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Propositions Concerning the Aerial RMA

TODAY WE HEAR a great deal about a revolution in military affairs (RMA)—what it is and why it is. The following propositions provide some thought about airpower's role in the RMA—a role that began over 80 years ago. The argument is tantamount to calling a spark a fire, which is true in many respects. A spark involves oxidation, produces heat and light, and consumes fuel. A single spark can produce a firestorm capable of incinerating thousands of square miles. The key determinant, however, is whether or not the spark is self-sustaining. Many inventions and innovative ideas die quickly; however, the spark of airpower in World War I survived against all odds, sustained itself, and fundamentally changed warfare.

First, if an event is truly an RMA, it must have global significance rather than limited impact on a single nation or military power. Global effect distinguishes an RMA from simply an anomaly in war fighting. Obviously, global ramifications do not occur overnight. The passage of time has validated the long-term impact of airpower since its introduction in World War I. Although a few isolated tribal conflicts in some parts of the world may not involve airpower, for the most part, the entire world has embraced airpower as part of war.

A second important consideration involves the way airpower connects the other services. An RMA is not based on independence or relative "decisiveness" compared to that of the other services—just the opposite. Rather than eclipsing "boots on the ground" or "command of the sea," airpower makes those necessities possible. What would the Army be without its airpower, whether from its own helicopters or from the Air Force's fixed-wing assets? Similarly, navies depend upon the air component for protecting the fleet; transporting supplies; and achieving presence, control, and strike. As Colin S. Gray recently wrote in his book *Modern Strategy* (Oxford University Press, 1999), "The tactical, operational, and even strategic relationship between sea power and airpower is so close that to talk of joint air-sea, or sea-air, warfare is misleading. Sea power and airpower have become interdependent" (p. 235).

A third argument favoring the aerial RMA is the deliberate nature of its creation. RMAs do not just happen—they are not the coincidental product or even by-product of new technologies. One finds the essential precipitants for the birth of the aerial RMA during World War I in the development of machine guns and artillery, which made stagnated warfare too horrific for people to tolerate. Consequently, as Dr. David R. Mets points out in his article in the Fall 2000 issue of *APJ*, they sought and found new methods and technologies that would allow them to avoid such warfare in the future (p. 60).

A fourth point about an RMA concerns its impact—not just on war but on society, for warfare is not an isolated event. In this respect, airpower, as it emerged from the Great War, did affect society in terms of damage, industrial activity, and air-minded thinking. It was not restricted to war, as were the machine gun, tank, submarine, and artillery, for example. In terms of its effect on transportation, communication, and the creation of social vulnerability, airpower fundamentally touched a broad spectrum of the civilized world. Admittedly, the submarine also changed the nature of warfare and affected civilization by cutting supplies and killing merchant mariners. Yet, the revolutionary nature of the submarine proved much more limited. Aside

from unique examples of scientific and exploratory submersibles like *Alvin*, used to search for the *Titanic*, nearly all below-surface naval activity has always had a military purpose—beginning with the carrying of underwater mines. Aircraft, on the other hand, had no such exclusive orientation to war; indeed, they dramatically promoted the linkage between war and society, as is the case today. In an effort to spur French and American interest in his three-engine bomber, Gianni Caproni identified the revolutionary difference between the technologies that produced the submarine and the aircraft: "It is not by chasing each bee in a garden that you would get the better of the swarm. You should rather destroy the bee hive" (see his "Memorandum on Air War" [1917], p. 2). In other words, submarines could not attack aircraft, but aircraft could attack submarines by going after their pens.

A fifth point involves the principles of war. In order to achieve revolutionary status, a new form of warfare must dramatically exploit at least some of these principles—for example, increased ability to mass, maneuver, surprise, and simplify. Since World War I, airpower has improved a combatant's ability to do each of these.

Sixth, an RMA entails rapidity of change. Consider, for example, that changes in airpower made a quantum leap between 1914 and 1918. Change during that short period of time was accelerated—velocity squared. Therefore, an RMA is distinguished by accelerating change—change squared.

A seventh proposition has to do with strategic effect. As should be the case, one hears much talk about effects of the type promoted in this issue's article by Ed Mann and his team. One can no longer fight a war simply by thinking in terms of inflicting damage. Rather, one must seek strategic effects—from damage, if necessary. Granted, a direct correlation may exist between damage and effects—certainly, Prussia's Frederick the Great (IV) thought as much. But great strategic effect may also arise from very minor damage. Consider the strategic effect of a single bullet fired from a pistol in Serbia in 1914—or of one Sherpa with a knife at the throat of a king. Yet, we often find airpower framed in an equation of damage rather than effects. This reflects the antiair argument of World War I: meager amounts of damage caused by aircraft compared to that caused by artillery. Yet, artillery's ability to create a moonscape on the western front failed to achieve the desired strategic effect of ending the war.

Interestingly, airpower's effect has extended even beyond the grand strategic level. Just as one categorizes war into tactics, operations, and strategy—moving from battlefield to theater to globe—so does the RMA process become larger. Airpower connects wars and warfare by spanning time.

An eighth RMA concept involves changing the basic military objective from gaining ground and/or killing and dislocating the enemy to obtaining command of the air. After aircraft enter the fight, air superiority becomes the necessary prerequisite to achieving other objectives. The *Schwerpünkt* shifts, and only airpower can hit it directly.

Finally, consider the RMA trinity: thought (codified in doctrine), organization, and technology. Technology usually grabs the spotlight as the revolutionary catalyst, but without the other two, it remains merely an invention—just a spark that cannot sustain itself. Ultimately, then, effects are the nexus of invention and revolution, and airpower—doctrinally, organizationally, and technologically—creates the effects (not necessarily the damage) on the battlefield and on warfare itself.

So what? Glad you asked. Thoughts about the RMA, as well as any number of other ideas (as promoted in journals like this one, for example) aren't just intellectual exercises designed to win programmatic battles. Like airpower, they can have tactical to strategic effect on doctrine, organization, technology, and war fighting. Ultimately, they affect people—how soldiers, sailors, and airmen fight and whether they live or die. This is not to promote the importance of all—or even any—of the articles in *APJ*. But the thinking and the dialogue that they encourage—in this case, concerning the RMA—*are* important. And that would be the final proposition. □

Ricochets and Replies

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

MEDICAL ARTICLES IN *APJ?*

I've enjoyed reading the *Journal* for the past few years and have often wondered if medical inputs would be appropriate. After reading several medical articles (e.g., "The Anthrax Terror: DOD's Number-One Biological Threat," Winter 2000; and "Exploiting the Psychological Effects of Airpower: A Guide for the Operational Commander," Winter 1999) written by nonphysicians, I feel that, as an operational medical officer, I can provide informative articles to your readers. It has been my experience that most commanders don't get the necessary "medical" information and insight from formal training schools and, for the most part, rely on "Doc" to take care of things as best as possible. My tour in Pacific Air Forces (Misawa) highlighted several deficiencies in this approach to what I believe is both the strongest and weakest link in warfare—the human element.

I am a preventive-medicine specialist, as are all my colleagues in the medical corps. With few exceptions, reactive medicine (such as the old orthopedic joke "bone broke, me fix bone") has been replaced with preventive programs such as Preventive Health Assessment (PHA), immunization programs (e.g., for anthrax), tobacco-cessation programs, or the Health and Wellness Center functions (e.g., ergonomics testing). In recent years, the medical leadership has "fitted" the medical paradigm into what is known as the Objective Medical Group (remember the Objective Wing concept?) and, more recently, into the Expeditionary Aerospace Force/Aerospace Expeditionary Force concept of operations with EMEDS, SPEAR, PCM/PCO teams, and other acronyms that you and most of your readers may neither fully understand nor appreciate. Long gone are the days of Alan Alda's M.A.S.H. or the Vietnam era of medical support and treatment.

Providing medical information to your large and expansive audience would be beneficial. I see only a win-win situation for the *Journal* and its readers. It would be a privilege to provide such input.

Maj Johann Westphall, USAF, MC, FS
RAF Lakenheath, England

COMMENTS ON THE JCS 94-TARGET LIST

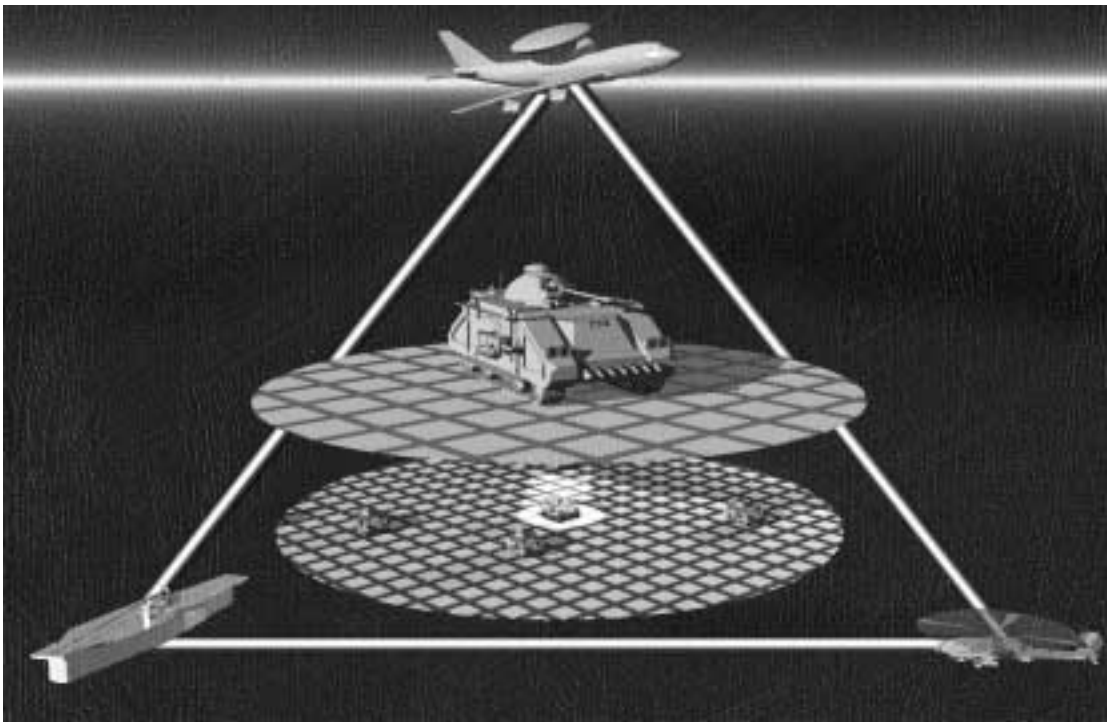
I thoroughly enjoyed Charles Tustin Kamps's article in the Spring 2001 issue ("The JCS 94-Target List: A Vietnam Myth That Still Distorts Military Thought"). I read Mark Clodfelter's *The Limits of Air Power: The American Bombing of North Vietnam* and must admit I subscribed to the revised party line that, given the weapon systems available at the time, Air Force planners of the day did not recognize who their enemy was or what it would take for airpower to contribute to their defeat. One wonders how so many learned authors could have referred to JCS 94 without actually having seen the list. I share Mr. Kamps's assessment that the planners got it right and that the failure of the campaign must rest squarely on the shoulders of those who would use the military instrument to make political statements rather than achieve political goals. Given the recent assessments of the success of

Continued on page 117

Who's Got the Big Picture?

DR. LOUIS S. METZGER
COL DONALD R. ERBSCHLOE, USAF

Editorial Abstract: A recent bombing accident in Kuwait underscores the fact that the Air Force can benefit from clearer operational pictures and external aids. Ironically, however, the Navy rather than the Air Force has taken the lead on the Single Integrated Air Picture, an effort to improve defensive capabilities. In this article, the Air Force's chief scientist and his military assistant advocate that the Air Force become the prime mover in obtaining a better integrated surface picture in order to enhance operational capabilities.



ON 12 MARCH 2001, during a nighttime close air support exercise at the Al Udairi Range in Kuwait, a US Navy F/A-18C accidentally dropped three 500-pound bombs on a manned observation post. Five Americans and one New Zealander were killed. Eleven individuals, including six Kuwaiti troops, were injured in the incident.

The report from the ensuing investigation listed three contributing factors: (1) nonstandard and misleading assessments of the aircraft's heading during its bombing run (by the forward air controller); (2) a loss of situa-

tional awareness by the ground forward air controller during the terminal control phase; and (3) environmental conditions at the range that complicated visual acquisition of the target.[1]

The Need for Operational Pictures

In short, because three key players—the aircraft, the forward air controller, and the ground forward air controller—had inconsistent "pictures" of what was happening that March evening, the resulting actions led to tragic consequences. Similarly, the accidental shootdown of two Army Blackhawk helicopters by two Air Force F-15s during Operation Provide Comfort in northern Iraq in 1994 provides another example of a "friendly fire" mistake caused by having the wrong picture.[2]

Military history is replete with the consequences of misperceived pictures, clouded by the fog of war—not only friendly fire incidents such as those noted above, but also battles and wars lost.[3] Confusion, misidentification, and conflicts in tracking and reporting become increasingly likely as the battlefield grows larger and includes a greater variety of players (both joint and coalition). Today, the convergence of three factors is causing us to focus on achieving better, more consistent, and more accurate pictures to guide our military actions: (1) decreasing tolerance for casualties and collateral damage; (2) the ability of modern technology, if properly employed, to substantially improve the clarity of our shared situational awareness; and (3) our desire to enable war-fighting strategies that depend on having a clearer and more timely picture than our opponent's—a building block for the revolution in military affairs.[4]

For all of these reasons, the Department of Defense is seeking a Family of Interoperable Operational Pictures (FIOP).[5] The department's multiservice approach to managing the Single Integrated Air Picture (SIAP) represents a significant step forward. Rear Adm Michael G. Mathis, SIAP's system engineer, leads this effort. SIAP, fused from data inputs and fed from a variety of sensors and platforms, promises consistent, uninterrupted, and unique tracks for all airborne objects in the theater volume, forming a tactical air picture that everyone will share. Fully realizing this objective will not be easy, however. Operational shortfalls observed in exercises such as the Joint Air Defense Operations/Joint Engagement Zone and its successor, the All Service Combat Identification Evaluation Team (ASCIET), indicate the need for substantial improvement.[6] We must accommodate migration from our legacy systems—and budget constraints pose a challenge. But substantial progress is possible and will be made.

SIAP activity, motivated primarily by the urgent need—most notably by the Navy—for a more detailed, accurate, and timely tactical air picture to enable improvements in missile defense, is preceding serious attention to the other tactical pictures, such as the one that we will dub the Single Integrated Surface Picture (SISP).[7] One may reasonably ask why the Air Force—the service to which one might naturally look for anything pertaining to the aerospace realm—was not the driving force in pushing for an improved SIAP. This article explores the answers to that question and, in the process, considers arguments for two conjectures:

1. The Air Force's need for an improved SIAP is likely to increase in the future.
2. The Air Force should have a vital interest in the SISP.

The Navy Takes to the Air

The Air Force's primary air-superiority tool is the manned fighter—the F-15 and its successor, the F-22. One can summarize the Air Force's rationale for the current air-to-air operation of its fighters as follows: *provide the fighters with a pretty good idea of where the enemy is,*[8] *allow the aircraft to establish themselves in the area of interest, and then let the onboard sensors and pilots figure out the enemy's exact location in order to execute the mission*.[9] In other words, the

main air-to-air weapon for the Air Force—the fighter and all it contains, including the pilot—is relatively error tolerant and, hence, autonomous. Moreover, recent air-to-air engagements generally allowed enough time for the human-in-the-loop autonomy to work. Because of the success of this autonomy, the Air Force has not given high priority to providing tighter coordination between its fighter weapon system and other systems. This autonomy, fundamental to Air Force culture, underlies the reason why the service was not a driving force for SIAP improvements.[10]

The Air Force's apparent nonchalance toward operational pictures is reflected in its slow adoption of Link 16 (one of the key components of SIAP) in the past and its current low level of interest in going beyond Link 16 for air defense.[11] To some extent, the Air Force's perception of Link 16's benefits suggests its cultural ethos of pilot autonomy—providing general situational awareness and deconflicting targets among wingmen, certainly important for formation engagements. Despite Link 16's ability to provide fighters a good idea of the enemy's location, that benefit is plagued by latency and accuracy problems—which accounts for the Air Force's reticence to buy into the system. If latency was so long or accuracy so bad that weapon system autonomy didn't have the time or ability to compensate, fixes (which are well within technical feasibility) would have been funded long ago.[12]

The world's premier air-superiority platform, the F-22

The Air Force's weapon system autonomy contrasts with the ground-based and ship-based antiair weapons of the other services that, once fired, provide little opportunity for assistance from humans-in-the-loop. Such weapons either proceed directly to where they were targeted (e.g., antiaircraft shells) or are tightly coupled to automated guidance of one type or another (e.g., surface-to-air missiles). They resemble munitions fired by the Air Force weapon of choice (the fighter) to the extent that they aren't very tolerant of errors in latency or accuracy. To date, however, Air Force fighters have not needed an improved SIAP to provide targeting for their air-to-air munitions.

One can make yet another comparison—one between the current Air Force tradition of reliance on the autonomy of a fighter (and wingman) and the traditions of the other services. Army batteries have a long history of coordinating overlapping zones of fire and relying on external sources to tell them where to aim. One can make a case that a sea captain's command of his or her ship in a fight provides a closer analogy to Air Force autonomy. But the Navy's recognition of the critical nature of air defense for the battle group and its requirements with respect to platform interdependence provided the motivation for any needed cultural shift. In response to the overriding need to withstand air—especially missile—attack, the Navy, most noted for its independence at sea, recognized the need for the interdependence of weapon systems at the tactical level. Its systems could not provide adequate defense against present and future threats without effective fire control and tight coordination, such as that provided across platforms by the Cooperative Engagement Capability system—the survival of the battle group required it.[13] Unsurprisingly, therefore, Navy initiatives

were the driving force behind SIAP, and Army acceptance came easily.

The Navy headed the ASCIET working group that defined the joint war-fighting shortfalls which prompted the creation of SIAP. It also fostered relevant activities such as development of the Cooperative Engagement Capability system.[14] Interestingly, this Navy leadership is reminiscent of their paving the way for an early operational picture with the Red Crown ground-control-intercept radar in Vietnam.[15]

The Air Force's Role in SIAP

The Air Force tradition of pilot autonomy evolved because it worked. After they are vectored to the right general vicinity, fighters rely on organic systems and well-trained pilots. Their success is due, in large part, to the aircraft's long (and generally uninterrupted) line-of-sight sensor range to the target. The balance among that range, the effective range of the fighter's munitions, and the requirements of its air defense mission has allowed the Air Force to take little interest in a SIAP much improved over that from an airborne warning and control system (AWACS) aircraft. Yet, history shows that this has not always been the case for fighter-intensive air defense, and the future could see this opportune balance upset once again.

During the Battle of Britain in World War II, British radio direction finding (Chain Home radar) turned out to be a crucial new technology because the Royal Air Force initially couldn't meet its mission needs without improving the combination of externally provided situational awareness and the fighters' own sensor capabilities. Today's balance was missing.[16] In the future, the balance we now enjoy may be upset by improvements in enemy capability (e.g., swarms of low-observable cruise missiles) or even by our wanting to take advantage of improvements in our own capabilities. Possible improvements such as uninhabited combat air vehicles or longer-range munitions, combined with better off-board, deep-look sensors, might fit the latter

Ground-attack aircraft would be primary users of an improved SISP.

category. Such a shift in balance would stimulate the Air Force's interest in an improved SIAP.

Meanwhile, the other military services and entities such as the Joint Theater Air and Missile Defense Organization, which have a more immediate need for SIAP, are viewing the Air Force as a contributor to that picture.[17] They want Air Force sensors to tightly couple into SIAP and Air Force airborne platforms to supply "high ground" line of sight for SIAP data relay. Envisioning a big bill to fully accommodate these expectations, the Air Force is asking that its contributions be justified as cost-effective. Each cost-effectiveness question should be answered not only in light of current circumstances, but also in anticipation of changes that may alter the Air Force's air defense balance, discussed above, and hence potentially increase the service's interest in SIAP.

The Surface Picture

Like Air Force fighter aircraft in air defense, Army infantry, armor, and cavalry in ground combat also tolerate some errors in situational awareness and can autonomously compensate with their own onboard systems and human operators. On the other hand, Air Force ground-attack aircraft in environments such as Kosovo are more dependent on external help in finding, identifying, and

tracking mobile or concealed targets. In addition, proliferation of long-range surface-to-air missiles as part of an enemy's integrated air defense system may prompt the Air Force to seek improvements in SISP (and thus increase its chances of survival), analogous to the Navy's interest in SIAP. Might the Air Force, therefore, purely for reasons of self-interest, become a driving force for a better SISP?

The Army is pushing to digitize the battlefield, with the initial priority of providing a timely and accurate blue-force picture.[18] Although the Army is also clearly interested in red-force situational awareness, as evidenced by its participation in and priority for the joint surveillance, target attack radar system (JSTARS) aircraft, the most stressful red-force SISP requirements (with respect to depth of coverage, timeliness, and accuracy) now derive from Air Force needs. This replicates the Air Force's acceptance of and tolerance for the AWACS air picture, whereas the Navy has more pressing SIAP needs, but with the relative roles of the three services intermixed. The Air Force may have the highest motivation for SISP today, but circumstances can change. What the Army now sees as balance will likely alter if that service's transformation results in the introduction of much lighter (and more vulnerable) force units or new, longer-range ground-to-ground munitions.

If the Air Force did want to push toward SISP improvements similar to the Navy's role with SIAP, would its approach to the operation of and future planning for surveillance platforms change? How would platforms like JSTARS, Rivet Joint, and uninhabited air vehicles be affected? Would the high priority the Air Force already gives to existing and future space-based surveillance components (e.g., space-based radar) increase further (similar questions apply to innovative sensor modalities such as hyperspectral, polarimetric, etc., as well as their fusion)? Would a drive toward a better SISP cause the Air Force to ask more of the other services or intelligence agencies in buying into and contributing to SISP improvements—and in what ways and according to what system-of-systems vision?

Fortunately, the Air Force is not ignoring surface-surveillance improvements. Air Force SISP needs are encompassed in a broad vision of finding, fixing, tracking, targeting, engaging, and assessing any target anywhere, as articulated in volume three of the *Air Force Strategic Plan*.[19] However, the Air Force currently has no specific SISP initiative that explicitly focuses requirements, planning, activities, funding, and collaboration with others in this area.

Conclusions

Integrated operational pictures will provide the war fighters of the future with unprecedented capabilities to engage the enemy across all domains. Although the FIOP will be the foundation of effective offensive operations, the reality is that current efforts have predominantly defensive roots. Incidents of fratricide and possibilities of successful attacks against US forces have crystallized the need for shared views that are comprehensive and unambiguous. Potential threats and possibilities of an unclear picture of those threats make us feel vulnerable, which, perhaps, is why—on a gut level—the Navy took the lead on SIAP and why the Air Force should take the lead on SISP. An improved SISP would likely enhance survival of Air Force assets against enemy attack initiated from the ground and increase the Air Force's ability to strike difficult ground targets successfully. □

Notes

1. "Investigation into the circumstances surrounding the live-fire incident involving a U.S. Navy F/A-18 aircraft that dropped three 500-pound bombs on Observation Post 10 at the Udairi Range, Kuwait, on 12 March 2001, resulting in the deaths of six military personnel and injuring 11 others" (US Central Command report, executive summary, April 2001).

2. *Aircraft Accident Investigation Board Report: US Army UH-60 Blackhawk Helicopter 87-26000 and 88-26060*, vol. 1, *Executive Summary* (Washington, D.C.: Office of the Joint Chiefs of Staff, April 1994).

3. Consider the Japanese raid on Pearl Harbor—a radar outpost at Opana Point in Hawaii observed a formation of aircraft inbound toward Oahu on the morning of 7 December 1941 and reported this to the Information Center. The pursuit officer on duty "assumed the flight indicated was either a naval patrol, a flight of Hickam bombers, or possibly some B-17s from the mainland." See *Report of the Joint Committee on the Investigation of the Pearl Harbor Attack*, 79th Cong., 2d sess., document no. 244, sec. 140, 1946. Another example: Lt Gen Thomas J. "Stonewall" Jackson was injured during a "friendly fire" attack on his scouting party by fellow Confederate soldiers. Jackson lost his left arm as a result and ultimately died from ensuing pneumonia. Some military historians have recently speculated that this event was pivotal to the outcome of the Civil War. See "Friendly Fire That Changed a War?" American Forces Information Service, 2 February 1999, online, Internet, 7 June 2001, available from http://www.defenselink.mil/news/Feb1999/n02021999_9902028.html.

4. See Adm Bill Owens with Ed Offley, *Lifting the Fog of War* (New York: Farrar, Straus and Giroux, 2000).

5. "The 'Family of Interoperable Operational Pictures' (we have called this 'FIOP') will bring together our battle management assets across all domains (air, ground, sea, and space). The FIOP will improve our joint and coalition forces' ability to prosecute a coordinated strategy, to include battle management, fire support, counter-fire, logistics, and intelligence across all echelons of command, from the CINC and Joint Task Force Commander, down to the Soldier, Sailor, Marine, and Airman, across all domains." From the Honorable Jacques S. Gansler, undersecretary of defense for acquisition and technology, "Challenges and Changes in the 21st Century, Theater Air and Missile Defense Systems," remarks, Theater Air and Missile Defense Workshop, Norfolk, Va., 2 August 2000.

6. Note this comment from ASCIET 2000: "The biggest thing we can continue to work on is getting everybody the same picture. With all the older data links, the new links, the new equipment, and some stuff doesn't talk to the other stuff. We've just got to keep pushing to get that common picture."

7. We consider the ground and maritime (excluding submarine) pictures together as comprising SISP.

8. Voice control from an airborne warning and control system (AWACS) aircraft is the primary means for most Air Force fighters, even today, although transition to data links is ongoing.

9. This mission may vary from lethal to nonlethal, based on the desired effects.

10. Some people speculate that this aspect of Air Force culture is at least partially an adverse reaction to Warsaw Pact reliance on strict ground-control-intercept tactics.

11. Link 16 is a tactical, digital information link that provides enhanced jamming resistance and navigation features. The Air Force, now convinced of the utility of the Link 16 data link, is trying to accelerate its fielding.

12. A fix for the largest contributor to excessive latency (a buffer delay) has only recently been fielded, but mitigating other significant sources for latency and improving accuracy with a new AWACS tracker remain unfunded.

13. Comdr Robert S. Kerno Jr. and Mr. Michael D. Roberts, "Interoperability through Commonality," *Surface Warfare Magazine*, March–April 2000, 27–31.

14. Lt Comdr Gary A. Gotham and Capt Alan B. Hicks, "A Fleet Perspective on Theater Air Warfare and Where We Are Headed," *Surface Warfare Magazine* 25, no. 5 (September–October 2000): 12–19.

15. Although the information from Red Crown was of great benefit to aircrews, its deep coverage was limited. The Air Force augmented this with its Teaball Weapons Control Center at Nakhon Phanom, Thailand. See Earl H. Tilford Jr., *Setup: What the Air Force Did in Vietnam and Why* (Maxwell AFB, Ala.: Air University Press, 1991), 243–45; and Mark Clodfelter, *The Limits of Airpower: The American Bombing of North Vietnam* (New York: Free Press, 1989), 165.

16. For a fascinating, firsthand account of the science and engineering that fed into early radar and infrared detection, see R. V. Jones, *Most Secret War* (London: Hamish-Hamilton, 1978), 91–105, 199, 228.

17. Herbert C. Kaler, Robert Riche, and Timothy B. Hassel, "A Vision for Joint Theater Air and Missile Defense," *Joint Force Quarterly*, no. 25 (Autumn–Winter 1999–2000): 65–70.

18. "The digitized battlefield is the cornerstone of the horizontal technology integration initiative. It is critical to ensuring America's Army remains the premier land combat force into the 21st century. Digitization is the application of information technologies to acquire, exchange, and employ timely battlefield information throughout the entire battlespace. It enables friendly forces to share a relevant, common picture of the battlefield while communicating and targeting in real or near-real time." See Senate and House, the Honorable Togo D. West Jr. and Gen Dennis J. Reimer, *A Statement on the Posture of the United States Army, Fiscal Year 1997*, 104th Cong., 2d sess., on-line, Internet, 7 June 2001, available from http://www.army.mil/aps/97/ch5.htm.

19. *Air Force Strategic Plan*, vol. 3, *Long-Range Planning Guidance* (Washington, D.C.: US Air Force Strategic Planning Directorate, 1998–2000), on-line, Internet, 7 June 2001, available from http://www.xp.hq.af.mil/xpx/afsp_c.htm.

Precision Aerospace Power, Discrimination, and the Future of War

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Editorial Abstract: Over the past decade, the use of precision weapons and advances in intelligence technologies for air and space have drastically revolutionized air warfare, permitting easier differentiation between military and civilian targets and greatly reducing casualties. Colonel Meilinger predicts that the time will come when airpower alone will win wars faster and at less cost in human lives than alternate tactics.

DURING OPERATION ALLIED Force over Kosovo, some observers questioned the tactics of the North Atlantic Treaty Organization's (NATO) airmen. No less worthy an individual than Sen. John McCain (R-Ariz.), a fighter pilot himself during Vietnam, wondered aloud as to the morality of flying and bombing above 15,000 feet. McCain and others were concerned that bombing from that "safe" altitude was inherently less accurate and therefore less humane than if the aircraft had flown lower. These critics were wrong. In the vast majority of cases, NATO airmen flew at the optimum altitude for achieving accu-

racy while also fulfilling NATO's political demands to avoid risk.

This article maintains that air warfare over the past decade has significantly humanized war—if such a phenomenon is possible. Tremendous technological strides in the use of precision weapons, as well as developments in air and space intelligence-gathering tools, have made it far easier to distinguish between military and civilian targets and then effectively strike the military ones. Moreover, such effectiveness has carried with it a marked reduction in risk to the attackers. In short, modern air warfare has reduced casualties among both the attackers and the attacked, thus making it an increasingly efficient, effective, and humane tool of American foreign policy.

True, Gen Wesley Clark, the NATO commander, directed airmen to take all precautions to limit friendly losses. Clark realized that the fragility of the NATO alliance during Allied Force necessitated such risk avoidance. Enemy missiles, antiaircraft artillery, and small-arms fire can be extremely deadly at low altitude.[1] As a consequence, strike aircraft were directed to stay above 15,000 feet when deploying their weapons. An important question is whether or not this requirement significantly and adversely affected accuracy. In the vast majority of cases, it did not. Before proceeding, a brief discussion of new air weapons and their characteristics would prove helpful.

Precision-guided munitions (PGM) have improved accuracy by orders of magnitude. These air-launched weapons are equipped with adjustable fins that allow them to alter course in flight and home in on their targets. PGMs have several different types of guidance systems—laser homing, inertial, optical or infrared imaging, or satellite signals from the Global Positioning System (GPS). These various guidance systems have strengths and weaknesses. For example, laser-guided bombs are highly accurate, but because lasers cannot penetrate clouds, one cannot use them when bad weather obscures the target. The most successful new PGMs employed over Kosovo used GPS guidance. These relatively inexpensive but highly accurate weapons in some cases allow a standoff capability—one can launch them several miles from the target—thereby lowering the risk to the delivery aircraft and crew. Perfect accuracy is not guaranteed—failure of the guidance system or aircraft equipment, as well as aircrew error, means that accidents still happen—but current PGMs have an accuracy usually measured in feet.

Although used in Vietnam, PGMs truly came into their own during the Persian Gulf War of 1991. Television networks showed cockpit videos detailing the accuracy of these weapons so frequently that they became one of the defining images of that war: the public saw bombs going down chimneys, through doors, and into specific windows. Seemingly, "air-shaft accuracy" had become so routine that everyone expected it. When American aircraft struck Serbian targets in Bosnia in 1995 and Serbia/Kosovo in 1999, they used PGMs almost exclusively in populated areas. Once again, the accuracy of these weapons was extraordinary. Visitors to Serbia were amazed to see radio towers neatly separated from their concrete bases and toppled, while civilian buildings not more than 50 feet away remained untouched. In another instance, the bombing razed a Serbian defense facility but left buildings on either side largely unscathed.

Mistakes occurred, but their relatively small number was remarkable. Human Rights Watch cites 90 instances of attacking NATO aircraft causing civilian casualties and collateral damage during Allied Force.[2] Most of these occurred in well-reported accidents in which bombs went astray or someone misidentified targets. For example, in one instance, aircrews received orders to bomb the wrong target—the Chinese Embassy—which they nevertheless precisely hit. In another case, a PGM was dropped on an airfield, but its guidance system failed, and the bomb landed in a residential area several hundred yards away. On another occasion, an aircraft attacked a bridge just as a passenger train unexpectedly came along. One must remember that these accidents occurred relatively infrequently, given the number of

strikes flown (14,000) and munitions dropped (28,000). NATO solidarity depended upon such precision. Moreover, because several NATO countries had already stated their opposition to a ground assault, the absence of a precision air campaign would have eliminated the possibility of any NATO military response whatsoever to the Serbs' ethnic-cleansing operations. Even the Serbs themselves realized the extreme accuracy and carefulness of the air campaign. Hence, Belgrade citizens wore shirts with targets painted on them and held rallies on bridges over the Danube—secure in the knowledge that the precision and discrimination of NATO air strikes meant that they would never have to pay for such foolishness. The charge that dropping these weapons from 15,000 feet was somehow inappropriate simply does not stand up to scrutiny.

Dropping a PGM in the midaltitude range—from 15,000 to 23,000 feet—achieves maximum accuracy, allowing enough time for the weapon to correct itself in flight and hit its designated target as close to a bull's-eye as possible. Dropping it from a lower altitude gives the weapon's steering fins less opportunity to correct the aim, decreasing its accuracy. From the pilot's perspective, this altitude range is also the most desirable for attacks on a fixed or preplanned target. The middle altitudes allow time to identify the target at sufficient distance, "designate it" (if the weapon is laser guided), and release. In short, for PGMs used against a fixed target in an established position—true of most of the targets struck in Serbia—the optimum altitude to ensure accuracy lies at or above 15,000 feet.

Because nonguided munitions or "dumb bombs" are inherently less precise than their more intelligent brothers, their optimum drop altitude is lower than that of a PGM. Even so, acquisition remains a limiting factor—coming in too low makes acquiring the target, lining up, and putting the bomb on target nearly impossible. One can imagine the difficulty of such target acquisition for a pilot roaring in at low altitude and 500 knots. At that speed and altitude, pilots generally have their hands full just trying to avoid hitting the ground. As a result, the compromise altitude for the delivery of unguided bombs is around 5,000 feet, putting the delivery aircraft right in the thick of fire from ground defenses. Allied Force air commanders resolved this dilemma by keeping aircraft at medium altitudes but restricting the use of non-PGMs to areas where there was little or no chance of civilian casualties or collateral damage.

Difficulty arises during attacks on mobile or transitory targets. In such cases, the key factor becomes target identification. Is the column below comprised of military or civilian vehicles? If both, which is which? Aircraft at medium altitudes have difficulty making such a determination. In this situation, pilots need information from someone closer to the target if they wish to avoid misidentification. Such sources include a forward air controller (FAC), who pilots an aircraft that generally operates at lower altitudes, or an unmanned aerial vehicle (UAV). The latter also flies at low altitude and can relay video it takes of the suspected target to an analyst, who rapidly determines its identity and sends that information either to the airborne aircraft or spotters on the ground. After one of these sources makes the determination, strike aircraft can attack from the optimum altitude.

Problems arose when aircraft at 15,000 feet saw what appeared to be military forces below but had no FAC, UAV, or ground spotters to consult. In such instances, given the strictures against both inflicting civilian casualties and taking casualties, aircrews found themselves in a quandary: they could not positively identify the target and could not go lower to do so. Usually, the pilots elected not to drop their bombs.

Exceptions did occur, however. On 14 April 1999 near Djakovica, Kosovo, NATO pilots attacked what intelligence sources had identified as (and which indeed appeared to be) a military column. But the column also contained refugees; consequently, as many as 73 civilians were killed in the air strikes.[3] This is the only known instance in the 78-day air campaign in which NATO intelligence sources and aircraft at medium altitude com-

bined to misidentify a target, thereby causing civilian casualties.

Could NATO have avoided this accident by directing the aircraft to fly lower? Probably. Indeed, NATO changed the rules after this, allowing aircraft in certain circumstances to fly lower to ensure target identification. But such instances involve a trade-off. Since flying lower places aircrews at greater risk of encountering enemy ground fire, at what point does the possibility of misidentifying a target override the danger of losing a plane and its crew? The Law of Armed Conflict states that an attacker does "everything feasible" to avoid harming civilians or nonmilitary targets. *Feasible* is a highly subjective term. Were friendly losses feasible if it meant shattering the alliance, a consequence that would have allowed Slobodan Milosevic to continue his atrocities unchecked?

An intelligence, communications, and geolocating network that relies on assets positioned in space, in the air, and on the ground has tied these new weapons together, making them extremely effective. Satellites collect imaging data, relay communications, and provide precise geographic updates; airborne sensors do much the same thing from closer in—as well as provide more flexibility for short-notice operations. Personnel on the ground and in the air receive, analyze, and disseminate the information gathered, while commanders at all levels use it to lead their forces. Over Kosovo, for example, a U-2 flying over a suspected target took video and relayed it via satellite back to the United States. There, analysts determined that the objects captured on film were Serb military vehicles, fused this information with three-dimensional terrain data and satellite imagery taken earlier, and generated precise geographic coordinates. They relayed these coordinates via satellite to orbiting command and control aircraft, which directed an airborne F-15E strike aircraft to attack. The F-15E then used GPS-assisted PGMs to knock out the targets. The entire process took place in minutes. As little as one decade ago, such an operation would have been a pipe dream.

Employment of these new technologies and tactics came together over the Balkans. Allied Force's almost total reliance on aerospace power made it unique. Although the use of ground troops—or even the threat of their use—would have been very helpful in bringing pressure to bear on Serb leaders, NATO ruled out that option early in the crisis, largely because the American public has become "casualty averse" over the past two decades. Mercifully, few Americans died in Grenada, Panama, and the Persian Gulf War, and the American public now expects such low losses. Even a few casualties are unacceptable. In October 1993, 18 American soldiers were killed and their bodies dragged through the streets of Mogadishu, Somalia. The revulsion felt by the American people and their subsequent outcry caused the government to withdraw our forces from that country.

Partly as a result of this concern over casualties, air forces bore the brunt of the NATO campaign. After 78 days of air strikes, Milosevic yielded and withdrew his military forces from Kosovo. More surprisingly perhaps, NATO suffered no casualties, and rigid procedures that governed the use of weapons, tactics, and the selection of targets minimized the Serbs' losses. Today, what is often called "the CNN [Cable News Network] factor" complicates the issue further and places even greater pressure on the commander.

In a sense, every bomb, missile, or bullet fired by an American airman, soldier, or sailor is a political act. When a bomb goes astray and hits a residential area, when a Tomahawk missile crashes into a hotel lobby, or when a sniper's bullet kills a pregnant woman getting water at a well, US *foreign* policy—not just *military* policy—suffers a setback. We can no longer afford to miss. More than that, even when we hit the target, we have to do so almost softly and with minimal impact.[4] One is reminded of TV Westerns many years back: the good guy—the one in the white hat—never killed the bad guy; he shot the gun out of his hand and arrested him. That is our new standard.

However, one must consider another issue that airmen have not adequately addressed but is germane to the subject of discrimination in war. Cluster bombs are air-deliverable weapons that deploy a large number of baseball-sized bomblets over a fairly wide area. Some of these bombs dispense land mines, while others deploy antiarmor, antipersonnel, or simple fragmentation bomblets against structures, radar sites, or runways. Some cluster bombs are precision weapons in their own right, each "sensor fused weapon" consisting of 40 individually targeted bomblets that home in on a vehicle's infrared signature. Others are deployed by a "wind corrected munitions dispenser" that makes the cluster-bomb canister accurate to within 30 feet. Still other cluster bombs have no precision guidance at all.

The problem is that an estimated 5 percent of cluster bomblets fail to explode on impact, essentially making them antipersonnel land mines. International agencies are already jumping on this issue, and airmen should expect these groups to push for a ban on the use of cluster bombs.[5] Although total prohibition would seem extreme, airmen must address this issue head-on. How many cluster bombs have been employed over the past decade and by whom? How effective have they been against their intended targets? What is their accuracy in actual operations? What percentage are duds? How difficult is it to defuse these duds after the conflict has ended? How many noncombatants have been killed or injured by unexploded bomblets? These are questions that airmen must answer. Some people might view the use of cluster bombs as an anomaly in the drive towards the precision employment of air weapons. One could probably make a strong case for the military efficacy and legality of cluster bombs—someone will have to do so soon.

Similarly, concern has arisen over the use of depleted uranium (DU) munitions. DU is an extremely hard substance that is ideal for the warheads on artillery shells or bullets which must penetrate the heavy steel used in armored vehicles. During the Persian Gulf War, the US Army and Air Force expended nearly 1 million such munitions. In the aftermath of the war, some people expressed concern that those rounds exposed military personnel and civilians to dangerous levels of radiation. Furthermore, shell fragments left behind could cause problems for the indigenous populace. The situation recurred in Allied Force when the Air Force's A-10 fighter-bombers expended thousands of rounds of DU-tipped 30 mm cannon shells. No one knows how much of a threat these shells present to the Serbian/Kosovar populations.[6] Nevertheless, airmen must examine this situation to determine if there is a better way to kill enemy armored vehicles. If the price for destroying tanks is poisoning the battlefield, then it is too high.

Despite these two exceptions, airmen clearly have made great efforts to limit civilian casualties and collateral damage over the past decade. Yet, some still voice concerns regarding the humanity of air warfare. In one sense, the drive to limit the suffering of noncombatants and structures is highly commendable. In another sense, however, the calls for greater accuracy, discrimination, and restraint in air operations seem puzzling when one realizes that traditional forms of war are far more deadly—especially to noncombatants—than modern air war. But one hears little debate on how best to control these other forms of war.

Wars have always hurt noncombatants. Over the centuries, however, various laws, treaties, conventions, and protocols have attempted to shield them from harm. On paper, these efforts look satisfying and noble—but reality is another matter. Paradoxically, as legal activities to soften the effects of war have accelerated, the numbers of civilian noncombatants killed have increased dramatically.

Well over 100 million people died in wars during the twentieth century—the bloodiest in history. One source claims that 110 million people died in just the first seven decades of the century: 62 million perished as a result of genocide or starvation caused by blockade and siege; 24 million were killed by small arms; 18 million by artillery and naval gunfire; 3 million

attributed to "demographic mixed"; 2 million more by chemicals; and just 1 million due to air attack.[7] These statistics, horrible as they are, do not include several million more deaths in Cambodia, Afghanistan, the Iran-Iraq War, Angola, Rwanda, Chechnya, and the Balkans. The vast majority of the victims were noncombatants. These statistics indicate that the principle of noncombatant immunity, at best, is a goal we have striven unsuccessfully to achieve; at worst, it is a myth that hides the truth. Innocent people have always suffered the most in war, especially in the traditional forms of land and sea warfare. On the Eastern Front in World War II, an estimated 10 million Soviet civilians were killed through starvation, artillery barrage, and gunfire; air attack was a negligible factor in piling up that horrendous death count. In fact, in all the wars of the twentieth century, of the 10s of millions of noncombatants killed, perhaps only 2 percent have died as a result of air attack.

Sieges, artillery bombardments, and ground campaigns have always been deadly. One of the more celebrated sieges of the past century was that of Leningrad during World War II. Over a period of nearly three years, German forces surrounded the city, attempted to starve its citizens, and pummeled it with artillery fire. In one of the more startling incidents of the siege, the Soviet garrison commander attempted to allow civilians trapped within the fortress city to escape. He called upon the German commander, Field Marshal Wilhelm von Leeb, to cease firing while the civilians departed. Von Leeb refused, ordering his troops to fire on the defenseless civilians if they tried to escape. Many did so and were slaughtered. Tried at Nuremberg as a war criminal for this incident, von Leeb claimed that his actions were permissible under the laws of war and was acquitted.[8] Over 1 million Russian civilians—allegedly protected by their noncombatant immunity—died during the siege of Leningrad.[9] Sieges of the past decade at Sarajevo in Bosnia-Herzegovina and Grozny in Chechnya have shown once again the devastation and deadliness of such operations. Recent instances of ground operations that have resulted in hundreds of civilian deaths include the invasion of Panama and the failed effort in Somalia.

Another pervasive and indiscriminate killer is the land mine. In 1993 experts judged that as many as 100 million unexploded land mines were scattered throughout 62 countries. The US State Department estimated that land mines killed or wounded more than 150 people per week worldwide. The American Red Cross, believing that figure low, suggested that 200 people were killed each week and another 100 or so wounded.[10] Both agreed that the majority of those killed and wounded were civilians.

Virtually all belligerents use land mines. In the Persian Gulf War, for example, the United States and its allies laid approximately 1 million mines along the Iraq-Kuwait border.[11] Millions more have been sown in South Korea along the border with North Korea. Although the mines have a defensive purpose, these "eternal sentinels" cannot distinguish friend from foe. After a war is over, the mines often remain, posing a huge danger to the local populace. Worse, removing mines is not an easy task: besides the risk, it costs nearly $1,000 to remove a mine, which costs only a fraction of that amount to plant.[12] Traditional war by sea has also proven deadly to innocents.

Clausewitz was wrong. War is not necessarily "a pulsation of violence," "fighting," or "mutual destruction," as he wrote.[13] For centuries, weapons of war have included the seemingly benign operations of naval blockades and sanctions designed to induce suffering in a target country or region. One expects that cutting off trade, food, and raw materials will lower the standard of living among the populace and thus cause unrest. When the turmoil grows to a certain level, the populace, hopefully, will move against its government and leaders to force a change of policy that will end the blockade or sanctions. As Vice President Al Gore stated succinctly in the presidential debate of 3 October 2000, "The people of Serbia know that they can escape all these sanctions if this guy [Milosevic] is turned out of power."[14] Unfortunately, this can be a slow, laborious, and very deadly

process. For example, according to British official history, over 750,000 German civilians died as a direct result of the Allies' starvation blockade of World War I. The Germans contend that the figure is much higher; in any event, it does not include civilians who died in Austria-Hungary, Bulgaria, and Turkey—German allies also under blockade.[15]

More recently, the Organization of American States (OAS) in 1991 and the United Nations (UN) in 1993 imposed sanctions on Haiti in the aftermath of a military coup that drove President Jean-Bertrand Aristide from office. Many believed that the use of military force to restore Aristide was too extreme an option because it would cause excessive bloodshed and suffering. The goals of the OAS and the UN in imposing sanctions instead were eminently noble: to induce the military junta to step down and restore democracy to Haiti. However, even supporters of the sanctions admit that the junta and its inner circle "not only survived but prospered" during the embargo.[16] As a consequence, the Haitian population paid the price for this supposedly humane action. Unemployment soared to 70 percent, the gross domestic product plummeted, and the inflation rate climbed to 50 percent. A study conducted by the Harvard Center for Population and Development Studies in 1993 found that the sanctions were killing 1,000 children per month.[17]

In Iraq, one finds an even worse example of how seemingly nonviolent weapons of war can be incredibly deadly. Since the end of the Persian Gulf War, several reports have detailed the severe suffering of the Iraqi populace as a result of the UN embargo. Although the Geneva conventions specifically prohibit the use of food deprivation as a weapon, the UN nevertheless imposed just such restrictions. The naval fleet enforcing the embargo turned back seed to grow crops, farm machinery, and over 4.5 million tons of food ordered by Iraq. Between 6 August 1990 and mid-March 1991, no food entered Iraq. As a consequence, the Harvard Study Group that visited Iraq in 1991 estimated that as many as 50,000 Iraqi children died from leukemia, diabetes, asthma, heart disease, and other ailments.[18] Outrage in the world community over this situation was so great that the UN lifted the embargo on food and medicine and instituted the "oil for food" program, which allows Iraq to sell some of its oil to buy food, medicine, and other necessities.[19] The results of this easing of the embargo have not been overly successful.

