as an appendix.

With a shift in fighter culture, the TAF rapidly revolutionized its training over the next several years. Anderegg meticulously documents how the Fighter Mafia created dissimilar adversaries with the Aggressors and established a realistic training exercise in Red Flag. By forcing young, inexperienced crews to "fight" against the simulated Red horde in an exercise they could survive and then debrief and learn real lessons, Red Flag allowed fighter crews to complete their first 10 combat missions effectively—and capability skyrocketed. Learning accelerated as gun-camera film and air-combat-maneuvering instrumentation became a standard

part of every mission and debrief. Finally, the expansion of ranges, incorporation of an Integrated Air Defense System, and inclusion of real-time feedback transformed Red Flag into the most realistic aerial combat training in the world, bested only by the real thing.

In the end, Anderegg details some of the innovative technologies, tactics, and training that pushed TAF lethality to the cutting edge, including laser-guided bombs, Maverick missiles, and the weapons-system evaluation program for air-to-air missiles. Never forgetting that fighter pilots drove the change, Anderegg provides his unique inside look at the individuals who underwrote the transformation. Finally, he concludes with an insightful examination of the development of three fighter aircraft—the F-15, A-10, and F-16. Born of combat, these great aircraft provided their pilots with the last measure of confidence necessary to become the world's premier fighter force.

Although Anderegg's initial discussion of the technical problems faced by fighter crews in Vietnam and his later explanation of the innovations to overcome them may burden the reader with excessive detail, they credibly prove both the requirement for and the success of the resulting transformation. More importantly, Anderegg's thorough analysis offers the reader a context for understanding why and how pragmatic fighter pilots stayed in the game to face the challenges of their day and bring about real change.

A must-read, *Sierra Hotel* presents today's Airmen with a shining example of how officers seemingly immobilized by the inertia of military bureaucracy can make a difference. The challenges of our time may be unique, but they are not so different that we cannot learn from the transformation of the decade following Vietnam, which instigated a revolution that produced the Air Force with which we are now entrusted. On another note, perhaps our current Air Force leaders can reread the Dear Boss letter written by one of their contemporaries. Many of the grievances it addresses have returned, and perhaps the only reason we haven't seen a similar exodus of fighter crews to the airlines has more to do with their dedication to the nation in a time of war than with the probability of a future Air Force better than the present one. If that is the case, then as one member of the Fighter Mafia admonished an earlier generation, maybe we all need to "get serious about dive toss."

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The Smell of Kerosene: A Test Pilot's Odyssey by Donald L. Mallick with Peter W. Merlin. NASA History Office (http://www.hq.nasa.gov/office/pao/History/history.html), 300 E Street SW, Washington, DC 20546, 2003, 252 pages, $22.00 (hardcover).

Test pilots have a special place in the aviation hierarchy. They are the best of the best—at the top of the pyramid, as this memoir explains. Along the way, however, *The Smell of Kerosene* makes clear that the job involves not only glamour but also hard work, long training, and considerable danger.

Although Donald Mallick idolized his older brother, who flew B-24s in the Eighth Air Force during World War II, he joined the Navy after two years of college because he was too young to get into the Air Force. Pinning on his wings and bars in 1952, he went on to fly F2H-2 Banshees off carriers. After leaving active duty in 1954 and earning his bachelor's degree in aeronautical engineering, he joined the National Advisory Committee for Aeronautics (NACA), predecessor of the National Aeronautics and Space Administration (NASA), in 1957 as a test pilot at Langley AFB, Virginia, and later moved to a similar position at Edwards AFB, California. Mallick also flew in the Naval Reserve. He retired in 1987, having logged over 11,000 flying hours.

Mallick had a long, diverse career that did not include flying aircraft on their initial or record-breaking flights. Instead, he flew the "wringing out" flights, the technical tests, gathering information needed to enhance aircraft performance and safety and to advance aeronautical science. At Langley (1957–63), for example, he flew stability-and-handling research tests with five different types of helicopters; qualitative evaluation of vertical and/or short takeoff and landing aircraft (XZ-2) and the F11F-1; developmental tests of a "g"-limiter system on the F2H-1; aircraft structural dynamics and flutter tests on the F-86D; quantitative and qualitative evaluation of flight controls on the F9F-2; variable-stability flying qualities on the F-100C; sonic-boom tests on the F8U-3; and support, executive, and photo chase in six different aircraft types—all of that in only his first five years on the job! During his career, Mallick flew a vast array of aircraft (125 types): subsonic (B-52 and B-57) and supersonic (B-58 and B-70) bombers; fighters, including the F-104, F-106, F-111, F-15, and F-8; transports; trainers; civil aircraft; helicopters; sailplanes; the Bell Lunar Landing Research Vehicle; the NASA Lifting Body; and the U-2 and SR-71. He offers readers a taste of all of these efforts.

