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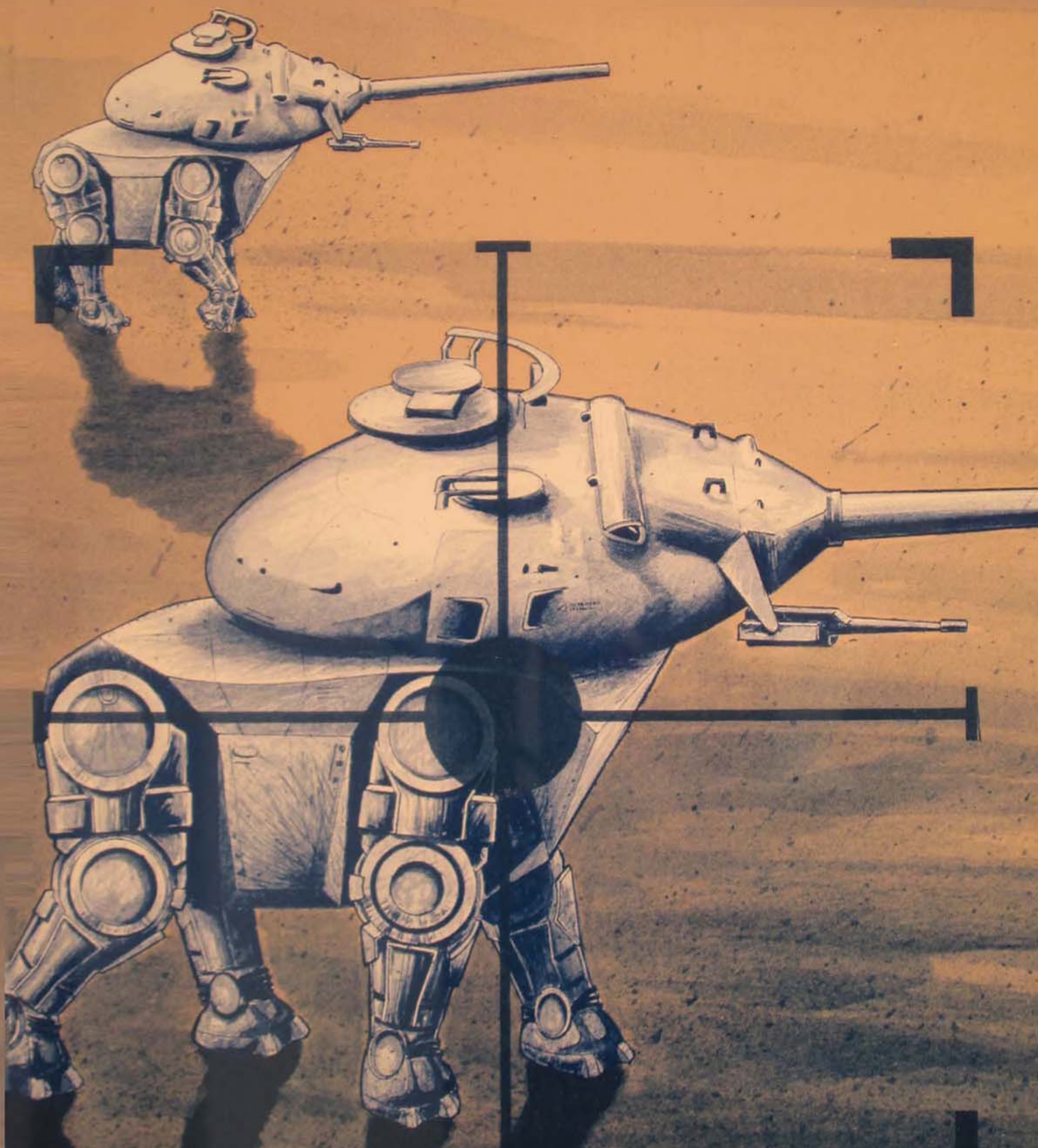

Winter Readings

- Strategic Paralysis
- Space Power Survivability
- The Art of Intelligence

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EDITORIAL

Making Pearls: A Perspective on Duty

Give unto me, made lowly wise,
The spirit of self-sacrifice.
—Wordsworth, "Ode to Duty"

"LIFE'S A b_ _ _ _, and then you die." Well, that just about sums it up, doesn't it? It's not easy being in the Air Force these days. It's not just the fact that we have fewer people and not as many dollars to work with. We've faced that issue before. No, the difficulty is that everything's *changing*, and everything's just so . . . indefinite. Perhaps the AFSC you've devoted your whole career to went away. Or your wing was deactivated, and you volunteered (and were turned down) for X number of jobs on the bulletin board. Or worse, the uncertainty of your future in the Air Force due to the threat of an impending _____(RIF, passover, SERB—you fill in the blank) makes you wonder about the efficacy of gambling away another year with the Air Force . . . or a separation bonus . . . or another assignment . . . ad infinitum. If you happen to complain too much, some optimist quotes you a sugary platitude like, "If life hands you lemons, make lemonade"—as if you didn't have a right to be angry and resentful.