In March 1996, the World Health Organization published a report on conditions in Iraq. Comparing the levels of infant mortality rates in 1996 with those before the war, it found that the rates had doubled and that the rate for children under the age of five had increased sixfold.[20] The report concluded that the shortage of food and medicine was directly attributable to "*financial constraints* as a result of the sanctions [which] have prevented the necessary import of food and medicine" (emphasis in original).[21] These findings were confirmed three years later, when the United Nations Children's Fund (UNICEF) visited Iraq and noted that statistics showed a steady and continual decline in mortality rates between 1960 and 1990: despite the oppressive dictatorship of Saddam Hussein, the Iraqi people were getting healthier as the economy grew. The war and subsequent UN embargo changed everything. The mortality rate of children under five jumped from 50 per 1,000 live births in 1980 to 117 per 1,000 by 1995. By 1999 it had climbed to 125. UNICEF concluded that if the mortality rates of the 1980s had continued through the 1990s, "there would have been half a million fewer deaths of children under five in the country as a whole during the eight year period 1991 to 1998."[22]

This is a staggering statistic. The UN has admitted that half a million infants have died as a direct result of its embargo on Iraq. When one compares this statistic to the total of 2,300 civilians that Iraq claims were killed during the six-week air campaign in 1991, the disconnect between perceptions of what constitutes humanity and discrimination in war becomes glaring. When we conduct military operations that cause such enormous death and suffering, we lose the moral high ground.

A great deal of ink has been spilled on the subject of whether or not sanctions and em-

bargoes have accomplished their purpose of forcing a change in behavior of the target leadership. The results are contradictory.[23] In truth, however, the question of whether or not sanctions and embargoes "work" misses the point. A more relevant question would be, Do the ends justify the means? Sanctions, embargoes, and blockades are not a "clean" option, and they do indeed cause very real levels of human suffering to the weakest members of a target society. That suffering must be factored into the costs when one evaluates different courses of action.

A wealth of empirical data gathered over the past several centuries shows that blockades, embargoes, sanctions, and sieges almost always have a percolating effect: they start killing at the bottom levels of society and slowly work their way upwards. The three-quarters of a million German civilians who died as a result of the starvation blockade in World War I were not soldiers, politicians, or factory workers—the productive members of the war society. Instead, the first to die were the old, the young, and the sick. Only eventually and very slowly did the effects begin reaching the upper levels of society. This has certainly been the case in Haiti and Iraq—for example, Saddam and his generals do not go to bed without their supper. We must remember this fact because it refutes the argument that one imposes a blockade, embargo, or sanction as a bloodless and humane way of coercing the leaders of a target country.

Many people have argued that such suffering is actually the fault of the country's leaders who either refuse to give in to the demands of the imposer or hoard food and medicine for themselves.[24] History demonstrates, however, that dictators subjected to an embargo generally react by attempting to win the war or conflict in which they are engaged. They will accept casualties to achieve their objectives, and when attacked they will attempt to protect those things most valuable to their society—the things that allow them to continue the fight. They will sacrifice—reluctantly, perhaps, but sacrifice they will—their weakest segments of society so that the strong can fight on. Nations at war for their survival (or the survival of their leader) don't generally take a "women and children to the lifeboats first" mentality. They cannot afford to do so. We must understand this. Thus, if we know from dozens of cases over several centuries what the result of our actions will probably be when we embargo Iraq, Serbia, or Haiti, then we cannot say afterwards that we didn't know the gun was loaded.

We have an alternative. During the past decade, the world has seen air war conducted with humanity, precision, and low risk—to both sides. It has been instrumental in achieving the political objectives of our leaders. Military force is neither a pleasant option nor one we should employ lightly. If necessary, however, we should do more than simply follow the letter of the law—we should limit as much as possible the harm to civilian noncombatants. Aerospace power, therefore, should be our weapon of choice because it is the most discriminate, prudent, and risk-free weapon in our arsenal. □

Notes

1. Over 700 surface-to-air missiles were launched at NATO aircraft, as well as 10s of thousands of antiaircraft artillery shells. Two NATO aircraft were shot down, but the pilots were recovered.

2. *Civilian Deaths in the NATO Air Campaign* (New York: Human Rights Watch, 7 February 2000), 5, on-line, Internet, 24 May 2001, available from http://www.hrw.org/reports/2000/nato. The agency's investigators actually visited only 42 of the 90 sites of the alleged civilian casualties.

3. Ibid., 12–13.

4. During Operation Northern Watch over Iraq, US aircraft sometimes dropped bombs with concrete warheads to limit the amount of damage caused in sensitive areas.

5. *2001 Review Conference of the United Nations Convention on Certain Conventional Weapons* (Geneva, Switzerland: International Committee of the Red Cross, 14 December 2000), 1–2, on-line, Internet, 24 May 2001, available from http://www.icrc.org/icrceng.nsf/c1256212004ce24e4125621200524882/6593a3660091df9ec12569b90033ed5d?OpenDocument.

6. Bill Mesler, "Pentagon Poison: The Great Radioactive Ammo Cover-Up," *The Nation*, 5 May 1997, on-line, Internet, 14 June 2001, available from http://past.thenation.com/issue/970526/0526mesl.htm; and Scott Peterson, "Aftershocks from Anti-Tank Shells," *Christian Science Monitor*, 9 January 2001, 1.

7. Gil Elliot, *Twentieth Century Book of the Dead* (New York: Scribner's, 1972), 147, 154, and 161. In another such estimate in *Civilizations, Empires, and Wars: A Quantitative History of War* (Jefferson, N.C.: McFarland, 1992), 273, William Eckhardt states that between 1900 and 1989, approximately 111 million deaths occurred due to war; he does not break down the cause of death, as does Elliot. *The Black Book of Communism: Crimes, Terror, Repression* by Stéphane Courtois et al., trans. Jonathan Murphy and Mark Kramer (Cambridge: Harvard University Press, 1999) states that fully 95 million people died at the hands of communist regimes in China, the Soviet Union, Vietnam, North Korea, and so forth during the past century. This incredible statistic *excludes* people killed in those countries during interstate wars.

8. Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations* (New York: Basic Books, 1977), 166–67. One can find the actual judgment of the court in *Trials of War Criminals before the Nuernberg Military Tribunals under Control Council Law No. 10, Nuernberg, October 1946–April 1949*, vol. 11 (Washington, D.C.: Government Printing Office, 1950), 563. Of note, the current US Army field manual (FM) on the law of war confirms the legality of this practice: "Thus, if a commander of a besieged place expels the noncombatants in order to lessen the logistical burden he has to bear, it is lawful, though an extreme measure, to drive them back, so as to hasten the surrender." FM 27-10, *The Law of Land Warfare*, July 1956 (change 1, July 1976), 20.

9. Harrison E. Salisbury, *The 900 Days: The Siege of Leningrad* (New York: Harper & Row, 1969), 514–16.

10. *Landmines: A Deadly Legacy* (New York: Human Rights Watch, 1993), 3–4.

11. UNICEF, *The State of the World's Children* (New York: Oxford University Press, 1996), 26.

12. Since the Mine Ban Treaty was signed in 1997, things have improved, but thousands of casualties still occur worldwide each year. See *Landmine Monitor Report* (New York: Human Rights Watch, September 2000). Of note, the three largest producers of land mines—Russia, China, and the United States—have not ratified the treaty.

13. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 87, 127, 236.

14. Transcript of presidential debate, 3 October 2000, on-line, Internet, 14 June 2001, available from http://www.c-span.org/campaign2000/transcript/debate_100300.asp.

15. A. C. Bell, *A History of the Blockade of Germany, 1914–1918* (London: His Majesty's Stationery Office, 1937), 672. The eminent British naval historian Adm Sir Herbert Richmond was unequivocally blunt regarding the purpose of the blockade: "What we have to do is to starve & cripple *Germany*, to destroy *Germany*. That is our prime object" (emphasis in original). Arthur J. Marder, *Portrait of an Admiral: The Life and Papers of Sir Herbert Richmond* (Cambridge: Harvard University Press, 1952), 219–20.

16. David Weekman, "Sanctions: The Invisible Hand of Statecraft," *Strategic Review* 26 (Winter 1998): 41.

17. Ibid., 40.

18. Eric Hoskins, "Pity the Children of Iraq," *Middle East International*, 24 January 1992, 16–17. Dr. Hoskins was the medical coordinator of the Harvard Study Group that visited Iraq in 1991. See also Alberto Ascherio, "Effect of the Gulf War on Infant and Child Mortality in Iraq," *New England Journal of Medicine* 327 (24 September 1992): 931–36.

19. Even with the easing of the sanctions, one notes some bizarre aspects: syringes were initially prohibited, as were plastic bags for transfusions, chlorine for water treatment, and even chemical fertilizer because they *could* be used for military purposes. John Mueller and Karl Mueller, "Sanctions of Mass Destruction," *Foreign Affairs* 78 (May/June 1999): 43–50.

20. *Health Conditions of the Population in Iraq since the Gulf Crisis* (Geneva, Switzerland: World Health Organization, March 1996), 6, on-line, Internet, 24 May 2001, available from http://www.who.int/eha/resource/pubs/000396.html.

21. Ibid., 16.

22. UNICEF, "Child Mortality: Iraq, Current Estimates," 27 August 1999, on-line, Internet, 24 May 2001, available from http://www.unicef.org/reseval/cmrirq.html.

23. For a good overview of when and how sanctions do or do not work, including a review of the literature on the subject, see T. Clifton Morgan and Valerie L. Schwebach, "Fools Suffer Gladly: The Use of Economic Sanctions in International Crises," *International Studies Quarterly* 41 (March 1997): 27–50. This article notes that, in some cases, sanctions are imposed for purely domestic political reasons—the need to show a restive populace that *something* is being done.

24. Claudette Antoine Werleigh, "Haiti and the Halfhearted," *Bulletin of the Atomic Scientists*, November 1993, 20–23; and Jesse Helms, "What Sanctions Epidemic?" *Foreign Affairs* 78 (January/February 1999): 2–8.

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The Myths of Air Control and the Realities of Imperial Policing

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Editorial Abstract: The RAF's concept of air control appeals to airmen because it involves airpower "doing it alone." Keeping one eye on the many myths that have magnified the supremacy of airpower, Group Captain Gray offers insights into wider geostrategic issues and the realities of air policing. He concludes that no military force, including an air force, can expeditiously resolve conflicts alone.

THE CONCEPT OF "air control" has long had considerable appeal to advocates of airpower from its inception in the cash-starved days immediately after the Great War to present times, when the more extreme exponents of our art cite it as an early example of airpower "doing it alone."[1] The term *air control* is almost invariably used to refer generically to the activities undertaken by the Royal Air Force (RAF) in the far-flung corners of the empire in the interwar years. Notwithstanding the existence of several worthwhile studies on the role of airpower in these areas, many myths have arisen over the intervening years. Some of these myths were deliberately

generated at the time, either to inflate the omnipotence of airpower or to denigrate it. It has been the subject of academic research in its own right and has long been a popular subject for journal articles and staff-college papers, as suggested by the notes to this article.[2] Part of the debate has been healthy, but some is less so as some parties have often made generalizations in order to draw modern parallels where none exist. The use of Iraq as a common venue, for example, can be decidedly unhelpful. The distaste or embarrassment felt by some authors over the imperial aspects of the subject and the period does little to aid understanding.

This article outlines the wider geostrategic issues extant when air policing was in vogue, with appropriate reference to the political priorities and niceties of the time. These latter factors will inevitably acknowledge the interservice rivalries—particularly for funding. The article also examines the various facets and the realities of air policing. As Sir John Slessor makes abundantly clear in *The Central Blue,* these roles extended far beyond the traditional concept of air control, encompassing a wide variety of tasks and missions more in tune with modern concepts of the utility of airpower;[3] these included routine patrolling, delivery of men and supplies, reconnaissance, medical evacuation, and famine relief. The article does not go into huge detail on the actual process or the tactics used in air control. Nor does it cover all areas of the empire. Finally, the article looks at what, if any, lessons one can draw from these operations and the often acrimonious debate that surrounded them.

The Geostrategic Environment and the Role of Airpower

As already suggested, the continuing struggle against Saddam Hussein tends to focus the mind of the modern analyst towards Mesopotamia as the central example of air policing in general and air control in particular. The reality is that the wider issues implicit in air policing were applicable from Great Britain and Ireland through Palestine and Africa to India. The political situation was different in each region, as were the strategic imperatives. It should therefore go without saying that the missions facing imperial forces (not just the British troops) were different, as were the threats.

Key to an understanding of the environment of those lean years is an overview of the economic situation. Midway through the First World War, it became evident that the material costs would be unprecedented. The countries on whose territory the war was fought clearly endured the costs of the physical destruction of hundreds of thousands of homes and farms. The fighting wrought similar havoc on miles of roads, railways, and telegraph lines. Livestock was slaughtered, and vast tracts of land were rendered unusable for agriculture. The actual monetary value of the munitions expended was greatly exacerbated by the hidden costs involved in refiguring industry onto a wartime footing and then returning it to peace—turning ploughshares into swords and then back again does not come cheap. These costs escalated rapidly with the unprecedented application of science and technology into areas such as shipbuilding, tanks, and the aircraft industry. Shipping losses were huge. The human costs were horrendous, with 8 million servicemen killed, 7 million permanently disabled, and a further 15 million wounded in some way. Civilian casualties amounted to at least 5 million, with many times that in Russia. The monetary cost has been estimated at $260 billion, which equalled 6.5 times the world national debt accrued from the end of the eighteenth century to the outbreak of the war.[4]

Britain lost 6.3 percent of its male population (723,000), a significant proportion of whom were from the social elite (28 percent of those going up to Oxbridge in 1910–14 died in the war).[5] Manpower requirements had caused Britain to draw deeply from the resources of the empire as well as from home—nearly one-third of British manpower came from abroad. Not only were India and the dominions galvanized by the need to provide troops, but also

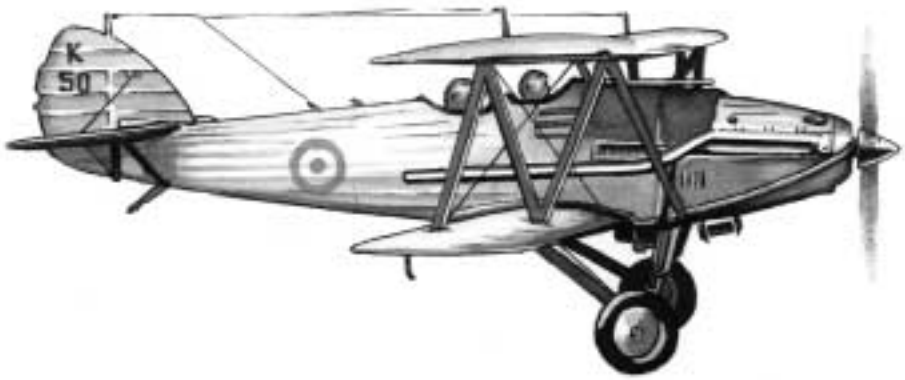
the pace of industrialization in these countries was considerably accelerated. Inevitably, one paid a price, with food shortages, inflation, and consumption of raw materials resulting in a concomitant need for closer British control. These factors in turn fuelled discontent.

The macropolitical costs of the conflict, therefore, were significant. Labor disputes contributed to the growth of nationalist movements, accelerating moves towards self-determination. Clamor for democracy found voice in the mass parties being formed. A rather bizarre combination of German anti-colonial propaganda, American idealism, and Oxbridge-educated lawyers (preaching the virtues of self-determination back in their own countries)[6] fanned the flames of revolution from Mesopotamia to Egypt and beyond to India.[7]

Thoughts in Whitehall in 1919 would have been largely shared between domestic matters and concern over the empire—Europe was by no means as central as it would become in later years. A combination of wishful thinking, economic necessity, and opportunism gave rise to a defense policy based on the absence of war in Europe for the foreseeable future—10 years or more. All planning, therefore, was based on this premise. The army would have as its primary function imperial policing and maintenance of law and order at home for the next decade.[8]

By 1916 it was evident that the Great War would see an end to the Ottoman Empire. Britain and France, therefore, completed a secret agreement partitioning the former Turkish provinces. The resulting Sykes-Picot Treaty of 1916 set up planned zones of influence with either independent Arab states or confederations thereof "under the suzerainty of an Arab chief." In their respective areas of influence, Britain and France would have "priority of right of enterprise and local loans" and would be the sole suppliers of advisers or "foreign functionaries at the request of the Arab State or Confederation of Arab States."[9] Britain was absolutely determined that its routes to India would not be jeopardized by instability, misrule, or foreign intervention (by Turkey or Russia). Furthermore, increasing dependence on oil reserves with the wane of the age of steam meant that the region, even then, was taking on its own strategic importance. But it is evident that the chosen modus operandi was not just a simple acquisition of territory—economic activity and strategic stability did not require such a blunt approach. The League of Nations mandate resulted in Syria and Lebanon going to France; Mesopotamia and Palestine went to Britain. The theory was that Britain or France would act as if they were guardian (to a child) while the League acted as a board of trustees.[10] Under international law, however, the mandate was not merely annexation.[11] Article 22 of the Covenant of the League of Nations expressed the degree of responsibility of the mandatory power as "the well-being and development of such peoples form a sacred trust of civilisation."[12] The mandated territories were effectively self-governing even though they received considerable "political support" from the mandatory authority.[13] In practical terms, as is evident from Sir John Salmond's description below, this was how business was conducted. In the case of Iraq, this method of self-governance provided a transition from the days of the Ottoman Empire to Britain relinquishing its mandate in 1930 on formal independence—albeit as a formal signatory to the Anglo-Iraqi Treaty. Inevitably, this treaty in Iraq and its companion six years later with Egypt did little to meet the more extreme demands of Arab nationalism.

Stability in the Middle East was inevitably complicated by the Jewish question. The Balfour Declaration of November 1917, which pledged a future Jewish homeland, was plainly incompatible with the rising demands of Arab nationalists. Nor was the situation eased by President Woodrow Wilson's utterances on self-determination. Neither these fine sentiments nor the Treaty of Versailles brought concrete gains or wider stability for Arab nationalists. Repatriation of thousands of British troops at the end of the war meant that the region would remain volatile at best.



Great Britain and Ireland

It may seem questionable to start a consideration of imperial air policing with the home front. But the reality has always been that events at home have considerable priority, and solutions devised will have some primacy. The popular perception of a loyal and motivated domestic population wholeheartedly supporting the war effort as the Great War drew to its successful conclusion tells, at best, only part of the story. Coal and rail strikes were almost commonplace. Conditions in the munitions factories were such that strikes were frequent, with tank production grinding to a halt on one occasion.[14] Contributory factors included allegations of profiteering, seemingly arbitrary transfers of personnel between factories, and the ever-increasing demands of the draft. Support for the small but active Communist Party was evident. Notwithstanding the rather dubious sympathies of some of its members, the armed forces were used to uphold a political and social order that was no longer immutable. As early as December 1917, aircraft were used to drop leaflets to aeroengine workers, urging them to end their strikes.[15]

Euphoria following victory was short-lived in the economic conditions of the time. After the war, a major rail strike threatened to disrupt totally the postal system in Britain. Aircraft were used to fly urgent dispatches to 76 administrative centers, thereby ensuring that contact was maintained between the police and central government. In an early example of the use of airpower in information operations (or psychological operations), copies of *The Times* were distributed to administrators in the provinces. This exercise was repeated during the general strike of 1926. Bombers from 9 and 58 Squadrons delivered 1,377,000 copies of the *British Gazette*.[16] In some areas, hostility to the middle classes and their reading proclivities was so great that bundles of newspapers had to be dropped from the air.

By the summer of 1920, two squadrons of aircraft had been deployed to Ireland. Mail drops were carried out along with regular patrolling duties. The presence of aircraft had something of a deterrent effect on the Irish Republican Army. Frustration over the flexibility of the terrorists was such that there were frequent calls for armed aerial intervention—Winston Churchill had demanded the use of aircraft against Sinn Fein members involved in drill in order to "scatter and stampede them."[17] Such requirements were strongly resisted, not the least by Hugh Trenchard himself.[18] This may have been because he could see that a successful outcome was unlikely, and he was unwilling to attract the criticism for his air arm that would inevitably follow. In any event, armed patrols were eventually

sanctioned, albeit under strict regulation, and few hours were actually flown.[19]

Mesopotamia

The fall of the Ottoman Empire and the widespread rise of nationalism that followed threatened Britain's trade routes to and from India. Stability, however, could not be guaranteed by diplomatic means alone, and garrison forces were required in many critical locations. Notwithstanding the evident potential for trouble, Churchill, as secretary of state for war and air, warned that the garrison in Mesopotamia[20] would have to be cut from its existing level (25,000 British and 80,000 Indian troops).[21] His attempts to find novel, cheap solutions fell on ground as stony as the desert. Even after the first round of cuts, the garrison was still costing over £18 million per year. In mid-February 1920, Churchill asked Trenchard if he would be prepared "to take Mesopotamia on." The deal would involve the reduction of the standing garrison to 4,000 British and 10,000 Indian troops but with an air officer as commander in chief and an extra £5 million on the air estimates. The Air Staff plan envisaged 10 squadrons, mainly based around Baghdad.

Arab nationalism spread during 1920, with a revolt in Syria followed by public protests in Mesopotamia. Reinforcements had to be brought from India at considerable cost. Order was subsequently restored by methods that probably made the activities of the paramilitary Black and Tans in Ireland seem rather tame. The efficacy of airpower was hotly contested, with army accusations that the use of aircraft had been instrumental in provoking the crisis. Trenchard countermanded that deployment of sufficient airpower would have had the necessary "morale effect" to prevent the rebellious outbreak.[22] Admittedly with the benefit of hindsight, Lt Gen Sir Aylmer Haldane, who had been commander in chief in Mesopotamia at the time of the rising, stated, "I must not omit to state that I had a few aeroplanes, which during the insurrection were increased by a squadron. Those available did invaluable work and, had I had sufficient [aeroplanes] at the outbreak of the rising I am inclined to think that it might have been possible to stifle or perhaps localise it." It is worthy of note that Haldane had agreed to speak at the Royal United Services Institute because he had "been struck by the almost complete ignorance regarding the occurrences" in Mesopotamia after the Armistice.[23] That lack of knowledge had not been reflected by an absence of rhetoric!

The air-control method was very much a joint operation involving considerable cooperation between air and land assets, often with the RAF ferrying troops, dropping supplies, and evacuating the wounded—as well as bombing targets.

With doctrinal and practical disputes running continuously between army and air force, it appeared as if compromise would be impossible. Churchill, however, still needed to reduce costs. He held a conference in Cairo in March 1921, at which a system of air control was proposed. After the inevitable round of bickering, his proposals went before the Cabinet in August 1921, with the suggestion that eight squadrons take over the policing duties in October 1922. They would be supported by two British and two Indian battalions, three companies of armored cars, and various ancillary units. (On the due takeover date, there were actually nine battalions.)

Air Vice Marshal Sir John Salmond took over as air officer commanding (AOC) in less than auspicious circumstances. The Turks were threatening the northern province of Mosul, and the Kurds were fighting a guerrilla war in Sulaymaniyah. A small-scale bombing attack on Turkish positions achieved striking success that Iraqi levies quickly capitalized on.[24] The air-control method was very much a joint operation involving considerable cooperation between air

and land assets, often with the RAF ferrying troops, dropping supplies, and evacuating the wounded—as well as bombing targets. By May 1923, Salmond had achieved what Maurice Dean has described as a "tremendous victory."[25] For readers unfamiliar with the "finer points" of air control, a part of Salmond's dispatch to Trenchard gives the details:

> No action is ever taken except at the request of the British civilian adviser on the spot, and only after this request has been duly weighed by the [Iraqi] Minister of the Interior and by the British Adviser and by the High Commissioner [in Baghdad]. Even after a request has passed this three-fold scrutiny, I have on more than one occasion, as the High Commissioner's chief Military Adviser, opposed it on the military grounds that I did not consider that the offensive action which I had been asked to take would lead to the result desired; and His Excellency has always acceded to such advice on the acknowledged basis that I am more perfectly acquainted with the effects it may be expected to achieve.
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> It is a commonplace here that aircraft achieve their results by their effect on morale, and by the material damage they do, and by the interference they cause to the daily routine of life, and not through the infliction of casualties. The casualties inflicted have been most remarkably small. A tribe that is out for trouble is well aware when the patience of Government has reached breaking point; and negotiations inevitably end in what is in effect an ultimatum in some form or other. Complete surprise is impossible and the real weight of air action lies in the daily interruption of normal life which it can effect, if necessary for an indefinite period, while offering negligible chances of looting or of hitting back.
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> It [air action] can knock the roofs of huts about and prevent their repair, a considerable inconvenience in winter time. It can seriously interfere with ploughing or harvesting—a vital matter—or burn up the stores laboriously piled up and garnered for the winter. By attacks on livestock, which is the main form of capital and source of wealth to the less settled tribes, it can impose in effect a considerable fine or seriously interfere with the actual sources of the tribe—and in the end the tribesman finds it is much the best to obey the Government.
>
> Occasionally the house or fort of a rebel leader like Sheikh Mahmud would be selected as a target of individual attack and this called for a high degree of bombing accuracy. Otherwise it was unnecessary, and indeed undesirable, to inflict serious or extensive damage. The object was really the air blockade of the recalcitrant village by means of intermittent light attacks, which were never delivered without due warning to the villagers so that they could leave their dwellings. After they had surrendered, troops or police would be flown in, with medical staff, to restore order, stop looting, treat the sick and the injured, distribute food and rehabilitate the area generally.[26]

Success in Mesopotamia was influential in convincing the Salisbury Committee that the fledgling service should remain in being. The acrimony between army and air force remained bitter at the highest of levels, with inevitable comments on the primacy of the bayonet (from Edward Stanley, Earl of Derby, the secretary of state for war) as well as accusations of brutality. Marshal of the RAF Sir John Slessor cites Sir John Salmond with approval in pointing out that casualties on both sides were considerably lower under air control.[27] The relative impunity with which aircraft could operate was a constant feature in the lists of virtues—particularly in comparison with cumbersome land operations.[28] By 1925 air control had effectively maintained the British influence in Mesopotamia—at a significantly reduced cost. It had also contributed considerably to the survival of the RAF. The euphoria surrounding these two rather momentous statements should not detract from the reality that it was the broader concept of air policing—allied with conventional diplomacy at ground level—that had stabilized a potentially disastrous situation. We pretend at our peril that air did it alone!

Palestine

The situation in the second mandate—Palestine—was somewhat less emotive on the

military front because the War Office did not consider the region as strategically important as Mesopotamia. There was, therefore, less resistance to Churchill's proposal to extend air control into this area. Furthermore, the actions of the single squadron that Churchill proposed to send would not guarantee the survival of the new service. During the Jaffa riots of 1921, some bombs were dropped to protect Jewish settlements from Arab raids. An AOC took command in May 1922, but by the mid-1920s, patrolling borders had become the main occupation.[29] Again, political influences and economic factors played their parts. Article 4 of the 1922 Mandate for Palestine established a "Jewish agency" as the appropriate "public body for the purpose of advising and co-operating with the Administration of Palestine in such economic, social and other matters as may affect the establishment of the Jewish national home and the interests of the Jewish population."[30] Over the period of the interwar years, Jewish immigration increased, with the population growing from 11 percent in 1922 to 30 percent in 1940.[31] The authorities had the task of balancing Arab nationalist aspirations with this influx from Europe and Asia.

Increased Jewish immigration in 1928 caused tension in Arab circles, which was followed by attacks on Jewish settlements. The garrison at that stage had been reduced to aircraft, armored cars, and police. Inevitably, they were unable to police the urban rioting adequately. Airpower was used for patrolling outlying areas, defending convoys, attacking looters, and flying reinforcements. Further riots in the mid-1930s again had to be suppressed on the ground, and control (and command) passed to the army. Airpower continued to be used until the end of the mandate, albeit largely in a support role.

India

The defense of India and, more importantly, its borders was a matter of critical importance to imperial Britain. Although internal unrest was of considerable concern and aircraft were used briefly in this role, the Air Ministry was at its most active in defense of the frontier. There was no real attempt to coerce the indigenous tribes into accepting Indian administration; the priority was maintenance of stability—in effect, an early form of peacekeeping. Airpower was used in force in operations in 1925, with more than 2,000 hours flown and over 150 tons of bombs dropped.[32] Trenchard immediately proposed that the existing six squadrons be increased to 10, with a corresponding reduction in battalions. This was not accepted, and sporadic action continued. Further proposals in 1929 met similar results. Beyond the usual army resistance, the nature of imperial life in India ensured that little progress would occur. The government of India was loath to embark on the risky course of entrusting vital frontier defense to new-fangled aeroplanes—particularly if the quid pro quo was widespread unemployment among Indian army officers and a reduction in their treasured policy of road building. Although Trenchard had negotiated direct access for the AOC to the viceroy, the RAF was a lowly 23d in the rigidly adhered to order of precedence.[33] As one of the squadron commanders, Arthur "Bomber" Harris, wryly made the point, having to follow the army's pack-mule transport made the going rather heavy! Furthermore, the local air staff comprised 15 officers, in marked contrast to the hundreds in the army headquarters in Delhi. Harris's frustration over lack of resources and poor tactics so disillusioned him that he resigned from the service; only Salmond's intervention stopped him from settling in Rhodesia as a farmer.[34]

There was, therefore, little prospect of Trenchard's achieving air-control primacy on the frontier. Individuals actively involved in operations were consistently frustrated by the overly prescriptive rules imposed by conservative (i.e., out of date) army headquarters staff. Slessor was also adamant that closer cooperation was essential between the squadrons and the troops they were supporting.[35] Again, air operations went far beyond mere bombing raids against mountain tribesmen. The efficiency of their operations, however, was often

hindered by the age, condition, and obsolescence of the equipment.

The Realities of Imperial Air-Policing Operations

The first point that one must reemphasize is that Britain, its empire, and the majority of its allies were in relatively dire economic straits at the end of the Great War. The war itself had wrought considerable financial and physical damage. Technology and the rising cost of mobilizing manpower had made armed conflict, and the prevention thereof, expensive propositions. The Great War had also encouraged the spread of nationalism and had increased social expectations. The era of imperialism was ever more rapidly coming to its close. The negotiations leading up to Versailles, coming as they did on top of fine promises made or imagined in the heat of war, raised expectations that could not be met. Self-determination would remain a source of hope for nationalists and a bane for those charged with administering empires on decreasing budgets. The requirements for imperial defense, as well as for policing operations, were, therefore, increasing rather than decreasing. Government defense policy centered on this role in the absence of a credible European threat; as neither a resurgent Germany nor a return to animosity with France seemed likely, national affinity for matters of the empire could take priority.

Imperial policing was a major, if not the most significant, defense task for all three services. The army, along with imperial forces and locally raised levies, was constantly involved. The Royal Navy was charged with protection of the sea and trade routes. It was only natural that the fledgling RAF would seek a role in the work at hand. The centrality of these tasks to the raison d'être of the armed forces is hard to grasp now with our later focus on home defense and then the North Atlantic Treaty Organization. But it is evident from the biographies of the RAF's senior leadership that such postings were regular occurrences.[36]

The services' struggle for their due share of the defense expenditure has always been high on the military list of priorities. It is not at all surprising, therefore, that both the navy and the army would resent every penny spent on the third arm. It is equally unsurprising that Trenchard and his senior colleagues would employ all means to ensure its survival. Although this is well-trammelled ground, it is important to note that the immediate use of airpower was not in dispute. The point of contention was that the RAF needed to exist as a separate service in order to provide that capability at the front line. At the time, it appeared that this could be justified only if airpower could claim outright primacy with its own person as the commander in chief—or with independent access to the political authority of the country or mandate concerned. Anything less would have undermined the chances of survival. This is not the same as more recent arguments advocating that "airpower can do it alone." Nor do many of the air-control arguments rest on the use of the bomber acting against strategic targets—although this was suggested from time to time (for example, over Kabul). Ironically, the real debate was not about airpower doing it alone—it was more about air in the lead. One can best illustrate this point by using *air control* to mean air as supported commander (i.e., in control of the whole operation).[37]

To the modern reader, who has almost certainly joined his or her own service and remained largely within its "stovepipe" of influence—or at least within its "comfort zone," the prospect of an airman taking direct control of all operations may seem strange. This, in part, reflects a noticeable tendency on the part of airmen to feel uncomfortable at the prospect of disposing of the other services' assets.[38] The senior RAF officers of the interwar years would have had less compunction in such matters. The vast majority started their military careers in the army and would have been trained accordingly. Trenchard, for example, served in India in the Royal Scots Fusiliers, where he proved himself an excellent horseman.[39] Similarly, Air Chief Marshal

Sir Hugh Dowding joined the army as an artilleryman, and Salmond served in the West African Frontier Force.[40] Slessor's four years at the Army Staff College at Camberley would have given him more than a mere insight into operations. Taking responsibility for the joint force would present few problems to such men.

Familiarity with the modus operandi of the other services is much easier to achieve—especially at the operational or tactical level. Firsthand accounts from the likes of Slessor illustrate the extent to which the services could act in harmony when there is a willingness to make full use of the potential of air. Harris's experiences show the dangers of relegating air to an underresourced and dormant support role. This has a clear resonance with many operations today.

Much of the contemporary debate on the efficacy of air control was at the military-strategic level—rather than at the tactical, where problems, theoretically, could be relatively easily resolved. Part of the acrimony stemmed purely from airmen's need to secure command positions in the scramble for the survival of the service. Relinquishing these positions of power was anathema to the army, both for reasons of pride and to prevent the new arm from gaining a toehold. Modern controversy over "star counts" again has some resonance. The debate went far beyond the confines of these issues even though they almost certainly underlay much of the controversy. Nor did the discussion solely concern the military efficiency of a given arm in any one situation—although this was contested on many occasions. The ethical and moral aspects of the situation were frequently mobilized, often with little attempt at veiling the underlying hypocrisy.

The air method was often criticized as brutal, causing resentment on the part of the victims. There were frequent accusations of "indiscriminate bombing." Sir Henry Wilson, chief of the Imperial General Staff, spoke in rather contemptuous terms of "the bomb that falls from God knows where and lands on God knows what."[41] This is another line of rhetoric that holds some resonance in the aftermath of Kosovo! Slessor goes to some lengths to convince his reader that the attacks were neither indiscriminate nor brutal. He also points out that the rules extant in one theater of operations allowed the shelling of villages—presumably rather brutal and fairly indiscriminate—but did not countenance air attack. No one would pretend, however, that accidents did not occur or that many bombs missed their targets. The environment in which the operations took place was comparatively Hobbesian: life was brutal, uncomfortable, and relatively short.

Modern Lessons?

If one attempts to draw modern lessons from the British military's (not just the RAF's) experiences of imperial policing, it is important to strip away the rhetoric and look beyond the internecine bickering. Many of the lessons at the grand strategic level merely reflect the economic and political realities of an empire in terminal decline that must continue to meet commitments and responsibilities with declining resources. To suggest that any military force, let alone airpower, can instantly resolve the problems of self-determination is either naïve or demonstrative of wishful thinking.

One must also view lessons drawn in the context of their times, when the empire was central to British foreign and domestic policy. This may not have universal appeal in these days of political correctness, but they were the reality of the day. At the military-strategic level, what could have been a healthy doctrinal debate over the best use of military force in a vast range of potential scenarios rapidly degenerated into a morass of dogma. If one can draw a modern lesson from the period of imperial policing and air control, it is the avoidance of such a futile debate.

To a lesser extent, this applies at the operational level, where there was, in modern parlance, the distinct risk of spending more energy in deciding who was to be the "supported" and who was the "supporting" commander than in concentrating on the military

task at hand. The second significant, and related, lesson at the operational level also involves the avoidance of dogma—particularly at the extremes of the spectrum, where advocates either suggest that "airpower can do it alone" or that only the bayonet can triumph. Commanders and their teams, of whatever cloth, need to be aware of each other's doctrine and must be comfortable with capabilities and limitations. From airmen's perspective, there is more to modern airpower than just precision weaponry. This may sound like a truism, but so much of the debate on the interwar role of the RAF has centered on air control—to the exclusion of other tasks—that it is worth reiterating. Slessor stressed the point that aircraft were used extensively in direct cooperation with land forces, in reconnaissance duties, patrolling convoys, photographic survey and mapmaking, civilian evacuation, medical resupply and evacuation, antislavery patrols, famine relief, fishery protection, troop transport, and the development of air routes. The lesson that advocates of airpower should draw from this list is that the ubiquity and flexibility of airpower render it a key asset to any commander. Many of the tasks facing us today chime with the roles enumerated by Slessor, reminding us that the missions in the core capability now termed *combat-support air operations* are underresourced at our peril.[42]

Any discussion on lessons learned—or as has become more fashionable, lessons identified—must be tempered with the acknowledgement that lessons are more often forgotten. Those that are remembered must be applied with the precision of a legal precedent—only in directly equivalent circumstances. Trenchard was well aware at the time that what was good in Mesopotamia may not be directly transferable to, say, an urban environment in Ireland or Palestine.[43] What is often more important than expecting lessons to be transferred from theater to theater is the accumulation of experience based on credible analysis of events. If the aftermath of an incident is dominated by rhetoric and recriminations, the emotion of the moment is more likely to lodge in the memory than the analysis. Rhetoric, therefore, is best left to journalists and armchair pundits.

The spectrum of conflict is as wide today as it was in the interwar years. There was an implicit danger at the time that the rhetoric necessary to ensure the survival of the fledgling service would be internalized during the formulation of the strategy needed to counter emergent Nazi Germany. Notwithstanding the personal experiences of officers who subsequently joined the Air Staff, the linkage between air control and emerging strategy has not been proven.[44] The range of works covering British interwar strategy tends to emphasize the role of the bomber in relation to cities and industry rather than tribesmen.

Finally, the advocate of the "airpower can do it alone" school would be well advised to read "The War Object of an Air Force," Trenchard's paper to the Imperial Defence College. In this seminal work, Trenchard expressed his belief that aerial bombardment in the war of the future was inevitable, that this was likely to be done without scruple, and that it would not be restricted to the zones of opposing armed forces. In language that is a far cry from the lessons of the colonial wilds, Trenchard went on to state that

> attacks will be directed against any objectives which will contribute effectively towards the destruction of the enemy's means of resistance and the lowering of his determination to fight. These objectives will be military objectives. Among these will be comprised the enemy's great centres of production to every kind of war material, from battleships to boots, his essential munitions factories, the centres of all of his systems of communication and transportation, his docks and shipyards, railway workshops, wireless stations, and postal and telegraph systems.[45]

Trenchard does not rule out air-to-air combat, nor does he preclude attacks on air bases; he just points out that these will not necessarily be the vital areas. Most importantly, Trenchard states that he has no wish to imply that "air by itself can finish the war." □

Notes

1. Whilst not necessarily extreme, see the views expressed in Carl H. Builder, "Doctrinal Frontiers," *Airpower Journal* 9, no. 4 (Winter 1995): 6–13; and Maj Marc K. Dippold, "Air Occupation: Asking the Right Questions," *Airpower Journal* 11, no. 4 (Winter 1997): 69–84. The role of airpower in general and in the far-flung corners of the empire was a regular subject in the Royal United Services Institute. In addition to the notes below, see also Wing Comdr J. A. Chamier, "The Use of the Air Force for Replacing Military Garrisons," *Journal of the Royal United Services Institute (JRUSI)* 66 (1921): 205; Group Capt J. A. Chamier, "Strategy and Air Strategy" and Flight Lt C. J. McKay, "The Influences of the Future of Aircraft on Problems of Imperial Policing," *JRUSI* 67 (1923): 274.

2. For serious works on the subject, the reader should start with either David E. Omissi, *Air Power and Colonial Control: The Royal Air Force, 1919–1939* (Manchester, England: Manchester University Press, 1990); or the relevant chapters in Philip Anthony Towle, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare, 1918–1988* (London: Brassey's Defence Publishers, 1989).

3. Sir John Cotesworth Slessor, *The Central Blue: Recollections and Reflections* (London: Cassell, 1956), 53ff.

4. All figures come from Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987), 360.

5. David Reynolds, *Britannia Overruled: British Policy and World Power in the Twentieth Century* (New York: Longman, 2000), 105.

6. *Self-determination* is a dangerous term, with connotations of breaking down or reforming supposed nation-states. A plethora of textbooks on international law deals with the subject, as does the author's unpublished MPhil thesis "The Impact of the Dissolution of Yugoslavia on the International Law of Self-Determination" (University of Cambridge, 1995).

7. Kennedy, 369.

8. See, for example, John Charmley, *Churchill: The End of Glory* (London: Hodder & Stoughton, 1993), 163.

9. *Sykes-Picot Agreement, May 1916*, on-line, Internet, 8 June 2001, available from http://www.stanford.edu/class/history187b/sykespicotdoc.htm.

10. Lawrence James, *The Rise and Fall of the British Empire* (New York: St. Martin's Press, 1996), 399.

11. See Malcolm N. Shaw, *International Law*, 3d ed. (Cambridge: Cambridge University Press, 1991), 156; and Ian Brownlie, *Principles of Public International Law*, 4th ed. (Oxford: Oxford University Press, 1990).

12. *The Covenant of the League of Nations*, on-line, Internet, 8 June 2001, available from http://www.yale.edu/lawweb/avalon/leagcov.htm#art22.

13. See, for example, the King-Crane Commission Report, 28 August 1919, in Harry N. Howard, *The King-Crane Commission: An American Inquiry into the Middle East* (Beirut: Khayat, 1963).

14. Described in Martin Gilbert, *Churchill: A Life* (New York: Holt, 1991), 392–93.

15. Omissi, 40.

16. Ibid., 41.

17. Gilbert, 422.

18. Andrew Boyle, *Trenchard* (London: Collins, 1962), 370.

19. Omissi (p. 43) quotes 10 out of 338 hours in April 1921.

20. In the hope of detaching events in the interwar years from those of today, I have used *Mesopotamia* rather than *Iraq*.

21. Omissi, 21.

22. Ibid., 24.

23. Lt Gen Sir Aylmer Haldane, "The Arab Rising in Mesopotamia," *JRUSI* 68 (1923): 68.

24. Omissi, 32.

25. Sir Maurice Dean, *The Royal Air Force and Two World Wars* (London: Cassell, 1979), 37.

26. Salmond to Trenchard, letter, subject: Air Control, 29 September 1923, Trenchard Papers, C11/27/143/2.

27. Slessor, 67.

28. Group Capt A. E. Borton, "The Use of Aircraft in Small Wars," *JRUSI* 65 (1921), 310.

29. Omissi, 44.

30. *The Mandate for Palestine, July 24, 1922*, on-line, Internet, 8 June 2001, available from http://www.fordham.edu/halsall/mod/1922mandate.html.

31. Martin Gilbert, *Israel: A History* (New York: William Morrow, 1998), 50.

32. Omissi, 48.

33. Ibid., 49.

34. Dudley Saward, *"Bomber" Harris: The Story of Marshal of the Royal Air Force, Sir Arthur Harris* (Garden City, N.Y.: Doubleday, 1984), 32.

35. Slessor, 122.

36. For a brief survey, the reader could do worse than glance through Air Commodore Henry Probert's *High Commanders of the Royal Air Force* (London: Her Majesty's Stationery Office, 1991).

37. For military readers unfamiliar with this concept, it is laid down in some detail in Joint Warfare Publication 0-10, *United Kingdom Doctrine for Joint and Multinational Operations*, September 1999, par. 538.

38. See Lt Col Howard D. Belote, *Once in a Blue Moon: Airmen in Theatre Command: Lauris Norstad, Albrecht Kesselring, and Their Relevance to the Twenty-First Century Air Force*, Cadre Paper no. 7 (Maxwell AFB, Ala.: Air University Press, July 2000).

39. Boyle, 35ff. Whatever the shortcomings of Boyle's biography, some of the anecdotes make entertaining reading. These include a clash over polo with the young Winston Churchill, whose gamesmanship did not endear the future prime minister to the future chief of the Air Staff. Trenchard also had a knack of subsidizing his own polo through the judicious buying and selling of ponies.

40. Probert provides details on most senior leaders.

41. Slessor, 66.

42. *British Air Power Doctrine, AP 3000*, 3d ed. (Great Britain: Directorate of Air Staff, Ministry of Defence, 1999), chap. 8. In "Kosovo Victory: A Commander's Perspective," *Royal Air Force Airpower Review* 2, no. 4 (Winter 1999): 2, Gen John Jumper, USAF, expressed his concern that these operations are downplayed in the aftermath of Operation Allied Force.

43. Boyle, 371. See also Malcolm Smith, *British Air Strategy between the Wars* (Oxford: Clarendon Press, 1984), 30.

44. Smith, 43; H. Montgomery Hyde, *British Air Policy between the Wars, 1918–1939* (London: Heinemann, 1976), 167, 224; and Phillip S. Meilinger, "Trenchard and 'Morale Bombing': The Evolution of Royal Air Force Doctrine before World War II," *The Journal of Military History* 60, no. 2 (April 1996): 265. These references tend to be "negative," in that each provides an opportunity to prove the case that is not taken.

45. Reproduced in full in Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive against Germany, 1939–1945*, vol. 4 (London: Her Majesty's Stationery Office, 1961), 71–83.

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Airpower and Restraint in Small Wars

Marine Corps Aviation in the Second Nicaraguan Campaign, 1927–33

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Editorial Abstract: Air control, as exhibited by the Royal Air Force during the British occupation of Iraq, is often cited as the consummate example of the successful and effective use of airpower. However, the US military need look no further than its own Marine Corps for an equally compelling example. As Dr. Johnson argues, unlike their European counterparts, Marine air leaders understood the need for restraint in using airpower for air control in Nicaragua during the first half of the twentieth century.

IT IS ONE of the peculiarities of airpower history that proponents have often claimed airpower to be a more humane instrument of war, whereas many critics have claimed that bombs dropped from the air are somehow more immoral than an artillery barrage or economic sanctions—even if the latter results in a greater number of civilian deaths.[1] Yet, it is rare to find historical examples of airmen accused of war crimes, much less tried for the same. This has created a paradox of sorts. For example, following revelations that US troops deliberately fired upon civilian refugees at No Gun Ri during the Korean War, James Webb, a Marine Corps combat veteran and former secretary of the Navy, wrote in *The Wall Street Journal*, "Perhaps the greatest anomaly of recent times is that death delivered by a bomb earns one an air medal, while when it comes at the end of a gun it earns one a trip to jail."[2] If we were to take this line of reasoning to its logical extreme, the tragedy at My Lai would have been regarded differently in history had a pair of F-4 fighter-bombers napalmed the village. Of course, the distinction appears to be that Lt William Calley and his soldiers killed Vietnamese women and children face-to-face

whereas the F-4 pilots would have been, to use popular jargon, simply "servicing a target."

According to Col Phil Meilinger, former dean of the School of Advanced Airpower Studies at Maxwell Air Force Base (AFB), Alabama, "Whether women and children are blown to bits by artillery, starved to death as a result of blockade, or killed in a bombing attack is a distinction the victims would not trouble themselves to make."[3] But airpower theorists and airmen themselves have over the years invariably pointed to the distinct psychological impact of airpower as being potentially far greater than the actual physical destruction wrought. If that is true, then civilians do in fact make a distinction between death by artillery fire and death by bombs. Giulio Douhet certainly believed in the efficacy of aerial terror to weaken, if not wholly undermine, the will of civilian populations, and as recently as 1997 the director of Defence Studies at the Royal Air Force Staff College averred that "airpower when used properly can be a devastatingly effective psychological weapon."[4]

A basic premise of classical airpower theory, then, has always been that people targeted from the air—whether combatants or noncombatants—react with much greater fear to aerial bombardment than to surface attack.[5] Apparently, this is equally true among guerrillas and other irregulars. In his book *Viet Cong Memoir,* Truong Nhu Tang described B-52 strikes as "undiluted psychological terror." Despite having been hunted by South Vietnamese and American ground forces and having endured all of the privations and hardships associated with the life of a guerrilla, Truong Tang noted that "nothing the guerrillas had to endure compared with the stark terrorization of the B-52 bombardments."[6] Thus, since the advent of the airplane, airpower enthusiasts have noted the psychological dimension of airpower and sought to exploit it. In that light, the use of the airplane by Great Britain to police its empire in the early part of the twentieth century serves as a case in point.