The strength of this book lies in its breadth. Mallick gives a good account of his pilot training and his experience flying off carriers. Additionally, he writes of his training in test-flying and the tedium of this work, not just the excitement and danger. Regarding the descriptions of the various aircraft he flew, I found his coverage of the B-70 and F8U-3 particularly well done. A few small concerns: he seems somewhat uncritical of the aircraft he flew since he has few negative comments, and although he mentions all the pilots with whom he flew, we learn little about them. Mallick does discuss the deaths and accidents associated with his line of work. (He had but one major aircraft accident in his career, walking away from a helicopter crash with injury only to his pride.) Profusely illustrated, *The Smell of Kerosene* is fine reading for people interested in aircraft and test-flying in the second half of the twentieth century.

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Future Roles of U.S. Nuclear Forces: Implications for U.S. Strategy by Glenn Buchan, David M. Matonick, Calvin Shipbaugh, and Richard Mesic. RAND (http://www.rand.org/publications/index.html), 1700 Main Street, P.O. Box 2138, Santa Monica, California 90407-2138, 2003, 152 pages, $15.00 (softcover). Free download at http://www.rand.org/pubs/monograph_reports/2005/MR1231.pdf.

Future Roles is in fact a report of a study conducted by RAND in the context of Project Air Force that examines the possible roles of nuclear weapons in contemporary US national security policy. The book makes the point that the United States should indeed review its nuclear strategy, most of which still reflects post–Cold War policy. The authors move from the origins of US nuclear strategy to current roles for US nuclear weapons to implications for future US nuclear strategy. In the process, they present four case studies in order to illustrate one of their conclusions: the need for smaller nuclear weapons that might give US nuclear strategy exactly the flexibility it needs.

Considering the radical changes in international relations and security around the world, it is remarkable that US nuclear strategy has not already undergone a thorough review. For instance, the important role of US nuclear weapons during the Cold War in terms of deterring attack and maintaining a dangerous yet stable nuclear balance has changed dramatically. The world is no longer bipolar, and potential threats have emerged in various parts of the world. Former nuclear powers are falling apart, and their ability to control their weapons is crumbling; new nuclear powers are emerging; nonstate actors might gain access to nuclear weapons; and so forth. What effect does all of this have on nuclear deterrence? Who should be deterred by what and for what? Even more frightening, most of these new players do not know the "rules of the nuclear game."

In order to tackle such problems, the authors found that the United States has a much broader range of nuclear strategies and postures from which it can choose, including the abolition of nuclear weapons, substantial reductions and alterations, "business as usual" (only smaller), a more aggressive nuclear posture, and/or nuclear emphasis. The best variant might call for a much smaller nuclear force operated differently and used more aggressively if the situation so demanded. The best option in the current situation, therefore, is a nuclear force not obliged to retaliate immediately and as massively as in the Cold War but still capable of believable deterrence—in other words, a credible nuclear force with a command-and-control structure that need not have the ability to strike back immediately but can answer every nuclear attack on the United States with certainty.

To illustrate the possible use of nuclear weapons, the authors present four case studies that show the illogic of employing them in operational and tactical situations. For example, damage might prove out of proportion, and the chances of collateral damage too high, especially if one takes into consideration casualties as a result of fallout and radiation. As the best option, they suggest waiting for technological advances in the field of conventional weapons—because they promise the best overall results in future combat situations—and using tactical nuclear weapons only as a last resort.

After presenting extensive arguments that readers unfamiliar with military strategy in general and nuclear strategy in particular will find hard to follow, the authors come up with several options: restructuring US nuclear forces, creating a different kind of command-and-control system, maintaining a smaller number of nuclear weapons (but enough to pose robust deterrence), and increasing the number of these smaller weapons to back up eventual flaws in conventional capabilities and stimulate production of more technologically advanced conventional arms. (As an aside, it is strange that studies still depict Russia as the major nuclear opponent

instead of China, another emerging world power with considerable nuclear capacities. Of course, readers could apply the case studies on military confrontation to China and come up with their own conclusions.)

Publishing on a subject so important to US national security can prove quite difficult because of the lengthy governmental clearance and review process. In this case, it took the authors almost three years to have this book published; even then, some of the references they used are not available to all readers. At any rate, reading a somewhat restricted version is better than reading nothing at all. *Future Roles* should prove interesting reading not only for the Air Force community but also for all military professionals and foreign-policy decision makers.

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Afterburner: Naval Aviators and the Vietnam War by John Darrell Sherwood. New York University Press (http://www.nyupress.org), 838 Broadway, 3rd Floor, New York, New York 10003, 2004, 368 pages, $35.00 (hardcover).

"Pilots, in many instances, were simply 'voice-actuated autopilots' . . . not nearly as crucial to the overall outcome as the guy in the backseat" (p. 93). Such is just one of the perspectives John Darrell Sherwood repeatedly offers in his latest book on jet-era fighter aviation. *Afterburner* makes several contributions to airpower history, most notably Sherwood's use of new interviews he conducted himself.

The book begins with a narrative of operations over Laos in old A-4C Skyhawks from a worn, tired carrier—the USS *Shang-ri La*. The heart of *Afterburner* relies on the wartime diary of naval flight officer James B. Souder, among the best of the Navy's F-4 Phantom "backseaters." Not a collection of "there I was" yarns, the book uses sources that address several issues of great importance to Air Force war fighters. Souder's experience is the most compelling, for it sheds light on the aircrew-leadership challenges he faced working with pilots transitioning from the single-seat F-8 Crusader to the two-seat F-4. The author explains how the refusal of many pilots to exploit the abilities of their naval flight officers resulted in missed opportunities to shoot down North Vietnamese fighters, divided squadrons into cliques, and even risked fratricide. Souder's story highlights the leadership challenge of a subordinate in a lower-status position who possesses better airmanship, sense, and knowledge than his superior. Indeed, *Afterburner* raises a fundamental leadership question: does authority rest on professional skill or self-conferred status? Souder's behavior as a prisoner of war (POW) is an object lesson in the Air Force core value of service before self. He nursed to health several severely injured pilots in 1972, even going so far as to clean out the large intestines of one helpless prisoner with his bare hands, no doubt saving the man's life.

Sherwood offers a second example of sacrificial leadership—that of Roger Sheets, commander of the air group, an experienced F-4 and F-8 pilot. Embarking upon the USS *Coral Sea*, he recognized that a Marine A-6 squadron desperately needed experienced leadership. Sheets chose to fly with it and lead those marines, knowing full well he was sacrificing his last chance for a MiG kill and "the distinct possibility of an admiral's star" (p. 193).

Compelling and raw, these stories force the reader to reflect on the challenges of teamwork within a small unit at war. The book also provides a much-needed examination of the tactics and capabilities of F-4s and A-6s from the point of view of the naval flight officer. Further narratives of joint rescue operations over North Vietnam provide familiar, if hair-raising, grist for truly joint training in all phases of tactics and operations. Sherwood also contributes to the literature on the POW experience with a chapter largely based on a 1999 interview with Cdr C. Ronald Polfer, an RA-5 Vigilante pilot shot down in May 1972. His story sheds light on the lives of prisoners during a portion of the war not heretofore covered to the extent of the Rolling Thunder years. Another new addition to Vietnam history is Sherwood's use of his recent interviews of Cdr Ronald "Mugs" McKeown. The narrative of his combat action against the North Vietnamese air force not only makes for good reading, but also illustrates the advances that naval aviation made in the quest for air superiority.

Sherwood attempts to set these vignettes within a larger narrative of the war, a choice that slows down the pace and verve of the book. Indeed, three of the last four chapters degenerate into a general air history of Linebacker I and II. For a book ostensibly about naval aviation, it contains way too much Air Force history, which the author rarely contrasts to that of the Navy. Sherwood also chose to include material from *Fast Movers*, his previous book.

These shortcomings, however, do not prevent *Afterburner* from being required reading for Airmen and air leaders. On the one hand, Sherwood operates under a couple of constraints beyond his control. Navy squadrons at war do not maintain as many

records as their Air Force counterparts, and the Navy has only just begun to declassify its Vietnam-era documents. On the other, Sherwood is achieving command of the historical record of the air war over Vietnam and adding important new material in the form of interviews. He presents all of this in a scholarly manner that avoids the straitjacketed style of an official history. Given time to write, he clearly has the ability to contribute a book on the air war over Vietnam akin to Gerald Lindermann's masterful *The World within War*. In fact, Sherwood offers an important topic for study: "Why these men fought so hard and so well during these final months remains one of the great mysteries of this unpopular war" (p. 250).