As Dr. Jim Corum has noted in his article "The Myth of Air Control," the British long relied upon terror in the form of punitive expeditions to bring rebellious native populations to heel.[7] Indeed, Col C. E. Callwell, in his seminal work *Small Wars,* first published in 1896, considered what we today would think of as wanton acts of destruction perpetrated against civilians to be a sound military principle:

> It is so often the case that the power which undertakes a small war desires to acquire the friendship of the people which its armies are chastising, that the system of what is called "military execution" is ill-adapted to the end in view. The most satisfactory way of bringing such foes to reason is by the rifle and the sword, for they understand this mode of warfare and respect it. Sometimes, however, the circumstances do not admit of it, and then their villages must be demolished and granaries destroyed.[8]

Although Colonel Callwell acknowledged "a limit to the amount of license in destruction" in small wars, he nevertheless acceded to a certain expediency in such "havoc" and noted that, despite the fact that burning crops and killing civilians was something "the laws of regular warfare do not sanction," it was oftentimes a necessary, albeit unfortunate, characteristic of small wars.[9]

The Royal Air Force (RAF) advanced air control as a substitute for the traditional punitive expedition on the ground. In short, such expeditions by air were relatively cheap, could inflict serious casualties upon recalcitrant natives without exposing English soldiers to any harm, and capitalized on the fact that primitive people were quite often terrified by airplanes. Thus, when combined with surface operations conducted by native levies or other non-English imperial troops, these operations were quite successful, and the RAF exploited the results to its own political ends. But in keeping with the nature of punitive expeditions in general, these aerial operations also tended to be quite brutal. For example, at the time, Wing Comdr J. A. Chamier of the RAF insisted that airplanes were to be used relentlessly, carrying out attacks "on houses, inhabitants, crops, and cattle."[10] Although repugnant to modern sensibilities, such an attitude was wholly in keeping with an imperial policy intended to

crush native resistance to British authority as quickly and effectively as possible. Moreover, Great Britain was not alone in this matter, as the French displayed an equal disregard for the lives and property of native peoples.

French imperial policy was similar to that of the British, and the French use of airpower to police their own colonial possessions was no less brutal—perhaps greater. The French air force played a significant role in the colonial fighting in Morocco and Tunisia prior to, during, and after World War I. Aerial bombardment of civilians by the air force in policing the French Empire was the norm. In fact, at Nalhout, Tunisia, in the fall of 1916, the French used chemical weapons against civilian targets, including mosques. Apparently, the French made no distinction between combatants and noncombatants in punitive operations; therefore, the use of gas was not regarded as particularly unethical or immoral—or even counterproductive. French use of aircraft in colonial warfare increased during the 1920s, with 21 squadrons operating in Morocco alone. According to Dr. Bill Dean, a professor on the faculty at Air Command and Staff College at Maxwell AFB, "As had been the case a decade before, the French had no qualms about bombing villages that were strictly civilian targets."[11] They even used American mercenary aviators at one point.[12]

Ironically, the British public was not especially outraged by their own soldiers or other soldiers in the employ of the empire torching villages in Iraq or Yemen, but they were moved to protest the use of airplanes for the same purpose. Early RAF reports on air-control operations stressed effectiveness and lethality, but later statements emphasized the use of airplanes in a more humane and less lethal manner. The proximate cause of this shift in emphasis was the rising chorus of protest in the British press and in Parliament. It would appear, however, that no such compunction developed about matters on the ground because punitive expeditions continued as before, and British troops repeatedly shelled villages without warning. But the restraint claimed by the RAF was probably mostly fiction, especially in the more isolated outposts of the British Empire. Contrast this state of affairs with the operations of United States Marine Corps aviation elements in Nicaragua during roughly the same time frame.

In *Quijote on a Burro*, a privately published classic on American intervention in Nicaragua between 1912 and 1934, Lejeune Cummins wrote in 1958 that "perhaps the only subject regarding the American intervention . . . upon which all authorities are able to agree is the efficacy with which the marines employed the air power at their disposal."[13] Indeed, Secretary of the Navy Curtis Wilbur reported in 1929 that Marine Corps aviation was "of inestimable value" in Nicaragua.[14] Cummins was thus moved to observe that "it is probably not an exaggeration to say that the marine occupation . . . could not have been accomplished" without Marine Corps aviation.[15]

Beginning in 1919, the Marine Corps had employed airplanes against the *cacos* in Haiti and "bandits" in the Dominican Republic, but the accompanying air units were added to these expeditions mostly as an afterthought and, therefore, generally operated without a clear idea of their role in each undertaking.[16] Six Curtiss JN-4B "Jennies" of the 1st Air Squadron, commanded by Capt Walter McCaughtry, deployed in February 1919 to San Pedro de Macoris, the Dominican Republic, while another six Jennies and six Curtiss HS-2L flying boats of the 4th Squadron under Capt Harvey Mims began operations at Port-au-Prince, Haiti, on 31 March.[17] Although some of these aircraft took part in active combat operations—experimenting with improvised bombing tactics against the indigenous irregular forces—it was not until improved radios became available in 1921 that air-to-ground cooperation proved at all practicable. Consequently, in both the Dominican Republic and Haiti, Marine Corps aviation proved its worth mostly in combat-support operations such as scouting, communications, mapping, transportation, and medical assistance. Nevertheless, as one Marine Corps aviator concluded afterwards, "We were there and they used us, and they used us to their advan-

tage, and consequently we became a useful and integral part of the Marine Corps."[18] In fact, not unlike the British and the French, the corps became increasingly aware of the facility of close air-ground counterguerrilla operations. And in Nicaragua, the Marine Corps began to perfect these techniques in a manner that ultimately laid the foundation for the highly effective system of close air support still in use by that service today.

United States interests in Nicaragua did not arise suddenly with the emergence of the revolutionary disturbances of the 1920s; this small country had been of strategic importance to the US government since the war with Mexico, when, along with the Isthmus of Panama, Nicaragua became vital to transcontinental communications. Suffice it to say that as a result of the Roosevelt Corollary to the Monroe Doctrine, the United States took on the role of hemispheric gendarme in order to protect American commercial interests throughout Latin America. President William Howard Taft subsequently made "dollar diplomacy" the paramount strategic consideration in Latin America, and when American capital investment was threatened in Nicaragua in 1926, the United States sent in the Marines.[19]

In February 1927, Marine Observation Squadron 1, commanded by Maj Ross "Rusty" Rowell, landed at Corinto, Nicaragua, with eight officers, 81 enlisted men, and six DeHavilland DH-4B aircraft. In May, Marine Observation Squadron 4, with seven officers, 78 enlisted marines, and six Boeing 02B-1s (a metal-fuselaged derivative of the venerable DH-4B) also arrived and were placed under Major Rowell's command. Combined, the two units were designated Aircraft Squadrons, 2d Brigade.[20] Major Rowell, an experienced pilot who had received instruction in dive-bombing during exercises conducted by US Army fliers at Kelly Field in San Antonio, Texas, was quick to appreciate the value of dive-bombing: "[It] seemed to me that it would be an excellent form of tactics for use in guerrilla warfare."[21] Thus, when he took command of the 1st Squadron in San Diego in 1924, Rowell had US Army A-3 bomb racks installed on the squadron's DH-4Bs and set about training his pilots in the technique.

Dive-bombing—more accurately, what we would today describe as glide bombing—had earlier been employed in Haiti. During the intervention there in 1919, Lt Lawson Sanderson of the 4th Squadron realized that the usual practice of horizontal release of bombs by the rear observer was inaccurate, to say the least. By trial and error, Lieutenant Sanderson settled upon the technique of dropping the nose of his aircraft in what was then considered a steep dive of 45 degrees. Flying directly at the target, Sanderson then released the bomb himself at an altitude of roughly 250 feet. The tactic proved considerably more accurate than horizontal bombing, and the other pilots in the squadron soon abandoned the old method in favor of the new one. Such accuracy would prove its worth to the Marine Corps in Nicaragua.[22]

Although much has been written about Marine Corps aviation in Nicaragua during what officially became known as the Second Nicaraguan Campaign, none of it is considered definitive. Gen Vernon McGee, a Marine Corps aviator, wrote one of the better essays on the topic in 1965. A veteran of the Second Nicaraguan Campaign, General McGee helped author his service's *Small Wars Manual*, perhaps the finest doctrine ever written regarding counterrevolutionary warfare. The general was convinced that concepts learned in Nicaragua were applicable to the ongoing counterinsurgency effort in Vietnam. His essay emphasized the technological aspect—specifically, the characteristics of airplanes useful in a counterguerrilla campaign—but his larger idea of looking to the Nicaraguan experience as a model for airpower in small wars bears consideration, particularly in contrast to the British air-control example.

Perhaps there is no better starting point than to examine what Major Rowell had to say regarding the lessons of Nicaragua. In an article published in the *Marine Corps Gazette* in September 1929, he acknowledged the examples set by the British and French (as well as the Italians and Spanish) with respect to the use of air-

craft in "bush, or guerrilla warfare" but went on to assert that "no broader experience has been gained, or greater success achieved through the employment of aircraft in minor warfare, than that which attended the operations of [the] Marines during the Nicaraguan campaign of 1927 and 1928."[23] Major Rowell spent the bulk of his article detailing organization, tactics, and so forth, but, particularly, his remarks regarding the unique character of the conflict warrant our attention in the context of airpower and restraint.

The Marine Corps had been dispatched to Nicaragua to aid the Conservative government of Adolfo Diaz and to protect Americans and their property from Liberal opposition forces led by Dr. Juan Sacasa. The Liberal army had disintegrated as a unified force but was replaced by small bands of guerrillas, the most prominent of which was led by Augusto C. Sandino. Although in rebellion against the government, Sandino also set about to rid the country of the American presence that had dominated it since the Taft administration. Waging a ruthless guerrilla war, Sandino presented the Marine Corps with an unprecedented challenge. Whereas in earlier conflicts in Central America and the Caribbean, the corps had faced nominally guerrilla formations ranging from organized criminals to politicized, disgruntled elements of society, in Nicaragua it faced a different kind of guerrilla opponent—one schooled and educated by Mexican Marxists and enjoying international support. The Marine Corps, therefore, was among the first regular forces in the twentieth century to face the "revolutionary guerrilla." Whereas in Haiti and the Dominican Republic the corps functioned as an occupation force, invoking martial law and having a free hand in the conduct of military operations in the field, in Nicaragua it supported the extant government and was thus constrained by political limitations that its predecessors in the Caribbean as well as British and French counterparts would have regarded as unthinkable.

Major Rowell in particular was sensitive to the limitations imposed on his operations, not the least of which was the impact of public opinion back home in the United States: "Public opinion, always to be respected, is sensitive to bloodshed and the newspapers are prone to publish rumors of scandals or abuses. . . . The practical effects . . . are numerous. For example: we may not bomb towns because it would not be consistent with a policy advocated at some international convention. . . . The safety of noncombatants becomes a matter of prime importance."[24]

It is important to note that Major Rowell's comments were offered in the context of a complaint: "We are required to conform to all of the rules of civilized warfare, while the enemy will torture prisoners, murder the wounded and mutilate the dead." Nevertheless, Major Rowell was bound by the restraints imposed upon him and at least grudgingly conceded to their political necessity. In a subsequent essay, he recounted how, in the earliest stages of the Marine Corps intervention, "the American mission was to stop the war—not to become involved in it."[25] This necessarily led to certain operational constraints. Major Rowell, therefore, "appealed to all pilots to avoid hostilities and to return fire only when necessary to save their own lives."[26]

But neutrality soon gave way to active combat operations as Sandino deliberately attacked Marine Corps patrols and garrisons as well as other Americans and their property. As the American role in Nicaragua became wider and deeper, operational constraints on the corps were loosened but never approximated the freedom its aviators enjoyed in the Caribbean—and certainly bore no similarity to the freedom of European air arms in their air-policing roles. For example, despite the fact that Major Rowell and other Marine Corps authors argued for the use of nonlethal chemicals such as tear gas (in contrast to the French use of lethal chemicals), US policy forbade such usage.[27]

It became clear to diplomats and Marine Corps commanders in Nicaragua that direct and even indirect infliction of casualties on the civilian population was not only contrary to policy, but also carried negative value. Whereas British and French aviators routinely

bombed villages and strafed collections of suspicious men—as well as women, children, and animals—the corps clearly understood that this was counterproductive and modified its tactics. Major Rowell, therefore, encouraged the service's pilots to use their best judgment when attempting to tell guerrillas from civilians on the ground: "It is sometimes rather difficult to distinguish between the hostile groups and the noncombatants. No fixed rules can be laid down in such cases. The aviators must have an intimate knowledge of the characteristics of and habits of each group. . . . [However,] pilots will always bear in mind that innocent people will sometimes flee upon the approach of airplanes."[28] Contrast this statement with that of an RAF pilot who stated that nine unidentifiable people in a group constituted an illegal assembly, so he dropped bombs on them.[29]

All of the above is not to say that innocent civilians did not die in Nicaragua as a result of air action. In his classic account of the Marine Corps fight with Sandino, Neill Macaulay described the service's tactics as "aerial terrorism."[30] Citing a particular mission led by Major Rowell, Macaulay noted that after observing several horses around a large house, Rowell and the pilot of another aircraft dropped bombs on the house and in the yard. Unknown persons were seen darting from the house into a nearby grove. Major Rowell strafed the grove but apparently to no effect. Macaulay, however, fails to mention the indicators that the Marine Corps recognized as pointing to probable guerrilla activity and the often extraordinary lengths to which its aviators would go to ensure that suspicious persons were indeed guerrillas.

Major Rowell instructed his pilots to fly no higher than 2,000 feet and generally 1,500 feet or lower—well within small-arms range—in order to distinguish between men and women, horses and cattle, and so forth.[31] He also stressed that pilots and their observers should become expert in the "organization, equipment, and habits of the enemy" through careful study. "Basically," he wrote, "reconnaissance consists of distinguishing between the normal and the abnormal."[32] When something on the ground seemed out of the ordinary, Marine pilots would swoop down to investigate. Towns that appeared to be abandoned were especially regarded as suspicious: "If the enemy is hiding there, some member of the party will probably decide to find a better place and make a dash for it. This may be induced by the patrol making a feint to attack. Under some circumstances, it will be possible to develop the situation by use of a few bursts from the front or rear guns. Occasionally a bomb may be expended for the same purpose."[33]

Several points of this statement are noteworthy. Major Rowell insisted that his pilots be able to distinguish between guerrillas and civilians in order to avoid harming the latter. In circumstances in which all indications pointed to guerrilla activity, attempts to flush them out were graduated (feint, then use guns, then maybe a bomb or two) and employed when civilians were unlikely to be in the way.[34] If the town were abandoned by the civilian populace, the expenditure of bombs was certainly less problematic than if the area were bustling with activity. Such restraint certainly appears to refute any accusation of aerial terrorism and seems almost magnanimous compared to the British propensity to bomb any suspicious activity.

As alluded to earlier, the Marine Corps went to improbable lengths to determine the nature of suspicious activity in order to avoid unnecessary civilian casualties. In his annual report dated 20 June 1928, Major Rowell recounted how Marine aircraft would approach suspicious locales "from behind hills or mountains, the planes gliding in with throttled engines," whereupon the pilots would fly low enough to the ground that the observer in the rear of the aircraft could "look into windows and doors." As a counter to this extraordinary tactic, the guerrillas often included women and children among their parties, "secure in the knowledge that the women [would] not be attacked."[35] This is not surprising, given that Major Rowell and his pilots were often (although not always) under standing orders not to attack towns and villages at all, even if the presence of

guerrillas was indisputable. In February 1928, for example, Rowell discovered Sandino and his main column in the town of Rafael del Norte. His fully armed patrol flew within a few feet of the building in which Sandino was being interviewed by an American journalist, at a level "where the pilots and observers looked into the muzzles of the enemy rifles." But Major Rowell did not attack. He later wrote that "this rare opportunity was passed by because it was the policy of the Commanding General to avoid the possibility of injury to the lives and property of innocent persons by refraining from attacks on towns."[36]

Unquestionably, Sandino and his guerrillas respected and feared the Marine Corps *lanzabombas,* as they were called by the Sandinistas.[37] Not only were Marine aircraft useful and lethal weapons in counterguerrilla warfare, but also they facilitated the political process crucial to counterrevolutionary warfare. To that end, these aircraft supported the national elections in 1928 at the height of the guerrilla war, especially in remote areas of the country:

> It was necessary to ferry by plane most of the American personnel to outlying districts, to supply them there, to maintain communication with them, to patrol the towns and mesas on registration and election days, and, finally, to bring to Managua the ballots. In order to accomplish this work, flying time generally reached its peak during the weeks immediately before and after the election periods. . . . [In 1928] on election day 237 cantons were visited by airplanes.[38]

As the war wound down, leading to eventual withdrawal of the Marine Corps in 1933, aviation continued to play a significant role in the political process. Because of an earlier agreement with the government and the insurgents, the United States agreed to oversee national elections again in 1932. The assistance provided by Marine aviators was invaluable, constituting the most extensive use of aviation in a political-support role during the intervention in Nicaragua.[39]

With the close of this chapter in Marine Corps history, much of what the corps had learned in Nicaragua was synthesized and eventually codified in the *Small Wars Manual,* first published in 1935 and revised in 1940.[40] As noted earlier, General McGee and other Marine Corps aviators participated in this effort, and an entire chapter of the manual was devoted to aviation.[41] Although the chapter was limited mostly to the composition of the aviation element, organization, types of missions, and so forth, the *Small Wars Manual* as a whole represented a major departure in the history of American military doctrine for small wars.

The 1935 edition was written by Maj Harold Utley, who had commanded marines in Eastern Nicaragua, as well as other marines experienced in small wars. The work was informed by the research of US Army officers and foreign experts in colonial warfare—including Colonel Callwell of the British army.[42] The 1940 edition was an encyclopedic work with over 400 pages of text comprising detailed treatments regarding organization, tactics, intelligence, propaganda, and a host of other topics, including the care and feeding of pack animals. But its treatment of revolutionary guerrilla warfare was groundbreaking and remarkably prescient regarding the nature of emerging revolutionary warfare: "After a study has been made of the people who will oppose the intervention, the strategical plan is evolved. . . . Strategy should attempt to gain psychological ascendancy over the outlaw or insurgent element prior to hostilities. [The] political mission . . . dictates the military strategy of small wars."[43] This statement is quite remarkable in that this was the first time that US military doctrine placed the political mission ahead of military requirements. It also illustrates the extent to which the Marine Corps recognized the "new" guerrilla threat, including the realization that "the motive in small wars is not material destruction; [it] is usually a project dealing with the social, economic, and political development of the people."[44]

The authors of the *Small Wars Manual* gave special consideration to the underlying socioeconomic and political grievances that gave rise to insurgency and thus defined the theory of victory in such situations as relying

upon an accurate assessment of the root causes of internal rebellion. For example, "the application of purely military measures may not, by itself restore peace and orderly government because the fundamental causes of the condition of unrest may be economic, political, or social." Consequently, "the solution of such problems being basically a political adjustment, the military measures to be applied must be of secondary importance and should be applied only to such an extent as to permit the continuation of peaceful corrective measures."[45] Given the primacy of the nonmilitary dimension, it is not surprising that the Marine Corps would acquiesce to the need for restraint—including the application of airpower. If the operational objective is to detach popular support from the guerrillas and reattach it to the central government, deliberately bombing civilians from the air is counterproductive.

In contrast to the service's recognition of the political dimension of small wars, the British, French, and other European powers of the same period continued to regard small wars as exclusively a military problem. Indigenous peoples were regarded as "inferior races" who understood only the sword and fire.[46] Resistance was to be smashed. European officers failed to discern and appreciate the manner in which ideologies borne out of Marxism, nationalism, Islam, and so forth, served to focus discontent and unify native peoples in a social, political, and military organization capable of resisting the regular armies of Europe. One must remember that the period encompassing the Marine Corps experience in Nicaragua (1910–33) and the British air-control experience between the world wars gave rise to such revolutionary figures as Mao Tse-tung, Ho Chi Minh, and Emiliano Zapata, among others. The corps appears to have understood the emergent political nature of small wars in the twentieth century, including the need for restraint in the application of airpower, better than their European counterparts.

But as Dr. Corum pointed out in his article, the United States Air Force retains a certain fascination with the British concept of air control. It goes without saying that Air Force officers pay less attention to the airpower experience of the Marine Corps in Nicaragua in the 1920s. This is unfortunate because in the context of the emerging challenge of small wars in the twenty-first century, the model provided by the corps in the Second Nicaraguan Campaign is probably more appropriate. One must wonder, then, why the British concept is often stressed in the US Air Force and the Marine experience is largely ignored.

One answer, perhaps the best one, is that Marine Corps aviation in Nicaragua does not serve the interests of autonomous operations and institutional independence held sacrosanct by the US Air Force. The RAF was one of the first major air forces to attain institutional independence, and air control served to solidify that independence as well as advance the timeless idea of achieving victory through airpower alone. Using the British example appears to validate theoretical and doctrinal propositions that the US Air Force has long held dear. Marine Corps aviation, on the other hand, has always been subordinate, and the Nicaragua experience in fact laid the foundation for this relationship between the air element and the ground commander. As General McGee wrote, "Undeterred by any necessity for counterair operations, and untempted by any 'wild blue yonder' schemes of semi-independent strategical forays, the Marines buckled down to their primary mission of supporting Marine ground forces."[47] The fact of the matter, however, is that airpower in a counterinsurgency environment is probably best suited to a supporting role, but this flies in the face of the airman's conviction that airpower is decisive.

Ironically, during the post–World War II counterinsurgency era, the RAF generally found itself subordinate to a ground-force commander—a fact often overlooked by people who promote the idea of air control. For example, during the 10-year war against communist Dhofari guerrillas in Oman, the air element "defied a time-honoured Royal Air Force principle in that it came under the command

of [an] Army brigadier." But as the British commander of the Dhofar Brigade pointed out, "all its work was in close support of the Army . . . and few disapproved of the arrangement."[48]

Compare this disposition with that of the Marine air element in Nicaragua. Based upon that experience, Major Rowell recommended the following:

> The senior air officer should have the same dual staff and command status that is given the artillery commander in the infantry division. In other words, the senior air officer should actively command the air organization and at the same time serve as the advisor to the [overall] commander on air matters. . . . The air squadrons will operate in support of ground organizations and also independently. In certain special situations, planes may be attached temporarily to ground units. As a general rule this practice should be discouraged. Better support can be given in most cases if the control is centralized.[49]

The similarity between this ordering of control and authority to the relationship between the joint force air component commander and the joint force commander today is so obvious as to require no further elaboration. In short, Major Rowell was advocating a structure not unlike what stands as current joint doctrine.[50] Nevertheless, the RAF concept of air control is generally held up as a model for "air constabulary" missions, and the Marine Corps example in Nicaragua is ignored.[51]

In closing, Air Force officers over the years have advanced various schemes by seeking to capitalize on the British air-control example, but much of the analysis regarding air control tended to ignore certain inconvenient facts—such as the presence of British ground forces and the apparent brutality of punitive expeditions conducted by British airmen. One must also note that these latter-day American studies tended to eschew any analysis of the political dimension—something also ignored by the British during the heyday of air control and something the US military has struggled with since the end of World War II. A primary weakness of C. E. Callwell's book as a useful guide for today has always been its emphasis on military operational solutions to political and social problems. In that sense, the Marine Corps *Small Wars Manual* is better doctrine. By the same token, the Marine airpower experience in Nicaragua is a better model for airpower in small wars. □

Notes

1. For an excellent discussion of ethics, morality, and aerial bombardment, see Louis Manzo, "Morality in War Fighting and Strategic Bombing in World War Two," *Air Power History,* Fall 1992, 35–50. For a contrasting view, see Phillip Meilinger, "Winged Defense: Airwar, the Law and Morality," *Armed Forces and Society,* Fall 1993, 103–23. Another excellent discussion of the law of war and airpower can be found in W. Parks, "Air War and the Law of War," *Air Force Law Review* 32, no. 1 (1990): 1–55.

2. James Webb, "Making Sense of No Gun Ri," *Wall Street Journal,* 6 October 1999.

3. Col Phillip S. Meilinger, letter to the editor, *Air Power History,* Winter 1992, 58.

4. Group Capt Andrew P. N. Lambert, "Shattering Impact: The Psychology of Air Attack," in *Air Power Confronts an Unstable World,* ed. Richard Hallion (London: Brassey's, 1997), 105.

5. In fact Group Captain Lambert asserts, "The evidence suggests that the psychological responses of a civilian population to bombing mirror almost exactly the reactions of soldiers to enemy fire." Ibid., 94.

6. Truong Nhu Tang, *Viet Cong Memoir: An Inside Account of the Vietnam War and Its Aftermath,* with David Chanoff and Doan Van Toai (New York: Vintage Books, April 1986), 167. The B-52 was equally feared by Iraqi soldiers during the Gulf War. Consequently, one of the most successful psychological-operations (PSYOP) leaflets of the war displayed a photo of a B-52 unloading its deadly cargo, accompanied by text warning of continued B-52 strikes. Regrettably, many observers concluded that the "B-52 leaflet" was a universally applicable leaflet in PSYOP, forgetting that, although the Vietcong were terrified by B-52 strikes, they rarely surrendered as a result.

7. Dr. James S. Corum, "The Myth of Air Control: Reassessing the History," *Aerospace Power Journal* 14, no. 4 (Winter 2000): 61–77.

8. Col C. E. Callwell, *Small Wars: Their Principles and Practice,* 3d ed. (London: Printed for Her Majesty's Stationery Office by Harrison and Sons, 1906), 41.

9. Ibid., 41–42.

10. Wing Comdr J. A. Chamier, "The Use of Air Power for Replacing Military Garrisons," *Journal of the Royal United Services Institute,* February–November 1921, 210.

11. William Dean, "The Colonial Armies of the French Third Republic: Overseas Formation and Continental Deployment, 1871–1920" (PhD diss., University of Chicago, 1999), 315–24.

12. The *Escadrille Cherifienne* flew 470 missions—often attacking towns that had already submitted to French authority—before being disbanded. Ibid., 324.

13. Lejeune Cummins, *Quijote on a Burro: Sandino and the Marines, A Study in the Formulation of Foreign Policy* (Mexico City: *Distrito Federal: La Impresora Azteca,* 1958), 54.

14. *Annual Report of the Secretary of the Navy, Fiscal Year 1928* (Washington, D.C.: Department of the Navy, 1929), 50, cited in ibid.

15. Ibid., 55.

16. By 1910, revolutions in Haiti followed a well-established pattern. A military strongman would form a *caco* army, consisting

mostly of military adventurers and conscripts. The *caco* army would seize the capital city of Port-au-Prince, surround the legislature, and oversee the election of the insurgent leader as the new president. When the Marine Corps landed in July 1915, a number of *caco* armies supporting Rosalvo Bobo resisted. Suppressing these irregular forces became the primary military objective of the Marine Corps in Haiti. Likewise, when the United States intervened in the Dominican Republic in 1916, armed clashes between marines and various irregulars erupted almost immediately. Generally lumped together as "bandits," these irregular forces actually comprised professional highwaymen known as *gavilleros,* ordinary criminals, discontented politicians who used banditry to advance their own ambitions, unemployed laborers, and peasants, the latter generally impressed into service.

17. Lt Col Edward Johnson, *Marine Corps Aviation: The Early Years, 1912–1940* (Washington, D.C.: History and Museums Division, Headquarters US Marine Corps, 1977), 49–51.

18. Maj Gen Ford O. Rogers, USMC, retired, transcript of oral history interview, Oral History Collection (Washington, D.C.: History and Museums Division, Headquarters US Marine Corps, 3 December 1970), 25, cited in ibid., 49.

19. For a full treatment, see Ivan Musicant, *The Banana Wars: A History of United States Military Intervention in Latin America from the Spanish-American War to the Invasion of Panama* (New York: Macmillan, 1990).

20. Johnson, 55–56.

21. Ibid., 53.

22. The use of aircraft to support marines on the ground is an important yet much overlooked aspect of airpower history. It is beyond the scope of this article to address the topic in the detail it deserves, but every student of airpower history should spend time examining the tactics, techniques, and procedures developed by the Marine Corps in Nicaragua, as it laid the groundwork for our concept of close air support today.

23. Maj Ross Rowell, "Aircraft in Bush Warfare," *Marine Corps Gazette,* September 1929, 180.

24. Ibid., 181.

25. Maj Ross Rowell, "The Air Service in Minor Warfare," United States Naval Institute *Proceedings,* October 1929, 872.

26. Ibid.

27. Rowell, "Aircraft in Bush Warfare," 195. See also Capt H. Denny Campbell, "Aviation in Guerilla Warfare," *Marine Corps Gazette,* pt. 3 (November 1931): 33. In both articles, the authors advocated the use of nonlethal chemicals ("a sneezing gas, a lachrymatory gas, a laughing gas, a cholic-producing gas or even a simple and harmless anaesthetic") over lethal compounds. According to Captain Campbell, such use "humanizes bullet warfare" (33).

28. Rowell, "Aircraft in Bush Warfare," 193–94.

29. Robin Cross, *The Bombers: The Illustrated Story of Offensive Strategy and Tactics in the Twentieth Century* (New York: Macmillan, 1987), 70.

30. Neill Macaulay, *The Sandino Affair* (Durham, N.C.: Duke University Press, 1985), 116.

31. As a result, Marine aircraft were struck by ground fire on virtually every mission.

32. Rowell, "Aircraft in Bush Warfare," 191–92.

33. Ibid., 193.

34. Macaulay recounts one incident, however, in which Major Rowell machine-gunned purported guerrillas in a house in a town where women and children were present. Sarcastically, Macaulay wrote, "The women and children were presumably not endangered by the machine-gun fire." But one can argue persuasively that at such low altitude and speed and with the superior marksmanship prevalent among the Marine aviators at the time, Rowell took the women and children into account when he made his decision to open fire. Given the absence of reported civilian casualties associated with this incident, Major Rowell apparently took a calculated risk and succeeded. See Macaulay, 116.

35. Maj Ross Rowell, "Annual Report of Aircraft Squadrons, Second Brigade, U.S. Marine Corps, July 1, 1927, to June 20, 1928," *Marine Corps Gazette,* December 1928, 250–51.

36. Ibid., 254.

37. Cummins, 54.

38. Capt Francis Mulcahy, "Marine Corps Aviation in the Second Nicaraguan Campaign," United States Naval Institute *Proceedings,* August 1933, 1131.

39. Cummins, 45.

40. In addition to Major Rowell, who left Nicaragua in August 1928, three other Marine aviators commanded the air element in Nicaragua: Maj Louis Bourne (August 1928 to December 1929), Maj Ralph Mitchell (December 1929 to July 1931), and Capt Francis Mulcahy (July 1931 to January 1933). As a colonel, Rowell rose to become director of Marine Corps Aviation from 1 April 1936 to 10 March 1939 and as a major general was at one point the senior Marine Corps aviator in the Pacific during World War II. But following a disagreement with the commandant of the Marine Corps and Adm Chester Nimitz regarding the use of Marine aircraft on escort carriers (as opposed to supporting marines on the ground), he was relieved and sent to Lima, Peru, as chief of the Naval Air Mission. It was a sorry end to the career of an otherwise illustrious and dedicated Marine Corps aviator. See Mulcahy, 1122; *Marine Corps Aircraft, 1913–1965,* rev. ed. (Washington, D.C.: Historical Branch, G-3 Division, Headquarters US Marine Corps, 1967), 49; and Peter Mersky, *U.S. Marine Corps Aviation: 1912 to the Present,* 3d ed. (Baltimore: Nautical & Aviation Publishing Company of America, 1997), 98.

41. See *Small Wars Manual* (1940; reprint, Washington, D.C.: Department of the Navy, 1987), 9-1-1 to 9-36-24.

42. Much of what the US Army had learned in terms of "pacification" came from its own experience in the Philippines at the turn of the century. During the guerrilla phase of that war, the official US policy under President William McKinley was one of "benevolent assimilation," emphasizing conciliation over military solutions. See Brian McAllister Linn, *The Philippine War, 1899–1902* (Lawrence: University Press of Kansas, 2000), 30.

43. *Small Wars Manual,* 1-8-13.

44. Ibid., 1-10-18.

45. Ibid., 1-9-15, 1-9-16.

46. In truth, the marines of the time were no less racist than the British or French. In his article on the use of aircraft in small wars, Capt H. Denny Campbell regarded the use of propaganda to be an "effective weapon . . . against races of uneducated, uncivilized, indolent and superstitious peoples." The distinction, however, is that marines recognized that mistreatment and brutality—even directed at what they considered to be inferior peoples—made success in counterrevolutionary war all the more difficult and perhaps impossible. (For the specific reference cited, see Campbell, pt. 3 [note 26], 33.)

47. Gen Vernon McGee, "The Evolution of Marine Aviation," *Marine Corps Gazette,* pt.1 (August 1965): 24.

48. John Akehurst, *We Won a War: The Campaign in Oman, 1965–1975* (Wilton, Salisbury, Wiltshire, England: Michael Russell [Publishing], 1982), 38.

49. Rowell, "Aircraft in Bush Warfare," 203.

50. According to Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms,* 12 April 2001, "the joint force air component commander derives authority from the joint force commander who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission" (222). Centralized control in support of the overall commander's objectives is at the heart of the joint force air component commander concept and was the principal concern of Major Rowell and the Aircraft Squadrons, 2d Brigade.

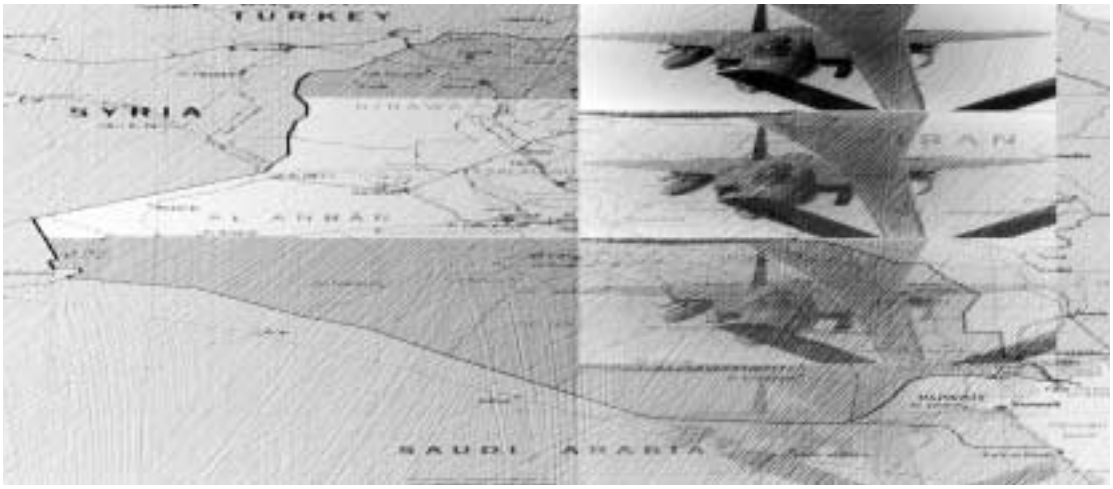
51. See, for example, Carl H. Builder, "Doctrinal Frontiers," *Airpower Journal* 9, no. 4 (Winter 1995): 6–13.

War Termination in the Persian Gulf

Problems and Prospects

COL MARK GARRARD, USAF

Editorial Abstract: Did President Bush prematurely declare a cease-fire in Operation Desert Storm, before we met our political objectives? According to Colonel Garrard, as soon as a war has begun, one must immediately consider terms for termination and peacemaking. If not, an untidy conclusion is inevitable.



No one starts a war or rather, no one in his senses ought to do so, without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it. . . . Since war is not an act of senseless passion but is controlled by its political object, the value of this object must determine the sacrifices made for it in magnitude and also in duration. Once the expenditure of effort exceeds the value of the political object, the object must be renounced and peace must follow.

—Carl von Clausewitz

IN PREPARING FOR Operation Desert Storm, President George Bush formed an extraordinary coalition that decisively trounced Saddam Hussein's forces. Yet, a decade later, many people in the United States voice a growing dissatisfaction with the political results of that conflict. Indeed, some assert that the conflict has not yet ended.[1] As we will see, the president publicly recognized the seeds of that discontent shortly after the cease-fire.

What went wrong? Did our objectives lack clarity? Did the coalition lack the means or will to achieve them? Were the objectives incompatible with each other? Did they change during the war? Should they have been modified? Did the National Command Authorities give adequate guidance to Gen Norman Schwarzkopf, commander in chief (CINC) of US Central Command (CENTCOM)? Did the CINC give adequate attention to war termination?

Perhaps one can illuminate the answers to these questions by examining war termination in the Persian Gulf through the prisms of interest, fear, and honor, which Thucydides identified 2,400 years ago as the three causes of war.[2] War and war termination are indeed inseparable, and, although no two wars are identical, the strategy for waging and ending conflict remains eternal.[3]

Background

During the predawn hours of 2 August 1990, Iraq fulfilled its territorial objectives by quickly invading and seizing Kuwait. The international community faced the prospect of losing one of the world's major oil producers and witnessing the annexation of a sovereign state—the first such occurrence since World War II. To liberate Kuwait, a coalition authorized by the United Nations (UN) and led by the United States gradually built up forces in Saudi Arabia. Consisting of a diverse group of 28 nations' forces, which included over 650,000 troops, the coalition remained intact despite Saddam's best efforts to shatter it.

When the Iraqis refused to withdraw from Kuwait by January 1991, allied air forces destroyed key targets in and around Baghdad and bombed Iraq's armed forces entrenched within and around Kuwait, after which coalition ground forces quickly overran the remaining enemy troops.[4] In military terms, the Gulf War was an overwhelmingly one-sided event and a clear coalition victory.

On 27 February 1991, President Bush unilaterally declared a cease-fire, proclaiming that "Kuwait is liberated. Iraq's army is defeated. Our military objectives have been met."[5] He did not allude to the nation's political objectives. Soon, however, nagging questions arose about the "premature" termination of the war.[6]

The War-Termination "Process" in the Persian Gulf

If one intends any conflict to advance long-term interests, one must consider the essential question of how the enemy might be forced to surrender or, failing that, what type of bargain might work to terminate the war. Such questions combine both the political and military realms. Not only the military contest but also domestic and foreign-policy developments contribute to the war's outcome. Although the question of terminating a war should arise as soon as the war has begun or in the course of advanced planning, it tends to receive little or no attention in war plans.[7] This element of premeditation with respect to war termination seems largely absent from the Gulf War. Gordon Brown, CENTCOM's chief foreign-policy advisor admitted, "We never did have a plan to terminate the war."[8]

Why? Neglecting war termination was likely due, at least in part, to the unexpectedly rapid pace of the ground war. President Bush and Brent Scowcroft, his national security advisor, acknowledged that "the end of effective Iraqi resistance came with a rapidity which surprised us all, and we were perhaps psychologically unprepared for the sudden transition from fighting to peacemaking."[9]

General Schwarzkopf describes a telephone conversation he had with Gen Colin Powell, chairman of the Joint Chiefs of Staff (JCS), on the final day of the war. Powell informed the CINC that he (Schwarzkopf) would participate in a formal cease-fire meeting with his Iraqi counterparts. According to Schwarzkopf, "It had never crossed my mind that I'd have to sit down opposite Iraqi generals—and we spent a couple minutes discussing how this might be arranged."[10] The president gave the CINC only 48 hours to prepare for the meeting. Powell directed Schwarzkopf to prepare "terms of reference" for the meeting. The CINC spent an hour dictating the terms, focusing exclusively on immediate military issues. He sought immediate release of all coalition prisoners of war; exchange of information on people missing in action; return of the remains of people killed in action; and exchange of information on mines and booby traps, as well as on any storage sites the enemy had established for weapons of mass destruction in the Kuwait theater of operations (KTO). He also sought to establish a de-

marcation line to physically separate the coalition and Iraqi armies. He transmitted the draft document to Washington, D.C., where the JCS and State Department reviewed and approved it. The terms of reference were thereafter sent to Iraq via Moscow.[11]

"The untidy end to the conflict showed that it is not enough to plan a war. Civilian and military officials must also plan for the peace that follows. . . ."

The draft terms of reference were modified only slightly in Washington. For example, for each occurrence of the CINC's clause "the coalition will negotiate," the State Department had substituted the clause "the coalition will discuss," reflecting its position that only the State Department negotiated for the United States of America. According to State, the military lacked such authority.[12]

Further, the CINC's decision to assume responsibility for two demanding senior military roles may have contributed to the command's acknowledged neglect of war termination. Specifically, General Schwarzkopf decided to serve as his own land-component commander despite General Powell's repeated urgings that the CINC appoint a separate land-component commander. The chairman was concerned that the land offensive was consuming too much of the CINC's energy and time.[13] Although General Schwarzkopf was pulling 18-hour days in the planning of the operation, he rejected General Powell's suggestions.[14]

The chairman determined that war termination in the Gulf merited further attention by the nation's senior war fighters. Accordingly, General Powell made photocopies of excerpts from Fred Ikle's book *Every War Must End* and sent them to key general officers during the buildup of Operation Desert Shield.[15]

Victory Requires More Than Battlefield Success

Michael Howard contends that "few wars, in fact, are any longer decided on the battlefield (if indeed they ever were). They are decided at the peace table. Military victories do not themselves determine the outcome of wars; they only provide the political opportunities for the victors—and even those opportunities are likely to be limited by circumstances beyond their control."[16] But the Bush administration displayed the traditional American penchant for divorcing war and politics. The president remarked, "Let the civilians and the president do the diplomacy, do the politics, wrestle with the press, and when the war is over, bear responsibility for the terms of surrender. But at the outset, once the lead-up to the fighting has begun, let the politicians get out of the way and let the military fight the war, and let them fight it to win."[17]

Yet, the president and others voiced reservations with respect to the political aftermath in particular. Reflecting on the outcome, President Bush admitted in a press conference shortly after the end of hostilities, "You know, to be honest with you, I haven't yet felt this wonderfully euphoric feeling . . . but I think it's that I want to see an end. You mentioned World War II—there was a definite end to that conflict. And now we have Saddam Hussein still there—a man that wreaked this havoc upon his neighbors."[18]

Since 1991 many people have become increasingly dissatisfied with the political end state. According to Michael Gordon and Bernard Trainor, "The untidy end to the conflict showed that it is not enough to plan a war. Civilian and military officials must also plan for the peace that follows. . . . [They lacked] a clear political strategy for postwar Iraq [and] failed to exploit the benefits that accrue to those who exercise overwhelming power."[19]

Prof. Brian Bond outlines two other considerations that, in addition to battlefield success, a nation must satisfy to realize a decisive victory. The first is firm, realistic statecraft with specific

aims. The second is the willingness of the vanquished to accept the verdict of battle and become reconciled to defeat.[20] Clearly, one or more of these elements was deficient to some degree in light of the fact that the president—and others—harbored lingering discomfort with the Gulf War's termination.

The coalition's success on the battlefield was overwhelming, and the administration's statecraft was strong and realistic. But the weakest link in attaining a decisive victory clearly resided in the last element—the enemy's steadfast refusal to accept defeat, which, in turn, set the foundation for future conflict. As Clausewitz recognized, "Even the ultimate outcome of war is not always to be regarded as final. The defeated state often considers the outcome merely as a transitory evil, for which a remedy may still be found in political conditions at some later date."[21] In this way did Hitler regard Germany's defeat in 1918, and in like manner has Saddam regarded Iraq's defeat in 1991.

Realistic statecraft with firm objectives, battlefield success, and the opponent's willingness to accept defeat correspond to Thucydides' theory that war arises out of some mixture of interest, fear, and honor.[22] Termination of conflict, then, becomes possible when a nation has—or perceives it has—the requisite leverage in at least one (usually two) or more of these elements to coerce its opponent into terminating the conflict on terms favorable to the coercer.[23] The greater the perceived leverage in these three areas, the more "satisfactory" the resulting peace.

Consider the US experience in Vietnam. Given South Vietnam's lack of political legitimacy and incapacity for effective self-rule, US statecraft proved inherently impotent. There was virtually no prospect of creating a politically and militarily viable South Vietnam. Moreover, US military superiority failed to defeat the communist threat before public support in the United States started to crumble, resulting in a unilateral withdrawal from the battlefield. Conversely, the North Vietnamese were willing to pay any price for victory—which included fighting for nearly three decades and suffering perhaps three times the casualties suffered by French and US forces combined. For Hanoi, accepting defeat was never an option.[24]

Gulf War Interest

Thucydides' *interest* encompasses realistic statecraft with specific objectives. According to President Bush, the coalition's war aims were as follows: "First, the immediate and unconditional withdrawal of all Iraqi forces from Kuwait. Second, the restoration of Kuwait's legitimate government. Third, security and stability for the Gulf—an important interest of the U.S. since the time of Harry Truman. And fourth, the protection of American citizens abroad."[25] Moreover, the UN's resolutions captured all the president's objectives.[26]

The president's third objective (regional security and stability—interestingly, the last of the four agreed to by the UN) reflects an ambiguity not present in the other announced war aims.[27] This uncertainty left the coalition with greater flexibility in dealing with Iraq as the Gulf crisis unfolded, but it also made the prospects of Iraqi cooperation (admittedly never great) less likely and ensured that this ambiguity would inevitably affect our view of war termination.[28]

As a nation attains its interests or objectives through a combination of military or diplomatic measures, the emphasis on conflict termination tends to shift to the other two elements—*fear* and *honor*. With respect to fear, the belligerent must consider whether continued fighting might cause losses disproportionate to the remaining objectives. As for honor, battlefield victories bestow a measure of prestige or credibility. The higher one values such honor, the more important conflict termination becomes while this element remains ascendant.[29]

Gulf War Fear

Fear not only can prompt a state to start a war, but also can contribute to a belligerent's calculations for war termination. As

one experiences success on the battlefield, *fear* of political and physical loss rises for the losing belligerent and declines for his winning opponent.

Iraq was unwilling to leave Kuwait or cease hostilities until coalition ground forces forced their way into Kuwait and Iraq. Fear generated by this physical invasion as well as the accompanying threat to the future of his regime certainly contributed to Saddam's decision to withdraw his forces from the KTO and submit to a cease-fire.

Clausewitz reminds us that the political object is the goal and that war is merely the means of reaching it.[30] Therefore, under some circumstances—particularly in limited war—too much battlefield success can jeopardize the political objective. This potential loss of the political object, whether through too much or too little success, gives rise to fear. The last thing the coalition wanted was to so thoroughly degrade Iraq's armed forces that the nation itself might dissolve.[31] Creating a vacuum in the region might have invited aggression by Iran or sparked further turmoil within Iraq (and perhaps beyond its borders) by radical Shiites—exactly the opposite of our objective of restoring stability to the Gulf. This same fear led the Saudis and Egyptians to push for early termination of the war.[32] It also weighed heavily on the Bush administration's decision makers, who wanted central political authority preserved in Iraq but without Saddam Hussein.[33]

Moreover, a reciprocal relationship exists between these factors. For example, if one side modifies its objectives, thereby adjusting that party's *interest*, that decision will necessarily affect the likely costs of the modified conflict—with a corresponding change in the level of *fear* felt by both sides. Korea provides an apt illustration. Because of battlefield success, when UN forces elected to pursue reunification of the peninsula (albeit briefly), China intervened; this action lengthened the war and increased US casualties, which served to delay termination of the conflict and increase its costs.

Similarly, any broadening of the coalition's war aims in the Gulf would have necessitated accepting a greater risk of adverse consequences. These potential consequences included compromising the coalition's continued existence, weakening political stability in the region, fomenting US domestic unrest,[34] and increasing the number of coalition and Iraqi civilian casualties.[35]

Gulf War Honor

Honor, whether called prestige or credibility, occupies a significant role in both modern and ancient warfare. In the Persian Gulf, for example, the US contribution to battlefield success helped restore a degree of public confidence in the armed forces and the nation itself—confidence that, according to some parties, the public had lost during the conflict in Vietnam. The administration and the armed forces highly valued this development. Many senior US officers in the Gulf had fought in Vietnam and were strongly influenced by that earlier conflict.[36] The day after the Gulf War ended, President Bush stated, "Because of what has happened [we have] reestablished credibility for the United States of America."[37]

The Gulf War coalition—particularly the support provided by other Arab forces—constituted essential political cover to maintain Saudi Arabia's honor in the Arab world. As custodian of Islamic holy sites, Saudi Arabia attempts to portray itself as the most Arab of the Arab nations. This is no easy task, given its close economic ties to the West. All of these concerns were caught up in the formation of the coalition. Indeed, Iraq repeatedly attacked Israel with Scud missiles precisely because it recognized that Arab members of the coalition would lose credibility with their respective populations if the Israelis were drawn into the war.