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The Politics of Air Power: From Confrontation to Cooperation in Army Aviation Civil-Military Relations by Rondall R. Rice. University of Nebraska Press (http://www.nebraskapress.unl.edu), 1111 Lincoln Mall, Lincoln, Nebraska 68588-0630, 2004, 384 pages, $49.95 (hardcover).

Rondall Rice, a US Air Force officer and history professor at the Air Force Academy, offers his readers an important study that should be on the bookshelf of every military historian of the interwar period. Through no fault of his own, though, Rice probably will not attract the audience he merits.

In a study of civil-military relations in the area of aviation, Rice challenges the idea that Brig Gen William "Billy" Mitchell, assistant chief of the Air Service, was the only major figure who questioned the policies of a series of presidential administrations. Rice argues that "early aviation reformers made alliances with politicians and worked with civilian business in order to advance aviation, gain additional roles and missions for the air arm, . . . and increase funding" (p. xiii). These efforts directly challenged civil authority in the making of defense policy.

Airplanes enthralled Americans, but the phrase "never again" summarized public feelings about foreign affairs and the nation's involvement in World War I. The second sentiment proved more powerful than the first. Administration after administration had no intention of increasing military appropriations and incurring the wrath of voters. Frustrated, Mitchell lashed out at what he saw as out-of-date thinking in the Navy and War Departments on how to use the military's limited funding. Calm came to the War Department after Mitchell's conviction when Maj Gen Mason Patrick, the moderate chief of the Air Service, established his authority. Some radicals continued to agitate for independence, using governmental resources for political lobbying. Henry H. Arnold, the future five-star general, ran afoul of Patrick quickly for such actions, barely avoiding court-martial.

The rogue image of the Army Air Corps returned when Maj Gen Benjamin Foulois misled Congress and Pres. Franklin D. Roosevelt. The general quickly agreed to have the Army Air Corps take responsibility for airmail deliveries without conducting a proper study of the mission. A number of deaths resulted, and Foulois was less than candid in his congressional testimony on the matter. Congress also became concerned when the Air Corps evaded legal requirements to use competitive bids for the purchase of new airplanes. Order returned when Oscar Westover and then Arnold succeeded Foulois. Ironically, Arnold found himself injected into a number of political controversies in the early 1940s that pitted isolationists against the preparedness movement. These controversies nearly brought about another period of confrontation when Roosevelt thought about removing the air general for failing to support administration policy.

One finds a number of noticeable blemishes—"weaknesses" is too strong a word—in this account. Most of these problems appear to be the fault of the University of Nebraska Press—the most significant being the cost. At $49.95 few individuals, even friends and family, will buy this book. This price and the lack of photos make it clear that the press is selling primarily to libraries. A number of items in the notes aren't included in the bibliography—newspapers, to cite a noticeable example. This absence appears to be the product of the press's style. Copyediting leaves something to be desired. One encounters a number of sentences with faulty syntax (e.g., "A staff memo called the an experimental bomber 'distinctly a plane of aggression'" [p. 141]). Although such mistakes are fairly minor, the point is that the publisher should have employed a good copy editor. These comments aside, this book is a worthy read and deserves a larger audience than it will likely receive.

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Mission Debrief

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The Editor

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Staff Brig Gen Qaa'id Kerish Mashthoob Al-Khuzaa'i, Iraqi air force, is director of air operations in the Iraqi Air Force Command. A 1978 graduate of the Iraqi Air Force Academy in Baghdad, he earned his flight instructor's diploma in 1985. General Al-Khuzaa'i continued his academic and professional pursuits to earn a Staff Academy diploma in 1989 and a BA degree in law in 2003. He enrolled in a training course at the US Army War College's Strategic Studies Institute in Washington, DC. His professional career includes teaching at the Al-Bakr Military University, duties as an air force wing commander, and eight years of service in various leadership positions. In 1999 he was discharged from military service for political reasons. He returned to service after the liberation of Iraq in 2003 as an assistant commander of the Al-Diwanya Province Public Safety Directorate, working with the US Marine Corps to maintain civil peace and order; he then assumed his current air force post.