Evidence suggests that the coalition likely would have unraveled if the United States had sought to extend the ground war into Baghdad. General Schwarzkopf believed that the French probably would have neither supported nor participated in such action and that the Arabs almost definitely would not

have.[38] Interpretations of the Koran and Muslim ethical discourse throughout the Gulf crisis support this view.[39] Thus, Arab prestige or Muslim credibility, as associated with the religious convictions of our allies, was another factor influencing war termination.

Moreover, the coalition's battlefield success came so rapidly and at so little cost that concerns arose about the easy victory's possibly causing political damage to many coalition members (Egypt, Turkey, and Morocco).[40] Similarly, the United States worried that its successful battles (e.g., the "highway of death" at Basra) would appear "un-American and unchivalrous"—that is, without honor, particularly if the United States were to continue the fighting.[41]

Joint Publications and War Termination

General Schwarzkopf's after-action report to the secretary of defense in April 1991 recognized the inadequacy of the US war-termination strategy in the Gulf: "The rapid success of the ground campaign and our subsequent occupation of Iraq were not fully anticipated. Thus, some of the necessary follow-on actions were not ready. . . . Documents for war termination need to be drafted and coordinated early." But the CINC failed to suggest a process for such termination.[42]

Current joint publications also address the substance (as opposed to the process) of war termination. Although they do not use the terms advanced by Thucydides and employed by Professor Bond, the publications address many of the same concerns. Joint Publication 3-0, *Doctrine for Joint Operations,* discusses the importance of using dominance in conflict (i.e., battlefield success) to leverage a "lasting solution."[43] It also addresses the link among national strategy, military strategy, and posthostility aims (i.e., firm, realistic statecraft with specific aims).[44] The publication acknowledges the importance of political primacy and explains that aspects of the military, economic, geographic, psychological, and political realms can work to one's advantage when a party attempts a "negotiated conclusion" to war. It also recognizes that successful exploitation of war termination "requires early planning and coordination both at the national level and in theater among diplomatic, military and political leadership."[45] Extant joint publications, however, offer no mechanism or process for ensuring the integration of the nation's diverse national interests during the difficult transition from war to peace.

Summary and Conclusions

This article illustrates that one may evaluate war termination in any age through the prisms of interest, fear, and honor—the three causes of war identified by Thucydides. During the Gulf War, coalition statecraft was strong and realistic, battlefield success was overwhelming, but the weak link in attaining a decisive political victory was the enemy's steadfast refusal to accept defeat.

In the Gulf, the United States neglected war termination. CENTCOM personnel acknowledge that they had not planned for the end of hostilities. Nor did the nation's leadership develop a termination strategy in advance of the cease-fire. As a result, the United States was unprepared to exploit its battlefield success politically during the cease-fire talks and unable to use the leverage acquired by means of the military instrument to compel the enemy to acknowledge defeat.

The State Department, although it was working postwar issues through the UN, offered only a superficial change to the CINC's hastily composed terms of reference, and no one in Washington, apparently, offered substantive guidance to General Schwarzkopf in advance of the meeting at Safwan, Iraq.[46] As a result, the CINC addressed only narrow military issues during the cease-fire talks. As US leaders contemplated the timing of the Gulf cease-fire, with coalition forces then occupying a great deal of Iraqi territory, the Bush administration possessed the greatest degree of potential leverage over Saddam. But it lacked a method for politically exploiting that battlefield success.[47]

Recommendations: Three Ideas for Strengthening the War-Termination Process

First, although the armed forces have the predominant role on the battlefield, the CINC is but one actor among several during conflict termination. The process requires interagency (and often coalitionwide) cooperation to deal with the diverse political, economic, humanitarian, and military issues. Rarely will conflict be resolved through the finality of unconditional surrender; limited war is the rule, and total war the exception. Accordingly, the United States must have the benefit of a variety of perspectives and expertise as it adjusts from war to a new and, hopefully, more favorable peace.

Although conflict termination typically generates a complex mixture of policy, economic, and humanitarian issues as well as military concerns, policy matters tend to predominate—particularly with limited war. This is the case, of course, because war is conducted in pursuit of political goals—goals that ought to be within reach at the close of a successful military campaign. Accordingly, if we want to maximize our chances of achieving more than battlefield success, we must have a senior representative from the Department of State and/or National Security Council with the CINC during peace talks and in-theater well in advance of the war's termination. An interagency approach best preserves the nation's diverse interests and permits more effective exploitation of US battlefield success.[48]

Second, US leaders must avoid the temptation to rush into the cease-fire process—to "cut and run" after the battlefield contest concludes. Joint publications should clearly remind us of the fog and friction inherent in conflict and of the dangers such disorder brings to war termination. No matter how much technological progress a force may achieve, the battlefield will remain a partially shrouded, complex, and confusing environment. One cannot attain a precise picture of the military situation. Moreover, the further removed one is from the conflict, the less complete is one's comprehension of events.[49] US leaders, therefore, must resist the temptation to rush the decision-making process on war termination and allow the relevant facts to develop more fully during the interagency process. Let the next Saddam sit and sweat while we hold his territory, consult with our coalition partners, and patiently explore our options.

Finally, because this process is so demanding, US joint doctrine must be written to forbid a CINC, at least during major theater war, from also serving as his or her own land-, air-, or sea-component commander.[50] The CINC must not attempt, as did General Schwarzkopf, to divide energy and attention between the daily operational challenges of a component commander and the larger strategic issues, including the challenges of conflict termination.[51] In other words, contributing beyond the battlefield to "a better state of peace" requires that the nation's senior war fighters use their limited resources to develop a strategic vision. Capturing and helping implement such a vision requires a CINC to spend less time thinking about what his or her forces are fighting against and more time understanding what our nation is fighting for. □

Notes

1. Dr. Grant T. Hammond, "Myths of the Gulf War: Some 'Lessons' Not to Learn," *Airpower Journal* 12, no. 3 (Fall 1998): 8. See also Avigdor Haselkorn, *The Continuing Storm: Iraq, Poisonous Weapons, and Deterrence* (New Haven, Conn.: Yale University Press, 1999), 102–16.

2. Betty Radice, ed., *Thucydides: History of the Peloponnesian War,* trans. Rex Warner (London: Penguin Books, 1972), 80.

3. "The most basic reason why strategy appears, alas, to be eternal lies in our human nature. . . . History as we know it yields no grounds for optimism that a positive kind of peace can be constructed to a degree which precludes the appearance of objective threats to security. As the aphorism has it: we have seen the problem and it is us." Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), 358.

4. Philip Towle, *Enforced Disarmament: From the Napoleonic Campaigns to the Gulf War* (Oxford: Clarendon Press, 1997), 184.

5. Micah L. Sifry and Christopher Cerf, eds., *The Gulf War Reader: History, Documents, Opinions* (New York: Times Books, 1991), 449.

6. Bobby Inman et al., "Lessons from the Gulf War," *The Washington Quarterly* 15 (Winter 1992): 70.

7. Fred C. Ikle, *Every War Must End* (New York: Columbia University Press, 1971), 17–18. Interestingly, Gen Colin Powell served with Mr. Ikle in the Caspar Weinberger era and was a fan of his book on war termination. David Roth, *Sacred Honor: A Biography of Colin Powell* (Grand Rapids, Mich.: Zondervan Publishing House, 1993), 208.

8. Michael R. Gordon and Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf* (Boston: Little Brown and Company, 1995), 461.

9. George Bush and Brent Scowcroft, *A World Transformed* (New York: Alfred A. Knopf, 1998), 488.

10. H. Norman Schwarzkopf with Peter Petre, *General H. Norman Schwarzkopf: The Autobiography: It Doesn't Take a Hero* (New York: Bantam Books, 1992), 470.

11. Ibid., 470–80. General Powell used *terms of reference* to denote the agenda for the officers' cease-fire discussions—and the CINC's objectives in those talks.

12. Nevertheless, the president *may* delegate authority to enter into specific international agreements to the CINC or to a team composed of military and civilian experts. See Title 1, *United States Code*, sec. 112b (the Case Act), which requires any agency or department of the US government entering into an international agreement to transmit the same to the State Department within 20 days. (The clear inference is that agencies/departments other than State *may* be authorized to negotiate international agreements on behalf of the United States.) State, in turn, must provide a copy of the written international agreement to Congress within 60 days of its going into effect. The Case Act is implemented by Department of Defense (DOD) Directive 5530.3, *International Agreements*, 11 June 1987.

13. Gordon and Trainor, 300–301.

14. Richard Pyle, *Schwarzkopf: The Man, the Mission, the Triumph* (New York: Signet, 1991), 100–101.

15. Roth, 208. "Thus it can happen that military men while skillfully planning their intricate operations and coordinating complicated maneuvers, remain curiously blind in failing to perceive that it is the outcome of war, not the outcome of campaigns within it, that determines how well their plans serve the national interest." Ikle, 2.

16. Michael Howard, "When Are Wars Decisive?" *Survival* 41, no. 1 (Spring 1999): 129–30.

17. George Bush, "Remarks at 51st Wedding Anniversary Celebration at the JFK Center for the Performing Arts, 20 Jan 1996" (Washington, D.C.: Federal Documents Clearing House, Inc., 1996).

18. Gordon and Trainor, 433.

19. Ibid., 476–77.

20. Brian Bond, *The Pursuit of Victory: From Napoleon to Saddam Hussein* (Oxford: Oxford University Press, 1996), 61.

21. Carl von Clausewitz, *On War,* ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 80.

22. Radice, 80.

23. Michael Rampy, "The Endgame: Conflict Termination and Post-Conflict Activities," *Military Review,* October 1992, 42–48.

24. North Vietnam's General Giap remarked that the death of human beings counted for little in comparison to the cause they fought for. Paul F. Wynnyk, "Vo Nguyen Giap: A Strategy for Protracted Revolutionary War," in *The Changing Face of War: Learning from History,* ed. Allan D. English (Montreal: McGill-Queen's University Press, 1998), 142.

25. George Bush, "Why We Are in the Gulf," *Newsweek*, 26 November 1990, 29. See also Marcia Lynn Whicker, James P. Pfiffner, and Raymond A. Moore, eds., *The Presidency and the Persian Gulf War* (Westport, Conn.: Praeger Publishers, 1993), 31.

26. UN Resolutions 660, 2 August 1990; 662, 9 August 1990; 664, 18 August 1990; and 678, 29 November 1990; see also *Triumph without Victory: The Unreported History of the Persian Gulf Conflict* (New York: Times Books, 1992), 416–19.

27. Why are US objectives sometimes ambiguous? Gen Maxwell Taylor offered some of the most important reasons: "It is a risky business for a senior politician to put on public record an estimate of future events which, if wide of the mark, would provide ammunition to his adversaries. Similarly, a president who announces specific policy goals affords the public a measure of his failure if he falls short of his hopes. Hence it is common practice for officials to define foreign policy goals in the broad generalities of peace, prosperity, cooperation, and good will." Maxwell D. Taylor, *Precarious Security* (New York: W. W. Norton and Company, 1976), 17.

28. Ian Johnstone, *Aftermath of the Gulf War: An Assessment of UN Action* (Boulder, Colo.: Lynne Rienner Publishers, 1994), 55–59. Objectives are often cast in ambiguous terms because the national leader's credibility is likely to suffer if they are not achieved. See Bruce Bade, "War Termination: Why Don't We Plan for It?" in *Essays on Strategy* 21 (1994): 217.

29. Perhaps this helps account for our difficulty—lacking battlefield success and yet concerned about US honor—in ending our role in Vietnam. According to Henry Kissinger, "What had started as an almost philosophical controversy over what constitutes a nation's honor ended up as a technical debate about the modalities of extrication. Even the new American President [Ford], really the only free agent among the principals, came to understand that there was no easy, therefore undiscovered way out of this morass; given what had gone before, the tragedy had simply become inevitable." Henry Kissinger, *Years of Renewal* (New York: Simon and Schuster, 1999), 464.

30. Clausewitz, 87.

31. *Triumph without Victory,* 395. Secretary of State James Baker explains that the administration's "one overriding strategic concern was to avoid what we often referred to as the Lebanonization of Iraq, which we believed would create a geopolitical nightmare." James Baker III with Thomas M. DeFrank, *The Politics of Diplomacy: Revolution, War, and Peace, 1989–1992* (New York: G. P. Putnam's Sons, 1995), 435.

32. The United States, given its light battlefield losses, likely was more susceptible to such pressure than it would have been in a more costly conflict. Fred Ikle has noted that the greater the effort and costs expended in a war, the more likely each party will insist on its own terms for ending it. Ikle, 38–42.

33. Baker, 435–38.

34. Whicker, Pfiffner, and Moore, 138–41.

35. More than likely, battle fatigue, logistics, fratricide, the possibility of stiffer resistance from the Iraqis when they were fighting to defend their homeland, and tougher geographic limits on maneuver warfare in the vicinity of Basra all contributed to the decision. See Lawrence Cline, "Defending the End: Decision Making in Terminating the Gulf War," *Comparative Strategy* 17, no. 4 (1998): 367–68.

36. Roger Cohen and Claudio Gatti, *In the Eye of the Storm* (New York: Farrar, Straus and Giroux, 1991), 214–16. General Schwarzkopf advised, "I hated what Vietnam was doing to the United States and I hated what it was doing to the Army. . . . Not only had Vietnam demoralized our soldiers [it also] wrecked our credibility with the American public." Schwarzkopf, 181–88. Senior US civilian leaders were also sensitive to the Vietnam experience. Note President Bush's journal entry for 14 February 1991:

"The military are unanimous in recommending the course of action that Colin and Cheney outlined to me the other day. I have not second-guessed; I have not told them what targets to hit; I have not told them how much ordnance to use or how much not to use, *I have learned from Vietnam*" (emphasis added). George Bush, *All the Best, George Bush: My Life in Letters and Other Writings* (New York: Scribner, 1999), 511. The secretary of state advised that "ultimately, the Persian Gulf crisis would establish in rather convincing fashion that our country's long and oftentimes debilitating post-Vietnam hangover had at least temporarily run its course." Baker, 331.

37. Gordon and Trainor, 467.

38. *Frontline,* Public Broadcasting System, 10 January 1996.

39. "If two parties from among the believers fall into dispute, then make peace between them. But if one party transgresses beyond bound against the other, then fight all of you together against the transgressor until it complies with the laws of God. But if it complies, then make peace between them with justice and be fair; for God loves those who are fair" (Koran, 49:9). In other words, when Iraq desisted from its transgression (relinquished Kuwait), it became the duty of the collective Muslim community to resolve the dispute by peaceful means. Rehabilitation of the offender, not annihilation, was the Arab goal. William Head and Earl Tilford Jr., eds., *The Eagle in the Desert: Looking Back on U.S. Involvement in the Persian Gulf War* (Westport, Conn.: Praeger Publishers, 1996), 52–53.

40. Phyllis Bennis and Michel Moushabeck, eds., *Beyond the Storm: A Gulf Crisis Reader* (Brooklyn, N.Y.: Olive Branch Press, 1991), 248–60.

41. Jeffrey Record, *Hollow Victory: A Contrary View of the Gulf War* (Washington, D.C.: Brassey's, Inc., 1993), 127. See also Schwarzkopf, 490.

42. Gordon and Trainor, 515, note 12.

43. Joint Publication 3-0, *Doctrine for Joint Operations,* 1 February 1995, I-9.

44. Ibid.

45. Ibid., I-10.

46. Schwarzkopf writes, "We'd as yet received no written instructions from Washington, and when Saturday evening rolled around [2 March 1991, the day before the cease-fire talks], I joked it would be interesting to see which came first: authorization to conduct the talks, or the talks themselves. More to the point, the terms of reference seemed to have disappeared without a trace." He concluded that DOD, State Department, and the White House "were having trouble keeping up with the pace of events." Schwarzkopf, 479–80. President Bush confirms this with respect to the CINC's ill-advised decision to permit the Iraqi military's continued use of armed helicopters: "Schwarzkopf was without instructions on the matter." Bush and Scowcroft, 490.

47. Although the *process* by which the Gulf War ended was inadequate and appeared ad hoc in nature, the *timing* of the decision to cease hostilities was consistent with the information the president possessed on 27 March 1991. Inevitably, the fog of war left the president, his staff, and commanders with less than complete knowledge of the enemy's remaining forces, their positions, intentions, and their assets—including weapons of mass destruction. Clausewitz reminds us that "war termination has the character of art and science, of will to negotiate through tacit and overt measures, of ability to adapt to the unforeseen and unforeseeable. . . . A great part of the information obtained in war is contradictory, even more are false, and most are uncertain." Clausewitz, 117.

48. The idea is not a new one. Gen Matthew Ridgway unsuccessfully attempted to acquire expertise from the State Department during his peace talks in Korea. Joseph McMillan, "Talking to the Enemy: Negotiations in Wartime," *Comparative Strategy,* no. 11 (1992): 452.

49. "The tactical situation was changing very rapidly, and we did not have a clear picture of exactly what was happening on the ground." Bush and Scowcroft, 484.

50. Why is termination strategy so extraordinarily demanding? Is it merely the fog of war? Colin Gray suggests that strategy is so challenging because it serves as a bridging function between two dissimilar elements—war and politics. Gray, 361. The termination of conflict, as it directly connects these two elements and does so in the course of a transition from one to the other, is at the very heart of this demanding strategic process. We must, therefore, reverse the traditional American approach of divorcing war and politics.

51. "Military staffs devote most of their work to details of battles and campaigns and to daily operational activities. The amount of time left to think about and plan a war as a whole is minute in comparison. . . . Very few military officers or civilian analysts are given the time and opportunity to put all these pieces together and to prepare estimates that bear directly on the overall strategy and that will help to show how the entire undertaking might be brought to a satisfactory end." Ikle, 17–18.

Another View of the Myths of the Gulf War

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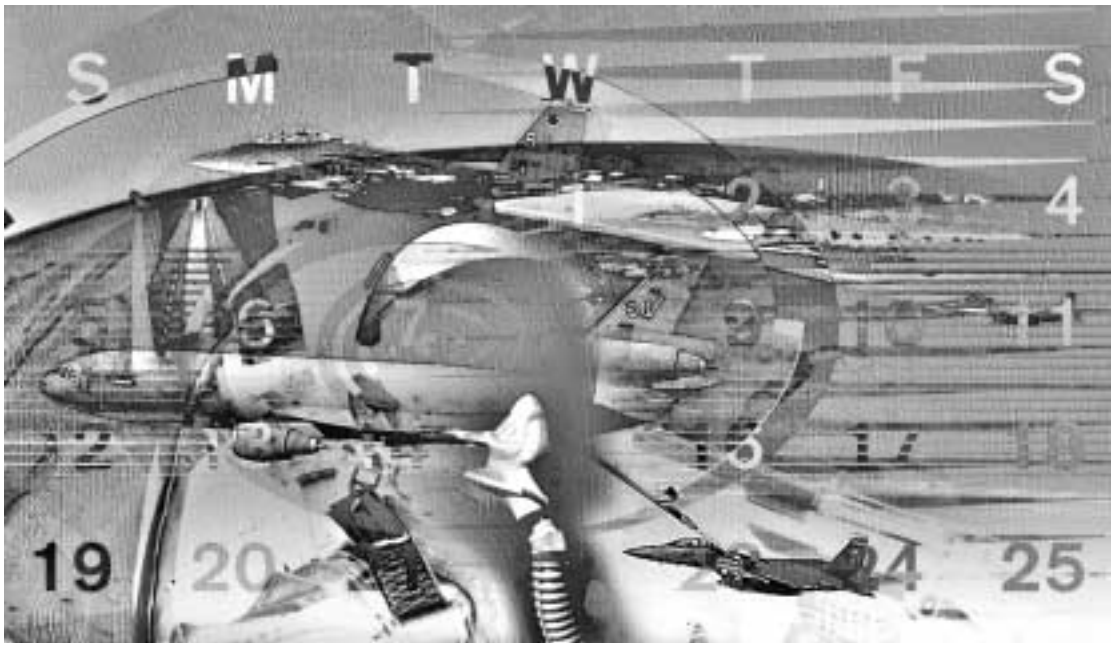
Editorial Abstract: Colonel Wojtysiak revisits one of the more provocative articles published by APJ *in recent years, Dr. Grant Hammond's "Myths of the Gulf War: Some 'Lessons' Not to Learn" (Fall 1998). He evaluates Hammond's 10 Gulf War "myths," discusses accuracies and inaccuracies, and concentrates on lessons learned. Since the Gulf War involved a first-rate air campaign, perhaps Dr. Hammond's myths should be considered truths with asterisks.*



I am sorry to think that you do not get a man's most effective criticism until you provoke him. Severe truth is expressed with some bitterness.

—Henry David Thoreau

AS AN ACTIVE duty officer and Gulf War veteran, I found it sometimes difficult to discern between the criticism and provocation in Dr. Grant Hammond's "Myths of the Gulf War: Some 'Lessons' Not to Learn," which appeared in the fall 1998 edition of *Airpower Journal*.[1]

"Myths" takes a recently all-too-familiar tone toward those who ballyhoo the successes of the Gulf War, particularly those of the much-heralded air campaign. Since Carl Builder's *The Icarus Syndrome* was published in 1995, it has become fashionable within military intellectual circles to characterize airmen and airpower enthusiasts as overly enamored with their own high-altitude grandeur. The academic community portrays airmen as smitten by technology and incapable of learning the true lessons of the past, as they are blinded by the glimmer of their often-serendipitous successes. Perhaps these characterizations were justified after debacles such as the "high risk–low reward" World War II daylight bombing raids over Germany or the misdirected and benign Rolling Thunder campaign over Vietnam. These campaigns were long, drawn-out affairs with confusing objectives and questionable successes.

But Operation Desert Storm was different and invigorating. In fact, the original name of the air campaign, "Instant Thunder," was intended to parody, and thus distance itself from, Rolling Thunder. This was a truly successful air war that paralyzed, incapacitated, and demoralized the enemy from the first sorties to the last on day 38—leaving only 100 hours of "mop-up" duty for the ground forces. The air campaign assured victory and effectively fulfilled Gen Billy Mitchell's promise that, "If the matter ever came to fighting an overseas enemy, airpower could decisively attack the enemy's vital centers without first defeating his armies or navies. Attacks on such vital targets would render war so decisive and quick that the total suffering would be less than otherwise."[2] It was our Air Force's finest moment, but it was more than a first-rate air campaign—it was also a remarkable war.

Strategically speaking, the Gulf War stifled the greatest threat to Middle East stability in the last 25 years—Iraqi president Saddam Hussein. Iraq's barbarous invasion of Kuwait in 1990 exposed Saddam as exceedingly ambitious and violent, as well as a potentially permanent threat to the region. It seemed that his army had hardly rested from a brutal eight-year war with Iran when it invaded Iraq's small, relatively defenseless neighbor and, perhaps inadvertently, seemed to threaten another in Saudi Arabia. The coalition of 38 countries, flying over 50,000 combat sorties in seven months and taking nearly 87,000 Iraqi prisoners of war, left Saddam isolated and his military reduced to virtual impotence outside of its own borders. Admittedly, he survived, but the Gulf War left Saddam Hussein in a strategic box from which there is no escape. Indeed, it seems that every now and then Saddam tests the limits of his box, only to be crushed back again by Operations Northern and Southern Watch.

The Gulf War was not perfect by military standards. The United States did make clear strategic and tactical errors during the campaign. Dr. Hammond, as well as others, makes solid arguments when he discusses the blundered war-termination process, the fruitless "Scud Hunt,"[3] and the intelligence miscues that resulted in a targeting process that sometimes lacked strategic effect. There are important lessons to be learned from our failures in the Gulf, but we must also recognize and learn from our successes. Dr. Hammond unfairly portrays the Gulf War as fraught with failures by occasionally exaggerating claims and offering his conclusions in lieu of arguments. His article crosses the line from constructive and thoughtful criticism to contrarian polemic, the net effect being a dilution of truly worthwhile lessons at the expense of extraneous chaff.

More than two years have passed since "Myths" appeared in *Airpower Journal*. Using the advantage of this extra hindsight, this article reexamines the 10 "myths," separating true lessons from chaff. Each is discussed on its own merits, citing the valuable lessons but also highlighting the flawed logic and incomplete conclusions. The author suggests an opposing view of the achieved end state, including the ideas that Saddam's survival was an acceptable result and that, overall, the United States retains an enhanced regional strategic advantage due to its successful efforts in the Gulf War.

Myth Number One—It Was a War

Dr. Hammond concedes that the Gulf War "was a war by definition" but claims that it was not a war in the classic sense because for most of the time, only one side fought. In support of this argument, he rightly points out that the United States suffered relatively few casualties in proportion to the total forces deployed, while most Iraqi air and ground forces chose to flee or surrender rather than fight.[4] However, this line of reasoning discounts the strategic-paralysis premise of the air campaign and its apparent success against the Iraqi forces. The air campaign was designed to put the Iraqis in a position where they could not respond, thus minimizing coalition casualties. War is war—the one-sidedness of the Gulf War should not determine its status as war. Indeed, the 1939 German blitzkrieg of Poland was one-sided, but few would argue that it constituted something less than war.

The renowned Prussian strategist Carl von Clausewitz defined war as an act of force to compel the enemy to do one's will.[5] This "classical" definition surely qualifies the Gulf War as a war. Saddam Hussein and his military were ejected from Kuwait by force and against their will—diplomacy did not effect the change; nor did the imposed sanctions. The coalition elected to use overwhelming force, which may have been more than necessary, but the level of force should not determine whether a conflict constitutes war.

Myth Number Two—It's Over

Dr. Hammond contends that the war is not over because "its impact lingers on in many ways, and the region may be no more secure than it was eight years ago."[6] His supporting arguments are that US forces remain in the region, the Iraqi military was not irreparably beaten, and Saddam's rhetoric remains as antagonistic as ever.

The following historical comparisons point out the need to maintain a strong military presence necessary to maintain the desired end state. Consider the strategic environment of post–World War II Europe or the Korean peninsula after 1952; decades after the victories, US troop strength in both regions remained in the hundreds of thousands. Indeed, for the second half of the last century, the entire US military essentially defined and justified itself in terms of maintaining the previously achieved end states after the two wars. The postwar end state was so important that it led to the theater military commanders in each theater being elevated to commander in chief (CINC) status. Our postwar presence in these two theaters, by any measure, overshadows the current US presence in the Gulf region. On the other hand, there was no US presence required following the Vietnam War, essentially because we lost that conflict and were obliged to leave. Perhaps a postwar peacekeeping presence is the price of victory—insurance to maintain the postwar end state.

Historical precedent implies that it is not necessary to end a war by leaving the enemy's army or regime in tatters. The excessively punitive measures of the post–World War I Treaty of Versailles led to the rise of Hitler and the Third Reich, thereby making World War II inevitable. But on the Korean peninsula, where the North Koreans maintained a powerful army and a venomously anti-US regime, deterrence succeeded for 50 years, allowing some healing of old wounds and possibly leading towards lasting peace. Iraq's post-1991 army does not constitute the regional threat that North Korea presents; nor is Saddam Hussein any more hostile than President Kim Il Sung.

Some may argue that the Korean parallel strengthens the claim that the Gulf War is not over, since the conflict ended only in armistice. Yet it would be difficult to contend that the Korean conflict never ended in either the classical or the conventional sense. Moreover, unlike the war against Iraq, the end of hostilities in Korea did not settle the underlying political issue that sparked the war. The question of whether the Gulf War is concluded or is in the process of concluding is less germane than whether or not the end

state is leading to the US goal of regional stability.

Myth Number Three—We Won Myth Number Four—We Accomplished Our Objectives

It is difficult to argue these separately, since logic suggests that the side that accomplished more of its objectives is the winner. Dr. Hammond begins his discussion of "Myth Number Three" with the absurd statement that "we did not win politically or militarily, for we did not accomplish our objectives on either front."[7] But his argument essentially boils down to the failure, in his view, to meet *every* objective. Specifically, he cites the realities that Saddam remains in power, that the Republican Guard forces were not effectively destroyed, and that Saddam still seeks to develop weapons of mass destruction (WMD).

In terms of achieving objectives, it is unreasonable to suggest that warring nations can guarantee the achievement of all objectives, political and military, when engaged in *limited* war. Unlike its attitude toward Germany and Japan in World War II, the United States never sought Iraq's unconditional surrender. The best the United States could do in the Gulf was to prioritize its objectives and obtain as many as possible without fighting a total war or breaking up the coalition. Once the United States achieved its political objectives, one could argue that the military objectives became unnecessary. This was the situation in the Gulf War—the coalition was built on political objectives, and the military objectives varied by individual countries. Indeed, any coalition that included countries as diverse as the United States, the Soviet Union, and Syria could not be expected to agree on everything.

The four political objectives, declared by President George Bush and reinforced by United Nations (UN) Security Council resolutions, included the unconditional and complete withdrawal of all Iraqi forces from Kuwait, the restoration of Kuwait's legitimate government, the reestablishment of security and stability of the Persian Gulf, and the protection of American citizens abroad.[8] In the nearly 10 years since the end of the war, it is evident that the United States realized its objectives. Dr. Hammond contends that the first two were met but that the latter two "constitute an open-ended commitment that we may have to demonstrate again."[9] Regional stability and protection of Americans are open-ended issues in many parts of the world today—so much so that our civilian and military leaders are now rethinking future force requirements. The open-ended commitments in the Gulf may prove to be vital, requiring and permitting a continuing US regional presence and influence in an area of vital geostrategic importance.

Often cited as the most glaring failure of the Gulf War is the survival of Saddam Hussein and roughly half of his Republican Guard protectorate. While these were among the military objectives (Saddam was never mentioned individually, but his removal was implicit in the objectives and his known residences were targeted), their achievement likely would have jeopardized the coalition's survival and the long-term US reputation in the region. To achieve them, a military march to Baghdad, outside the auspices of UN resolutions and with questionable coalition consent, probably would have been necessary. The likely end state would have been an uncertain Iraq and the possible disenfranchising of the United States as a powerful broker in future Gulf affairs. Instead of regarding this as a failure, one could argue that, by deciding to cease hostilities after meeting the political objectives (thus allowing Saddam and enough of the Republican Guard to escape), the United States wisely placed its political objectives ahead of all others. History suggests that this was a sensible choice.

The continued US presence and its role in Gulf affairs are justified more by the continuance of Saddam's regime than by any other single factor. Saddam may be bad for Iraq, but his continued hold on power arguably enhances regional influence by the United

States. He is universally accepted as a regional "bad actor" amongst such disparate nations as Egypt, Israel, Iran, and the United States. Valuable regional US allies, such as Saudi Arabia and Kuwait, remain committed to the US regional presence as long as Saddam's containment remains a regional rallying point. These former coalition partners, either directly or tacitly, continue to support the US-led enforcement of Iraq's no-fly zones. In fact, the United States is granted virtual carte blanche to contain Saddam in operations such as Desert Strike (1996) or Desert Fox (1998)—thus defining and limiting Iraq's role in the regional balance of power.

Saddam's addiction to WMD, especially his quest for a nuclear device, remains an ongoing concern. Dr. Hammond simply restates a lesson definitively discussed in Eliot A. Cohen and Thomas A. Keaney's *Gulf War Air Power Survey* (*GWAPS*) years earlier. The *GWAPS* identified intelligence miscalculations that led to targeting failures: "Overall, the United States did not fully understand the target arrays comprising Iraqi nuclear, biological, chemical, and ballistic missile capabilities before Desert Storm."[10] Nevertheless, Ambassador Richard Butler, the UN weapons inspector, believes that the coalition was effective in this regard and reduced Iraq's WMD capability by "at least an order of magnitude" during the Gulf War and then again in the Desert Fox raids of 1998.[11] Urging continued vigilance by the United States and coalition members, Butler believes that Saddam will never abandon his pursuit of WMD.

Myth Number Five—Technology (PGMs) Won the War

Dr. Hammond's claim that the statement "precision-guided munitions (PGM) won the war" constitutes a myth of the Gulf War seems dubious at best since no one seems to have made this declaration, outside of his article.[12] The *GWAPS* does not assert that technology won the war, though it does cite five technologies that "worked best in the Gulf War," including "stealth/low observability, laser-guided bombs, aerial refueling, the high-speed antiradiation missile (HARM), and the secure telephone (STU-III)."[13] Other Gulf War reviews have discussed the effectiveness, or lack thereof, of the various technologies, but none have made the naïve assertion that the outcome would have been any different—absent PGMs or any other technology.

Nevertheless, Dr. Hammond believes that the role of technology in the Gulf War, specifically that of stealth and PGMs, was overstated because they were used in relatively small numbers and our intelligence was not as accurate as our weapons. He reminds us that roughly 95 percent of the coalition ordnance consisted of "dumb" bombs dropped by non-stealth aircraft.[14] These numbers are correct, but they tell only half of the story. According to the Department of Defense's (DOD) final report to Congress on the Gulf War, stealth aircraft using PGM ordnance flew only two percent of the total attack sorties but struck about 40 percent of the strategic targets attacked. They were also the only aircraft to attack targets in downtown Baghdad (the area presenting the greatest threat area), hitting targets in all 12 categories.[15] This remarkable performance validated the technology and led Maj Gen David Deptula, director of the Air Force Quadrennial Review and one of the key architects of the air war, to conclude that stealth technology and PGMs, combined with the effects-based targeting used in the Gulf, constituted no less than a revolution in military affairs.[16] Whether it was a revolution or simply an evolution, technology made its impact on the Gulf War.

The more important question is whether our technology has outpaced our intelligence capability. Dr. Hammond rightly posits that precision munitions are worthless without precision intelligence.[17] The mistaken bombing of the Chinese Embassy in Belgrade in 1999 underscores this argument and indicates that the United States may still have some catching up to do on the intelligence front.

Myth Number Six—The "Vietnam Syndrome" Is Over: US Military Might and Prestige Are Restored

The American public's confidence in the military has nearly doubled since the aftermath of the Vietnam War. A Harris Poll conducted in January 2000 found that confidence in the military is higher than that of any other institution, including the medical profession or the legal profession, the latter epitomized by the Supreme Court.[18] A second Harris Poll specifically addressed the issue of US military prestige over the last 20 years, showing that 70 percent of Americans felt military officers had "very great prestige" or "considerable prestige," the former at 42 percent (up from 22 percent in 1982).[19] The success of the Gulf War was surely the primary reason for the changes in these numbers.

Dr. Hammond points to the approximately 40 percent decrease in US military forces since 1990, arguing that the United States is less effective at deterring would-be aggressors and less likely to fight them than in the past.[20] But connecting the Gulf War with the drawdown of the 1990s is misleading since it ignores the end of the Cold War. On 1 August 1990, the day before Iraq invaded Kuwait, President Bush was scheduled to announce upcoming "major cuts in US military forces."[21] However, the speech was delayed due to diversions surrounding the impending invasion, and the cuts were officially announced during the budget battle of late 1990—months before the war. Indeed, the fact that the United States was able to execute the military drawdown in the aftermath of the Gulf War yet still keep Iraq in check is a testament to the level of US dominance.

That said, Dr. Hammond rightly questioned whether the so-called Vietnam Syndrome is over, as President Bush claimed at the end of the Gulf War. In reality, the actions of the Bush administration and its top military leaders were clearly influenced, even preoccupied, by the ghosts of Vietnam.[22] Unfortunately, this might have resulted in some of the poor decisions surrounding the bungled war termination. Clearly, the United States wanted to avoid a potential quagmire from an Iraqi civil war, but the decision to declare victory—unprecedented in that it came before the enemy requested terms, allowing the victorious soldiers to return to a hero's welcome—was an overreaction to the Vietnam experience. The relative detachment of the Washington establishment (i.e., leaving the war fighting *and* peace negotiating to the theater CINC) reflected that experience. This was followed by the reactionary view that the postwar revolutionary uprisings in the north and south were a snare for a protracted US involvement. All these events fell into the category of "Vietnam's lessons" applied inappropriately to the Gulf War. Had this series of mistakes not characterized the war-termination process, Saddam Hussein might have vanished as a troubling regional influence.

Despite the lingering psychological effects of the Vietnam Syndrome, the actual military capability of the United States relative to the rest of the world stands in stunning contrast to that of the post-Vietnam era. After Vietnam, the United States stood conventionally outmanned and outgunned by the Soviets, and the short-term trend was getting worse. Since Vietnam, the United States has completed a major military buildup, achieved important victories in the Cold/Gulf Wars, and afterwards experienced a significant military drawdown. Currently, the United States has no peer competitor, and there appears to be none on the horizon—for a while at least. One can argue whether or not this means a safer world—but one cannot doubt the ability of the US military to respond when necessary.

Myth Number Seven—We Can Do It Again If Necessary

Desert Strike, Desert Fox, and—on a different continent—Operation Allied Force

all demonstrated that the United States has the political will, international ties, and military strength to take forcible actions when necessary to achieve its objectives. But more impressive is simply the way we were able to pull off the Gulf War, considering our state of readiness for that conflict. The US military of 1990 was heavy, slow moving, and tailored for conventional battle in Europe. As such, it was generally unprepared for action in US Central Command's area of responsibility and faced the logistical nightmare of moving required forces into the theater.[23] But Saddam Hussein, among his numerous other failures, lacked a sense of strategic timing and failed to act before the coalition assembled a huge force. The United States cannot count on such a foolish adversary during the next war.

Sweeping changes in US military doctrine and force structure since the Gulf War reveal a concerted effort to take this lesson to heart. Joint doctrine has taken an expeditionary twist, and Air Force basic doctrine now admits that "the decline of both total force structure and worldwide bases has decreased the size of our forward presence and forced the US military to become primarily an expeditionary force—our service is able to rapidly project power over global distances and maintain a virtually indefinite 'presence' over an enemy."[24] The Army is also engaged in an enormous metamorphosis, intended to create a "light and lean" force. Gen Eric Shinseki, Army chief of staff, testifying before Congress in 1999, outlined his vision:

> Our goal is to be able to deploy a combat-capable brigade anywhere in the world within 96 hours after receipt of an order to execute liftoff, a division within 120 hours, and five divisions in 30 days. These forces will be light enough to deploy, lethal enough to fight and win, survivable enough to return safely home. They will be versatile enough to make peace or fight wars. They will be agile enough to transition from peacemaking to war fighting and back again quickly. And they will be lean and efficient enough to sustain themselves whatever the mission.[25]

Clearly, the US military understands the importance of being prepared to "do it again." As a result, we should be readier and more prepared for the next war than we were in the Gulf.

Myth Number Eight—Others Paid for the Cost of the War

The Gulf War was little more than a blip on the financial screen of the United States, especially in comparison to the cost of previous major wars. The highest estimate Dr. Hammond cites is $100 billion spent, half of which was paid by other governments—mostly Saudi Arabia and Kuwait. But the real story, according to Dr. Hammond, is the long-term cost the United States will pay in terms of the wear and tear upon its equipment and manpower. This point is difficult to reconcile with his earlier claim that by 1997 the defense share of the US gross national product was the lowest since Pearl Harbor.[26]

A cost-benefit analysis tells the story beyond the economic costs. Americans have always inherently valued human cost over financial cost, as exemplified by Gen Colin Powell's (chairman of the Joint Chiefs of Staff during the Gulf War) recommendation to use overwhelming force and expensive technology rather than engage the Iraqis in a conventional battle. As a result, the United States suffered only 146 combat fatalities, a tiny number compared to those in past wars and a pittance compared to Iraq's losses. In addition to saving lives, the extra dollars spent in the Gulf also allowed the real-world testing of weapons and theories of force structure. It is impossible to measure how much these lessons contributed to wiser post–Gulf War military spending. Additionally, it is impossible to put an economic value on US gains in the world's leadership quotient as a result of the Gulf War. Political leadership begat economic leadership, and for the entire decade following the Gulf War, the rest of the world looked to the US economy. In the meantime, the United States enjoyed its greatest peacetime economic expansion in history.

Myth Number Nine—The Gulf War Represents an Almost Unblemished Record of Success, Superior Military Performance, and Accomplishment

If this claim constitutes a myth at all, it is not considered as such among those who wear military uniforms. Officers who attend intermediate and senior service schools are bombarded with the glut of critical evaluations of the Gulf War. These writings provide excellent insight and unbiased lessons to be learned from the experience. Dr. Hammond cites three important "blemishes," including intelligence failures linked to targeting and battle-damage assessment, the pointless "Scud Hunt," and problems with fratricide.[27] But all three of these, as well as others, are officially addressed in the *GWAPS*, which provides a balanced account of the war—and the Air Force doesn't appear to be paying mere lip service to them. The decade since the Gulf War saw a flood of doctrinal changes and institutional modifications intended to ensure that such failures are not repeated. One of the most notable of these has been the creation of a formal joint air operations center (JAOC)—a focal point designed to assess, plan, and execute the integrated targeting process in combat. A flexible JAOC, comprised of strategy, combat plans, combat operations, and mobility teams, may help address targeting problems in the next war.

Numerous well-written books also detail the lessons of the Gulf War, warts and all. Those wishing to explore its political-military dimension should read *The Commanders* by Bob Woodward and *Hollow Victory* by Jeffrey Record. Military aspects are covered in *The Generals' War* by Michael Gordon and Gen Bernard Trainor and *Thunder and Lightning: Desert Storm and the Airpower Debates* by Edward Mann. The biographies of Gen Colin Powell and Gen Norman Schwarzkopf provide additional, if one-sided, insight into the war. Those seeking an "almanac" version of the war should consult DOD's *Conduct of the Persian Gulf War,* its final report to Congress. This 800-page volume contains a plethora of tactical information and an informative section on lessons learned. No war is perfect, and many people, both inside and outside the process, critiqued the Gulf War before "Myths" was published.

Myth Number 10—The Promise of Airpower Was Finally Fulfilled

The fulfillment of the promise of airpower depends on which airpower "promise" one has in mind. Dr. Hammond concedes that "airpower came far closer to achieving its goals and accomplishing our military aims than ever before," but he rightly points out that airpower alone was unable to close the deal without surface forces. On the other hand, it is also worth mentioning that the architect of the Gulf's air campaign, Col John Warden, now retired from the Air Force, contends that airpower alone could have achieved victory after just another week of strategic attack.[28] Current Air Force doctrine seems to have accepted Hammond's notion, but Warden's argument continues to stir up debate, as well as the parochial insecurities of the sister services. Meanwhile, the American psyche and the political leadership seem to have reached a dangerous conclusion about airpower.

Dr. Hammond was prophetic in proposing this myth, but he targeted the wrong audience. Since the Gulf War, Western politicians—not military professionals—seem to have oversimplified airpower's effectiveness, even implying the existence of a new paradigm. They apparently believe that airpower is a panacea that can routinely achieve military objectives through precision engagement, and with only limited collateral damage or friendly casualties. This unsophisticated view of airpower was evident in 1999 during Allied Force, when North Atlantic Treaty Organization (NATO) leadership publicly announced it would attempt to remove Serbian forces from Kosovo with air strikes exclusively. Military

professionals, including airmen, disagreed with the strategy of ruling out surface engagements from the outset. Yet, at first glance the "paradigm" seemed to work. In reality, however, the air strikes were relatively ineffective, blurring the lines between political and military objectives and sometimes placing them in direct conflict with each other.[29] Diplomatic breakdowns and the loss of Russian support may have had more to do with Serbia's surrender than the effects of airpower—but that's another set of myths.

Conclusion

The "myths of the Gulf War" are generally not myths at all but "truths with asterisks." These asterisks are the genuine lessons that we must internalize so we do not repeat the mistakes of the past. Overall, the Gulf War was a successful effort, and the world is a better place because a militarily intact Iraq does not control Kuwait and its assets. Unfortunately, Saddam's regime survived, but it continues to reinforce the military necessity of a powerful US presence in a region that includes two-thirds of the world's known oil reserves. The first test of coalition warfare in the post–Cold War era was a major victory because of US diplomacy and military might. Yet, our greatest accomplishment may have been in showing military restraint when it counted.

If the United States hopes to continue to lead the rest of the world, it must demonstrate that it can be trusted to accomplish the coordinated aims of the many, rather than embarking on selfish crusades. The United States suffered tough consequences in Korea and especially Vietnam when it tried to run its strategy "on the fly," since the fog of war led to changing objectives and confused ideas about the desired end state. Perhaps the most enduring lesson of the Gulf War is that placing predetermined political objectives before military aims was the right choice. □

Notes

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2. William Mitchell, *Winged Defense: The Development and Possibilities of Modern Airpower—Economic and Military* (1925; reprint, New York: Dover Publications, Inc., 1988), 16.
3. Hammond, 7.
4. Ibid., 15.
5. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 75.
6. Hammond, 8.
7. Ibid.
8. President George Bush, "The Deployment of US Armed Forces to Saudi Arabia," address, 8 August 1990, reprinted in *Military Review*, September 1991, 82. Additionally, for a full listing of United Nations Security Council resolutions, see DOD's final report to Congress: *Conduct of the Persian Gulf War*, (Washington, D.C.: Department of Defense, 1992), appendix B.
9. Hammond, 9.
10. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report* (Washington, D.C.: Department of the Air Force, 1993), 79.
11. Ambassador Richard Butler, interview with Col Roman Hrycaj, Maxwell AFB, Ala., 29 November 2000.
12. Hammond, 10.
13. Keaney and Cohen, 223.
14. Hammond, 11.
15. DOD, *Conduct of the Persian Gulf War*, 703.
16. Brig Gen David Deptula, "Effects Based Operations," address to the Air War College, Maxwell AFB, Ala., 27 November 2000.
17. Hammond, 11.
18. Harris Poll Library, "Harris Interactive," Harris Poll no. 7, n.p., on-line, Internet, 26 January 2000, available from http://www.harrinteractive.com.
19. Ibid., Harris Poll no. 51, 6 September 2000.
20. Hammond, 11.
21. Michael R. Gordon and Bernard E. Trainor, *The Generals' War* (New York: Little, Brown & Company, 1995), 25.
22. Hammond, 11.
23. For a synopsis of the nearly insurmountable logistics problems faced by US Central Command during Operation Desert Shield, see Gordon and Trainor, 54–74.
24. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, September 1997, 32.
25. House, *Status of Forces: Testimony to House Armed Services Committee, Statement by the Chief of Staff, U.S. Army, Gen Eric K. Shinseki*, 21 October 1999, 106th Cong., 1st sess., 21 October 1999.
26. Hammond, 13.
27. Ibid., 15.
28. John Warden, *The Air Campaign* (New York: Excel Publishers, 1998), 158.
29. Earl A. Tilford, "Operation Allied Force and the Role of Airpower," *Parameters*, Winter 1999–2000, 28.

Shades of Sentinel?

National Missile Defense, Then and Now

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Editorial Abstract: Due to emerging long-range missile threats, US officials are seeking changes in the ABM Treaty. However, this proposal is similar to that of the 1967 Sentinel Plan, and dangers that Secretary of Defense Robert S. McNamara warned against years ago could apply to current plans. Might we be making the same mistake we made 33 years ago in deploying a costly and unnecessary limited national missile-defense system?

AMERICAN EXPECTATIONS WERE modest for the June 2000 Clinton-Putin summit regarding efforts to change Russian opposition to a US proposal to amend the Antiballistic Missile (ABM) Treaty to permit deployment of a limited national missile defense (NMD) system. Nevertheless, US officials hoped the Moscow meetings would "lay the groundwork for reaching agreement . . . to negotiate ABM Treaty changes."[1] Although the United States portrayed its proposal as only a limited system designed to protect against emerging long-range missile threats from "dangerous states of concern, such as North Korea, Iran, Iraq and Libya," the Russian government was not forthcoming.[2] Indeed, President Vladimir Putin, while acknowledging the possibility of new missile threats, characterized the US proposal as a "cure which is worse than the disease."[3] Perhaps as significant as the divergence of positions on this issue is the similarity between the current US proposal and circumstances surrounding the US decision in 1967 to deploy a limited NMD system, subsequently named Sentinel. Equally important, Secretary

of Defense Robert S. McNamara, in announcing the decision, cautioned against two dangers associated with the Sentinel plan that may offer insights for the present NMD debate.