Lt Col J. P. Hunerwadel, USAF, retired (BS, George Mason University; MS, Embry-Riddle Aeronautical University), is a senior doctrine analyst in the Joint and Multinational Doctrine Directorate at Headquarters Air Force Doctrine Center, Maxwell AFB, Alabama. He previously served as an instructor and evaluator pilot in the B-52, T-38, and T-1 aircraft, with more than 4,000 flying hours and 26 combat missions during Operation Desert Storm. He also served as an instructor at the College of Aerospace Doctrine, Research and Education (CADRE) at Maxwell, where he taught campaign planning as well as operational design and helped develop planning curricula for Air Command and Staff College, Air War College, and CADRE. The principal author of Air Force Doctrine Documents 2-1.2, *Strategic Attack*, and 2-1.9, *Targeting*, the first Air Force doctrine publications to discuss effects-based operations in depth, Colonel Hunerwadel is widely recognized as one of the US military's leading experts on the effects-based approach to operations.

Col Steven D. Carey (USAFA; MBA, Golden Gate University) is vice-commandant of the College of Aerospace Doctrine, Research and Education, Maxwell AFB, Alabama. His previous assignments include chief, Operations and Intelligence, Sixteenth Air Force, Aviano AB, Italy; chief, Commander's Action Group, United States Air Forces in Europe, Ramstein AB, Germany; chief, Air Warfare Concepts Division, Air Force Doctrine Center, Maxwell AFB; and commander, 58th Fighter Squadron, 33d Fighter Wing, Eglin AFB, Florida. A fighter pilot with 4,000 flying hours, he flew combat missions in Operation Desert Storm and served as director of operations for Combined Air Forces North in Operation Iraqi Freedom. A graduate of Squadron Officer School, Air Command and Staff College, and Air War College, Colonel Carey also served as a National Defense Fellow with the RAND Corporation in Santa Monica, California.

Col Robyn S. Read, USAF, retired (BS, Texas A&M University; MS, Gonzaga University) is a research analyst with the Airpower Research Institute, part of the College of Aerospace Doctrine, Research and Education at Maxwell AFB, Alabama. His principal research interests include coalitions, small-war activities, and effects-based operations. During a 30-year career on active duty in the Air Force, he served as a forward air controller, tanker pilot, munitions test engineer, research pilot, staff officer, and squadron commander. He also worked security-assistance issues for two years while assigned to the US Military Group in Bogota, Colombia. He has taught at the Air War College, primarily in strategy, doctrine, and airpower. Colonel Read is a graduate of Squadron Officer School, Armed Forces Staff College, and Air War College.

Maj Jack Sine (BEE, University of Dayton; MA, American Military University) is assigned to the Naval Postgraduate School, Monterey, California, as a student in the National Security Affairs Department. Previously, he served as chief, air superiority weapons requirements, Weapons Division, Directorate of Operational Capability Requirements, Deputy Chief of Staff for Air and Space Operations, Headquarters US Air Force. Major Sine has served as assistant director for operations, flight commander, F-16 standard evaluation flight examiner (SEFE), and instructor pilot with the 55th Fighter Squadron, Shaw AFB, South Carolina, and flight commander with the 69th Fighter Squadron, Moody AFB, Georgia. Other assignments include Misawa AB, Japan; Kunsan AB, Republic of Korea; and the Air Warfare Center, Eglin AFB, Florida, as electronic combat systems engineer. Major Sine is a senior pilot with over 1,800 hours in the F-16.

Maj Ronald F. Stuewe Jr. (USAFA) is an Intermediate Development Education student in the Defense Analysis, Special Operations/Low-Intensity Conflict program at the Naval Postgraduate School in Monterey, California. He previously served as chief of flight safety for the 57th Wing and as an instructor at the USAF Weapons School at Nellis AFB, Nevada. He has also completed operational assignments with the 25th Fighter Squadron, Osan AB, Republic of Korea; the 74th Fighter Squadron, Pope AFB, North Carolina; and the 55th Fighter Squadron, Shaw AFB, South Carolina. Major Stuewe, a senior pilot with 2,000 hours in the A/OA-10 aircraft, is a distinguished graduate of Squadron Officer School and a graduate of the USAF Weapons School and Air Command and Staff College.

Manohar Thangaraj (BS, University of Iowa) is a candidate for a master's degree in international affairs at Marquette University. His focus areas are US defense policy in South Asia, missile defense, and the relationship between defense constructs and the future of US national security policy in the region. He is studying with Dr. Raju G. C. Thomas, a renowned expert on South Asian security. Prior to graduate school, he worked on an industrial basis with some members of Congress on issues relating to technology transfer between the United States and India.

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