The Decision to Deploy Sentinel

In September 1967, after two decades of ABM development programs, Secretary McNamara announced in a speech that the United States would deploy a system to protect itself against an emerging Chinese missile threat.[4] Neither McNamara nor President Lyndon Johnson had confidence in the ability of an ABM system to protect the United States from a full-scale Soviet missile attack. Pressure was building from Congress and the Joint Chiefs of Staff to deploy missile defenses in response to a series of Chinese nuclear tests and the flight of a Chinese ballistic missile.[5] In a speech to the editors of United Press International, Secretary McNamara explained the administration's rationale for a limited missile defense:[6] "There is evidence that the Chinese are devoting very substantial resources to the development of both nuclear warheads and missile delivery systems. . . . Indications are they will have . . . an initial intercontinental ballistic missile [ICBM] capability in the early 1970s, and a modest force in the mid-70s."[7] McNamara added that heretofore the lead time for the Chinese to deploy a missile threat against the United States allowed for postponement of a decision to field a defensive system, but now it was necessary "to go forward with this Chinese-oriented A.B.M. deployment."[8]

In November, McNamara announced that the light ABM system would be called Sentinel, and it became evident that bases would be located near American cities to protect them from possible Chinese missile attacks. Growing public opposition to the program led newly inaugurated president Richard Nixon to suspend deployment until further studies were completed.[9] Nixon decided to field a system named Safeguard, not to shield American citizens but to protect silo-based nuclear retaliatory missiles at two US Air Force bases. Only one ABM site was completed, but it experienced technical deficiencies leading to its deactivation in 1976, after only a few short months of operation and an expenditure of $5 billion.[10] In the same year the United States deactivated Safeguard, the Chinese conducted their first ICBM test—well past the date projected by McNamara.[11] Equally significantly, they did not deploy a "modest force in the mid-70s" as McNamara prophesied. Indeed, such a capability did not appear until 1993 or 1994, when China deployed about 14 ICBMs and perhaps 12 sea-launched ballistic missiles (SLBM).[12]

In the years following its acceptance of the ABM Treaty, which constrained American and Soviet missile-defense activities, the United States continued ABM research and development, but until President Ronald Reagan declared his intention in 1983 to make nuclear weapons "impotent and obsolete," the program was limited. Reagan's vision was scaled back, first by President George Bush in 1992 and even further by the Clinton administration in 1993. In both cases, the decline and dissolution of the Soviet Union and improved relations with the Russian government undermined the rationale for an NMD of the magnitude proposed by Reagan. By the late 1990s, renewed interest in NMD emerged as concerns were raised about the possibility that so-called rogue states could threaten the United States with long-range ballistic missiles armed with weapons of mass destruction armed with nuclear, biological, or chemical (NBC) warheads.

The Ballistic Missile Threat to the United States

If, as some believe, the missile threat is sufficient to modify the ABM Treaty to permit deployment of a limited NMD costing perhaps more than $60 billion and possibly disturbing relations with Russia, China, and US allies in Europe, questions arise regarding the sources of this threat, its nature, and whether the threat merits a program as costly and potentially disruptive as the missile-defense system proposed by the United States.[13]

According to a recent paper prepared by the National Intelligence Council (NIC), "during the next 15 years the United States most likely will face ICBM threats from Russia, China, and North Korea, probably from Iran, and possibly from Iraq. The Russian threat . . . will continue to be the most robust and lethal, considerably more so than that posed by China, and orders of magnitude more than that potentially posed by other nations."[14] If one sets aside the Russian ICBM force, which, American officials acknowledge, the limited NMD could not repel, the most likely potential missile threats to the United States emerge from four sources, with other possible threats remaining strictly hypothetical. Yet, possible missile threats posed by the four—China, North Korea, Iran, and Iraq—may be problematic.[15]

China currently deploys only about 20 ICBMs and 12 JL-1 SLBMs, with a modest range of 2,150 kilometers.[16] An NIC paper notes that "Chinese strategic nuclear doctrine calls for a survivable long-range missile force that can hold a significant portion of the US population at risk in a retaliatory strike" and avers that "China will likely have tens of missiles targeted against the United States" by 2015.[17] It is unclear why China would deploy a significantly larger long-range missile force over the next few years. China has never possessed more than a small number of ICBMs, which, as the NIC paper points out, constitutes a retaliatory force—that is, a response to a nuclear attack against its homeland, not a first-strike capability. A survey of the International Institute for Strategic Studies series The Military Balance shows that between 1976 and 1994, China never deployed more than eight ICBMs and no SLBMs before 1993 or 1994. Even now the Chinese ICBM force is quite low compared with that of the United States and Russia. If an NMD system is deployed by the United States, China might see no alternative except increasing both the size and sophistication of its missile force in order to preserve its retaliatory capability—a possibility suggested by China's chief arms negotiator.[18]

Similarly, it is not certain that North Korea, Iran, or Iraq will pose missile threats to American territory that merit deployment of an NMD by 2005, as currently envisioned.[19] Among these countries, only North Korea might pose a near-term threat to the United States—albeit limited and only if it surmounts technical hurdles. If North Korea developed a reliable third stage for its Taepo Dong-1 space launch vehicle (SLV) and a shroud to protect a warhead through the stress of atmospheric reentry, it might be able to deliver a "light payload" to the United States, but analysts believe such a development is "unlikely."[20] In coming years, the more likely possibility is that North Korea may test the more capable Taepo Dong-2. However, as an NIC paper points out, this action could be "delayed for political reasons."[21]

Intelligence assessments highlight what North Korea *could* do to threaten the United States with long-range missiles—not necessarily what it *will* do. The apparent success of the June 2000 summit between North Korean leader Kim Jong Il and President Kim Dae Jung of South Korea and the ongoing dialogue may prefigure the integration of North Korea into the global mainstream. Even if the pace is slow and tentative, if incentives are created politically and economically for North Korea to moderate its behavior and to cease development of an ICBM, the outcome could be both less costly and less risky than NMD deployment. The landmark decision by the Clinton administration to ease some sanctions against North Korea should contribute to political normalization. However, any inconsistent policies pursued by the United States may prove detrimental to this process. Such policies include asserting a North Korean ICBM threat as part of the rationale for NMD while simultaneously seeming to support a North-South rapprochement.

In coming years, Iran may also pose a long-range missile threat to the United States although there is no certainty about such a threat. An NIC paper notes that "Iran *could test* an ICBM that could deliver a several-hundred-kilogram payload to many parts of the United States in the last half of the next decade using Russian technology and assis-

tance" (emphasis in original).[22] The paper further observes that analysts disagree on the timing of Iran's first test. Some believe the test is "likely [to occur] before 2010 and very likely before 2015 (although an SLV with ICBM capability probably will be tested in the next few years)."[23] Yet other analysts project "less than an even chance" for an Iranian ICBM test by 2015.[24]

Several features in this projection merit scrutiny. First, the variance between analysts' projections of when Iran might *test* an ICBM is sufficient to question the necessity for a deployed NMD system by 2005. Second, it has been suggested that Iran "is likely to test a space launch vehicle by 2010 that could be converted into an ICBM."[25] But even doing so would not establish the need for an NMD system since an ICBM test does not constitute an operational threat. Finally, it is noteworthy that the potential for an Iranian ICBM capability seems to hinge on access to foreign technology—Russian or North Korean, for example.[26] Perhaps, as an alternative to modifying the ABM Treaty or even the threat of a unilateral US withdrawal, Russia could be convinced to halt its assistance to Iran's missile program. For its part, North Korea may be dissuaded by the prospect of political and economic openings with the industrialized countries. Ultimately, the possibility of an Iranian ICBM program is as much a technology-diffusion problem as a missile-proliferation issue; thus, measures to curtail suppliers could have a greater impact than NMD.

Similarly, some experts believe that if Iraq receives significant foreign help, it could develop an ICBM capability between 2005 to 2010, but most analysts contend it is unlikely Iraq could conduct a flight test before 2015.[27] The independent variable in this equation seems to be, as with Iran, the availability of external assistance and technology. For reasons noted above, an effective method to forestall an Iraqi ICBM capability may entail applying political and economic quid pro quos aimed at technology suppliers. Even if Iraqi intransigence prevents enforcement of United Nations Security Council Resolution 687, which prohibits Iraq from possessing any ballistic missile with a range greater than 150 kilometers, pressure on suppliers of critical technology may be key to preventing the development of a long-range missile.

Perhaps, as an alternative to modifying the ABM Treaty or even the threat of a unilateral US withdrawal, Russia could be convinced to halt its assistance to Iran's missile program.

It is also problematic whether North Korea, Iran, or Iraq could equip ICBMs with weapons of mass destruction. Due to a variety of atmospheric and topographical factors, chemical warheads do not pose a large-scale threat to American cities.[28] Further, ballistic missiles may not be the preferred delivery method for biological weapons. On long-range ballistic missiles, such as ICBMs, the agent must be well insulated against the heat of atmospheric reentry, and effective dispersal is difficult due to high-reentry velocities.[29] Additionally, North Korean, Iranian, and Iraqi nuclear-weapon "designs are likely to be too large and heavy" for missile delivery. Finally, they likely will "have only a few nuclear weapons, at least during the next 15 years."[30]

The purpose of the foregoing discussion has not been to dismiss the concerns of advocates of a limited NMD. Rather, it is intended to illustrate that the ICBM threats ascribed to certain "states of concern" may be so problematic that they do not necessitate deploying an NMD system. The possibility that North Korea, Iran, and Iraq will develop and deploy ICBMs depends on several factors: US relations with these countries could improve instead of deteriorate; political and economic conditions in those countries could shift priorities from confrontation to cooperation with other states; and a host of other variables cannot be known with a level of certitude to justify the political risk or economic

cost associated with a policy shift on NMD deployment. Nearly 34 years ago, the United States made a premature decision to deploy a limited missile defense that proved to be both costly and unnecessary. The lessons of the Sentinel experience could be instructive in the current debate.

The ICBM threats ascribed to certain "states of concern" may be so problematic that they do not necessitate deploying an NMD system.

Sentinel Redux?

Near the end of his speech announcing the decision to deploy missile defenses, Secretary McNamara outlined two dangers. First, he observed that an ABM system could deter "only a narrow range of threats."[31] Today, and for the foreseeable future, the United States will confront threats to its security unlike the Cold War. A once well-defined threat emanating from an unambiguous source has been replaced by more amorphous threats from neglected or forgotten corners of the world. The deployment of a limited NMD would protect the United States from threats that may never emerge, while consuming political and economic capital that could be expended on other projects and programs of more immediate and diverse concern. Moreover, the deployment of a defensive system against uncertain threats could disrupt US relations with Russia and China during a time when their cooperation is necessary to resolve other issues and problems.

A second danger highlighted by McNamara was the temptation to expand a light ABM defense into a more robust system.[32] McNamara observed that failure to resist this impulse could result in an "arms race [that] would rush hopelessly on to no sensible purpose."[33] Although the United States has assured Russia and China that the proposed NMD is not designed to defend against their missile forces, the system could be expanded to meet more robust threats. A recent Defense Department publication states that "initial deployment, Capability 1 (C^1) will be limited to 20 missiles. Increasingly capable deployment options after C^1 will add further capability to the NMD system."[34] It is conceivable that the expandability of this limited system is a key factor in Russian and Chinese opposition to the plan, just as the capacity to enlarge Sentinel was the basis for McNamara's concern nearly 34 years ago. Rather than reducing "the strategic value of long range ballistic missiles,"[35] as a Defense Department fact sheet claims, the NMD could set the stage for a defensive-offensive weapons competition. Perhaps, as President Putin suggested, the cure could be worse than the disease.

Conclusion

In the final analysis, the spread of NBC weapons may be the "greatest potential threat to global stability and security" since the darkest days of the Cold War.[36] However, it seems likely these weapons would be delivered using methods other than ICBMs, for reasons identified above. Alternative delivery methods such as aircraft, cruise missiles, ships, trucks, special-operations troops, or terrorists would be less expensive than developing and deploying ICBMs—and more reliable than long-range missiles. Moreover, nonmissile delivery would circumvent the NMD, and some methods of employing weapons of mass destruction could be used covertly, thus minimizing, or entirely obviating, culpability and the threat of retribution. To avoid the miscalculations that led to the Sentinel deployment decision and to preclude the dangers suggested by Secretary McNamara, there should be a clearer understanding about the ICBM threat. □

Notes

1. Ambassador Alexander Vershbow, US permanent representative on the North Atlantic Council, "National Missile Defense: Political Implications," address to the 17th International Workshop on Political-Military Decision Making, Berlin, Germany, 3 June 2000, n.p., on-line, Internet, 15 June, available from http://usinfo.state.gov/topical/pol/arms/stories/0060508.htm.

2. Ibid.

3. Elaine Sciolino, "Clinton and Putin Fail to Close Gap on Missile Barrier," *New York Times*, 5 June 2000.

4. Secretary of Defense Robert S. McNamara, "Speech on Anti-China Missile Defense and U.S. Nuclear Strategy," address to the editors of United Press International, San Francisco, Calif., 18 September 1967.

5. Donald R. Baucom, *The Origins of SDI, 1944–1983* (Lawrence, Kans.: University Press of Kansas, 1992), 27 and 34.

6. Interestingly, McNamara devoted considerable attention early in the speech to affirm that deterrence of nuclear aggression would continue to rely on strategic offensive forces, not missile defenses. Moreover, he cautioned that a "heavy" ABM system deployed throughout the United States would encourage the Soviets to build more offensive forces to nullify American defenses. Ibid., 39.

7. McNamara speech.

8. Ibid.

9. Opposition to Sentinel was rooted in several concerns. Some opposed deploying interceptors close to American cities, fearing explosions of the missiles themselves or their nuclear warheads. Others believed that deploying missile defenses near cities could make nuclear attacks against these areas more likely and that such a deployment might appear to be a "thick" system, thus precipitating an arms race with the Soviet Union. Finally, questions were raised about the potential cost of even a light ABM system relative to spending on domestic programs. Baucom, 39.

10. Col Stephen P. Moeller, "Vigilant and Invincible," *Air Defense Artillery*, May–June 1995, 40.

11. International Institute for Strategic Studies, *The Military Balance, 1977–1978* (London: International Institute for Strategic Studies, 1977), 52.

12. International Institute for Strategic Studies, *The Military Balance, 1993–1994* (London: International Institute for Strategic Studies, 1993), 152.

13. Regarding the cost estimate, see Charles Babington, "U.S. Set to Share Missile Defense Research," *Washington Post*, 1 June 2000. The Russian position on the US proposal is available in Deputy Secretary of State Strobe Talbott, press briefing, National Hotel, Moscow, Russia, 4 June 2000, n.p., on-line, Internet, 15 June 2000, available from http://usinfo.state.gov/topical/pol/arms/stories/0060406.htm. The Chinese position is available in "China Warns against Amending ABM Treaty," *USA Today*, 7 June 2000; and Kevin Platt, "China Threatens to Boost Nukes," *Christian Science Monitor*, 22 June 2000. For European concerns about the US proposal, see, for example, National Security Advisor Samuel Berger, press briefing, Crowne Plaza Hotel, Berlin, Germany, 1 June 2000, n.p., on-line, Internet, 15 June 2000, available from http://usinfo.state.gov/topical/pol/arms/stories/000611206.htm; and William S. Cohen, secretary of defense, news briefing, Sydow at the Haga Palace, Stockholm, Sweden, 12 June 2000, n.p., on-line, Internet, 15 June 2000, available from http://usinfo.state.gov/topical/pol/arms/stories/00060108.htm.

14. NIC, "Foreign Missile Developments and the Ballistic Missile Threat to the United States through 2015," September 1999, n.p., on-line, Internet, 19 June 2000, available from http://www.cia.gov/cia/publications/nie/nie99msl.html.

15. Libya was identified earlier as a country of concern; however, it is excluded from the discussion because it is unlikely it will present a missile threat to the United States since "it has made little progress acquiring or developing long-range missiles." See Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, D.C.: Government Printing Office, November 1997), 34.

16. International Institute for Strategic Studies, *The Military Balance, 1999–2000* (London: International Institute for Strategic Studies, 1999), 186 and 310.

17. NIC., "Foreign Missile Developments."

18. Comment by Sha Zukang, "China Warns against Amending ABM Treaty," *USA Today*, 7 June 2000.

19. Department of Defense (DOD), fact sheet, *National Missile Defense Program* (Washington, D.C.: Ballistic Missile Defense Organization, External Affairs, n.d.), 1.

20. Robert D. Walpole, "The Ballistic Missile Threat to the United States," statement, Senate Subcommittee on International Security, Proliferation, and Federal Services, Washington, D.C., 9 February 2000, n.p., on-line, Internet, 19 June 2000, available from http://www.cia.gov/cia/publicaffairs/speeches/nio speech-20900.html.

21. NIC, "Foreign Missile Developments."

22. Ibid.

23. Ibid.

24. Ibid.

25. Walpole.

26. NIC, "Foreign Missile Developments"; and Walpole.

27. Walpole.

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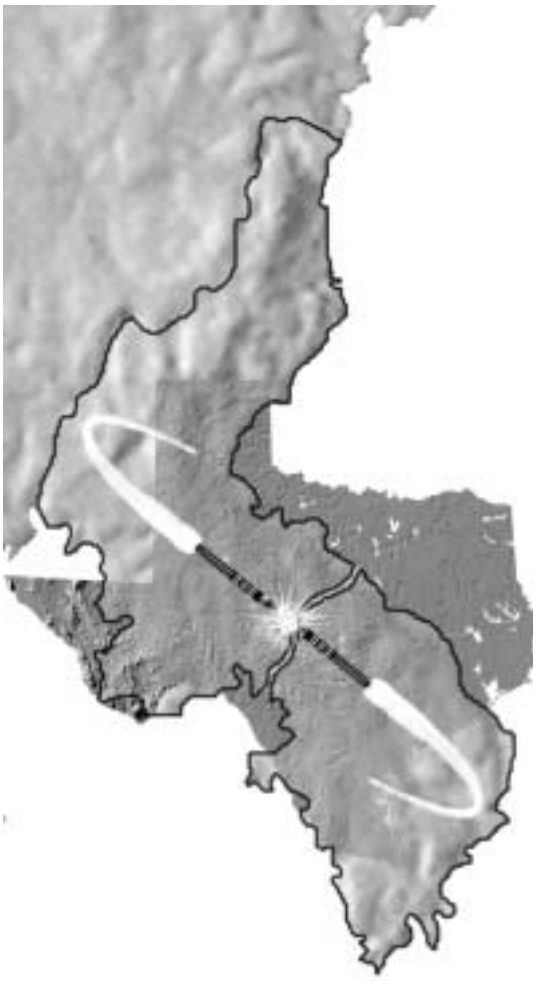
Organizing for Success
Theater Missile Defense in Korea

COL Dale C. Eikmeier, USA

Editorial Abstract: To meet rising threats from ballistic missiles, Combined Forces Command and US Forces Korea created a theater-level missile defense command that serves as an excellent model for other theaters. The Combined and Joint Theater Missile Operations Cell fuses several theater missile defense elements into one joint organization, providing significant war-fighting abilities without additional force structure.

COMBINED FORCES COMMAND, Korea (CFC) and US Forces Korea (USFK) recently completed a theater missile defense (TMD) reorganization initiative that is proving to be an innovative solution to a serious war-fighting challenge. The initiative grew from a problem shared by many of the geographical commanders in chief (CINC) and may prove to be a model for other theater-level organizations. Prior to this initiative, missile-defense responsibilities in Korea were spread between several component staffs and service-specific organizations. This situation produced confusion, lacked unity of effort, and contributed to needless friction and inefficiency. Additionally, these organizations lacked the proper structure and resources for the execution of TMD.

Recognizing this problem, USFK approached it from the view that TMD is inherently a combined and joint mission area. It then created a new organization, the combined and joint theater-missile operations cell (CJTMOC) reflecting the combined and joint nature of the mission. The CJTMOC combines elements of the Joint and Combined Staff, air component staff, and the US-based 32d Army Air and Missile Defense Command (32d AAMDC). It pulls together the various TMD players into one combined and joint organization capable of planning, integrating,



and executing TMD operations at the theater level.

Cause for Concern

What caused USFK to look back at its organization and doctrine? CFC faced a serious war-fighting dilemma that, if left unresolved, could jeopardize its mission. It faced a growing theater ballistic-missile threat (possibly equipped with weapons of mass destruction) without a theater-level missile-defense command to counter the threat. Although all of the services have some TMD capability, no single service can provide a war-fighting CINC with an organization capable of producing integrated missile-defense plans. The only active organization with this capability is the 32d AAMDC, located at Fort Bliss, Texas.[1] Unfortunately, the 32d AAMDC is available to a CINC only during actual crises and major exercises.

So what options were available to the command? The best option was to create during peacetime a distributed TMD organization that merged elements of the in-theater staffs with the 32d AAMDC. Although units from Korea and Texas are geographically separated, the new organization would function as a theater-focused organization.

This option had several advantages. For example, merging in-theater staffs with the 32d AAMDC combines theater and missile expertise, producing a theater-level organization more capable of integrating all of the services' missile-defense capabilities into one coherent operation. This also allows 32d AAMDC a greater voice during peacetime in the development of the TMD concepts and plans used during war. Together these factors should produce better plans, faster and smoother transition during crises, and better integration of missile defense operations, directly improving joint war fighting in Korea.

Creating the New Organization

Creating the organization required three components: a distributed structure, defined lines of authority, and requisite communications connectivity. CFC created the structure of the organization by using a distributed organizational structure, merging in-theater missile-defense staff sections with elements of 32d AAMDC and providing the coordinating authority needed to function. The use of modern communications enabled the organization to function as one, regardless of the geographical separation. The result was a split-based organization capable of meeting CINC requirements, without added force-structure costs.

CFC is currently testing the CJTMOC concept. The CJTMOC, working for the air component commander (ACC), merges elements of 32d AAMDC, Combined and Joint Staffs, and the air component staff into one joint team. The team is equipped and staffed for planning and execution of joint and combined missile-defense operations at the theater level.[2] During peacetime (armistice in Korea) the cell is a split organization, based in both the United States and Korea.[3] In a contingency with the deployment of the 32d AAMDC to Korea, the units would physically merge into one command.

The CFC's intent is to better use available resources to produce a synergistic organization supporting a seamless transition from peace to war. This concept involves more than the exchanging of liaison officers or establishing a "reach back" (the ability to directly access remotely located data and resources without having to go through other organizations first) capability. It represents a new way of organizing separate staffs into a specific, mission-focused organization and, if successful, will serve as a model for other theaters facing similar challenges.

Understanding the Differences: Before and After

To understand how the new organization improved TMD, we must review how the previous organizations operated. Prior to February 2000, there were three different and competing staff organizations that could claim

prepotency of TMD in Korea.[4] While all contained some expertise in TMD, each one lacked both a combined and joint in-theater perspective. Additionally, because each organization claimed prepotency, theater integration was usually not achieved at desired levels.

The first organization was the Air and Missile Defense Division, part of the Combined and Joint Staff. The division consisted of one US Army air-defense colonel, a Republic of Korea (ROK) air force officer, and a ROK army air-defense officer, all supported by "borrowed" air-defense personnel from the US Eighth Army.[5] Although combined, the staff was not joint, lacking expertise in anything other than ground-based air-defense operations.

The air-component staff was the second organization involved in past operations. As the area air-defense commander (AADC), the ACC was responsible for TMD and required a missile defense staff for assistance.[6] Therefore, the commander created his own TMD coordination cell, an "ad hoc," minimally manned organization staffed by US Seventh Air Force personnel and a ROK air force liaison officer. The result was a predominately US Air Force cell focused on airpower attack operations and the passage of ballistic missile early warnings.[7]

This structure produced an odd relationship between the Combined Staff, the Joint Staff, and air-component missile-defense staff. Rather than focusing on theater-level and component-level issues, they focused on different elements of TMD.[8] The Combined and Joint Staffs wrote active defense policy, plans, and procedures while the air-component staff wrote attack-operations policy, plans, and procedures. This separation blurred the areas of responsibility between the combined and joint headquarters and component headquarters, contributing to a lack of integration in missile-defense plans and procedures.

The third organization with missile-defense responsibility was 32d AAMDC, which has worldwide theater air- and missile-defense responsibilities.[9] Although it lacks joint representation, it is organized and equipped for theater-level planning and coordination of all missile-defense activities, including attack operations, active defense, and passive defense. Unfortunately, the 32d AAMDC is not in a position to participate in Korea's day-to-day TMD. As a result, the two in-theater cells developed missile-defense plans and operating procedures without much input from the 32d AAMDC. This lack of coordination meant that, in a contingency, the 32d AAMDC was expected to coordinate and execute operations that it had little voice in developing. During exercises, this situation contributed to needless confusion and produced more than a fair amount of friction.[10]

According to current joint doctrine, TMD is clearly a joint mission area.[11] Unfortunately, all three organizations are service solutions to a joint-mission problem. Despite doing their best to "think jointly" they were service specific in their areas of expertise and perspective. Lt Gen Charles H. Heflebower, combined air component commander (CACC), realized that coupling the in-theater experience of the air component, Combined, and Joint Staffs with the expertise and robustness of 32d AAMDC, would produce a joint and combined organization ideally suited for executing the TMD mission. Such an organization would be capable of pulling together the separate missile defense plans into a synergistic TMD plan.

The Reorganization Process

In November 1999, to exploit the potential strength of such an organization, General Heflebower directed a TMD reorganization.[12] He had a simple premise: organizations should train and organize as they would fight. He wanted to use the strengths of each organization to balance the others' weaknesses. His intent was to gain efficiency and unity of effort by merging parts of the three competing organizations into one planning cell—under the leadership of one commander. His guidance was to create and train a combined and joint theater missile-operations organization that integrated, located, and aligned mis-

sile-defense expertise and functions under the CACC. Lastly, it should be organized the same in armistice as in war, facilitating a seamless transition.[13]

The CACC's role as the theater's AADC provided the doctrinal foundation for the creation of the CJTMOC. To assist him, the commanding general of 32d AAMDC was designated the "theater air-defense advisor for TMD" (US joint doctrine uses the term *deputy area air defense commander*. The two terms are synonymous.). Since the commander of 32d AAMDC, as the theater air-defense advisor for TMD, is responsible for executing a combined as well as a joint mission, he logically required a combined and joint staff to assist him. The need for this staff resulted in the creation of the CJTMOC working group.

In December 1999, a working group met and designed the CJTMOC, thus meeting General Heflebower's intent. The working group's first step was to redefine the functions and responsibilities of the existing staffs and the new organization. This step was necessary because the different commands established the three existing staffs independently and never reviewed their functions in total. This caused confusion and needless friction during combat exercises. The working group decided that the Combined and Joint Staff's Air and Missile Defense Division would be responsible for developing theater policy and guidance. The new organization, CJTMOC, would be responsible for theater-level planning and execution. After defining areas of responsibility, the working group addressed the critical step of manning and budgeting for the new organization.

The group took the existing operations and intelligence sections of AAMDC and combined them with the existing air component's TMD coordination cell, forming the base of the new organization. The group added positions for ROK air force officers, increasing the Korean military's contributions to TMD—particularly in attack operations and passive defense. Because the CJTMOC picked up additional planning requirements from the Joint Staff, three newly approved joint positions were moved to the cell, providing the planning nucleus. The incumbents in these positions included a US Navy surface-warfare officer with Aegis experience, a US Army officer with Patriot experience, and an USAF space-operations officer. These positions, along with the ROK air force positions, made the in-theater portion of the cell truly joint and combined (fig. 1).

The concept design allows the in-theater portion of the cell to work day-to-day, Korean-specific, missile-defense issues, sharing information and ideas with AAMDC and collaboratively producing plans and procedures. The commander of 32d AAMDC, as chief of CJTMOC, provides guidance and approves products for forwarding to the CACC for approval.

The CJTMOC has two main divisions: operations and intelligence. The operations division, responsible for current operations and future planning, is made up of five sections. The first four sections represent each of the pillars of TMD: active defense; attack operations; passive defense; and command, control, communications, and computers. The fifth section contains liaison teams from the 32d AAMDC that are sent to the various component headquarters in wartime to assist in plan execution. The intelligence division's plans and operations section focuses on intelligence preparation of the battlefield, targeting intelligence to support active defense, and attack operations.[14]

Army Heavy, Yet Joint?

The organization is Army-heavy—a strength, not a weakness. Continuous operation in wartime requires the robustness that the 32d AAMDC provides. The Army portion comprises not only air-defense artillerymen, but also Army aviation, special operations, chemical weapons, field artillery, and intelligence personnel.[15] The organization has a solid mix of joint personnel: Korean air defenders, and pilots; a US Navy surface-warfare officer; and USAF pilots, space operators, communicators, and intelligence personnel. This mix makes the CJTMOC a well-structured organi-

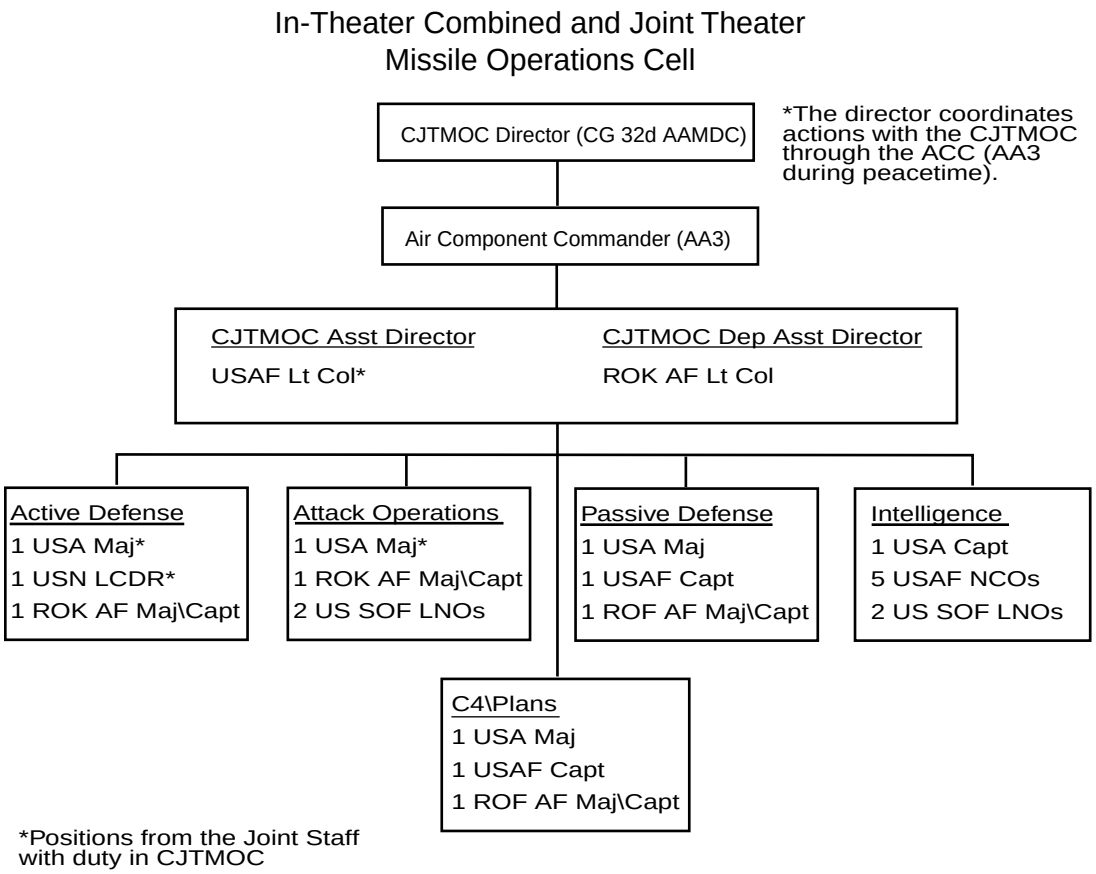


Figure 1. In-Theater Combined and Joint Theater Missile Operations Cell

zation capable of joint and combined theater-level missile-defense operations, planning, and execution. One must remember TMD is more than air defenders shooting Patriot missiles; the additional non-air-defense specialties bring the unique skills required for combined and joint TMD.

Dual Requirements of CJTMOC

Two requirements were needed for the CJTMOC to function during armistice and allow a seamless transition in war: staff authority and communication technology. During armistice the CJTMOC operates in a split-based mode, with the 32d AAMDC's portion in Texas, while the ACC's portion is at Osan Air Base, Korea, both connected electronically. However, the two portions actually belong to different commands, the 32d AAMDC belonging to US Army Forces Command and the Osan cell to ACC. For the organization to work as one, the commander of the 32d AAMDC, as chief of the CJTMOC, required the authority to directly consult and coordinate TMD issues with the CACC staff. The CFC and ACC gave this authority by approving "direct liaison authorized" for deliberate planning.[16] This authority allows the cell's armistice split-based elements to staff and coordinate the development of plans and pro-

cedures as if they were one organization. However, it is a cell with a specific and defined purpose: deliberate planning of TMD operations. The authority does not give either commander the ability during armistice to command, task, or compel agreement. Additionally, the parent units of personnel making up the cell retain administrative control over their personnel (fig. 2).[17]

The second requirement was communications. Existing phone and computer systems provided the ability to work together using video teleconferencing, net meetings, classified/unclassified E-mails, and voice systems. The sharing of ideas, information, and draft plans now occurs on virtually a daily basis, despite differing time zones. Communication between the US and Korean cells is fostering a "one team concept," breaking down archaic organizational barriers that once supported a "we versus them" attitude.

There are several positive aspects of this new organization. The theater CINC, as well as the ACC, now has a single point of responsibility for TMD operations. The commander of the 32d AAMDC as the theater air defense advisor for TMD (deputy area air-defense commander), now has a combined and joint

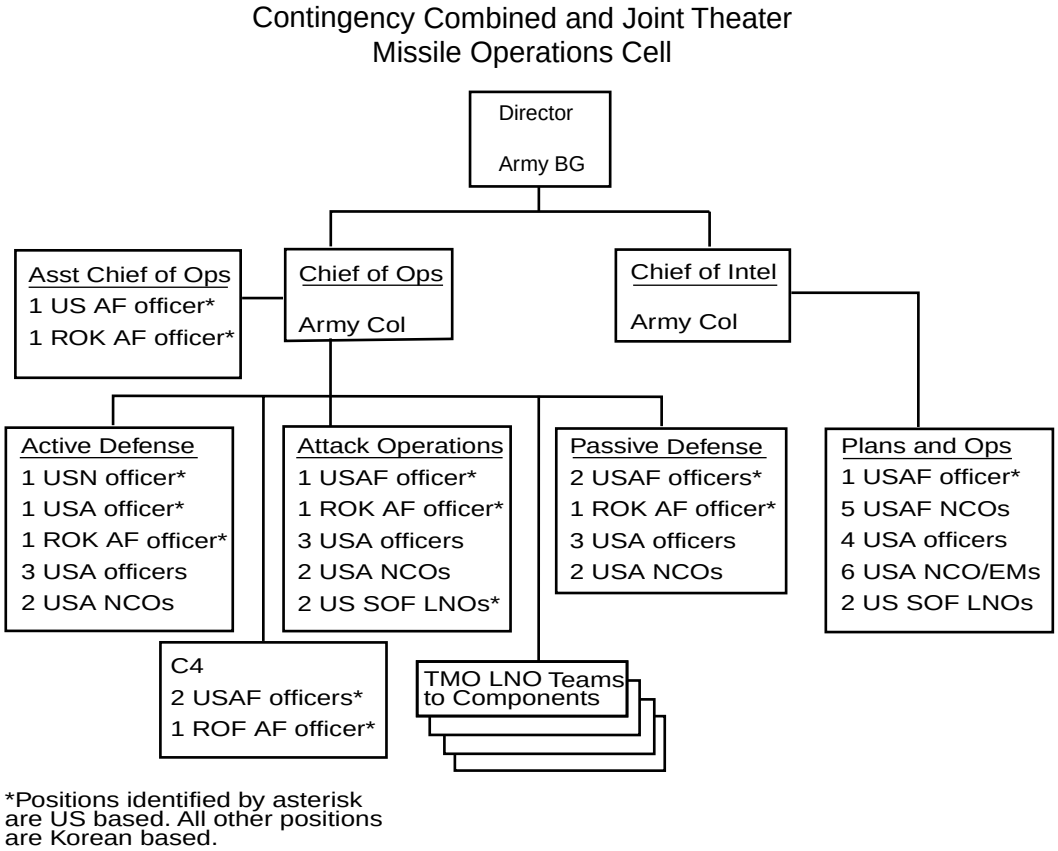


Figure 2. Contingency Combine and Joint Theater Missile Operations Cell

staff with day-to-day in-country experience to assist him/her. The CJTMOC also gives the commander of the 32d AAMDC a larger voice in the development of plans and procedures that he/she is expected to execute in war. Additionally, the in-theater cell has the facilities and most of the communications, intelligence architecture, and equipment in place ready for the commander and staff of the 32d AAMDC. All of this facilitates a seamless wartime transition, requiring only a physical move to Korea. CFC expects these positive aspects to replace inefficiency and friction with synergy, thus improving overall theater-level air and missile-defense planning, execution, and war fighting.

Unproven Concept Concerns

As with any unproven concept, CJTMOC does have its critics. One area of concern is the increased workload this may place on the 32d AAMDC. The fact is the 32d AAMDC already has worldwide mission responsibility, and this initiative does not add to those responsibilities. What it does provide is an improved structure that should make executing those responsibilities easier. Will the 32d AAMDC be able to participate in planning for Korea, given its other responsibilities? We believe so—we also believe that the investment in the planning of the Korea mission will pay huge dividends in the event of war. Regardless, this is an experiment, and the workload will be tested and adjusted as lessons are learned. However, the burden on the 32d AAMDC should be manageable because the in-theater staff's functions and personnel have been redistributed, enabling them to shoulder more of the burden.

Another concern is what might happen in a contingency if the 32d AAMDC is already committed to another theater. The answer is simply that the command initially fights the best it can without the 32d AAMDC. Given the current force structure, this lack of a second quickly deployable AAMDC is a real concern, emphasizing the need for in-theater CJTMOC-like organizations to fill the gap. In war with or without the 32d AAMDC, the CJTMOC will have produced sound integrated missile-defense plans and procedures in collaboration with the best subject-matter experts available, resulting in improved theater war-fighting capability. If another AAMDC is activated (the Army National Guard is organizing an AAMDC) and deployed, Korea will have the plans and procedures on hand. If there is no missile-defense command, the in-theater cells will work harder, but they will have a sound product to work with. Either way, CJTMOC is better prepared

Insights for Positive Improvement on Joint Doctrine

The CJTMOC has great potential to provide insights for improving joint doctrine. Although many people assume that the operations directorate of a joint staff (J-3) has the lead in TMD, joint doctrine actually takes a "committee" approach to TMD. Joint Publication 3-01.5, *Doctrine for Joint Theater Missile Defense* states that "the J-2, J-3, J-4, and J-6 are the primary staff elements responsible for JTMD [joint theater missile defense] operations at the joint force level."[18] Each of these staff sections certainly has a role in missile defense, but can four different staff sections actually share primary responsibility? Many will argue that J-3 has "primary responsibility" and that the other staff sections only provide support. However, joint doctrine further confuses the responsibility issue by saying that the JFC normally assigns overall missile-defense responsibility to the AADC.[19] Does this mean that parts of the Joint Staff or J-3 work for the AADC? Probably not—the CJTMOC avoids these issues and offers a better, simpler way by providing the AADC (who has been given the responsibility by the JFC) with a staff capable of assisting him/her in that responsibility, along with relieving the joint force staff from detailed missile-defense planning requirements.

CFC is testing CJTMOC in exercises and continues to study, change, and refine its role. No one is claiming that this organization

is "the way" to organize for TMD, but it is certainly "a way" that may provide useful insights. The missile-defense cell may also provide insights into other joint and service doctrinal questions. For example, does the joint TMD area require a "functional component command" similar to special operations commands? Should the 32d AAMDC be a jointly manned organization? Is the AAMDC best utilized by working for the JFC, the ACC, or the land component commander?

Conclusion

By reorganizing and using communications technology, CFC solved the dilemma of not having its own theater-level air- and missile-defense command. As a result, the CINC now has a "train as you fight" organization, designed and resourced to coordinate and execute joint and combined TMD.

Is this organization a model for other theaters? The strategy of employing a small, forward military presence that relies on US-based reinforcements suggests the answer is yes. Given the resource-constrained environment, the CJTMOC concept may be a way to provide critical war-fighting capabilities without adding force structure. The concept of merging small, in-theater assets with more robust, US-based assets via electronic means during armistice and war is certainly worth exploring. □

Notes

1. *FY 00 Air and Missile Defense Master Plan*, USAADASCH (Fort Bliss, Tex.: US Army Air Defense Artillery School, 1999), 9-5.
2. Executive Summary of meeting conducted at Yongsan Korea, 27 December 1999, between Lt Gen Charles Heflebower, commander 7th AF and Col Dale C. Eikmeier chief, CFC/USFK, CJ3 Air and Missile Defense Division, subject: Korean Theater Missile Operations Restructuring Initiative, USFK, Korea, 3 January 2000.
3. A peace treaty in Korea has not been signed; therefore, a state of war exists under armistice conditions.
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5. Eighth Army (TAADS-R), *Document, P8W5GMAA*, US Army Garrison, Yongsan Korea, 15 September 1998.
6. Joint Publication (Joint Pub) 3-01.5, *Doctrine for Joint Theater Missile Defense*, 19 October 1999.
7. Unpublished working papers and author's notes.
8. Joint Pub 3-01.5, I-3. Joint TMD is made up of four elements: CI, active defense, passive defense, and attack operations.
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10. Author's observations as CJ3 CFC/USFK, during exercise Ulchi Focus Lens 99.
11. Joint Pub 3-01.5, I-1.
12. Lt Gen Charles H. Heflebower, CACC, discussion with author, Osan AB, Korea, 15 November 1999.
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15. TOE no. 44601A00.
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18. Joint Pub 3-01.5, II-2.
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Out of Balance
Will Conventional ICBMs Destroy Deterrence?

DR. ROBERT L. BUTTERWORTH

Editorial Abstract: In light of the dissolution of the Soviet Union and the end of the Cold War, some scholars argue that the use of extended-range weapons does not provide deterrence and invites unnecessary risks. In this article, Dr. Butterworth contends that deploying only a small number of ICBMs will not erode US deterrence and that proposing a nonnuclear alternative of conventional ICBMs might boost, rather than erode, Russian confidence that a US nuclear strike is highly unlikely.

IT WOULD BE particularly reckless, according to some views, for the United States to use intercontinental ballistic missiles (ICBM) in new ways—to boost a space-operations, space-maneuver, or common aero vehicle or an advanced conventional penetrator for strikes against time-urgent, high-value, or deeply buried targets worldwide.[1] These missiles would not be carrying nuclear warheads, and they would be based far away from ICBM fields (perhaps four missiles in Florida and four in California), distant from nuclear-storage facilities, unhardened, and open to continual surveillance as well as many transparency measures. The fear is that using them would trigger a Russian nuclear strike.

"The systems built to control Russian nuclear weapons are now crumbling,"[2] Russian nuclear weapons are now on an unstable hair trigger, and Russia has been losing the "ability to distinguish reliably between natural phenomena or peaceful ventures into space and a true missile attack."[3]

In other words, US deterrence cannot be very strong because Russia is very weak.[4] But is influence really an inverse of power? Would US deterrence be eroded by launching a few conventional ICBMs against a non-Russian target? Would it evaporate if Russia mistakenly believed the target was *not* non-Russian? Only a dozen years ago, the answers across the board were negative. A special White House commission, in fact, was calling on the Pentagon to develop very-long-range, highly accurate, "smart" conventional weapons. The commission membership included Gen Andrew J. Goodpaster, Gen Bernard A. Schriever, Gen John W. Vessey Jr., Dr. Henry Kissinger, Dr. Zbigniew Brzezinski, Dr. Joshua Lederberg, and Adm James L. Holloway III. They found that "current technology makes it possible to attack fixed targets at any range with accuracies within one to three meters. These accuracies and modern munitions give us a high probability of destroying a wide variety of point and area targets with one or a few shots without using nuclear warheads."[5] They concluded that such a capability "can make a major contribution to halting Soviet attacks anywhere on the perimeter of the USSR."[6]

The contrast appears stark. During the Cold War, the United States could expect to use extended-range weapons to kill Soviet troops on their own borders, and those weapons were expected to strengthen deterrence. But today, after the Cold War and the Soviet Union have both disappeared, it is asserted that using such weapons against a terrorist headquarters in Afghanistan would risk Armageddon. Formerly, relative weakness caused worries about US deterrence; today, it is relative strength.

But the contrast is not in fact real. The apparent paradox of strength and weakness is not the unfolding of military history but an artifact of incomplete analysis. The inferences urged by the alarmist views of Russian affairs are based on overly simplified notions of deterrence and ignore the very different traditions of Russian military assessments.[7] Moreover, Russia and the United States have been working jointly for years to reduce the possibility and scope of system errors, as well as paint a record of cooperation against which allegations of fatal enmity sound increasingly loony. If the United States wants to field a handful of unprotected ICBMs with conventional warheads, Russian leaders may see a chance to bargain for dollars, but they will not see a mortal threat.

The Fog of Deterrence

In the simple, abstract models of deterrence made popular in academic writing 40 years ago,[8] ambiguity courted disaster. Effective deterrence required a clear message from one side to the other about the retaliation that certain actions would bring. The goal was to leave no doubt about the nature of the threatened punishment, the circumstances that would trigger it, or the capability to inflict it.

Those simple models were intellectual toys, devoid of historical relevance. In practice, deterrence was never so clear.[9] Instead of the models' "actors," former undersecretary of defense Fred Ikle reminds us that there are governments and military organizations as well as bureaucratic and political complexes run "by people who are ignorant of many facts, people who can be gripped by anger or fear, people who make mistakes—sometimes dreadful mistakes."[10] Instead of the models' "messages," there are force postures—complex amalgams of policy, doctrine, and forces—that must serve many goals and address many contingencies, including notably both deterrence and what to do if deterrence fails.[11] It also embodies a mixture of declaratory policy, employment doctrine, and acquisition programs, each of which is at least chronologically out of step with the others.

As former Arms Control and Disarmament Agency official Janne Nolan observes, "Generalities about deterrence hide the continuing probability of being compelled to rely on forces dedicated to warfighting in the event of the failure of deterrence."[12]

Nolan's statement itself masks a mountain of unavoidable operational ambiguity. Consider, for example, a planning scenario described by George Seiler:

> A target-rich, weapon-poor situation in which the weapons are not survivable or executable due to C^3 [command, control, and communications] considerations after riding out a Soviet attack. In such a scenario, it becomes difficult to decide where to place the allocation emphasis [for targeting residual US forces]—nuclear forces, conventional forces, leadership, or the industrial and economic base. Also, if the goal of escalation control is considered, rules of allocation would shift the least survivable forces to the target set with the highest probability of execution which still limits escalation, possibly resulting in a weapon-target mismatch.[13]

Deterrence issues in practice, unlike the modelers' artifice, are inherently speculative; assessments of cause and effect depend centrally on counterfactual inferences and so invite *"post hoc, ergo propter hoc"* fallacies. Like civil-court proceedings, assessments must be based on reasonableness, probabilities, and the preponderance of evidence. As a result, Nolan observes, "It is difficult to state categorically what is effective deterrence and what is not."[14] But it is not difficult to distrust sweeping conclusions that are based on one or two factors. Conventionally armed ICBMs may present some ambiguity to Russian analysts, but it will be small compared to what they and their predecessors have been confronting and reducing for half a century.

The Soviet Legacy

James Schlesinger explained deterrence quite directly when he was secretary of defense: "The purpose of all U.S. strategic forces, indeed the entire U.S. military establishment, after all, is to influence calculations by the Soviet Union in such a way that there is always a commanding voice in the Kremlin saying 'Not today, Comrade.'"[15] Today, Russian calculations determine whether US deterrence succeeds or fails, but the analytic approach—like the nuclear forces themselves—is a legacy from Soviet days.

Soviet rhetoric about deterrence generally shifted over time with changes in the correlation of forces. During the Khrushchev years, the Soviet posture was relatively weak, and the threats bombastic and unrestrained. Later, once larger and more survivable forces had been fielded, Soviet rhetoric became much less inflammatory.[16]

Unlike the declaratory rhetoric, the fundamental analytic approach seemed quite stable—and quite different from US approaches. Soviet analysts paid particular attention to operational considerations within a total scenario assessment[17] and were "unaccustomed to thinking about weapons and technological competition outside the full operational context in which they would be used."[18] Forces would be used for different purposes in different circumstances. As Stephen Meyer notes, it was, therefore, pointless to argue whether Soviet programs were aimed at building disarming capabilities, carrying out preemptive strikes, retaliating by launching on warning, or ensuring assured destruction.[19]

Nor did Soviet analysts share the US concern with a surprise bolt out of the blue (BOOB) attack. Once again, they looked instead to the strategic setting. "Surprise attack, in the Soviet historical experience, does not arise in a political vacuum but in an identifiable political-military context."[20] Moreover, nuclear strikes would not end the war: "[Soviet] doctrine stresses the reconstitution of remaining forces and the continuation of the offensive where possible, despite heavy losses and widespread devastation."[21]

Overall, traditional Soviet assessments would have found little threat in American proposals to deploy a handful of conventionally armed, unprotected, treaty-constrained ICBMs on the Florida and California coasts.[22] The missiles would be too few, too weak, and

too vulnerable to influence the strategic balance. Like many weapons, they could be launched without warning against Russian targets, but Soviet analysts would not see a BOOB attack as a serious possibility in light of history, the correlation of forces, and the prevailing tenor of interactions.

The Context Today

But is the Soviet approach still relevant? Russian assessments today are made by people trained in Soviet methods but facing dramatically changed circumstances.[23] When the USSR collapsed, its military was already in the midst of "ongoing restructuring plans, crisis in the ranks, declining respect for the armed forces, republic challenges to the military draft evasion, declining quality and morale of conscripts, demoralized officer corps, and military reform."[24] Ten years later, both the Soviet empire and its successor (the Commonwealth of Independent States) have dissolved; part of the former empire is at war with Russia; parts of the former bloc are members of the North Atlantic Treaty Organization (NATO); and Soviet-style communist governments have disappeared everywhere except North Korea and Cuba. Internally, economic relations, political authority, and military systems have all crumbled. To the inefficiencies of Soviet organizations have been added pervasive corruption, rotting institutions, and aberrant leadership. Bruce Blair lists several problems affecting the nuclear forces: "coups, rebellions, secession, severe civil-military tensions, huge cuts in defense spending, dire working and living conditions even for elite nuclear units, operational atrophy and declining proficiency in matters of operational safety, widespread corruption, and pervasive demoralization."[25]

Such powerful pressures lead some Western observers to expect to see sharp inversions in post–Soviet Russia's strategic behavior. Some observers believe that "the 'nuclear threshold' is being lowered" because "Russia will lack strategic options between low-intensity operations and full nuclear response."[26] Others worry that the United States might face several thresholds, corresponding to separate nuclear warlords. Blair raises "the specter of nuclear anarchy in the former Soviet Union,"[27] and Daniel Goure believes that regional political leaders might form alliances with military forces in their territories, "and you wind up with a kind of Chinese warlord situation. . . . There's a real chance the center will not hold."[28]

In view of these changes, will Russia continue to analyze military affairs using approaches developed during the Soviet years? Perhaps not; eventually, as the influence of the Bolshevik "super rationality" approach to analysis fades, military assessments might become different in method as well as circumstance. Or perhaps the legacy approach will be jettisoned by a new ideology. Certainly, the prevailing military mood and outlook seem darker. To traditional conservatism have been added feelings of weakness, hopelessness, shock at the loss of the Soviet empire, and helplessness in the face of world events beyond Russian influence. Such discontents can nurture extremist, perhaps ultranationalist, policies.

Change Is Not Imminent

But that day has not yet come. Russian behavior to date reveals no change in approach to reaching assessments, and official statements on current doctrine and strategy are consistent with traditional Soviet methods applied in current circumstances. How to configure its strategic nuclear forces has been an acutely important debate within Russia's military.[29] According to the 1997 "National Security Concept of the Russian Federation,"

> Russia does not strive for parity in the armaments and armed forces with the major states of the world and seeks to implement a principle of realistic deterrence based on determination to make an adequate use of the available military might for preventing aggression; . . . the main task of the Armed Forces of the Russian Federation is to ensure nuclear deterrence, which is to prevent both a nuclear and conventional large-scale or regional war; [and] to accomplish

> this task the Russian Federation should have a potential of nuclear forces which can guarantee that planned damage will be caused to any aggressor state or a coalition of states.[30]

One Russian analyst observed that "there is no real alternative to nuclear deterrence, and all the indications are that President [Vladimir] Putin will continue the former nuclear policy."[31] Russia also approved a new military doctrine on 21 April 2000. It reflects the belief that there has been "a decline in the threat of large-scale war, including nuclear war."[32]

As described by Nikolai Sokov, "No longer are nuclear weapons reserved solely for extreme situations; now they can be used in a small-scale war that does not necessarily threaten Russia's existence."

Current Russian policy explicitly reverses earlier Russian and Soviet promises not to be the first to use nuclear weapons in war, but American leaders consider this change unimportant. "The Russian Federation reserves the right to use nuclear weapons in response to the use of nuclear and other types of weapons of mass destruction against it and (or) its allies, as well as in response to large-scale aggression using conventional weapons in situations critical to the national security of the Russian Federation."[33] Western analysts believe that "the rationale behind the change is that Russia's conventional forces, which continue to deteriorate, would be no match for that of most potential adversaries."[34] This modified posture is the Russian confirmation of what US officials believed for some time. "The old Russian doctrine . . . about no first-use of nuclear weapons was nothing that we took particularly seriously. . . . The current doctrine . . . says that Russia reserves the right to use nuclear weapons first in extremis. . . . That has a certain similarity to . . . American policy since 1962 and NATO policy since 1967."[35] In the view of Mary FitzGerald, "the new stance stems logically from [Russia's] loss of quantitative superiority in conventional arms, from the proliferation of nuclear weapons, and especially from [Russia's] ongoing lag in the [revolution in military affairs]—especially as epitomized by Desert Storm."[36]

Russian statements and exercises in recent years reflect worries about weakness in conventional forces and suggest that that defense against an invasion might not be possible without using nuclear weapons.[37] "Deputy Director of the Russian Strategic Analysis Centre Konstantin Makiyenko considers it quite logical that Russia should allow itself to use nuclear weapons, even in response to a nonnuclear attack."[38] Editorial writers in the United States saw here "an alarming shift in planning," wherein Russian leaders now felt "obliged to rely on nuclear weapons to defend their frontiers against even a nonnuclear attack."[39] The most recent Russian "National Security Concept," published on 14 January 2000, appeared to widen the range of circumstances under which Russia might employ nuclear weapons. As described by Nikolai Sokov, "No longer are nuclear weapons reserved solely for extreme situations; now they can be used in a small-scale war that does not necessarily threaten Russia's existence."[40]

But Soviet authorities might have used nuclear weapons under similar circumstances 15 years ago, depending on their calculations of force balances and perceptions of Western intentions. According to an American defense official, "We always believed that Russian doctrine allowed for the early first-use of nuclear weapons. And as I recall, some of the documents that were found by the Germans after the Russian forces departed East Germany seemed to indicate quite strongly that the war plans called for early nuclear strikes."[41] Possession of conventional options per se (or the lack of them) says nothing about preferences for or likelihood of nuclear use. In fact, according to Alexei Arbatov, in Russian strategic nuclear thinking,

"nuclear weapons employment strategy . . . is not seen as closely related to force levels, structure, posture, and systems characteristics. . . . Any declaration on the need to compensate Russian conventional weakness with nuclear strength is predominantly a general political argument, not a reflection of a consistent strategic analysis, assessment of contingencies, or planning of defense policy options."[42] There is a domestic audience for these events too, as contending views of military reform compete for money and power.[43] As one Western analyst concluded recently, "A new military doctrine . . . will provide only more declaratory statements and more military guidelines [and] . . . cannot be fully implemented financially, given current defense spending."[44]

Nor have worries about funding, threats, and decay derailed the rigorous strategic focus that characterized Soviet assessments. Press accounts of the recent "security concept" also reported that the deputy chief of the Russian Defense Ministry's general staff said that "the strategy's apparent suspicion of Western intentions should not be blown out of proportion" and that Russia "remained interested in 'mutually beneficial and neighborly cooperation on an equal footing with Western countries.'"[45] In addition, "Mr. Putin, who spent a decade or more watching the West as a K.G.B. agent in East Germany, is said by friends to be well aware that any threat that Europe and the United States pose to Russia is not military, but economic and cultural."[46] The recent security concept itself "stresses that Russia can regain superpower status—its clear aim—only if it pursues capitalism and integrates itself further in the global economy and political system."[47]

Russian actions have also been reassuring. Previously deployed nonstrategic nuclear weapons have been called back to Russia, although efforts to dismantle them have been slow. Strategic arms reductions have continued toward the limits called for by START I. START II was ratified by the Russian Duma on 14 April 2000, which also opened the way for talks on START III to begin.[48] Some weapons modernization has continued, along with work on underground defense facilities, exercises and testing, and discussions with the United States on a range of arms-control measures. Despite some interruptions and friction—saber rattling over NATO enlargement, friction with peacekeeping partners in Kosovo, and delay in arms-control measures—Russia cooperates with NATO in strategic discussions, regional security agreements, and international peacekeeping work. On the whole, Russian words and deeds are consistent so far with an approach to nuclear issues that is not significantly different from Soviet methods.

Some observers believe that the question of Russian assessments has become moot, overtaken by the hazards of system decay. "The nuclear danger of the next decade," according to Graham Allison, "arises less from malicious [national military] intent than from mistakes, incompetence, theft, or loss."[49] Blair agrees that "all the trends pertinent to the functioning of Russia's nuclear command and early warning system are negative, casting strong doubt on its ability to endure the stress and strain indefinitely. Russian nuclear forces are becoming more susceptible to accidental, unauthorized, or mistaken launch."[50] These worries concern both the command and control (C^2) systems, which are reported to need modernization urgently, and the radar and satellite early warning systems, which have substantial gaps in geographic and temporal coverage.[51] "Russia's early-warning system is so decayed that Moscow is unable to detect U.S. intercontinental ballistic missile launches for at least seven hours a day and no longer can spot missiles fired from American submarines at all."[52] Without funds to remedy these failings and to address "Y2K" problems, some Western observers fear that Russian leaders might decide to retaliate, based on uncertain warning, or to decentralize the nuclear-release decision. Central authorities might lose control over nuclear weapons in any case, owing to splintering of authority at the top or to local insubordination.[53]

Such anxieties seem determinedly overblown. After a visit to Russia's Strategic Rocket Forces in October 1997, Gen Eugene Habiger, commander in chief of US Strategic Command, reported that he was impressed that the Russians "have a program which is ensuring the safe, secure processes involved regarding nuclear weapons" and that "the thing that struck me about going into their command centers, command-and-control centers is that they are very much geared to a fail-safe mode. And what I mean by that is that any one of the command centers, from the national level down to the unit level, can inhibit the launch of an intercontinental ballistic missile."[54] The following spring, Habiger testified that he was "confident in the safety, reliability, and security of the strategic command and control elements within Russia. I follow the de-alerting debate with interest and concern. In large part, it appears to be a resolution without a problem."[55] Three months later, after a visit from Russian nuclear security experts and another tour of Russian strategic forces, Habiger again reported that he did not at that time "have any serious concerns [about Russian nuclear weapons programs and security]. I see some things they can improve upon."[56] Press accounts quoted George Robertson, NATO's secretary-general, as saying that the status of Russia's strategic missile system "should not be a matter of mutual concern at the moment."[57] Russia also plans to reduce its strategic nuclear forces over the next few years by retiring some aging ICBMs.[58]

Enduring Efforts to Ensure Stability

Several cooperative programs are further shrinking these risks. The Cooperative Threat Reduction ([Sen. Sam] Nunn-[Sen. Richard] Lugar) Program has provided technical and financial help to Russian nuclear-weapons-management programs for several years. The United States has been particularly interested in finding ways to strengthen mutual confidence in strategic early warning,[59] believing that "Russia's early-warning system is incomplete and does not provide the level of assurance that the United States has demanded from its own system for many years."[60] Russia, like the Soviet Union before it, was never able to monitor all potential avenues of attack all the time. Such a situation would be intolerable to the United States, but such shortcomings appear to be less exigent in Russian assessments. They, like Soviet calculations, appear to give considerable weight to the ongoing tenor of strategic relations when evaluating indicators of possible attack.[61]

Still, improved transparency and cooperation could certainly be welcomed. Assistant Secretary of Defense Edward Warner announced in March 1998 that an interagency working group was "examining a range of measures that the U.S. and Russia might take cooperatively or in parallel to address such concerns."[62] Six months later, President Bill Clinton and President Boris Yeltsin agreed to an initiative on shared early warning.[63]

In early 1999, Russia and the United States agreed to extend this effort to include establishing a special facility near Air Force Space Command (Colorado), where Russian and US launch specialists monitored events during the period of peak concern about Y2K failures (mid-December 1999 through mid-January 2000).[64] Despite serious differences over Kosovo and other issues, the Center for Year 2000 Strategic Stability was established close to Headquarters NORAD, was operated by Russian and American officers, and successfully accomplished its purposes.[65]

Cooperation on early warning continues today. On 4 June 2000, Presidents Clinton and Putin agreed "to a permanent military collaboration [by establishing] a jointly staffed monitoring agency for missile launches."[66] This Joint Data Exchange Center (JDEC) will be housed in Moscow; it was scheduled to start in June 2001 and be in full operation in September.[67] Further measures to improve transparency and mutual confidence were agreed upon in December 2000, when the two countries negotiated a "Memorandum of Understanding on Missile Launch Notifications," which "covers both pre- and post-launch notification and incorporates

legally binding obligations as well as voluntary commitments that substantially exceed those contained in existing agreements."[68] Also under way is another joint early warning project, the Russian-American Observation Satellite (RAMOS). Scientists from both countries "will design, build, launch, and operate two satellites that will provide stereoscopic observations of the earth's atmosphere and ballistic missile launches in short wavelength and mid-to-long wavelength infrared bands. . . . The satellites are scheduled for launch in FY04 with a nominal two-year life expectancy."[69]

Cooperation for reducing nuclear threats now includes a number of activities, some of which are funded from the Nunn-Lugar Cooperative Threat Reduction Program, and others separately or from agency and departmental appropriations. They include funding for International Science and Technology Centers (in Moscow and Kiev); Material Protection, Control, and Accounting Programs; Initiatives for Proliferation Prevention; and several bilateral forums (US-Russian Commission on Economic and Technological Cooperation; Strategic Stability Working Group; and Safeguards, Transparency, and Irreversibility Talks).[70]

In addition, the United States sought to help stabilize Russia's political and economic affairs. Part of the endeavor involved joint efforts to assure secure control of nuclear weapons and related material, together with mutual visibility into each country's assurance programs. On a broader front, "the United States has undertaken extensive efforts, successful in many cases, to build a partnership with Russia across political, economic, and security fields. Russia's agreement with NATO will assist in peacefully integrating it into a broader European security architecture. These arrangements may ultimately alter Russian attitudes towards NATO and western security structures and shape a stable European security environment."[71]

There have been questions within the United States about the effectiveness of some of these activities, and there are also reductions in the budget proposed for them for fiscal year 2002.[72] Although these cuts face opposition,[73] they are not being presented as a departure from earlier US policy goals.

Conclusion

If Russian actions were purely reactive, determined by technical shortcomings and system failures instead of by policy, American deployment of conventional ICBMs would be irrelevant to deterrence. The missiles would neither exacerbate nor assuage existing Russian weaknesses in early warning, C^2, safety assurance, and survivability. Of course, deterrence itself would also be irrelevant. Why try to exercise influence if actions are divorced from policy?

But in fact, policy is still relevant to Russian behavior although its depth and basis are not easily gauged these days. Leadership questions—authorities, stability, and continuity—make it ever harder to determine how assessments are reached and whose views are influential. The demand for money is so great and corruption so extensive that one wonders how much is staged solely to keep American funds coming. A few years ago, as Patrick Garrity notes, Russia seemed particularly determined to play upon "Western fears about the nuclear-related consequences of Russia's political turmoil to gain outside support for Moscow's efforts to hold the federation together and to maintain the semblance of Russian great power status. . . . The Russians act as if this nuclear card will allow them substantially to determine the conditions for Western financial assistance, and otherwise to limit intrusions on Russian sovereignty." There has been less of this recently; indeed, Garrity noted in early 1995 that this "Russian strategy is already starting to wear thin in the United States."[74]

Nevertheless, it is clear from the events of NATO expansion, Balkan peacekeeping, and arms-control negotiations that Russian nuclear operations remain under the control of Russian policy and that the policy reflects traditional, Soviet-style assessments. The leadership,

as FitzGerald notes, seems "well aware of the dangers involved in any resort to nuclear weapons. They seem dedicated, through arms control limitations and other measures to ensure that such weapons are never used."[75]

Perhaps, by providing the United States with a nonnuclear option for prompt response at intercontinental ranges, these weapons would even increase Russian confidence that a nuclear strike by the United States against a target anywhere is most improbable.

Such conservatism fits comfortably within post-Soviet circumstances. Gone are the institutional pressures toward strategic assertiveness—revolutionary ideology, protection of empire, and global competition. Gone are the military prospects for being able to fight, let alone win, a strategic nuclear war. Gone, too, must be any sense of practical military threat from the West. Alarmists, for example, have painted the Russian reaction to the launch of a sounding rocket from Norway in late 1995 as evidence of Moscow's vulnerability to surprise and miscalculation. Yet, Russian and American analysts alike note the operational reliability of the warning procedures and the prudence of Russian authorities.[76] Nor have they been disquieted by the use in combat of US "strategic deterrent" forces. In recent years, the United States has launched "deterrent" weapons against Afghanistan, Sudan, Iraq, and the Balkans. None had nuclear warheads, but many were on trajectories that could have extended into Russian territories.[77] Recent operations in Kosovo included attacks by B-2 bombers from bases in the continental United States. Apparently, US deterrence is still sufficiently strong to withstand nomenclatural deviancy.

On balance, US deployment of a small number of conventionally armed ICBMs would not erode US deterrence. It might provide another opportunity for Russian leaders to bargain for dollars, but Russian military assessments will not be disturbed. In fact, particularly in light of the ease with which conventionally armed ICBMs can be adapted to several transparency measures, it is difficult to construct a plausible scenario in which Russian assessments would find them unsettling. Perhaps, by providing the United States with a nonnuclear option for prompt response at intercontinental ranges, these weapons would even increase Russian confidence that a nuclear strike by the United States against a target anywhere is most improbable. □

Notes

1. Missions for and interest in such applications are shown, for example, in Defense Science Board, "1998 Summer Study Task Force on Joint Operations Superiority in the 21st Century," vol. 1, "Final Report" (Washington, D.C.: Undersecretary of Defense for Acquisition and Technology, October 1998), 30–31 and H1–H7; USAF Scientific Advisory Board, "Report on a Space Roadmap for the 21st Century Aerospace Force," vol. 1, "Summary," SAB-TR-98-01 (Washington, D.C.: Department of the Air Force, November 1998), 26–28; US Space Command, *Long-Term Plan* (Colorado Springs, Colo.: USSPACECOM, 1998), chap. 6 ("Global Engagement") and subchapter on "Force Application," on-line, Internet, 9 May 2001, available from http://www.peterson.af.mil/usspace/LRP/ch06.htm#ForceApplication; and Robert Wall, "USAF Weighs Multi-Role ICBM," *Aviation Week and Space Technology*, 18 October 1999, 34. On deeply buried targets, see Lt Col Eric M. Sepp, *Deeply Buried Facilities: Implications for Military Operations*, Occasional Paper no. 14 (Maxwell AFB, Ala.: Center for Strategy and Technology, Air War College, May 2000).

2. Bruce G. Blair, Harold A. Feiveson, and Frank N. von Hippel, "Taking Nuclear Weapons Off Hair-Trigger Alert," *Scientific American*, November 1997, 76.

3. Ibid., 79.

4. The editor of the *Bulletin of the Atomic Scientists*, for example, writes that "America's decisive lead in the Revolution in Military Affairs Sweepstakes may in the long run promote the proliferation of weapons of mass destruction and encourage Russia to rely ever more heavily on nuclear arms. Deterrence on the cheap." Mike Moore, "Unintended Consequences," *Bulletin of the Atomic Scientists*, January/February 2000, 64.

5. Commission on Integrated Long-Term Strategy, Fred C. Ikle and Albert Wohlstetter, cochairmen, *Discriminate Deterrence: Report of the Commission on Integrated Long-Term Strategy* (Washington, D.C.: The Commission, January 1988), 50.

6. Ibid.

7. The indictment by George and Smoke remains valid today: "The large deterrence literature has grown up with almost

no systematic attention to historical cases of deterrence, to the explanation thereof, or to inductive theory-building therefrom." Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974), 61.

8. For example, see Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Mass.: Harvard University Press, 1960).

9. As George and Smoke note, "The many kinds of situations in which this relationship between actors can occur and the historically changing international system within which such situations arise generate enormous complexity" (11).

10. Fred Charles Ikle, "Nuclear Strategy: Can There Be a Happy Ending?" *Foreign Affairs,* Spring 1985, 810.

11. Herman Kahn, "The Arms Race and Some of Its Hazards," in *Arms Control, Disarmament, and National Security,* ed. Donald G. Brennan (New York: George Braziller, 1961), 90–91.

12. Janne Nolan, "Future Nuclear Doctrine," in *Transforming Nuclear Deterrence,* ed. Hans Binnendijk and James Goodby (Washington, D.C.: National Defense University Press, July 1997), 48.

13. George J. Seiler, *Strategic Nuclear Force Requirements and Issues,* Research Report AU-ARI-82-1, rev. ed. (Maxwell AFB, Ala.: Air University Press, 1983), 27.

14. Nolan, 49.

15. James R. Schlesinger, "The Strategic Environment," *Washington Quarterly* 4, no. 4 (Autumn 1981): 56. Understanding and replicating Soviet calculations, in order to influence them more effectively, was the primary mission of the Office of Net Assessment, which Schlesinger established upon becoming secretary of defense. Andrew Marshall created the office for Schlesinger and has directed its work ever since.

16. "Once the Soviet force-posture began to acquire sizable numbers of hardened ICBMs and submarine-launched missiles . . . [there came] a new emphasis on quiet self-confidence and circumspection . . . [including] a substantial downplaying (though not total abandonment) of the former urgency assigned to preemption, a sharply reduced estimate of the probability of American attack against the Soviet homeland, and a growing willingness to hedge assertions that a central war in Europe would 'inevitably' erupt to the strategic nuclear level with qualified pronouncements that such a war might stand a chance of remaining limited." Benjamin S. Lambeth, "The Sources of Soviet Military Doctrine," in *Comparative Defense Policy,* ed. Frank B. Horton III, Anthony C. Rogerson, and Edward L. Warner III (Baltimore: Johns Hopkins University Press, 1974), 206.

17. The framework of this discussion draws from a lecture delivered by Andrew W. Marshall, director of the Office of Net Assessment in the Department of Defense, to a meeting of the Defense Policy and Program course of George Washington University held at the headquarters of the National Security Agency on 8 November 1984.

18. John G. Hines and George F. Kraus, "Soviet Strategies for Military Competition," *Parameters* 16, no. 3 (Autumn 1986): 28.

19. "Soviet strategic preferences vary both by contingency and by context within a contingency. It would be foolish, therefore, to try to determine a priori and out of context which might be the Soviets' preferred nuclear strategy." Stephen M. Meyer, "Soviet Nuclear Operations," in *Managing Nuclear Operations,* ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington, D.C.: Brookings Institution, 1987), 529.

20. Ibid., 479–80.

21. Department of Defense, *Soviet Military Power, 1985* (Washington, D.C.: Government Printing Office, 1985), 15–18.

22. Frank Oliveri, "Air Force Concept: Launching Non-Nuke Minuteman Missiles from Cape," *Florida Today,* 4 September 1998.

23. See the general survey provided by Amy F. Woolf and Kara Wilson, "Russia's Nuclear Forces: Doctrine and Force Structure Issues," Congressional Research Service (CRS) Report for Congress (Washington, D.C.: Library of Congress, 23 May 1997); and Amy F. Woolf, "Nuclear Weapons in Russia: Safety, Security, and Control Issues," CRS Issue Brief for Congress (Washington, D.C.: Library of Congress, 1 March 1999).

24. Department of Defense, *Soviet Military Power, 1991* (Washington, D.C.: Government Printing Office, 1991), 13.

25. Bruce G. Blair, "Loose Cannon," *The National Interest,* Summer 1998, 87.

26. "Nuclear Weapons First in Russia's Defence Policy," *Strategic Comments* 4, no. 1 (January 1998): 2.

27. Bruce G. Blair, *Global Zero Alert for Nuclear Forces,* Occasional Papers (Washington, D.C.: Brookings Institution, 1995), 14ff.

28. Daniel Goure, quoted in Paul Mann, "Nuclear Risks Mount in Besieged Russia," *Aviation Week and Space Technology,* 7 September 1998, 60.

29. Steve Zaloga, "Russia's Strategic Forces Stumble," *Jane's Intelligence Review* 12, no. 10 (1 October 2000): 12–14.

30. "National Security Concept of the Russian Federation: Endorsed by the Russian Federation President's Decree No. 1300 [dated 17 December 1997]," as printed in *Daily Review,* 9 January 1998, 32ff.

31. "Russian Military Reforms Come Unstuck as Nuclear Deterrence Gains Upper Hand," *BBC Worldwide Monitoring,* 13 January 2000, article translated from *Nezavisimaya Gazeta* [Moscow], 12 January 2000.

32. "Text of Military Doctrine of the Russian Federation," *BBC Worldwide Monitoring,* 25 April 2000, article translated from *Nezavisimaya Gazeta* [Moscow], 22 April 2000.

33. Ibid.

34. Igor Khripunov, "Last Leg of the Triad," *Bulletin of the Atomic Scientists* 56, no. 4 (July/August 2000): 58–64.

35. Senior defense official, background briefing, subject: Visit of Russian Defense Minister Igor Rodionov to the United States, 12 May 1997, on-line, Internet, 9 May 2001, available from http://www.defenselink.mil/news/May1997/x051297_x0512rus.html.

36. House, *Mary C. FitzGerald, Statement to House Armed Services Committee,* 105th Congress, 1st sess., 13 March 1997.

37. Michael R. Gordon, "Maneuvers Show Russian Reliance on Nuclear Arms," *New York Times,* 10 July 1999, 1.

38. "Russian Expert Backs His Country's Nuclear Deterrence Strategy," *BBC Worldwide Monitoring,* 14 January 2000.

39. "Russia's Nuclear Defense," *New York Times,* 19 July 1999, A18.

40. Nikolai Sokov, "Russia's New National Security Concept: The Nuclear Angle," 19 January 2000, on-line, Internet, 9 May 2001, available from http://www.nyu.edu/globalbeat/nuclear/CNS0100.html.

41. Senior defense official, background briefing, 12 May 1997.

42. Alexei Arbatov, "Russian Military Doctrine and Strategic Nuclear Forces to the Year 2000 and Beyond" (paper prepared for the conference on Russian Defense Policy towards the Year 2000, Naval Postgraduate School, Monterey, California, 26–27 March 1997), 7, on-line, Internet, 9 May 2001, available from http://nsa.nps.navy.mil/Publications/Tsypkin/RusDef97/Arbatov.html.

43. See, for example, Pavel Felgenhauer, "Russian Military Reform: Ten Years of Failure" (paper prepared for the conference on Russian Defense Policy towards the Year 2000, Naval Postgraduate School, Monterey, California, 26–27 March 1997), on-line, Internet, 9 May 2001, available from http://www.mis.nps.navy.mil/nsa/Felg.html.

44. Walter Parchomenko, "The State of Russia's Armed Forces and Military Reform," *Parameters,* Winter 1999–2000, 98–110.

45. Michael Wines, "Russia Lowers Nuclear Threshold," *New York Times,* 15 January 2000.

46. Ibid.

47. Ibid.

48. Daniel Williams, "Putin Wins Vote on START II; Russian Lawmakers Give Approval to Arms Treaty," *Washington Post*, 15 April 2000, A1.

49. Quoted in Paul Mann, "Russian Armory Remains Huge," *Aviation Week and Space Technology*, 7 September 1998, 64.

50. Blair, "Loose Cannon," 87.

51. David Hoffman, "Russia's Missile Defenses Eroding: Gaps in Early-Warning Coverage Raise Risk of Launch Error," *Washington Post*, 10 February 1999, A1.

52. Jonathan S. Landay, "Early Warning Moscow's Outdated Missile-Detection System Is Danger to Russia and West," *Seattle Times*, 13 January 2000, A3.

53. Blair, Feiveson, and von Hippel, "Taking Nuclear Weapons," 77.

54. Eugene Habiger, commander in chief, US Strategic Command, Department of Defense news briefing, 4 November 1997, on-line, Internet, 9 May 2001, available from http://www.defenselink.mil/news/Nov1997/t11071997_thabiger.html, 2–3.

55. Senate, *Gen Eugene Habiger, Testimony to Senate Armed Services Committee, Subcommittee on Strategic Forces*, 105th Cong., 2d sess., 31 March 1998, in Federal News Service transcript, 9.

56. Eugene Habiger, commander in chief, US Strategic Command, Department of Defense news briefing, 16 June 1998, on-line, Internet, 9 May 2001, available from http://www.defenselink.mil/news/Jun1998/t06231998_t616hab2.html.

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59. "Pentagon Presses Russia for 24-Hour Missile Watch Center," *Defense Information and Electronics Report* (Ballistic Missile Defense Organization External Affairs Digest [E-mail newsletter], 25 February 2000).

60. "Improving Russia's Access to Early-Warning Information: Preliminary Results" (Washington, D.C.: Congressional Budget Office, 3 September 1998), 10.

61. This interpretation is in keeping with the earlier comments about Soviet assessments and BOOB attacks.

62. Senate, *Prepared Statement of Edward L. Warner, III, Assistant Secretary of Defense, Strategy, and Threat Reduction, before the Senate Armed Services Committee, Strategic Forces Subcommittee*, 105th Cong., 2d sess., 31 March 1998; Federal News Service transcript, 21.

63. Language as provided in Senate, *Prepared Statement of Honorable Edward L. Warner III, Assistant Secretary of Defense for Strategy and Threat Reduction, before the Senate Armed Services Committee Subcommittee on Strategic Forces, Subject: Nuclear Deterrence*, 106th Cong., 1st sess., 14 April 1999, 8.

64. Edward L. Warner III, assistant secretary of defense for strategy and threat reduction, briefing, subject: Defense Consultative Group Visit to Moscow, 25 February 1999; see also Michael R. Kraig, "Nuke Launch Ultimate Y2K Nightmare: U.S., Russia Cooperating on Early-Warning System," *Baltimore Sun*, 9 May 1999.

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72. "U.S. programs that pay to help Russia reduce and safeguard its nuclear weapons and materials have been targeted by the Bush administration for cuts of 12 percent below this year's level and 30 percent below the figures proposed in the Clinton administration's fiscal 2002 budget." Walter Pincus, "Bush Targets Russian Nuclear Programs for Cuts," *Washington Post*, 18 March 2001, A23.

73. Michael McFaul, "A Step Backward on Nuclear Cooperation," *Washington Post*, 11 April 2001, A27; Daniel Schorr, "Russia and the US, Cooling Off," editorial, *Christian Science Monitor*, 19 January 2001, 11; and Peter Baker and Susan B. Glasser, "Focus Shifting in U.S.-Russian Relations; Bush Emphasis on Security Issues Is Worrying Advocates of Reform," *Washington Post*, 15 January 2001, A15.

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75. FitzGerald, 11.

76. Interviews with Ashton Carter, Gen Eugene Habiger, Gen Vladimir Dvorkin, and Alexander Pikayev, Public Broadcasting System, *Frontline*, February 1999, on-line, Internet, 9 May 2001, available from http://www.pbs.org/wgbh/pages/frontline/shows/russia/interviews.

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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 aerospace-power items of interest.*

Air Force Transformation

Past, Present, and Future

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Editorial Abstract: Transformation, the centerpiece of the recent Quadrennial Defense Review, is a subject of continuing importance as an underlying driver of where, why, when, and how the Department of Defense will be shaped to meet the challenges of the evolving security environment. Defense officials and pundits alike have elevated this concept to preeminence in the discourse on future military structure. Yet, frequent use of the word has done little to clarify its meaning. This article, drawn from General Deptula's testimony to the House Armed Services Committee, discusses Air Force transformation, delineating not only the definition of the term, but also its ramifications for the military services' structural and operational enhancement.

THE AIR FORCE defines transformation as fundamental change involving three principal elements and their interactions with one another: (1) *advanced technologies* that, because of the new capability they yield, enable (2) *new concepts of operation* that produce order-of-magnitude increases in our ability to achieve desired military effects, and (3) *organizational change* that codifies the changes in the previous elements or enhances our ability to execute our national-security strategy. From the Air Force point of view, military transformation involves much more than acquiring new systems or reacting to failure. It means actually shaping the course of change through aggressive, integrated, and coherent change processes. The Air Force approach to transformation also embraces the notion that we cannot achieve meaningful transformation without integrating our expanding capabilities with those of the other services and elements of national power. In light of this definition, this article briefly describes the

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transformation the Air Force went through in the early 1990s, is going through today, and is planning for the future.

The Seeds of Transformation

The best way to illustrate the Air Force's transformation philosophy is to offer some recent examples.

The Gulf War

Prior to 1991, two separate, leap-ahead military technologies had matured enough to offer an order-of-magnitude breakthrough. The first was low-observable (i.e., stealth) technology, and the second was the development of precision-guided munitions. Together, these two capabilities, in conjunction with an effects-based planning methodology, allowed US forces to execute an innovative concept of operations that has come to be known as *parallel warfare*. Simply put, parallel warfare is the simultaneous application of force across the breadth and depth of an entire theater.

In the first *24 hours* of the Gulf War, US aerospace power launched attacks against over 150 separate and distinct targets—more than were engaged in the *years* 1942 and 1943 in the Combined Bomber Offensive of World War II and many orders of magnitude greater in terms of force-application capability (a feat yet to be acknowledged in some circles). It had a devastating impact on Iraq's ability to wage war and played a critical role in the coalition's successful liberation of Kuwait—achieved at far less cost in lives than anyone expected before the war began.

Technology and new operational concepts do not tell the entire story, however. The air campaign that set the conditions for victory in the Gulf War could not have happened without the organizational innovation that emerged from the Goldwater-Nichols Department of Defense Reorganization Act of 1986. That new joint-war-fighting structure allowed the centralized control of American forces through the joint force commander and of all US airpower, regardless of service affiliation, through the joint force air component commander. The results were a lightning-quick victory for the coalition that saved thousands of American and Iraqi lives. These Gulf War breakthroughs hinted at a larger transformation still to come—one that is still evolving with stealth, precision, parallel war, and centralized aerospace control.

End of the Cold War

Some revolutions have a short shelf life. What seems unique at the time tends to become the norm. America became accustomed to seeing surgical strikes and Iraqi soldiers surrendering en masse—stealth and precision, once revealed, became commonplace. But since change is part of our culture, the Air Force, within a mere five months of the Soviet Union's implosion, stood down the venerable Strategic Air Command (SAC), Tactical Air Command (TAC), and Military Airlift Command (MAC), replacing them with two new, more flexible organizations—the integrated Air Combat Command (ACC) and Air Mobility Command (AMC). This was an organizational transformation stunning in scope for such large organizations. After all, many people considered SAC the ultimate symbol of the entire US military and thought of MAC as merely a support organization. Underlying this dramatic change were the internal shocks generated by the Gulf War, which suggested that a new perspective would better serve the nation. No longer were aerospace platforms either "strategic" or "tactical"; neither were airlift and air-refueling assets simply minor "support" functions. What really mattered was how we used our aerospace assets in an integrated way to achieve strategic, operational, and tactical *effects*.

Throughout the decade of the 1990s, the Air Force transformed itself into a force comprised primarily of precision-capable strike aircraft. It delivered the world's first stealth, long-range, high-payload bomber—the B-2. It fielded a full constellation of Global Positioning System satellites that provided precision navigation to the entire joint force, anywhere in the world. It introduced the C-17, able to deliver equipment,

personnel, and supplies directly from the United States all the way to a combat zone—a key enabler no other country possesses.

As the grand national-security strategy of containment shifted to one of global engagement, the United States downsized forces, and deployments and operating tempo skyrocketed. Seemingly temporary deployments away from home became semipermanent. Increasingly, the nation relied on aerospace power to shape the world and respond to all kinds of crises—a practice especially evident in a string of contingency operations in Mogadishu and Haiti; humanitarian and disaster-relief missions in Latin America, Asia, and Europe; and more combat-focused crises such as the Balkans and the maintenance of air-exclusion zones over northern and southern Iraq.

Expeditionary Aerospace Force Concept

The increased operations tempo and reduced force created a strategy-to-force-structure mismatch. This, in turn, led to recruiting and retention problems and then to our second major post–Cold War organizational transformation. The Air Force developed the Expeditionary Aerospace Force (EAF) concept in 1999 to make itself more flexible and to stem the recruiting and retention downturn. The EAF had at its core the formation of an entirely new way of doing business by using 10 separate Aerospace Expeditionary Forces (AEF) in a rotational concept that provided our airmen predictability and stability. In turn, this supplied the theater commanders in chief with fresh, motivated units made up of active, Guard, and Reserve personnel. Whereas the change from SAC, TAC, and MAC to ACC and AMC had provided an integrated and functional organizational structure, the formation of the EAF was more fundamental. It produced a new, expeditionary mind-set in our people.

The Air Force enjoys an unprecedented level of organizational flexibility that originated in its common heritage. Airmen expect change, look forward to it, and thrive on it. Again, these recent changes and breakthroughs all occurred *within our budgetary means* during a time of downsizing and rising operational tempo. So the three elements that define *transformation* came together in the 1990s—the Air Force has been there and done that, not just talked about it. And the transformation continues.

Air Force Modernization and Transformation

Air Force modernization is based on revolutionary trends first glimpsed in the Gulf War, the deployment challenges of the post–Cold War environment, and our projections about the future security environment. In order to turn those trends, challenges, and projections into reality, the Air Force has instituted a comprehensive, corporate-style process for tying our vision to the future security environment. It is a process that allows for creativity by focusing not on platforms, but on requirements for future capabilities. Good ideas from laboratory projects, war games, experimentation, actual combat, and a variety of other venues feed into our strategic-planning process and are distilled into 14 "critical future capabilities" (table 1). The programming process then filters programs through those critical capabilities to ensure that the Air Force is staying on course.

Table 1

The Air Force's 14 Critical Future Capabilities

1. Rapidly dominate (within days) adversary air defenses to allow freedom to maneuver, freedom to attack, and freedom from attack.
2. Render an adversary's cruise and ballistic missiles ineffective before launch or soon after.
3. Protect our space assets and deny an adversary space capability.
4. Create desired effects within hours of tasking, anywhere on the globe, including locations deep within an adversary's territory.
5. Provide deterrence against both coercion and attack from weapons of mass destruction by maintaining a credible, land-based nuclear and flexible conventional strike.

6. Create precise effects rapidly, with the ability to retarget quickly, against large, mobile, hidden, or underground target sets anywhere, anytime, in a persistent manner.
7. Assess, plan, and direct aerospace operations anywhere in near real time, tailored across the spectrum of operations and levels of command.
8. Provide continuous, tailored information within minutes of tasking with sufficient accuracy to engage any target in any battle space worldwide.
9. Ensure our use of the information domain, unhindered by all attempts to deny, disrupt, destroy, or corrupt it; also ensure our ability to attack and affect an adversary's information in pursuit of military objectives.
10. Provide the airlift, aerial refueling, and en route infrastructure capability to respond within hours of tasking to support peacetime operations or a crisis.
11. Build an aerospace force that enables robust, distributed military operations with time-definite sustainment.
12. Build a professional cadre to lead and command expeditionary aerospace and joint forces.
13. Implement innovative concepts to ensure we recruit and retain the right people to operate our aerospace force in the future.
14. Achieve an unrivaled degree of innovation founded on integration and testing of new concepts, innovations, technologies, and experimentation.

Transformational Military Technology

The following discussion provides a glimpse of some of the future capabilities the Air Force is pursuing that provide the near-order-of-magnitude increases in offensive capability which mark a true transformation.

Space and Cyberspace

The Air Force is leading the transformation that is occurring in the realms of space and cyberspace. Today, the Air Force manages space systems that provide the nation vigilance, communications, precision navigation, and timing signals that synchronize the Internet and enable such technologies as mobile phones and pagers. However, we are transforming our space force into a *space-control force*—one that ultimately will provide *persistent* intelligence, surveillance, and reconnaissance around the globe. This is an especially important capability as our adversaries move to mobile platforms. Space-based radar exemplifies the kind of system that will allow us to do that. Air Force programs will also prove critical to evolving missile-defense systems with satellite constellations like the Space-Based Infrared System, and the Air Force will provide the critical command and control architecture to make such systems work.

The Air Force intends to move space far beyond those near-term missions, however. The future offers near-real-time global-force application, which will give us the next generation of missile defense conducted from space-based platforms *and* the next generation of effects-based warfare—in one system. What does near-real-time global-force application mean? It means that when the National Command Authorities (NCA) decide they want to achieve a particular effect, the Air Force can comply within minutes of the decision.

In order to provide that kind of option to the NCA, we need systems such as space-based lasers, combat aerospace vehicles, and space-maneuver and operations vehicles. Coupled with computer-network defense and computer-network attack, they will achieve effects at the speed of light. Again, the focus is not just on platforms but on the way we look at and integrate information technology so we can achieve dynamic battle-space control, integrating and rapidly fusing information from every appropriate source. We are not talking about days or weeks to plan for these operations, as we do today. We want a system that allows adaptive execution in minutes, with precision that can come only from *predictive* battle-space awareness. This type of system changes an entire mind-set—from one that calls for operating in small groups that affect geographically limited locales to one that calls for US and allied forces to think and

operate across the entire globe (i.e., global network-centric warfare).

Precision Weaponry

The precision era that started so tenuously in Vietnam has now evolved to an all-weather capability. The remaining hurdles for precision-engagement weaponry are at hand and require aggressive stewardship to make them a reality. The Air Force is pursuing smaller and more precise munitions such as the small-diameter bomb, which will produce a dramatic increase in the lethality of each platform. The next generation of autonomous "seeking weapons" will meet the challenge of moving targets. Their small size and ability to seek, characterize, and precisely attack mobile targets will allow US aerospace power to reduce an enemy's mechanized formations to dismounted infantry in hours. This has huge ramifications for how the joint force configures itself and fights. Finally, the Air Force is also pursuing directed-energy weapons—the ultimate in speed, lethality, and precision. The airborne laser constitutes a very important element of boost-phase missile defense, but the technology has even greater meaning for the future.

Stealthy Combat Platforms

Stealth and precision work together to present our adversaries an insoluble dilemma. The operational implications are obvious, especially against an increasingly formidable air-defense threat consisting of advanced surface-to-air missile systems, but the strategic implications might be even more important. The simple decision to transform our airpower into a predominantly stealthy, precision force will cause our adversaries to change their national-security priorities—it will *dissuade* them from making choices we'd prefer they not make. Today, they have to contend only with a silver-bullet stealth force, but their problem magnifies geometrically if we transform into a primarily stealthy force. Stealth in numbers has *strategic* meaning.

Four platforms will define the stealthy Air Force of 2020: the B-2, F-22, joint strike fighter, and unmanned combat air vehicle. In the air war over Serbia, the B-2 proved its ability to fly with global range and impunity, striking targets in any weather. The F-22 distills into one platform multiple capabilities that in the past required many separate aircraft to accomplish; such capabilities include air dominance, negation of enemy air defenses, precision attack, supercruise, advanced all-aspect stealth, and information integration. This constitutes another leap for increased capabilities with commensurately reduced requirements—similar to what the F-117 offered the nation during the Gulf War. The F-22 has capabilities that *no other aircraft possesses,* providing the United States a true asymmetric advantage critical to maintaining its sole superpower status. In antiaccess environments, the F-22 can operate for thousands of miles with tanker support; unlike legacy platforms, however, it will remain survivable and lethal when it reaches the combat zone. Similarly, while not as capable in all respects, the joint strike fighter can operate in the modern air-defense environment and will also help close the gap in military technology that strains our key alliances—again, stealth in numbers has strategic impact. Finally, the Air Force is aggressively pursuing a stealthy unmanned combat air vehicle as part of an advanced-technology demonstration. Applying lethal force from an uninhabited vehicle is risky, but it is also the wave of the future. That is why, together with the Defense Advanced Research Projects Agency, we are attempting to come to grips with those risks and, through experimentation, turn unmanned air vehicles into lethal systems. Stealthy airpower is a crucial, asymmetrical advantage that the United States cannot squander—we need to capitalize on that advantage to shape our future.

Transformational Operational Concepts

The Air Force has always been at the forefront of capitalizing on innovative technolo-

gies to transform the way the military fights—to leverage those technologies to achieve dramatic leaps in operational capability. The Air Force believes that the huge increases in capability shown over the last decade, as well as those desired for the coming decades, point to new ways of conducting military operations—not only for the Air Force, but also the entire joint force. New joint, operational concepts can provide integration templates for how the United States conducts military operations across the spectrum of conflict.

Effects-Based Operations (EBO)

Providing a perspective for planning, executing, and assessing military operations, EBO integrates other elements of national power to produce effects that compel desired political outcomes. Legacy methods focus on destroying targets, moving arrows on a map, and waging wars of attrition. But EBO moves beyond those narrow, tactical viewpoints. Under this campaign-planning philosophy, the military planner uses superior knowledge to avoid attrition encounters, applying force at the right place and time to achieve specific operational and strategic effects. EBO promotes greater planning agility; it is also less plodding and more adaptive to the achievement of specific effects. Although we have used elements of EBO in the past, through aggressive education and training in these operations, warriors from every service can achieve a more comprehensive framework for integrating all elements of the military—as well as multinational and governmental agencies—into a coherent campaign philosophy.

Global Reconnaissance Strike/Global Strike Task Force

Potential adversaries are taking advantage of various methods to deny US forces access to their centers of gravity. We must deny the enemy his antiaccess strategies through the use of stealthy, long-range platforms that can apply precise force with great rapidity. The Air Force has pioneered two operational concepts for crushing antiaccess threats. First, the concept of global reconnaissance strike offers a total joint-force solution for "breaking down the door" to allow follow-on joint operations. Second, the global strike task force outlines the Air Force's key contribution to the joint antiaccess campaign, showing how the F-22/B-2 team provides indispensable capability for holding the antiaccess systems of various adversaries at risk. These "rapid takedown" concepts constitute the core of our future operational employment against any adversary's antiaccess strategy.

Rapid-Halt Operations

Our interest in global prosperity compels us to retain the capacity for rapidly halting adversary aggression that threatens the stability of the world community. Joint aerospace forces will constitute the key to this capability, which not only provides rapid, global ranging but also plays a huge role in deterring destabilizing behavior. Capitalizing on the precision, global reach, and knowledge provided by US aerospace power, this concept allows for the rapid employment of tailored joint forces to seize the initiative by isolating, incapacitating, and rapidly halting aggression. Using this concept, the Air Force has shown that it can rapidly "swing" forces from one theater to another, allowing fewer forces to conduct more than one major theater war simultaneously.

Coercive Campaigns

Not all US military operations focus on bringing about an unconditional surrender or forcing a change of regime. In fact, only the most extreme historical cases sought these goals. In the post–Cold War environment, the United States is interested in controlling aberrant behavior and shaping hot spots, not annexing territory. This requires a different military-campaign mind-set—one that focuses on coercing the target nation through coordinated military and diplomatic means. In a coercive campaign, effects-based employment of appropriate elements of national power can modify an opponent's behavior to comply with US strategic objectives.

The theme of all these operational concepts is that new capabilities enable new military approaches that can expand strategic options for both the United States and its allies, while constricting those of our adversaries. The future demands new operational constructs that take advantage of US asymmetries and offer quicker, less bloody means of expanding global peace and prosperity.

Transformational Organizations

On the organizational side of the transformation journey, the EAF must evolve from the Cold War restrictions under which it still labors. The first 15-month cycle of AEF rotations taught us that reorganization alone would not fully realize the potential in the EAF concept. For example, the 10 AEFs are not equal in capability because the Cold War force was never constituted for that requirement. Furthermore, none of the AEFs is independently capable, and many of them have no standoff precision capability; must share stealthy platforms; and overstress certain low-density, high-demand assets.

To fully realize the EAF concept, we must transform it into a force consisting of 10 independently operating, equally capable AEFs. The theater commanders in chief must know that each AEF will deliver a known capacity for command and control, stealthy platforms, all-weather precision engagement, and other key functions. The EAF, however, includes more than our deployable assets. Space; intelligence, surveillance, and reconnaissance; national missile-defense architecture; our nuclear posture; intertheater airlift; recruiting/retention; and our excessive infrastructure all require attention. If the past 10 years are any indication, the future security environment requires a more balanced, fully capable EAF than we have today.

Conclusion

Aerospace forces operate as part of a joint, interagency, and coalition team—this understanding drives the Air Force's modernization program. Transformation is a difficult process, but the United States Air Force has linked its modernization plan to critical, future capabilities that will expand the nation's strategic options by offering order-of-magnitude increases in offensive combat capability. It's not just about greater capability—it's about capitalizing on this nation's key asymmetrical advantage to shape our world. In our position as the world's predominant economic and military power, we cannot afford to be reactive—we must invest in success.

What implications does transformation have for our traditional means of analysis and for the metrics we use in judging effectiveness? It is extremely important to adopt a capability-based approach when we make decisions about organization, concepts, and system procurement. Cost per unit is often used today as a measure of merit in making such decisions. But a more accurate measure of merit that captures the real value or capability of a particular system is cost per target engaged or—better yet—cost per effect desired. In this fashion, one is led to consider all the elements required to achieve a specific effect. This is particularly important in dealing with stealthy systems. In many cases, although such systems may appear more expensive on a per-unit cost basis than less capable systems, they actually become significantly less expensive in terms of both lives and dollars when one considers all the elements required for alternatives to accomplish a similar effect.

The past decade has proven that aerospace power's inherent speed, range, and flexibility allowed it to make the transformational leap from the Cold War to the demands of the new world. We have a rare opportunity to shape our nation's future by capitalizing on those strengths. As history's only *aerospace nation*, we have a strategic obligation to fully realize and exploit the asymmetrical advantages of aerospace power. Recognizing the necessity of change, the Air Force is committed to transforming itself to best serve the interests of the United States. □

Every great revolution brings ruin to the old army.

—Leon Trotsky

Dominant Effects: Effects-Based Joint Operations

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Editorial Abstract: This and the following article are thought-provoking pieces generated primarily from results of the Title X Global Engagement war game hosted by the College of Aerospace Doctrine, Research and Education at Maxwell AFB, Alabama, in 1999. The articles are synopses of larger research projects published as monographs and are available on Air University's Research Web site: http://research.maxwell.af.mil. The concept of "Dominant Effects" explores targeting under a new paradigm for success that steps away from traditional thinking based on destruction. The concept of "Global Dynamic Operations" argues for a change in command and control that would more efficiently employ limited, high-demand aerospace assets needed in several theaters at the same time. These challenges to conventional thinking represent the kinds of products our Air Force war-gaming and educational programs should keep producing.

"THE POINT I'M trying to make is that you can't just rack them [targets] up and prioritize them and go from top to bottom. You have to look at what you want to achieve in each one of those individual target sets, and maybe you don't have to kill the target to achieve your objective. Maybe absolute damage and levels of destruction ought not be your measure of merit and, in fact, might not be what you really want to have happen. . . . You know, a 2,000-pound bomb can go off down the hall, it will make a heck of a lot of noise and we won't be dead, but I can guarantee you we ain't gonna continue to sit here and drink coffee and carry on this conversation. . . . You're going to get out of there."[1]

The power of this argument may make the conclusion seem obvious, but then Lt Col Dave Deptula argued long and hard with Air Force targeteers to apply

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effects-based thinking to the air plan for the Gulf War in 1990 and 1991. According to Deptula, "They [Air Force targeteers] go to JMEMs [Joint Munitions Effectiveness Manuals] and they open it [*sic*] up and that's what they're focused on. They're focused on destruction, *absolute destruction"* (emphasis in original).[2] As chief planner in-theater of the strategic air campaign, however, Deptula had certain desired effects in mind and didn't particularly care how they were achieved, so long as they were. He was not concerned about killing individual sector operations centers (SOC); rather, the objective was to break down the Iraqi integrated air defense system itself. This approach might leave individual air defense elements functional but only in the autonomous mode, which would make them much easier to avoid and attack, if necessary. In other words, once the air defense system was no longer integrated, it would be much easier to deal with. By thinking this way, Deptula was able to reduce from eight to two the number of 2,000-pound precision-guided bombs directed at each SOC on the first night of the war. Not only did this achieve the desired effect, but also it released an enormous amount of firepower to concentrate on other critical systems.

This example demonstrates the basic premise of effects-based operations (EBO). Focusing on the conditions desired—the effects—to achieve assigned objectives enables one to avoid focusing on pseudo-objectives, such as destruction. Stated so simply, it seems patently obvious. But experience suggests the difficulty of maintaining such a focus. For example, according to Gen John Jumper, commander of US Air Forces Europe during Operation Allied Force over Kosovo, planners managed an approved target list on a day-by-day basis without reference to specific effects they desired to create.[3] Further evidence that planners have difficulty staying focused on effects-based thinking came to light during the chief of staff of the Air Force's Title X Global Engagement IV war game, executed in October 1999 to explore EBO. After the game, key players and overseers said that EBO had worked fine as long as the players focused on the concept. Yet, it broke down rapidly during the game as players concentrated their attention on the mechanics of operational planning rather than the outcomes desired by senior leadership involved in the game.[4]

On the one hand, in the current joint and interservice debate over EBO, critics argue that the US military has essentially always done EBO—that it is nothing new. On the other hand, is it possible that in the area of EBO, our military might be languishing with institutional or procedural thinking that fails to keep pace with technological capabilities? Perhaps EBO is indeed something new that will require changes in the way the military thinks and operates.

A review of a number of cases going back as far as World War II indicates that the US military has struggled to apply effects-based principles for over 50 years. For example, one finds the US military attempting to apply EBO in Air War Planning Document 1, written in August 1941 by US Army Air Corps planners.[5] A historical review of EBO lies outside the scope of this article, but the general picture is that, despite deep EBO roots, the military has never really institutionalized the thought processes necessary to ensure consistent adherence to EBO principles.

Only now is EBO being tentatively and unevenly incorporated into service and joint doctrine.[6] At the same time, the concept is neither thoroughly nor evenly understood among military people. Is EBO synonymous with effects-based targeting? Is the joint developmental concept known as "rapid decisive operations" merely EBO with a different title? Does EBO have as its objective, as one presumably well-informed source stated, the "disabling of targets while

minimizing collateral damage"?[7] The simple answer is *no*. All of these concepts are much too narrow and unnecessarily constrained to war-fighting scenarios. Broader views consider EBO equally applicable and useful to all forms of military operations, whether combat related or not. The current confusion inhibits the full implementation of EBO, and a fully developed theory is necessary to move beyond petty debates. Toward that end, this article presents a comprehensive EBO concept designed to encourage joint discussion in hopes of avoiding the potential negative outcomes of such an ad hoc implementation. How did we end up in the present predicament, whereby a piecemeal and incoherent application of EBO may be currently under way within the US military?

More than 10 years after the end of the cold war, the US national security establishment is still calling the current era the "post cold war," a sign that the nation is looking back at least as much as it is looking forward. In other words, the United States is still struggling to understand the dominant characteristics of the New World Order. The Soviet Union is gone. China, the only remaining communist threat of any size, is maturing as a military power but remains too weak to be considered a significant near-term threat. *Joint Vision [JV] 2020* proceeds from the premise that the United States will have no "peer competitor" for the next 10 to 20 years.[8] Nonetheless, it is widely accepted that significant, though difficult-to-define, threats to US and international security lurk in the shadows—brushfire wars; drug traffic; international terrorism, including "cyberterrorism"; and the proliferation of weapons of mass destruction. At the same time, increasingly numerous peacekeeping and peace-enforcing missions, as well as increased deployments for the post-cold-war US military, create concerns over operations and personnel tempos. In light of these developments, one finds a growing consensus for a new paradigm in international security affairs that requires an updated vision for military operations.

In the past, the US military has viewed itself as the ultimate guarantor of the nation's destiny, holding the mandate "to fight and win the nation's wars." In this view, presence proved useful as a deterrent, but military planning had as its basis a "conquest paradigm" rooted in Napoleonic warfare as articulated by Carl von Clausewitz. The ultimate goal in warfare, according to Clausewitz, is to impose a political settlement by capturing or threatening an opposing nation's territory and capital. Since a military force protects the enemy capital and nation, "disarming" or destroying that force becomes the principal aim of Napoleonic-type warfare.[9] In the twentieth century, the concept of "total war" raised this view close to its pinnacle. Almost everything even remotely connected to the support of war fighting, especially national industrial capacity, was subject to attack and destruction. In fact, destruction became the penultimate measure of combat assessment and success—this was the twentieth century's total-war conquest paradigm.

Following World War II, however, an American war of conquest became less and less likely, and the objectives of military operations much less clear. In fact, military operations often represented only a small part of a much larger effort aimed at achieving limited political objectives. This perspective is one reason that World War II might occasionally be called "the last good war" by students of history who believe US military operations in Korea in the 1950s and Vietnam in the 1960s and 1970s were aberrations in which "unnecessary" political constraints tied the hands of the military. This opinion has led some people to argue that one should employ the military only when political commitment allows the use of overwhelming force to "conquer" the opposing

force with minimal losses.[10] Recent history, however, suggests the existence of many relevant uses of military force besides conquest or even coercion.

As conquest and coercion become less relevant to American security concerns, the US military grows increasingly aware that the Napoleonic paradigm of destroying the enemy army is of little use in the current geopolitical structure. In its place are peacetime engagement, military operations other than war (MOOTW), and smaller-scale contingencies (SSC). One may also conduct a major theater war (MTW)—but usually to achieve limited objectives. This does not mean that Napoleonic-type warfare no longer exists or that "fighting the nation's wars" is no longer an important role for the US military. It simply suggests that the conquest paradigm no longer offers a sufficiently broad view of the purpose and nature of military action and that a new paradigm has arrived—something that one might term a "success paradigm." In this view, achievement of national political goals—not conquest—defines military success. Applications across the entire spectrum of military engagement combine with other instruments of national power to achieve these goals. The growing interest in EBO amongst the military services is one indicator of this paradigmatic shift. As already indicated, however, the US military, working jointly, needs to pull the EBO concept together into a cohesive theory.

Although the military has already made progress toward this goal, the concept is moving forward in piecemeal fashion rather than cohesively or deliberately. This has continued and will continue to produce inconsistent and unreliable results. Only a comprehensive, shared vision of what EBO is and how it works can provide the necessary cohesion. Such a vision must include the following:

1. a fully developed theory grounded in effects-based thinking,
2. a process to facilitate development of an organizational culture of EBO, and
3. a lexicon to promote understanding through a common language.

The remainder of this article presents a developmental concept called "Dominant Effects" (DE) that provides all three of these features. DE fits well with the terminology of *JV 2020* and captures the idea of effects-based thinking as a lens through which one may focus *JV 2020*'s four operational concepts to create the goal of "full-spectrum dominance" (fig. 1). DE posits that appropriate movement, supply, attack, defense, and maneuver create functional, systemic, and psychological effects well beyond the immediate

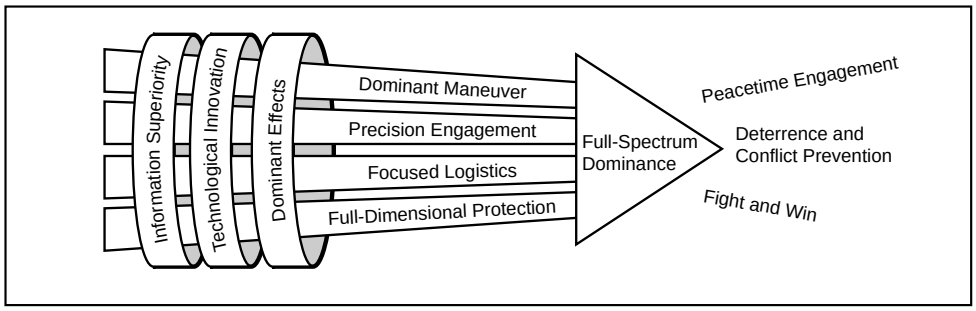


Figure 1. Creating Full-Spectrum Dominance

physical result of tactical or operational events. Military organizational schemes and thought processes, therefore, should focus first on achieving these higher-level effects. Yet, it is worse than folly to assume that military operations will produce only the desired effects. Hence, DE explicitly considers potential effects, either unintended or collateral, of planned operations that might otherwise complicate achievement of the intended effect(s).

Certain effects (often called indirect or second- and third-order effects) are relatively far removed from the action itself and likely to cascade through an entire system and into other systems. Some of the resulting outcomes may assist in creating the intended effects, while others tend to negate them. By considering these collateral and cascading effects in military planning, one can plan actions to mitigate the likelihood of serious, negative, unintended effects. Other possibilities include choosing an alternative approach to achieve the same desired effect(s) or altering military objectives.

The effects-based approach argues against focusing upon tactical-level actions such as the physical destruction of targets. Although important, the delivery of weapons on targets is not as significant as the positive or negative aspect of higher-level effects. For this reason, it is crucial to predetermine the indicators useful in measuring successful achievement of the desired higher-level effects.

Fully incorporating the envisioned paradigm shift requires sophisticated research, assessment planning, and analysis, including appropriate attrition- and nonattrition-based modeling and simulation. To exploit systemic or psychological reactions requires extensive research on the target audiences, the specific reaction desired from the target audience, the methods of inducing that reaction, and the means of collecting and analyzing data that indicate progress toward success. One cannot expect to find finite and universal answers, but this process should provide a better basis for planning and should help in achieving national objectives and policy goals in the new geopolitical context.

An idealized planning model (fig. 2) will enhance effects-based thinking before, during, and after operations. The process depicted is both continuous and iterative. The initial phase in the model is *strategic environment research*, which begins well before the conception of any specific operation. This phase asks and attempts to answer several broad-ranging questions: What kind of functional, systemic, and psychological effects might one seek in certain generalized circumstances? How might one produce them and under what circumstances? And what kinds of indicators would be appropriate to determine the nature and extent of these effects? The second phase involves *determining policy goals*, including a statement of the intended effects and outcomes that will lead to achieving those goals. The third phase entails *developing a strategy* to employ the vast range of resources available to achieve the desired effects. Next comes *mission parsing and integration*, which determine the elements of national power best suited for each task and the ways all the elements will work together to achieve policy goals. The final phase, *effects assessment*, calls for using information provided through intelligence collection and other sources to determine whether policy goals are being achieved and what needs to be done next. This series of steps requires interagency discussion and decisions by the National Command Authorities. The military needs to participate proactively in these deliberations and research, but it will not control them. The military can benefit from fully articulating a clearly defined effects-based process even though it might not precisely implement that process.

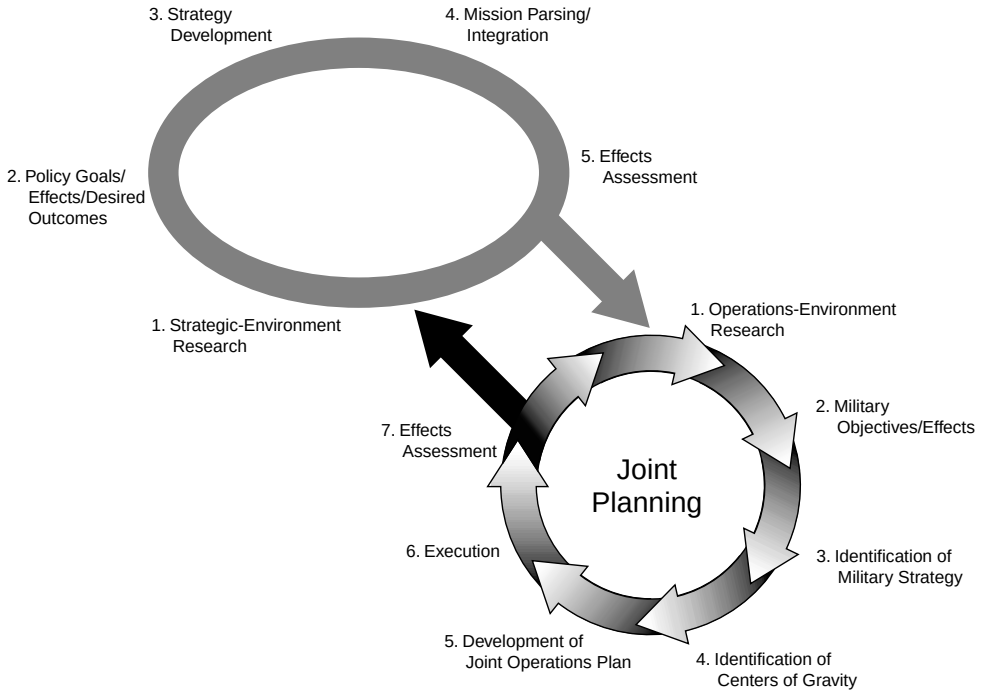


Figure 2. Idealized Functional-Planning Process

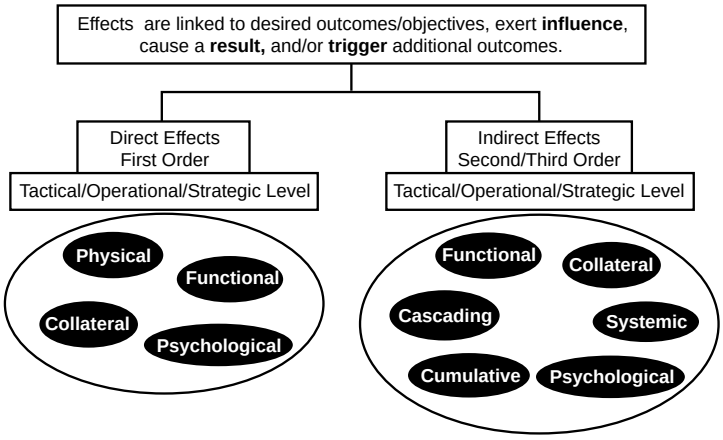
With missions assigned to appropriate agencies and an overall lead agent chosen to maintain proper integration of all efforts, the military begins its own planning process (fig. 2, second ring). With the exception of an overt emphasis on effects, this proposed process follows a model very similar to the current joint air operations planning process described in Joint Publication (Pub) 3-56.1, *Command and Control for Joint Air Operations*, 14 November 1994. The emphasis on effects becomes apparent in two critical ways. The first is an expansion of the phase involving the determination of military objectives, including deliberate consideration and articulation of desired and potential collateral effects. The second is in the assessment phase, which evaluates progress in terms of the positive and negative effects of operations. Again, this is a continuous cycle with no specific beginning or end. Planners, operators, and assessors must consider effects assessment in the objectives- and effects-determination phases to ensure that appropriate means exist to monitor progress toward the established objectives. Less explicit, but seemingly obvious in this process, is consideration of effects during the execution phase. In fact, although the model depicts effects assessment as a phase, assessment planning and actual effects assessment must be integral to the entire process if EBO is to be fully successful. For this reason, the military planning organization must employ a seamless team of integrated experts with a generalist background in aerospace power operations. Intelligence, for instance, cannot be a separate function that delivers a “finished product” to the operations planners. Intelligence experts must fully integrate themselves into the operations-planning team along with experts in operations, maintenance, and logistics, among others.

Assessment includes more than what one customarily refers to as combat assessment or, colloquially, battle-damage assessment. Assessment must provide the commander more information than the physical and functional effects of weapons employment. To conduct EBO, commanders need assessments of both systemic and psychological effects. This part of the DE process represents perhaps the most difficult challenge and will require great effort over many years to deal with a number of complex issues. For example, one of the major issues involves understanding and, more importantly, measuring the will of a target audience (an adversary or other group one wishes to influence). Historically, the United States does not have a good track record in this regard and often resorts to mirror-imaging the target audience. Fully implementing DE will not be easy, but it is a very rich concept for improved operations planning.

The DE concept provides a hierarchical overview of the effects-based process and levels the playing field for the services in terms of EBO. Perhaps the most appealing aspect of EBO is that it applies across the spectrum of engagement, from peacetime through MOOTW and SSCs to MTW. The concept appears ideal for the wide variety of actions that an expeditionary US military force may face in the twenty-first century. Similarly, DE applies across all levels of employment;[11] that is, it works equally well from the tactical through the operational and up to the strategic level of employment.

DE shows great promise in illuminating a clear and comprehensive perspective of EBO. It is vitally important in refining a successful transition to a broad new paradigm of military action for achieving national political goals. That paradigm is based not on destruction but on success.

Lexicon of Proposed EBO Terms



General Definitions

effects: the physical, functional, systemic, and/or psychological outcomes, events, or consequences that result from specific military action. They may occur at all levels of employment and can produce or trigger follow-

on outcomes (modified from Air Force Doctrine Document 2-1.2, "Strategic Attack," draft, 1 January 2000).

effects-based operations: military actions and operations designed to produce distinctive and desired effects through the application of appropriate movement, supply, attack, defense, and maneuvers. EBO focuses on functional, systemic, and psychological effects well beyond the immediate physical result of a tactical or operational event. Furthermore, EBO is equally concerned with military actions and operations that trigger additional effects beyond those desired.

dominant effects: an effects-based concept of joint operations applicable across the entire spectrum of operations and at all levels of conflict. It focuses the four operational concepts of *JV 2020* (full-dimensional protection, focused logistics, dominant maneuver, and precision engagement) through employment of EBO to achieve full-spectrum dominance.

direct effects: immediate, first-order effects (weapons-employment results, etc.). They are the results of military actions with no intervening effect or mechanism between act and outcome. Direct effects are usually immediate and easily recognizable (see Joint Pub 3-60, "Joint Doctrine for Targeting," preliminary coordination draft, 6 June 2000).

indirect effects: effects created through an intermediate effect or mechanism, producing a final outcome or result. Indirect effects are second- and third-order effects, which may be functional, systemic, or psychological. They tend to be delayed and typically are more difficult to recognize than direct effects (modified from Joint Pub 3-60, "Joint Doctrine for Targeting," 6 June 2000, preliminary coordination draft).

Types of Direct Effects (First-Order Effects)

physical effects: the effects created by direct impact through physical alteration of the object or system targeted by the application of military action.

functional effects: the direct or indirect effects of an attack or operation on the ability of a target to function properly. In essence, these effects answer the question, To what extent has the function of the target been degraded or affected by military actions?

collateral effects: outcomes that result when something occurs other than intended. They may be either positive or negative as regards the original intent. In one sense, collateral effects may constitute the incidental direct or indirect effects (usually unintentional) that cause injury or damage to persons, objects, or systems. In a broader perspective, collateral effects cover a wide array of possible downstream results (modified from Joint Pub 3-60, "Joint Doctrine for Targeting," 6 June 2000, preliminary coordination draft).

psychological effects: an operation's impact on the mental domain of a target audience.

Types of Indirect Effects (Second- and Third-Order Effects)

functional effects: (see "Types of Direct Effects," above)

collateral effects: (see "Types of Direct Effects," above)

cascading effects: indirect effects that ripple through an enemy system, often influencing other systems as well. Typically, these effects can influence nodes critical to multiple systems. The effects may cascade either upward or downward; however, most often this cascading of indirect effects flows from higher to lower levels of operations. For example, when an enemy central headquarters is destroyed, the effects cascade down through the enemy echelons, ultimately disrupting numerous tactical units on the battlefield (modified from Joint Pub 3-60, "Joint Doctrine for Targeting," 6 June 2000, preliminary coordination draft).

systemic effects: indirect effects on the operation of a specific system or systems. In essence, they answer the question, To what degree has the system or systems been degraded or affected by military actions?

cumulative effects: the effects resulting from the aggregate of many direct or indirect effects. They may occur at the same level or at different levels of employment as one achieves the contributing lower-order effects. However, cumulative effects typically occur at higher levels of employment (Joint Pub 3-60, "Joint Doctrine for Targeting," 6 June 2000, preliminary coordination draft).

psychological effects: (see "Types of Direct Effects," above)

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Notes

1. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and Lt Col Edward C. Mann III, 11 December 1991, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala., 17–19.

2. Ibid., 22.

3. Quoted by Benjamin S. Lambeth, "Control of the Air: The Future of Air Dominance and Offensive Strike," speech delivered at the Rydges Canberra Hotel, Canberra, Australia, 15–16 November 1999, 14, on-line, Internet, 16 May 2001, available from http://idun.itsc.adfa.edu.au/ADSC/Air/Air_paper_Lambeth.htm.

4. Gen John Shaud, USAF, retired, Rosslyn, Va., interviewed by authors, 15 June 2000; and Sam Clovis, Montgomery, Ala., interviewed by authors, 4 May 2000.

5. For a limited set of examples, see Gary Endersby, Tom Searle, and Edward Mann, *Dominant Effects: Effects Based Joint Operations* (Maxwell AFB, Ala.: Airpower Research Institute, in press).

6. The Air Force Doctrine Center is making a concerted effort, in accordance with four-star guidance from past Corona conferences, to write EBO into all service doctrine, and EBO terminology is being written into select segments of joint doctrine (notably Joint Pub 3-60, "Joint Doctrine for Targeting," 6 June 2000, preliminary coordination draft; and program directive for Joint Pub 3-70, *Joint Doctrine for Strategic Attack,* 16 March 2000). Judging by responses from service representatives at a recent Joint Forces Command/J-39 conference on the subject, the Navy is well on board, but the Marine Corps seems skeptical and the Army at least mildly opposed to incorporating these concepts into doctrine.

7. Amy Butler, "DOD Urged Not to Forget Benefits of Attrition, Annihilation Strategies," *Inside the Air Force,* 9 June 2000, 14.

8. *Joint Vision 2020* (Washington, D.C.: Joint Chiefs of Staff, 2000).

9. Carl von Clausewitz, *On War,* ed. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 90–93.

10. This perspective is clearly evident in the [Caspar] Weinberger-[Colin] Powell Doctrine, which considers the use of overwhelming force an important element to ensure military success and decrease the risk of friendly casualties.

11. Although doctrine refers to levels of war, it seems more appropriate to describe them in this context as levels of employment.

Global Dynamic Operations

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AS WE ENTER the twenty-first century, the United States finds itself as the sole superpower, dominant in economic, political, and military spheres throughout the world. The American military is clearly superior to any other in the world—in air and space, on land, and at sea. Clearly, "no one else comes close." We have no peer competitor at present and none on the immediate horizon—which is important, not from a desire to have world hegemony but simply to protect national interests and promote world peace and stability. We are in a very comfortable position—and in an uncomfortable one as well. Although we may be the top world power, we must not remain content and idle in that comfort zone.

If anything is certain, beyond death and taxes, it is change. Regardless of our intent and actions, other nations will chafe at American superiority, and some will challenge it. George Tenet, director of Central Intelligence, recently testified to the Senate Foreign Relations Committee that "the fact that we are arguably the world's most powerful nation does not bestow invulnerability." He went on to warn that "in fact, it may make us a larger target for those who don't share our interests, values or beliefs."[1] If we are to maintain our present position and superiority, we must anticipate these changes and take steps today to meet future challenges—or pay the consequences.[2]

It is important to consider where we are and where we are headed. The implosion of the Soviet Union has rearranged the world's power structure. The demise of our rival of a half century has left us not only superior to all comers, but also attempting to adjust to the post-cold-war world. In contrast to the situation we faced in the cold war, in which the threat of nuclear war and the enemy (the Soviet bloc) were obvious, today the specific threat is less clear. The national strategy was notionally set to accommodate two major theater wars (MTW) or a number of smaller contingencies. Although the overall situation appears less dangerous than in the past, overall military commitments have not subsided but increased since 1990. For example, since Operation Desert Shield/Desert Storm, US Air Force deployments have increased threefold.[3]

At the same time, however, the US military has declined in numbers as a reaction to the loss of the Soviet threat. Accompanying this downsizing is the appearance of new technologies that promise greater capabilities with fewer forces. But new equipment is also much more expensive, reducing the number of units acquired. Whatever the cause, this has resulted in a 40 percent reduction in both Air Force personnel and aircraft inventory.[4] So we must do more with less.

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In addition, America's clear military dominance and the demise of the "evil empire" have changed our relationship with our allies. Two factors are of immediate concern. First, the United States has drawn back some of its forces to US territory since the end of the cold war. One visible indication is that we have reduced our major overseas bases by two-thirds.[5] The second concerns our mutual contributions to the common cause, for we are not only in a different league from would-be foes, but also from our allies. The latter are significant for diplomatic and political purposes—for bases and manpower. But today, and in the foreseeable future, they can contribute little military force to complement high-tech American forces.

The Problem

In 1990, when Iraq invaded Kuwait, the US military was in excellent shape. It fielded a large, well-trained force armed with the most modern weapons. Designed to fight a large, well-equipped force in Europe, in the Gulf War it faced what turned out to be a smaller, much less capable force in a conventional conflict and in terrain well suited for both air and tank operations. Anticipating heavy losses against a desert-smart, tough, determined foe, the Air Force committed most of its inventory of key forces in the Gulf War. The entire F-117 and F-15E force; both joint surveillance, target attack radar system (JSTARS) aircraft; and the bulk of US precision-guided munitions went to the Gulf. Although the Air Force deployed only 27 percent of its tactical aircraft to the Gulf, these included 93 percent of its aircraft capable of launching laser-guided bombs (LGB). In addition, it sent 85 percent of all its equipment designed to operate from bare bases, 92 percent of its entire refueling assets, and many of its critical munitions: 43 percent of available cluster-bomb units, 52 percent of its antiradiation missiles, 63 percent of the LGB stockpile, and 63 percent of its Maverick missiles. Had another major action occurred at this time, the United States would have been stretched, at the very least.[6]

That potential scenario was precisely the one played out during the Global Engagement IV war game in 1999. The game involved two near-simultaneous theater wars in Asia in 2010. One of four key problems the players identified was trying to allocate high-demand, low-density aerospace assets—specifically, the B-2—most efficiently and effectively.[7] Both theater commanders needed and wanted these bombers at the same time. The players attempted to meet requirements by basing all the bombers at Diego Garcia, but this did not solve the basic problem of who would control the aircraft. The after-action report noted that "the conventional construct of 'swinging' forces from one theater to another does not seem to capture the requirements of commanders to conduct two-theater warfare in 2010."[8] Following the game, Secretary of the Air Force F. Whitten Peters recognized the problem: "What is not yet clearly defined is our ability to 'swing' from one MTW to the next. . . . It is important that we include the potential for just such a requirement [for the future]."[9] In brief, then, the problem is how the United States is going to fight certain systems that in the future will be in high demand and short supply.

We do not know what these specific systems will be in the future. At present they consist of such items as intelligence surveillance, and reconnaissance (ISR) / battlefield-management assets (such as the airborne warning and control

system, JSTARS, and Rivet Joint aircraft); electronic-warfare aircraft (EA-6B and EC-130H); special operations forces (MH-53J helicopter and MC-130P and MC-130E aircraft); Patriot air defense units; rescue aircraft (HC-130 and HH-60G) and chemical/biological defense.[10] Clearly, if present trends (limited forces and greater commitments) continue and if our assumptions for the future are correct (that we will have to perform more tasks with fewer resources and prepare to fight two MTWs simultaneously), then certain systems undoubtedly will be in short supply.

A Solution

A possible solution to the problem, or at least a *piece* of the solution, is organizational. New technology will allow home-based or space-based assets to operate effectively anywhere in the world, and an organizational concept known as "Global Dynamic Operations" (GDO) might be able to take advantage of this technology. GDO, which involves centralized control of scarce assets, has historical precedent as well as logical justification.

Throughout their history, airmen have fought ground commanders for control of their aircraft.[11] Out of such conflicts over command and control of air assets grew developments in air doctrine that influence much of what the Air Force does to this day. Basically, a system had to be worked out that could address the allocation of limited assets in high demand in different locations. Unfortunately, until development of that system—specifically codified in products such as War Department Field Manual (FM) 100-20, *Command and Employment of Air Power*—both airmen and ground soldiers lost their lives due to inefficiencies.

A strategic example of the GDO concept in action is that of the B-29s of Twentieth Air Force in World War II. Acting as the executive agent of the Joint Chiefs of Staff (JCS), Gen Henry H. "Hap" Arnold, chief of the Army Air Forces (AAF), retained direct control of the B-29 force. Three different theater commanders wanted the bombers for their own theater: Gen Douglas MacArthur in the Southwest Pacific Area, Adm Chester Nimitz in the Central Pacific, and Lord Louis Mountbatten in the Southeast Asia Command. Because the aircraft's extended range allowed it to reach targets in more than one theater and due to the political connections and personal forcefulness of all three commanders, the decision makers decided that a system of centralized control was necessary.[12] The system worked. B-29s operated in three theaters, effectively bombed Japan, and provided support to the Navy (mining and suppression of kamikaze airfields in southern Japan) yet remained under centralized (AAF) control.[13] The major rationale for this arrangement still exists (and certainly will continue to do so).

But the examples aren't just historical. The National Reconnaissance Office was certainly created to deal with this kind of problem, and it clearly involves centralized control of scarce space resources. In addition, US Transportation Command is the central authority that dictates where, when, and how US military and contract air and sea transport is executed worldwide. Admittedly, both of these are support organizations, but the principle is still the same—how to allocate and employ high-demand, scarce aerospace resources most efficiently and effectively.

From a logical standpoint, GDO makes sense and seems inevitable in the long run. Basically, it envisions the global planning and employment of aerospace power. It executes "dominant maneuver" on a global scale. Technology continues

to shrink the globe, moving us toward one aerospace theater. We simply cannot continue to limit our aerospace thinking to the past and present wherein time and geography frame our thinking and processes, limiting us to tightly drawn geographic theaters. Clearly, by facilitating more efficient command and control, GDO would join *Joint Vision 2020*'s[14] perspective of reducing the "fog and friction" of war. In particular, it would help eliminate the competition between commanders in chief (CINC) for high-demand, low-density assets.

In addition, GDO might help with another current problem—the apparent growing American aversion to casualties. GDO promises to reduce the vulnerability of US forces deployed to forward bases in foreign lands. It clearly falls in line with post-Vietnam desires and influences such as the [Caspar] Weinberger-[Colin] Powell doctrine geared to ensure military success at the least possible cost and the greatest possible popular support. GDO does just that, helping protect both assets and people. In the words of Maj Gen Charles Link, home basing will "project distant military effects without projecting vulnerabilities in the same ratio."[15]

Proposal

Certain assets, defined as high demand and low density, must be assigned to a central authority—perhaps labeled a global force air component commander (GFACC). Presently, the services designate which of their assets are high demand/low density, and these are handled in accordance with the Global Military Force Policy. The secretary of defense uses this policy to appropriate these forces to the various CINCs. But this is strictly a peacetime arrangement. At present, no structure exists to handle the situation in wartime. As a result, the secretary would have to referee the CINCs as they worked out an agreement on the use of such forces.

In a two-MTW situation, this would cost precious time and produce a faulty compromise. Consider the birth of the world's first air force. The Royal Air Force (RAF), created in 1917, came into being on 1 April 1918, largely as a result of nearly four years of competitive bickering over assets between the Royal Flying Corps and the Royal Naval Air Service during wartime. Only an amalgamated RAF could set proper priorities.[16] Two things dictate priorities: need and time. One theater might have a greater overall need than another for a given limited asset—but perhaps not as quickly as the other theater. In a two-MTW scenario, decision makers will seek military victory in both theaters as quickly and cheaply as possible, thus requiring the careful application of scarce resources to achieve the optimum effect overall. Considering the increasingly high-speed look of war in the not-too-distant future, this may need to take place very rapidly. A system in which each CINC fights to win his or her theater war without the knowledge of, or perhaps even concern for, what is going on elsewhere will likely take more time and may not use assets optimally.

In GDO, the GFACC would report to the secretary of defense directly or through the JCS. A GFACC would own globally capable aerospace assets either permanently or as the need arose, in which case these assets would go to the GFACC via a change of operational control. A number of possible arrangements come to mind. One would entail redrawing the Unified Command's boundaries to place both war zones under one commander. Another involves getting the

GFACC from US Strategic Command. A third would use the commander of Air Combat Command as the air component commander of Joint Forces Command. Another possibility calls for assigning the GFACC's responsibility to the Air Force chief of staff. The particulars of this potential command designation obviously would have to be worked out, but the imperative is simply recognition of the importance and inevitability of the concept.

Potential Problems

For all its advantages, the GDO concept has problems—but so did Orville and Wilbur's concept of powered flight. First, GDO threatens many established Air Force comfort zones. It flies in the face of current thinking and has the appearance of breaching a cornerstone Air Force concept of "centralized control and decentralized execution," a tenet of both the joint world and the Air Force world *as we now know it*. But everyone should bear in mind that the first objective of airmen from the very first aerial conflict was to centralize control over air assets under airmen, a battle that has continued into the twenty-first century. Some people have suggested that the elevation of jointness to Olympian heights is a new parochialism similar to the obsession some airmen have had with strategic bombing.[17] In reality GDO rejects neither jointness nor centralized control and decentralized execution, but critics may claim that it does.

For this and other reasons, any GFACC arrangement would face significant challenges. Sister services will most likely have doubts and reservations, based primarily on their thinking that such high-demand, limited aerospace assets are only part of the strategic equation and that a GFACC would hold inappropriate authority in employing such assets. Their argument is that the concept is simply not joint. Wrong argument. Joint employment of forces does not mean equal sharing. Rather, each service brings its fighting ability to the table for use in the best possible manner, even if that means excluding other services in certain situations. Each situation dictates which services and arms receive support and which provide support. In the end, surface services would have to be persuaded to agree with the importance of the GDO concept to a world-crisis situation, even though they might have few forces in this category. Considering the historical record, this will be no easy task.

Another objection, no doubt, would come from the unified CINCs, who would stand to lose some power. Quite simply, GDO runs contrary to the trend of giving the CINCs more authority, not less. Further, some people in the Air Force would object to the pressures on "reach-back" capabilities—the air-tasking-order cycles and logistics. And some might remember command and control problems in Vietnam between Strategic Air Command and Seventh Air Force. Finally, it is possible that GDO might require some sort of change in public law—never a small or easy task. Yet, such a move is simpler to accomplish and probably more rational if contemplated in peacetime rather than in the heat of crisis.

The Air Force attained its present status by overcoming the inertia of tradition when tradition blocked innovation. GDO goes against some entrenched principles and powers; surely the obstacles are real. But the potential problems on the horizon are real as well. We will be derelict if we sit idle in our comfort zone and do not attempt to best use our technological advantages, taking steps to maximize their effectiveness. Presently, one hears discussions about whether the military has

or has not entered a new era called a revolution in military affairs (RMA). Certainly, new technology offers exciting possibilities, but an RMA requires more than just new technology. It also demands innovations in doctrine and organization. We must develop all three elements to enable the RMA, and GDO helps that process. It offers a way to build the organization required to support a new way of war. Although many of our problems have solutions outside the military, this is a case in which the Air Force can do something to improve the situation. We must take that step.

Studies suggest the existence of three emerging areas where military operations will change under the current RMA: weapons, space, and information. GDO clearly fits the first and is enabled by the third. As stated in "Concept for Future Joint Operations," "First, long-range precision weapons, with unprecedented worldwide mobility, coupled with effective sensors, C^2 systems, and precise intelligence will alter operations and tactics. Long-range precision engagement can play an increasingly prominent role in power projection at all levels across the range of military operations."[18] Indeed, this is the vision of GDO, but with added reality. High-tech expenses will continue to limit the number of some of those longest-range, most precise weapons. At the same time, however, demand for them will continue to increase.

In essence, GDO seems the ultimate legacy of the 1986 Goldwater-Nichols Department of Defense Reorganization Act, which sought to improve military advice to the National Command Authorities, produce more efficient use of resources, enhance the effectiveness of military operations, and improve management and administration in the Department of Defense. The act certainly gave CINCs more command authority, and, on the surface, GDO might appear to erode the power and authority of the CINCs. In reality, however, through greater efficiencies and global perspective, it increases their power by more effectively employing assets to improve their collective force.

Obviously, the Air Force of tomorrow will be far more capable than it is today, surely in ways we can barely conceive. It may well be true that our future capabilities will exceed our capacity to control them, especially as the world shrinks due to technological innovations. More than likely, Global Dynamic Operations will be part of the Air Force of tomorrow, so it is time to start thinking about how better to organize it—today.

Maxwell AFB, Alabama

Notes

1. Quoted in Chuck McCutheon, "Defining, Asserting the National Interest," *Congressional Quarterly Weekly,* 14 October 2000, 2398.
2. This of course brings to mind Giulio Douhet's ageless quotation that "victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur." *Command of the Air,* trans. Dino Ferrari (1942; new imprint, Washington, D.C.: Office of Air Force History, 1983), 30.
3. Mackubin Owens, "The Price of the Pax Americana," *Wall Street Journal,* 18 October 2000.
4. F. Whitten Peters, "The International Dimension of Aerospace Power," speech delivered to the Air Force Association, Washington, D.C., 15 September 1998.
5. Ibid.
6. Thomas A. Keaney and Eliot A. Cohen, *Revolution in Warfare? Air Power in the Persian Gulf* (Annapolis: Naval Institute Press, 1995), 176–77.
7. The other three were forward support, simultaneous deployment and employment, and early offensive ground-force operations. The chief of staff of the Air Force directed further study of the issues raised by Global Engagement IV under the (initial) titles Dynamic Shift, Dominant Effects, Agile Combat Support/Rapid Global Mobility, Theater Ballistic Missile Defense, and Early Offensive Ground Operations. See "Global Engagement IV," draft after-action report (Maxwell AFB, Ala.: Air Force Wargaming Institute, January 2000), iv–v, vii–viii.
8. Ibid., v.

9. F. Whitten Peters, "Preparing for the Next Challenge," remarks to the Global Engagement War Game dinner, Montgomery, Ala., 28 October 1999.

10. Orientation briefing, Joint Chiefs of Staff, Washington, D.C., subject: Global Military Force Policy, 20 June 2000.

11. Soldiers want direct support close to the front, whereas airmen want to attack strategic targets far to the enemy's rear or enemy ground forces some distance from the front.

12. For information about Twentieth Air Force, see Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 5, *The Pacific: Matterhorn to Nagasaki, June 1944 to August 1945* (1953; new imprint, Washington, D.C.: Office of Air Force History, 1983), 33–41.

13. See Kenneth Werrell, *Blankets of Fire: U.S. Bombers over Japan during World War II* (Washington, D.C.: Smithsonian Institution Press, 1996).

14. *Joint Vision 2020* (Washington, D.C.: Joint Chiefs of Staff, 2000).

15. Elaine M. Grossman quoting Maj Gen Charles D. Link in an interview of 22 September 2000. See "As Aerospace Role Grows, Air Force Focuses on Developing Leaders," *Inside the Pentagon* 16, no. 40 (5 October 2000): 8.

16. Eric Ash, *Sir Frederick Sykes and the Air Revolution, 1912–1918* (London: Frank Cass, 1999), 112–13.

17. David Mets, "A Glider in the Propwash of the Royal Air Force," in *Airpower and Ground Armies: Essays on the Evolution of Anglo-American Air Doctrine, 1940–43*, ed. Daniel R. Mortensen (Maxwell AFB, Ala.: Air University Press, 1998), 50–51, 55, 82.

18. "Concept for Future Joint Operations: Expanding *Joint Vision 2010*" (Suffolk, Va.: Joint Warfighting Center, May 1997), 24.

Aerospace Power Chronicles

"Precision Capability"

Are we really a precision-capable Air Force? Lt Col David Neuenswander's article "Joint Laser Interoperability: Tomorrow's Answer to Precision Engagement" focuses on the Department of Defense's current laser-designator systems as well as the precision-engagement capabilities and shortfalls in those systems. His article is important to the debate about what needs to be done to make joint laser interoperability a reality.

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Aerospace Power Chronicles

Riding the Information-Revolution Tiger

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JOINT VISION 2010 (JV 2010) is the doctrinal framework inside which US forces will take advantage of new technologies to enhance their capabilities and develop new organizational structures.

Centered on achieving battlefield dominance across the spectrum of military operations, the four primary themes of *JV 2010*—dominant maneuver, precision engagement, focused logistics, and full-dimensional protection—point the services in the same direction in terms of developing new capabilities. "The basis for this framework is found in the improved command, control, and intelligence which can be assured by information superiority."[1]

Information superiority allows military operations to be executed inside the enemy's decision cycle, effectively diminishing significant enemy resistance. Information superiority means we will have better knowledge of friendly and enemy forces and intentions than the opposition. Information superiority is at the core of future military innovation and modernization. If one achieves information superiority, *JV 2010* postulates that it will provide dramatic advantages in command and control (C^2) capabilities over our enemies.

However, the United States is in danger of not being able to realize the *JV 2010* goal of developing a military force capable of being successful in unexpected circumstances across the full spectrum of military operations. The United States does not place a high enough priority on the development and procurement of C^2 assets. Specifically, the United States must accelerate the fielding of the Joint Tactical Information Distribution System (JTIDS) and develop a C^2 system able to support dissemination of information between American and allied forces in order to have them in place by 2010.

This article addresses the potential benefits of C^2 in the information revolution and considers how to best ride this "information tiger." It defines C^2 and explains the "revolution in military affairs" (RMA) and its implications for future C^2. Lastly, the article considers the rewards and risks of the C^2 system postulated by *JV 2010*.

C^2 Defined

For the purposes of this article, the definition of C^2 given in Joint Publication (Joint Pub) 3-0, *Doctrine for Joint Operation*, will be used: "Command and control is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of a mission."[2] *Command* is the authorized directing of people to accomplish the mission. *Control* is intrinsic to command—the process which "regulates forces and functions to execute the commander's intent."[3] C^2 is the process commanders employ to plan, direct, assess, coordinate, and control forces to accomplish the mission. The time frame for gathering information and acting on it is called the *decision cycle*. The decision cycle

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has three common parts—observing, deciding, and acting. The C^2 process focuses on the "deciding" portion within the decision cycle.

Revolution in Military Affairs

JV 2010 sets the stage for one of the most influential events shaping current military needs—the RMA. Today many believe a RMA caused by significant advances in information technology is in progress.[4] However, for a true revolution in military affairs to occur, the military needs not only to incorporate the technology but change its operational structure too. Technological advances occurring today will impact the way future war is conducted, and the ideas presented in *JV 2010* are designed to be the foundation for the military's efforts to take advantage of this technology.

The greatest military changes resulting from the technological revolution in military affairs should be organizational and doctrinal, as the networking of forces permits dispersed integrated operations. Our ability to globally link command, control, and communications (C^3) systems with surveillance, reconnaissance, and intelligence assets will become the governing factor in determining US war-fighting capability. Smaller dispersed and synchronous forces operating with better situational awareness than their adversary's forces are the military's vision. For example, during Operation Desert Fox (1998 air attacks on Iraq by US and British forces—main weapons used were Tomahawks, B-52s, and Tornados) information technology enabled the Air Force and Navy to coordinate operations through an interoperable C^2 structure. This allowed the services to coordinate a strike package that executed near-simultaneous missile attacks against over 50 targets in Iraq.

Despite the tremendous potential of the current RMA, there are associated issues that need to be explored. The first of two issues considered is the diffusion of key RMA technologies such as space systems, computer architecture, telecommunication systems, and global-information distribution networks.[5] Specifically, how fast and to what extent will the technological advantages be diffused to other nations? This is very difficult, if not impossible, to determine, but some deductions can be made based on available information: (1) many RMA technologies are products of the civilian market, making some degree of diffusion a probability; (2) since the military is becoming increasingly rooted in dual-use technologies, the rate of diffusion could potentially be rapid; and (3) if a key technology is diffused, it may not yield much in the way of a comparative advantage during war.

The second issue to be considered is asymmetric strategies. Even though many world economies are growing, the ability or desire of some nations to spend the money for research and development or acquisition of key RMA technologies has declined. Therefore, countries that are unable or unwilling to invest in key technologies, such as Iraq, North Korea, or various countries in the Balkans, will likely consider asymmetric strategies such as terrorism, weapons of mass destruction, information warfare, and others. During the recent Kosovo operation then-president Slobodan Milosevic adopted an asymmetric approach. President Milosevic was hoping to create a humanitarian crisis, ending the North Atlantic Treaty Organization (NATO) operation by cleansing Kosovo of ethnic Albanians and fracturing alliance cohesion. The effectiveness of asymmetric strategies in

countering new technologies is still uncertain, but anticipating asymmetric challenges in future conflicts is a must.

Therefore, the *JV 2010* view that improved C^2 can be "assured" by information superiority should be expanded. More consideration should be given to the possibility that technology diffusion and asymmetric strategies of the future could prevent the United States from achieving an unimpaired stream of high-quality information necessary for decision making. Expansion could include training exercises that incorporate an "enemy" capable of conducting information warfare against us. The scenario could incorporate a "denial of service" attack on a base server, saturating it with requests for information similar to what happened to Yahoo in February 2000. These types of scenarios would allow decision makers to train in a hostile and realistic environment.

The current information-technology revolution provides the opportunity to build a C^2 system for the twenty-first century that will provide high-quality, relevant information to commanders significantly faster than their opponents will be able to acquire it. A net advantage in decision cycle time would allow the United States to achieve economy of force, mass, and maneuver that are superior to that of its enemies. For example, during Desert Storm, a joint surveillance, target attack radar system (JSTARS) aircraft was able to track Iraq's vehicle and troop movements over the entire battlefield. JSTARS provided the timely, accurate information on Iraqi force positions essential to our quick defeat of Iraq's forces at Al-Khafji.

Strategy

To determine future C^2 needs, we need to consider challenges in our strategic environment and deduce the corresponding military implications influencing future C^2 systems. According to the 1997 *US National Military Strategy*, the principal threats to American security are "regional dangers, asymmetric challenges, transnational dangers, and wild cards."[6] These challenges paint a picture of future warfare characterized by terrorism and indeterminable warning times. Conflicts will be fought in uncertain environments against countless and diverse adversaries, using weapons of mass destruction as leverage against the United States.[7]

This environment will require the military to respond rapidly by projecting power overseas, conducting joint/coalition operations, and simultaneously operating across the full spectrum of the theater. Our experiences during Operation Allied Force illustrated the need for each of these requirements. Additionally, it is important to recognize that even though America provided the preponderance of the military forces for Allied Force, our NATO allies provided people, planes, ships, submarines, logistics, infrastructure, overflight permission, and political support. NATO allies were partners in this operation's success, and future operations will again require their support.

In the future, the military will be required to achieve victories with a smaller force structure because it is unlikely that current budget levels will keep up with force-structure and modernization requirements. Therefore, in order to continue to project power globally and shape the international environment with a potentially smaller force, the services will have to convert into an even more efficient combined force. *JV 2010*'s emphasis on information superiority will impact all aspects of how the services fight their battles, with the largest impact

likely in the C^2 area. This major impact is necessary because C^2 and technological innovation will enable dominant maneuver, precision engagement, focused logistics, and full-dimensional protection.

Future C^2 Needs: Rewards and Risks

JV 2010 articulates the need to "collect, process, and disseminate an uninterrupted flow of information." To achieve this, we will require a C^2 process that is near real time, fully integrated, and adaptable. Each of these attributes will be discussed, beginning with the need for a near-real-time C^2. The goal is to field a C^2 system that supports near-real-time planning, execution, and assessment because decision makers need high-quality information available where and whenever necessary. Therefore, it is essential to collect, disseminate, fuse, and display pertinent information (targeting, threat, and intelligence) in near real time. This permits friendly forces to operate in a near-real-time decision cycle. It also allows the decision maker to operate inside the enemy's decision cycle while contributing to economy of force by making it possible to employ forces more efficiently. Near-real-time C^2 also contributes to unity of effort by helping to synchronize joint and coalition forces in time and space. These benefits are possible because of the availability of high-quality information coupled with increased decision-cycle speed, providing more time to coordinate joint and coalition force movements.

Next, the capabilities an integrated C^2 system will provide to decision makers will be considered. For a C^2 system to be fully integrated, it needs to be resident on a global grid (an Internet-like system that securely and redundantly links the observing, deciding, and acting elements) of the decision cycle. Consider the advantages of having the observing, deciding, and acting elements linked together through a global grid. This type of integration would make possible a common operating picture of the entire theater and allow simultaneous planning by different organizations across air, land, and sea domains. Regardless of their location in space or time, the global grid allows for total integration. Additional advantages of the global-grid concept include continuously updated plans based on near-real-time integrated results and thorough evaluations of alternate courses of action conducted collaboratively across and within domains.

The United States was given a preview of the potential and current need for an integrated C^2 system during Allied Force. For example, our information technologies enabled the use of video teleconferencing and collaborative planning at the joint force air component commander level and higher. The lack of C^2 system integration did not enable a high degree of synchronization between all NATO war fighters, resulting in geographically separated package commanders not being able to use teleconferencing to brief other allied pilots. Due to this limitation, it was not uncommon for Navy and Air Force strike assets to share the same piece of sky without knowing each other's plans. The ability to teleconference would have enhanced planning and mission synchronization across and within domains.

Additionally, as technology improves, the potential of information systems will continue to grow. During Allied Force, there was a limited ability to pass high-fidelity data necessary for strikes against time-sensitive targets to all necessary

locations. Consider the potential of having a data-link capability, such as JTIDS, across all strike and C^2 platforms. In addition to facilitating data exchanges and the targeting process, it would establish a common operational picture that would enhance battle management significantly.

Finally, the requirement for the C^2 system to be adaptable across the full spectrum of operations will be explored. The information grid must be able to provide tailored information to users, based on their needs and functions. Examples include providing requested logistics, intelligence, operational fire, planning, or other functional information where and when needed. This tailored information management will permit decision makers to make rapid, informed decisions using high-quality information tailored to their needs. Military staffs or private contractors stationed virtually anywhere inside or outside the theater of operations could coordinate planning, intelligence, logistics, and other types of decision making as long as they were connected to the global grid.

However, a C^2 system already heavily dependent on information technology and becoming even more so has its shortcomings. First, reduced decision cycles are still subject to the fog of war. For example, the downing of an Iranian airliner by the USS *Vincennes* and the downing of two United Nations Blackhawk helicopters by Air Force F-15s occurred despite the presence of information that could have prevented the mishaps. The *Vincennes*' crew may have confused the Airbus with F-14s that had taken off from Iran. Airborne warning and control system aircraft crew members did not challenge the F-15 pilot's misidentification of the helicopters even though it had information suggesting the presence of friendly helicopters in Northern Iraq, resulting in the loss of lives and aircraft.[8] Most recently, the unintended bombing of the Chinese Embassy in Belgrade during the Kosovo operation was the result of a failure in the process of validating targets. None of the military or intelligence databases used to validate targets contained the correct location of the embassy. These examples illustrate the confusion inherent in tense, time-compressed military operations that will be present regardless of how much high-quality information is available. However, it must be remembered that the goal of an improved C^2 system is not to totally eliminate the fog of war but to ensure that the US military operates with less uncertainty than its enemies.

Second, continuously improving technology could lead to the pursuit of faster response times as a goal in and of itself. Herein is a potential shortcoming—resulting from a hurried decision—where a mind-set that places a premium on speed could cause accidental conflict escalation. The objective of a faster response time is to reach a speedier decision than the opponent. The danger that needs to be avoided is hurrying to the acting element without adequately considering the observing and deciding elements. The time advantage the C^2 process provides inside the enemy's decision cycle should be used to make sound decisions *quicker* than the enemy does, not necessarily as *quickly* as possible.

Critical to success is the necessity for C^2 systems to be able to integrate and share information across the battlefield among multinational partners. As stated in *JV 2010*, "We expect to work in concert with allied and coalition forces in nearly all of our future operations, and increasingly, our procedures, programs, and planning must recognize this reality." This is a key point because the technology envisioned by *JV 2010* in the area of C^2 will likely outpace our partner's ability to acquire it. Equipment that is not interoperable will slow down decision cycles, reduce the quality and amount of information available, and increase risk.

Therefore, the services need to place more emphasis on purchasing equipment that is interoperable with our multinational partners instead of expecting them to keep pace with us. In these times of shrinking defense budgets, it is becoming increasingly difficult for our military partners to modernize at the pace that our military is able to purchase and incorporate new technology.

This point was illustrated during Allied Force in which disparities between our capabilities and that of our allies came to light, most noticeably in C^3 capabilities. These disparities impacted our ability to operate at optimal effectiveness with our NATO allies. Specifically, existing data networks were not sufficient to support the flow of data among key nodes of the NATO information grid, and this problem was compounded by the lack of interoperability between US and NATO databases. The problem continued throughout the operation and, unfortunately, a single data network to support coalition operations was never established.

A final shortcoming is that US information technology is vulnerable to information attack, either physical or electronic. For example, an enemy could attack hardware, software, power grids, or cable connections, causing a potential system or nodal failure. Couple this with the fact that the military information structure is entangled with the civilian infrastructure, and the military has little to no control over this situation, making security a legitimate concern.[9] Admittedly, given the complicated interdependencies between information infrastructures, there is no way to make them impervious to attack. However, there are things the military can do to reduce the risk: Educate military personnel in information warfare, include information warfare in exercises, design systems to reduce their vulnerability, and use encryption.

Although the interoperability of C^2 hardware is important for successful joint and coalition operations, it is not the only element necessary for success. The full potential of information technology cannot be achieved without supporting doctrinal and organizational changes. C^2 is often based on the tenets of centralized control and decentralized execution. This is consistent with C^2's current hierarchical organizational approach. However, exploiting new technology may require a decentralization of command authority so opportunities are not missed.

Examples of poor interoperability illustrating this point can be found in the Leyte Gulf Operation conducted during World War II. Adm Thomas C. Kinkaid and Adm William F. Halsey Jr. lost an opportunity to destroy the Japanese Central and Northern Forces because of the hierarchical C^2 structure they were working in. Kinkaid assumed Halsey was guarding San Bernardino Strait, protecting amphibious shipping; however, Halsey had taken his forces north in pursuit of the Japanese Northern Forces because he viewed his primary mission as offensive, not defensive. The result was that elements of the Japanese Central and Northern Forces were able to escape. If Halsey and Kinkaid had been better able to "self-synchronize" their efforts by using a globally netted, flatter C^2 system, the results may have been different.

Flatter organizational structures that delegate authority and utilize the tenets of centralized control and decentralized execution would create a more dynamic organization able to quickly respond to change. For example "the flight deck of an aircraft carrier provides an excellent, although small-scale, representation of a decentralized flexible organization."[11] It has a well-trained crew; it is a responsive, flat organization; and relevant, necessary information is widely distributed. "The flight deck operates on the basis of simple decision rules, with authority for action

placed at the action levels, dependent upon position, skill, and information."[12] For example, the joint force commander could organize his/her C^2 structure in a similar manner by employing a well-trained smaller staff, guided by commander's intent, working in an environment where relevant information is widely distributed—a decentralized, flexible C^2 structure.

Additionally, the commander's intent becomes critical when one decentralizes execution. If a subordinate knows what the commander intends to do, the appropriate decision can be made in the commander's absence—or in the absence of further guidance from the commander. The increases in the availability of high-quality information achieved through information superiority should help subordinates make these decisions. The Navy is an example of a task-oriented organization utilizing commander's intent to imply "command by negation." Command by negation is based on a common understanding of the objective to be achieved. It has the advantage of shorter reaction times because subordinates do not have to constantly ask for permission to act. If the decision is not overruled, it is approved. During World War II, the Germans used the concept of *Auftragstaktik*, which provided a great deal of freedom of action to subordinate commanders. The German system told subordinate commanders what they were supposed to do and relied on their initiative to accomplish it. The point being illustrated by these examples is that "speed of action can only be achieved through a process that decentralizes decision making and delegates authority."[13]

There are some shortcomings associated with a more decentralized C^2 structure that need to be recognized. First, increased information will create an environment where senior leaders will be tempted to get more involved in the execution of operations. This may occur because the C^2 system of the future will likely provide the senior commander with what he or she believes is the most complete picture of the battle space.[14] Additionally, in a decentralized C^2 environment, a decision by a subordinate can cause an unwanted escalation of the situation. Further, decentralized execution makes horizontal coordination across domains much more critical. If horizontal coordination does not occur, the operational commander risks losing control of the operation.[15]

Another shortcoming associated with a decentralized C^2 structure based on information superiority is the lack of common doctrine in multinational operations. It seems unlikely that every ally or coalition partner will adopt our view of the future of war as articulated in *JV 2010*. Previous attempts to convince our partners in Europe and Korea to accept AirLand Battle were met with resistance because the doctrine was technology dependent.[16] The absence of common doctrine could affect our ability to integrate and synchronize activities with our allies and coalition partners. Since doctrine consists of common terminology used to communicate commander's intent, command relationships, and control measures, among other things, it will be very difficult to prosecute a war with multinational partners without common doctrine.

Conclusion

Dominant C^2 in future wars depends on the services taking full advantage of the opportunities made possible by advances in information technology. Future battlefields will be characterized by highly integrated coordination requiring multilevel security and simultaneous actions, with US forces striving to achieve

rapid defeats—instead of fighting wars of attrition. The US military will be required to achieve rapid success with a much smaller force than in past wars. Moreover, it will not be enough to be joint in future operations; it will be necessary to integrate and improve interoperability with our multinational partners.

It is likely that future enemies will recognize how valuable information superiority is to us, and the relative vulnerability of our information systems will make future attacks on them a high probability. This, combined with other asymmetric strategies and the potential diffusion of technology, will make it difficult to "assure" information superiority.

Even though there are issues to be "worked through" and risks to be considered, these issues and risks are not reasons for rethinking investments in technology. The services must continue to improve the C^2 process by taking advantage of new technologies to maintain a comparative C^2 advantage over our enemies. However, process improvements alone will not be enough to ensure dominant C^2; organizational and doctrinal changes also must occur. Flatter, decentralized organizations staffed with people who understand C^2's value will be required to effectively field a C^2 system that can employ our nation's power to its maximum potential across the full spectrum of operations. Moreover, doctrine needs to be developed that defines command relationships, terminology, and control measures in multinational operations.

Taking advantage of the current revolution in military affairs by effectively integrating C^2 with precision engagement, dominant maneuver, focused logistics, and full-dimensional protection should enable the United States to continue to project power globally and shape the international environment in the twenty-first century. This strategy recognizes the necessity of having forces that are able to quickly respond to contingencies across the full spectrum of war. Therefore, improved information technology has to be pursued to preclude future technological advances from knocking us off the "technological tiger" primarily responsible for our success. The "tiger" is running, and if the concepts articulated in *JV 2010* are to be realized by 2010, C^2 assets need to be given a higher priority by all the services and our coalition partners now.

Recommendations

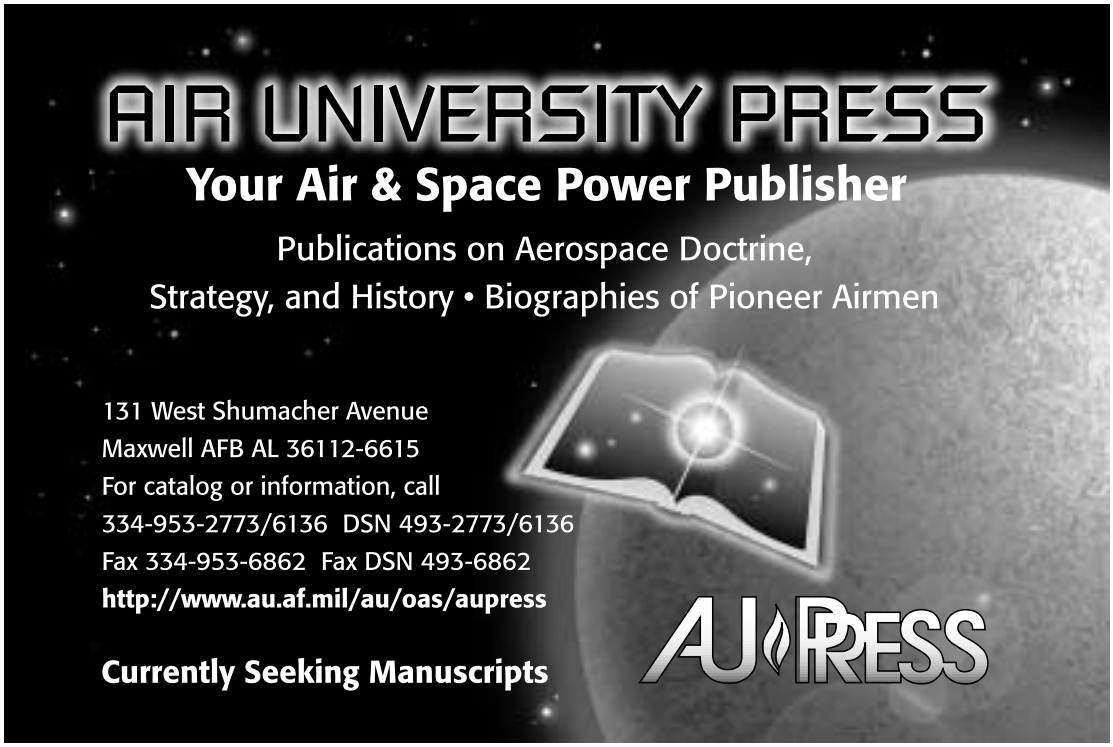
The following recommendations are provided for force planners to consider as they try to achieve the concepts articulated in *JV 2010*. First, accelerate the fielding of JTIDS. A secure, tactical data link is needed immediately across US and NATO strike and C^2 platforms to provide the timely exchange of high-fidelity data between sensors and shooters. JTIDS would establish a common operating picture, which would reduce the decision-cycle time and ensure that a higher quality of information is available on which to base decisions. This is a lesson not learned in Desert Storm; it was equally applicable to Allied Force but not applied. Our ability to link C^2 systems with surveillance and strike assets is a governing factor in achieving the goals set forth in *JV 2010*.

Second, develop a C^2 system able to support dissemination of information between US and NATO forces. The problem of how to disseminate information (infrastructure) and how to disseminate it securely (classification levels) was a problem during Desert Storm and Allied Force. This shortfall reduces reaction times, limits the ability to engage time-sensitive targets, and increases the potential

for error. If not addressed now, it will hinder our efforts to achieve *JV 2010* concepts. □

Notes

1. Joint Chiefs of Staff (JCSC), *Joint Vision 2010* (Washington, D. C.: 1995), 19.
2. Joint Pub 3-0, *Doctrine for Joint Operations* (Washington, D. C.: 7 February 1996), II-16.
3. Ibid., II-17.
4. See for example, Graham R. N. Ramsey, *The Revolution in Military Affairs: A Primer for the Uninitiated*, Strategic Research Report no. 9-96 (Newport, R.I.: US Naval War College, 1996), 8; and Arthur K. Cebrowski, and John L. Garataka, "Network Centric Warfare: Its Origins and Future," US Naval Institute *Proceedings*, January 1998, 29.
5. James R. Fitzsimonds and Jan M. Van Tol, "Revolution in Military Affairs," *Joint Forces Quarterly*, Spring 1994, 24–31.
6. JCSC, *National Military Strategy* (Washington, D.C.: September 1997), 8–19.
7. Ibid., 1.
8. Brian C. Nickerson and Dario E. Teicher, "Factors That Affect Shipboard Operational Decision Making" (thesis, Naval Postgraduate School, Monterey, Calif.), 5–9.
9. *Department of Defense Science Board Task Force on Information Warfare Defense (IWD)* (Washington D.C.: Office of the Undersecretary of Defense for Acquisition and Technology, 1996), ES-2.
10. David Alberts, "The Future of Command and Control with DBK," Institute for National Strategic Studies, 8, on-line, Internet, October 1995, available from http://www.ndu.edu/ndu/inss/books/dbk/dbkch05.html.
11. Paul J. Reason with David G. Fregmann, *Sailing New Seas*, Newport Papers no. 13 (Newport, R.I.: Naval War College Press, 1998), 11.
12. Milan Vego, "Operational Command and Control", in "Operational Art" 3d draft (Newport, R.I.: Naval War College Press, 1998), 180.
13. Capt James R. FitzSimonds, "The Cultural Challenge of Information Technology," *Naval War College Review* 51, no. 3 (Summer 1998): 16.
14. Ibid.
15. Robert W. Rissacassi, "Principles of Coalition Warfare," *Joint Forces Quarterly*, Summer 1993, 60.
16. JCSC 3-0, VI-2.



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the Combined Bomber Offensive when targeted against the industrial complex of Germany and Japan, maybe the assessment should suggest that the Vietnam planners learned from the mistakes of World War II rather than trying to repeat the successes.

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STARTING LEADERSHIP EARLY: THE KEY TO "DAL" SUCCESS

After reading the articles related to the Developing Aerospace Leaders (DAL) concept in the Summer 2001 issue of *Aerospace Power Journal,* I hope a broad-based dialog emerges about what it takes to develop leaders in the Air Force. We can improve the development of our leaders through a process that offers thorough academic preparation in leadership and that provides proven leadership abilities. These officers will be ready for the challenges that face the Air Force in the twenty-first century.

The theme of the DAL articles seems to focus on academically oriented solutions for preparing tomorrow's senior leaders and thus misses a critical part of the process that Lt Col John M. Fawcett Jr., USAF, retired, briefly addresses in his article "Leadership and Reorganization: A New Model for the Air Force": "The average fighter pilot sees responsible command for the first time as a lieutenant colonel" (p. 66). This is a critical shortfall that we need to remedy in our Air Force's DAL quest.

From this flyer's perspective, the Air Force has lost the tally on building leaders among young flyers—witness the lack of opportunities to lead that are available to younger (O-3 and O-4) Air Force flyers in assignments at wing level and below. Immediately the question arises, What about the flight commander? This position occupies a small part of building a leader, as does the flight-lead upgrade program, instructor upgrades, and so forth. These largely involve leading either a flight of five to 10 officers who have similar values, education, beliefs, and goals or a flight of two to four aircraft. What is missing is the opportunity for our young officers to lead whole sections of a squadron, both officer and enlisted.

In "A Word from the Chief: Transformational Leaders," Gen Michael E. Ryan states that "we viewed the DAL initiative as a chance, for the first time in 20 years, to thoroughly review development practices and procedures, as well as research options and opportunities, and create a more deliberate development process for all airmen. . . . This requires highly competent airmen to arrive in positions of leadership with a much broader skill set than we've deliberately developed in the past. . . . Our aerospace operations require leaders with an increased scope of knowledge and experience beyond that of their initial specialty" (p. 4).

I hope that the Air Force uses General Ryan's vision of developing leaders with a "much broader skill set than we've deliberately developed in the past," along with the improvements proposed in *APJ*'s DAL articles, to offer opportunities to lead people sooner and more often. In "Responding to the 'Developing Aerospace Leaders' Initiative: A Master Attack Plan for Reforming Undergraduate Professional Development," Col Tom Drohan and Col Doug Murray quote Col Robert McDermott, former Air Force Academy dean: "'Leaders develop from a system where a man has many opportunities to solve problems, make decisions, and assume responsibility for the decisions he makes. He has to have time to think, time to sit and time to reflect. . . . We have no right to isolate him mentally for four years, but we are doing just that by the simple device of not giving him enough time to pursue his own interests'" (p. 17).

In the Air Force fighter squadrons in which I have served since 1982, we often isolate our flyers from the unique challenges of leading a group of people towards the accomplishment of squadron (or group or wing) objectives. By way of comparison, a lieutenant in a security forces squadron (Security

Police), a captain in air traffic control, and a major in a mission support squadron have opportunities to lead and learn that flyers don't generally see until they are selected as operations officers or squadron commanders. I was very fortunate that, during my last F/EF-111 assignment with the 27th Fighter Wing, I was chosen as detachment commander (DETCO) for two combat rotations to Operation Provide Comfort at Incirlik Air Base, Turkey, and Operation Southern Watch in Dhahran, Saudi Arabia. I commanded three to four EF-111s, eight aircrews, and approximately 70 maintenance personnel; I also deployed these forces in support of the operations. I had been in standardization and evaluation and had served as an F-111D/F and EF-111 instructor; furthermore, I had preparatory DETCO experience by taking the EF-111s to Green Flag. But all this was scant preparation for being "in command"—for being "the leader" to whom everyone in the unit looked for direction. I learned many lessons, especially involving personnel, from these two DETCO assignments: clearly articulating the mission objectives; providing people with the guidance, vision, and boundaries within which I expected them to accomplish the mission; passing on the operations group and wing commanders' directions; and letting these professionals carry out their respective tasks. Beyond ensuring the accomplishment of the mission, I found that I spent most of my time taking care of "people" issues—emergency leave; interpersonal conflicts; discipline; and fixing such issues as pay, mail, and morale, welfare, and recreation. Most young Air Force flyers never get this opportunity.

Today, once again I am honored to be in command. Again I see that the Air Force is full of professionals who can carry out any mission, once they understand what is required. The lessons I learned at Incirlik and Dhahran are still valid. At this level, my biggest challenges remain "people related," running the gamut of normal, daily issues to which most Air Force flyers generally have very little exposure prior to assuming command. By the time an Air Force officer—specifically, a flyer—is selected for command of a squadron, the DAL process should have included not only a solid academic foundation in leadership, aerospace history, and doctrine, but also several junctures wherein these officers have had the opportunity to lead various groups of people in accomplishing the wing's primary mission.

The Air Force needs to look into new ways of developing tomorrow's senior leaders. As General Ryan said, "Preparing officers to command effective, mission-oriented units must be a deliberate process developing both competence and credibility in the mission area assigned and an appropriate passion for the responsibility of command" (p. 4). In order to do this for Air Force aviators, we need to transform our process for shaping future leaders. As lieutenants and junior captains, these officers need to master their weapon system; consequently, additional duties should be minimized so they can immerse themselves in learning how to use their aircraft to win battles. As Air Force flyers, this is our responsibility—when called upon by our superiors, we must employ our weapon systems to effectively support national objectives in a myriad of circumstances. Like the Navy, the Air Force must find ways to give young officers (captains and majors) a chance to lead people—and do it early in their professional development, across a broad range of responsibilities. Through the unique challenges of command—whether as leader of a training shop or a group of maintenance personnel, or as the squadron's administrative officer—some officers will rise to the top and excel, and some will not. But all will learn valuable leadership lessons, and the Air Force will gain future senior leaders equipped with the chief's "much broader skill set."

These early leadership opportunities will enhance DAL's objective of ensuring that individuals who reach senior-level positions are well prepared to lead effectively. According to DAL's Web site, "The mission of the DAL Program Office is to promote the deliberate and systematic development of future Air Force leaders through the implementation of inno-

vative procedures and policies. . . . This preparation will include the proper balance of core competencies, career broadening assignments, professional education, training, mentoring, and deployments when applicable" (see http://www.dal.af.mil/mission.htm). A significant number of the Air Force's future senior leaders are lieutenants who fly the line today. Providing enhanced leadership opportunities to these officers will add to the great foundation proposed by the DAL program.

At the outset, I noted that this letter represented the viewpoint of one Air Force flyer. I have neither studied nor closely followed the DAL process or its products. After reading the DAL articles in the Summer 2001 issue of *APJ*, I fervently hope that discussions are under way which address the matter of offering Air Force flyers more chances to lead people, as part and parcel of the overall program of Developing Aerospace Leaders.

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RESPONSE FROM THE DAL OFFICE

We appreciate the concerns outlined in Lieutenant Colonel Boardman's letter and, in fact, agree with the author—there is work to be done in the area of leadership development. For more than a year, we have studied Air Force policies and practices for preparing officers for leadership positions and have identified several areas for improvement. Throughout our research, we've maintained a close, open dialogue with senior leadership, to include the specialty functional leaders and Corona membership, outlining our results and discussing the "way ahead." They agree that we must find a better balance between honing technical and operational skills of flying officers and developing the leadership abilities necessary to ensure the continued success of our Air Force. Current DAL work is focused on that institutional requirement and, once complete, will improve the leadership development not only of pilots but also of all officers. The Air Force recognizes its responsibility to better prepare airmen to succeed in command. The DAL initiative is charting that course. We encourage the writer to stay engaged and to continue to contribute thoughtful ideas to the DAL effort.

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DEATH OF THE WAR FIGHTER?

I read with interest the Summer 2001 issue of *APJ*, which focused on leadership. An underlying theme of the articles addressed the concept of the war fighter. Both Dr. Mike Thirtle ("Developing Aerospace Leaders for the Twenty-First Century: A Historical Context for the DAL Concept") and Lt Col John M. Fawcett Jr., USAF, retired ("Leadership and Reorganization: A New Model for the Air Force"), hint at the centrality of the war fighter to Air Force leadership, while Dr. David R. Mets ("In Search of a Twenty-First-Century Air-Leadership Model: Fodder for Your Professional Reading") specifically states that "piloting is not the same as air leadership" (p. 44). Yet, none of the authors addresses the definition of the war fighter. The Air Force—the entire military, for that matter—lives with a military ethos built around the concept of the war fighter. The military believes strongly that senior leadership must be made up of war fighters. Who better to represent the respective services than someone who has been there and done that—at the "pointy end of the spear"? Only a "true war fighter" can lead the Air Force into battle. I believe that this murky concept has become even more difficult to define with recent developments in the employment of aerospace power.

Risk? War is a risky business, and those who wage war risk their lives and the lives of those they lead. This characteristic certainly distinguishes us from most of society. Yet, the current aversion to casualties in both civilian and military leaders creates an environment in which most risk is avoided. We fire long-distance weapons from outside the range of our ad-

versary's defenses, saving both the lives of our airmen and our nation's political will.

This creates some confusion when it comes to determining who is really at risk. Is a fighter pilot flying a highly maneuverable combat aircraft with built-in self-defense systems 30,000 feet above Kosovo *more* at risk than a big, slow, unarmed reconnaissance aircraft flying during "peacetime" off the coast of China? Apparently not. Are sailors manning the guns of a battleship considered warriors? They certainly don't face much of an immediate threat from the enemy. If soldiers are never employed, for fear of taking casualties, can we still consider them warriors simply because they train as warriors? Certainly, we agree that military servicemen live in a dangerous environment; accidents can happen, even during peacetime training. What about the "warriors" who monitor a vital space system or conduct computer attacks while sitting in a nicely furnished office in the middle of America? One could argue that they are the safest of us all—or high on the target list for a preemptive special-forces attack.

Following the explosion at Khobar Towers, we seem very concerned about force protection and our vulnerability "behind the lines," yet our definitions of combat still focus on the front lines. Can we still use risk to define war fighters when everyone is equally at risk?

Lethal force? Some people tell me it is the employment of lethal force that separates war fighters from "others." But again, hasn't modern technology changed this? The current method of combat is high tech and interconnected. Target engagements require the cooperation of several different actors; threats are detected, located, and identified by "warriors" in multiple aircraft and ground stations—and even by those back in the home country via satellite links. What is the difference between an AWACS controller who commits a fighter to engage an enemy aircraft and that same fighter pilot who then shoots a missile? The distinction is blurry even for the Air Force, as the court-martial of Capt Jim Wang demonstrated in 1994. If a reconnaissance aircraft transmits the location of a surface-to-air missile site to a SEAD aircraft with the push of a button, and the pilot fires a radar-seeking missile based solely on this information with the push of a button, and a missile then guides itself to the target—who has really employed the weapon? Who is held accountable if things go wrong? Can a successful computer virus not bring down a city's electrical grid just as surely as a few bombs? What about nonlethal devices such as acoustic or heat "weapons"? None of these systems satisfies our traditional conceptions of lethal force.

Are the airmen who employ these systems considered war fighters? Or do we still confine that definition to people who deliver things that go "boom"? We must also question why the experience of operating destructive weapons early in a career ensures an officer's ability to conduct a theaterwide air campaign later on. Perhaps knowledge of the enemy is just as important as knowledge of our own weapons. Perhaps an intelligence officer or a reconnaissance officer could employ aerospace power as well as someone from the more destructive end of the arsenal. After all, our goal should be to coerce the enemy, not just to blow up stuff.

My intent is to ask the question, Who is a war fighter? I hear this concept tossed around every day to explain why certain things take place, why certain elites are chosen, and why certain benefits are dispersed in certain ways. Yet, I rarely hear anyone actually describe the concept. If I do, it is in vague terms tied to "risk" and "lethal force."

War fighters are all around us, and defining them does not consist of looking at their Air Force specialty code or the specialty badge on their uniforms. Defying risk and employing coercive measures on the adversary are not limited to those we have traditionally termed war fighters. These people face challenges, and they seek roles of responsibility as they persevere through hardship. So why do we continue to limit ourselves to an anachronistic, outdated, Homeric image of a war fighter?

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GENERATION X TALKS BACK

In her article "Professional Military Education for Company Grade Officers: Targeting for 'Affect'" (Summer 2001), Capt Alisen Iversen might have avoided all of her research and simply said what she means: "All young company grade officers (CGO) are SLACKERS!" She cites numerous sources emphasizing our broken families, our decline in morals, and—most of all—our "me" attitude. It is interesting to note that all preceding generations have considered their respective youths unruly, immoral, and too questioning of authority. Plato said that "the teacher . . . fears his pupils . . . while pupils have in low esteem their teachers as well as their overseers; and, overall, the young copy the elders and contend hotly with them in words and in deeds." The elders distrust the young, and the young distrust the elders. Instead of engaging in the tired stereotype, Captain Iversen could actually look out into the Air Force and find thousands of examples that counter her argument. For example, she could visit Prince Sultan Air Base in Saudi Arabia, where CGOs oversee security forces, run the maintenance squadrons, and fly the majority of sorties over Iraq, during which they are fired upon—every day. That doesn't sound like "self before service"—it sounds like "service before self." She insinuates that Generation "X" has a "what's in it for me?" attitude and attempts to prove that point by citing three CGOs who think that their fellow CGOs are more concerned with themselves than with the Air Force team. In one instance, she quotes a captain who says that "'the Air Force needs officers who are truly dedicated out of a calling to serve—not ones who didn't have job offers right out of college or are just here to get flying hours so they can go work for American Airlines'" (p. 62). She should talk to pilots in fighter or AWACS units and ask them how many days they are TDY a year—180 or more for most of them. For some individuals, certain intangibles like family and stability do come before the Air Force. No one should be put down for seeking a different occupation than the Air Force. The fact that some officers might put in their separation papers does not mean that they aren't patriotic or out there every day all across the globe doing their jobs. All of the CGOs in my unit disagree with Captain Iversen's thesis. We are doing our jobs and doing them well. Don't stereotype us!

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Net Assessment

Responsibility is the test of a man's courage.

—John Jervis, Adm Lord St. Vincent

The Mind of War: John Boyd and American Security by Grant Tedrick Hammond. Smithsonian Institution Press (http://www.si.edu/sipress), 470 L'Enfant Plaza, Suite 7100, Washington, D.C. 20560, 2001, 288 pages, $29.95.

One of the most important books on airpower theory, strategy, technology, organization, and history to come out this year is Grant Hammond's biography of Col John Boyd, USAF. Appropriately, it is larger than life—Boyd's life—for the United States Air Force of today reflects the impact of many of Boyd's ideas. Boyd is not that well known outside either the circle of people with whom he worked or students of his art of thinking—most notably exemplified by his concept of the "OODA loop" (observe, orient, decide, and act). Such relative anonymity is about to change. Hammond's biographical study, which also addresses numerous important facets of airpower and the Air Force, will definitely attract wide attention.

One of the great challenges of biography is to understand and portray the true person and not the superhero. Certainly, some readers might accuse Hammond of overselling his champion. Yet, had Boyd never lived, what would have been the historical difference? Counterfactual speculation is ahistorical and antischolarly, but one is forced to conclude that Boyd truly made a difference to the Air Force as well as to its sister services. In most positions, including those in high-level leadership, others likely would have filled the gap and produced a similar result. In Boyd's case, however, his contribution was genius that rarely comes along. That, combined with his selfless ambition to improve the nation's war-fighting capability, allowed Boyd to have the kind of fundamental impact that made him truly profound.

As pointed out in this solid biography, Boyd's fingerprints were everywhere—evidence of a true Renaissance man whose interests ranged from aerodynamics to economics to cosmology. Hence, this biographical study covers a wide range of topics not only interesting to a variety of readers, but also invaluable to the general story of military aeronautical progress during the past 40 years. Boyd's most significant contributions were in the areas of aerial tactics and combat aircraft. He authored the first and only real tactics manual of his time, the "Aerial Attack Study," which trained a cadre of air-to-air experts and had a substantial impact on generations of Air Force pilots. He invented an "energy maneuverability theory" that utilized modern comparative analysis to ascertain the optimal aircraft and maneuvers needed to achieve air superiority. Furthermore, his massive 327-slide briefing "A Discourse on Winning and Losing" has influenced military and industry audiences far and wide. In many respects, Boyd might be considered the father of modern aerial combat, both as fighter-pilot practitioner and theorist. At the least, he exerted the single most important influence on the design of two critical combat platforms—the F-15 and F-16 air superiority fighters.

But how Boyd went about all this both led to his success and became his tragic flaw. He was the quintessential intellectual maverick—a man who thrived on bending the rules and violating the regulations. Whether stealing computer time, jumping the chain of command, or risking his reputation and career, he did what he thought was necessary, regardless of who or what got in the way. Such proclivities made Boyd both famous and infamous. He was loved or hated, revered as a genius or despised as a loose cannon. In a way, he lacked common sense but at the same time had uncommon sense—which made him the ideal subject for Hammond, who has a passion for challenging orthodoxy. True to form, Hammond uses this biography to upbraid the Air Force for not granting Boyd the recognition he deserved and to criticize the service's systemic detractors who reward company people over critical thinkers. Very likely, this biography would have pleased Boyd.

In his assessment of Boyd's thinking process, Hammond engages in extensive psychoanalysis—perhaps to excess. But Boyd was a very deep thinker, and his cognitive process affected people just as profoundly as did the product of his mind.

Certainly, the OODA loop is just such an example. Hammond's study, therefore, is more a biographical case study of how someone thought than it is a chronology of a person's life.

After reading this gripping biography—so well researched, crafted, and effective in bringing the reader into Boyd's life—I can only regret never having met Boyd and having missed the opportunity to publish his writing in *Aerospace Power Journal*. As Hammond points out, however, Boyd most likely would have rejected that opportunity. He didn't write much, and what he did write wasn't for publication. Boyd preferred briefings, which he constantly revised. Fortunately for the public, he had a dedicated biographer who understands the importance of publications. Now the name John Boyd will become much more widely recognized in Air Force and Department of Defense circles—as well it should be.

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They Called Them Angels: American Military Nurses of World War II by Kathi Jackson. Praeger Publishers (http://www.greenwood.com/praeger.htm), 88 Post Road West, Westport, Connecticut 06881-5007, 2000, 248 pages, $62.50.

A poignant collection of personal anecdotes from World War II nurses, *They Called Them Angels* offers accurate, firsthand narratives of what the nursing field entailed. Contrary to the oft-seen movie depiction of the boy-crazy, highly primped, and ridiculously mannered wartime nurses (all of whom were female in World War II), Jackson's rendering is a more precise and deserving description of valor, commitment, and unrelenting compassion.

The author's thorough and captivating depiction of nursing from stateside general hospitals to overseas battlefronts surpasses all expectations. She begins with the training required of all nurses and concludes with personal accounts of a few of their postwar careers. Although a number of nurses remained in the military, some of them advancing in rank as high as brigadier general, others chose to leave the service and marry the men with whom they had fallen in love during the war.

From a mosquito haven rampant with malaria and dengue fever, to an aircraft unprotected by the Geneva Red Cross, to the confinement of a ship under strict water rationing, World War II nurses were ubiquitous. Jackson's book encompasses every theater in which nurses served throughout the war. She describes the conditions and challenges each theater posed for the medical field. Service personnel in the Pacific and Mediterranean theaters suffered raging disease while those in the European theater experienced dwindling supplies and strict rationing of food and water. Nurses in the China-Burma-India theater feared imminent attack and kept their helmets close at hand.

Through her graphic descriptions of the nurses' horrendous living and working conditions and drastic lifesaving measures, Jackson kindles in the reader a sense of gratitude for their heroic service. The book makes clear that these nurses knew how to have a good time, but that portion of their experience pales in comparison to the gallantry, commitment, and vitality these women demonstrated each day. Although extensive training taught the nurses how to keep a patient alive, they came to realize that no training could ever impart the sincere care and tenderness that so often proved the most effective and invaluable of cures.

The book's appendices include the names of nurses who responded to the author's questionnaire, as well as various wartime prayers, pledges, and hymns associated with their profession. The 24-page bibliography and extensive citations not only assist researchers but also lend credibility to Jackson's effort.

Her book stands apart from typical academic studies of the Army Nurse Corps during this era. Not only is it historically accurate (to the extent that reputable sources can confirm such personal accounts), but also it is surprisingly entertaining. To read *They Called Them Angels* is to acquire a deep sense of respect and admiration for all World War II nurses—and to have an enjoyable experience doing so.

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Waging Modern War: Bosnia, Kosovo, and the Future of Combat by Gen Wesley K. Clark. Public Affairs (http://www.publicaffairsbooks.com), 250 West 57th Street, Suite 1321, New York, New York 10107, 2001, 512 pages, $30.00.

Waging Modern War is another book written about an air war by an Army general—not just any Army general but one whose bacon was saved by

airpower, and one who hardly can credit airpower for its unique attributes. "We have to be very careful with inflated expectations of what we can do with high technology, precision strike from a distance," retired general Wesley Clark said in a Fox News interview in May 2001, promoting his book. "Ultimately it's going to take good people on the ground, up front, to work in some very complex environments."

Complex environments? That would describe Operation Allied Force, the coalition war-that-couldn't-be-called-war presided over in 1999 by a commander in chief (CINC) uniquely positioned to understand his political masters and circumstances—an officer who also had the advantage of having sized up his opponent for years. Yet, Clark's assumptions about Yugoslav president Slobodan Milosevic's will to resist proved faulty, and as supreme allied commander Europe and CINC of United States European Command (EUCOM), Clark never really prepared contingencies for the 78-day air war that unfolded. What he did instead—as reflected in his lopsided prose—is agitate, almost with masochistic zeal, for anything but airpower. Clark provides excruciating, sometimes painful, detail of the political constraints under which he operated. Yet, nowhere does he look back to ask whether his push for Task Force Hawk or for a ground campaign contradicts the realities he describes.

General Clark says the war was "personal" for him but tells his tale with a strange passivity and subtle disassociation. Gen Henry Shelton, chairman of the Joint Chiefs of Staff (JCS), was "high on the idea" of Apache helicopters. The "biggest concern" of Lt Gen Michael Short, the air component commander, was the loss of aircraft. National security adviser Sandy Berger demanded that Serbian forces in the field be the priority for attack. Everyone else was concerned about civilian collateral damage. Clark's EUCOM staff developed a "mechanical . . . attrition" methodology for assessing the success of strikes. The "processes of approving . . . targets, striking the targets, reading the results, and restriking were confusing." So where is Clark? One might conclude that this is chateau generalship sine qua non (His office is even called the chateau!). Physically removed from his joint task force and air component commanders, with decisions being made all around him—in Brussels, the Pentagon, and the White House—Clark portrays himself as unable to influence much of what was going on.

Unlike the bland war autobiographies by Colin Powell and Norman Schwarzkopf, *Waging Modern War* is most honest in describing tense relationships between Clark and Secretary of Defense William Cohen, General Shelton, and Clark's Army colleagues in the Pentagon. The author's account of seat-of-the-pants decisions constantly being made by a small circle of ranking officers and civilians over the telephone does not inspire much confidence in formal planning, staffing, or "command and control."

I kept hoping for some insight into the mind of a supreme commander unable to command. And I wanted Clark to reflect on why prewar judgments proved so wrong. Finally, it would have been nice to know whether Clark thinks there might have been a different or better way to fight the war. The CINC claims that people on the ground are essential for this kind of "modern war," but he does not make his case, leaving us wondering whether this is merely the conclusion of an obsessive Army officer or a standard worthy of debate.

What of the air war? Given the scores Clark seems intent on settling with the Pentagon, it is odd that he does not directly take on the now well-aired disputes he had with General Short, his combined and joint force air component commander (JFACC), over whether the emphasis of attacks should be on "strategic" or "tactical" targets. Clark's arguments are twofold: First, he says that the "moral and legal imperative" of using force "was to go after the Serb ground forces that were committing or aiding the ethnic cleansing." Second, he argues that Milosevic's center of gravity was the Serb "military machine and police in Kosovo."

Both arguments are worthy, but Allied Force is appallingly fallow territory to plumb the intellectual depths of this doctrinaire—I would say outmoded—debate between target sets that are in practice complementary. Clark admits that even if strikes were successful against Yugoslav forces in Kosovo, "the air actions still wouldn't hit the paramilitary units that were causing most of the damage" and ominously describes "strategic bombing advocates . . . gaining the upper hand in the interagency discussions." Weren't they also interested in winning the war? How did Clark expect to change the realities of airpower's inability to stop paramilitary operations?

Unquestionably, General Short stonewalled Clark in not putting the level of emphasis on ground forces that the CINC wanted, but Clark never reflects on whether his focus on Serb forces remains convincing. At one point he says that he told Short, "We're going to win or lose this campaign based on how well we go after the ground targets." Well, it didn't turn out that way. Did Clark in fact have a subconscious agenda, once he did not

obtain the instant victory he initially forecast? "There were limits as to what the air campaign could realistically achieve," he says again and again. When "we weren't having the desired effects with the air campaign," he began to stress the "limitations of the campaign" to his Pentagon masters, "setting the stage for the move to a ground option."

Airpower, according to Clark, is a diminishing asset. He believed that "eventually we would run out of easy-to-strike targets"—easy, as defined by those "that were projected to generate only small numbers of accidental casualties." Clark decries the micromanagement free-for-all that vetoed urban, electrical power, communications, and other targets. But he also reveals his own preconceptions about civilian collateral damage that seem to undermine his passing the buck to Washington and North Atlantic Treaty Organization (NATO) allies. "By the end of May," Clark reports, pressure to avoid collateral damage forced NATO to eliminate targets and pare back the campaign. "The weight of public opinion was doing to us what the Serb air defense system had failed to do: limit our strikes."

So Wesley Clark leaves some challenges for airpower advocates:

- Is this the only way in which politically constrained wars can be fought?
- Would strategic attacks have brought the war to a more rapid, successful conclusion, thereby ultimately reducing the risk to civilians in an ever-escalating conflict?
- Why isn't strategic attack some anti–Army airpower conspiracy?
- Was public and political fretting in response to actual civilian harm, or was it based on imagined damage?
- Can one make a comparison between damage from the air war and damage that would have occurred in Kosovo had we used Army Apache helicopters and ground rockets—followed, of course, by Clark's desired ground invasion?

Why do these questions have to be answered? Fast-forward to the future. It's 2010, and America is once again using its military forces in a humanitarian intervention, with all the usual constraints. A JCS chairman, Air Force chief, CINC, or JFACC goes before a president to argue that this time the air campaign should be done the "right" way—none of that hesitant, micromanaging, gradually escalating, namby-pamby stuff. Someone argues for going after the head of the snake or effects-based targeting or some other strategy du jour—it doesn't really matter. What matters is a president's likely reply: "General," he'll remark with some consternation after having received the killer briefing, "What was wrong with Operation Allied Force? Not one NATO pilot was lost, civilian harm was indeed kept at a minimum, Milosevic was in the Hague within two years of the cease-fire, and Yugoslavia is a democracy today. In Iraq, general, we fought your strategy, and Saddam Hussein is still there."

Was Allied Force such an aberration? Perhaps Clark's dichotomy between real war (ground war, that is) and air war is not merely an "Army" general's perspective. Maybe this is the dominant political view in our society. General Clark is wrong about so many things, but airmen ignore these preconceptions at their own peril.

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