Well, perhaps you do have reasons for being angry and resentful. But you also have a choice—although it's not necessarily an easy one to make. I've often heard motivational speakers use the pearl-making capability of the oyster as an example to inspire higher performance. An oyster responds to a grain of sand intruding into its closed ecosystem by secreting a solution called mother-of-pearl, which covers the irritant and eventually makes a pearl. It's nice to think that what was once an irritant can become a thing of beauty and lasting value. The trouble is that the recipient of that oh-so-wondrous pearl isn't the same creature that had to suffer with the irritant for who knows how long! I don't believe I've ever heard a comment on what the oyster gets out of the pearl-making bargain.

Think about it. If the sand is an irritant, isn't the pearl simply a bigger annoyance? After all, the oyster keeps secreting the mother-of-pearl, and the pearl just gets bigger and bigger. Admittedly, the oyster's central nervous system isn't particularly sophisticated, but it would seem we could associate *some* pain with wrenching the oyster apart to extract the pearl. And what happens to the oyster after the pearl is harvested? Well, I'm not a marine biologist, a philosopher, or someone who makes a living off oysters, so I don't have those answers (nor do I want them). But I do know that the oyster doesn't have a choice about whether to make a pearl. Fate gives it an irritant, it makes a pearl, and we humans reap the benefits—literally.

As with the oyster, irritants force themselves into our professional and personal lives every day. Some of these intrusions aren't merely irritants but full-scale catastrophes which, through no fault of our own, cause us and others great personal suffering. Unlike the oyster, WE have a choice. We don't have to accept the pearl-making process. We can refuse or resist or complain it away. Or we can give in and make a pearl, even if we aren't the ones who'll reap the value. The metaphorical pearl-making process is long and uncomfortable. Often the pearls (those things of great value to our organizations, families, or

society as a whole) will be harvested at great personal cost and sacrifice. How many of us are willing to produce pearls under those conditions? How many of us are willing to risk personal pain and loss for a better way and a better Air Force? Not many of us. But perhaps we should take that risk. Eventually, the oyster will die anyway. The pearl and its value will remain for years.

I think I'd rather leave even one pearl behind. It's better than an empty shell.

GDF

apj RICOCHETS

Letters to the editor are encouraged. All correspondence should be addressed to the Editor, Airpower Journal, *401 Chennault Circle, Maxwell AFB AL 36112-6428. We reserve the right to edit the material for overall length.*

COMMAND AND CONTROL CONCERNS

I agree that Air Force command and control (C^2) could be speeded up and made more flexible and survivable, but I think that 1st Lt Gary A. Vincent's article on "A New Approach to Command and Control: The Cybernetic Design" (Summer 1993) takes changes too far. He wants to combine implicit C^2 with improved computer technology to completely overhaul C^2 as we know it. Implicit C^2—embodied in mission orders, a shared understanding of the commander's intent, and trust for subordinate commanders—is a great idea. It could be called "total quality warfare." Improved computers and communications are also an excellent idea that would let the theater air control system (TACS) achieve its full potential. The problem occurs when Lieutenant Vincent suggests removing all layers of authority from TACS and the US Army except for theater headquarters and flights or companies, which he considers "basic action units" (BAU). The resulting system would be slower and less able to execute implicit C^2.

Currently, TACS consists of basically independent systems for air superiority (control and reporting center [CRC], forward air control post [FACP], airborne warning and control system [AWACS]) and close air support (air support operations center [ASOC], tactical air control party [TACP], airborne battlefield command and control center [ABCCC]). A separate system (airlift control center [ALCC], airlift control element [ALCE], combat control team [CCT]) supports airlift missions. These units control current operations and process requests for unplanned sorties. Preplanned sorties, including interdiction and strategic strike missions, are scheduled and coordinated directly by the air operations center (AOC). That's where the problem is. Aircraft on ground alert for air defense or close air support can be scrambled in minutes. Interdiction sorties have to be spelled out detail for detail in the air tasking order (ATO), more than a day in advance. It's not the C^2 system that slows down responsiveness—it's the lack of one. Flexible, responsive interdiction/strike missions could be planned and executed by a composite wing tailored for them. Another approach would be to create the ground attack control center, which up till now has been a footnote hidden in Tactical Air Command and Air Combat Command regulations. Any system that speeds up the planning cycle would make offensive air operations much more flexible.

In many system training exercises at a CRC, one thing that slowed air defense execution time in TACS was waiting for permission from the tactical air control center (TACC, now AOC) to scramble, commit, and shoot. As with any other mission, having AOC try to do everything just slows the whole system down.

Lieutenant Vincent's desire to implement implicit C^2, including mission-type orders, conflicts with his desire to take layers of command out of the loop. The trouble is, if one gives mission orders to a company or flight, the mission has to be company- or flight-sized. If the theater commander has a larger problem, he or she has to break it down into smaller problems, and then down into BAU-sized missions suitable for relatively junior commanders. For

continued on page 81

STRATEGIC PARALYSIS

AN AIR POWER STRATEGY FOR THE PRESENT

MAJ JASON B. BARLOW, USAF

The most complete and happy victory is this: to compel one's enemy to give up his purpose, while suffering no harm oneself.

—Count Belisarius

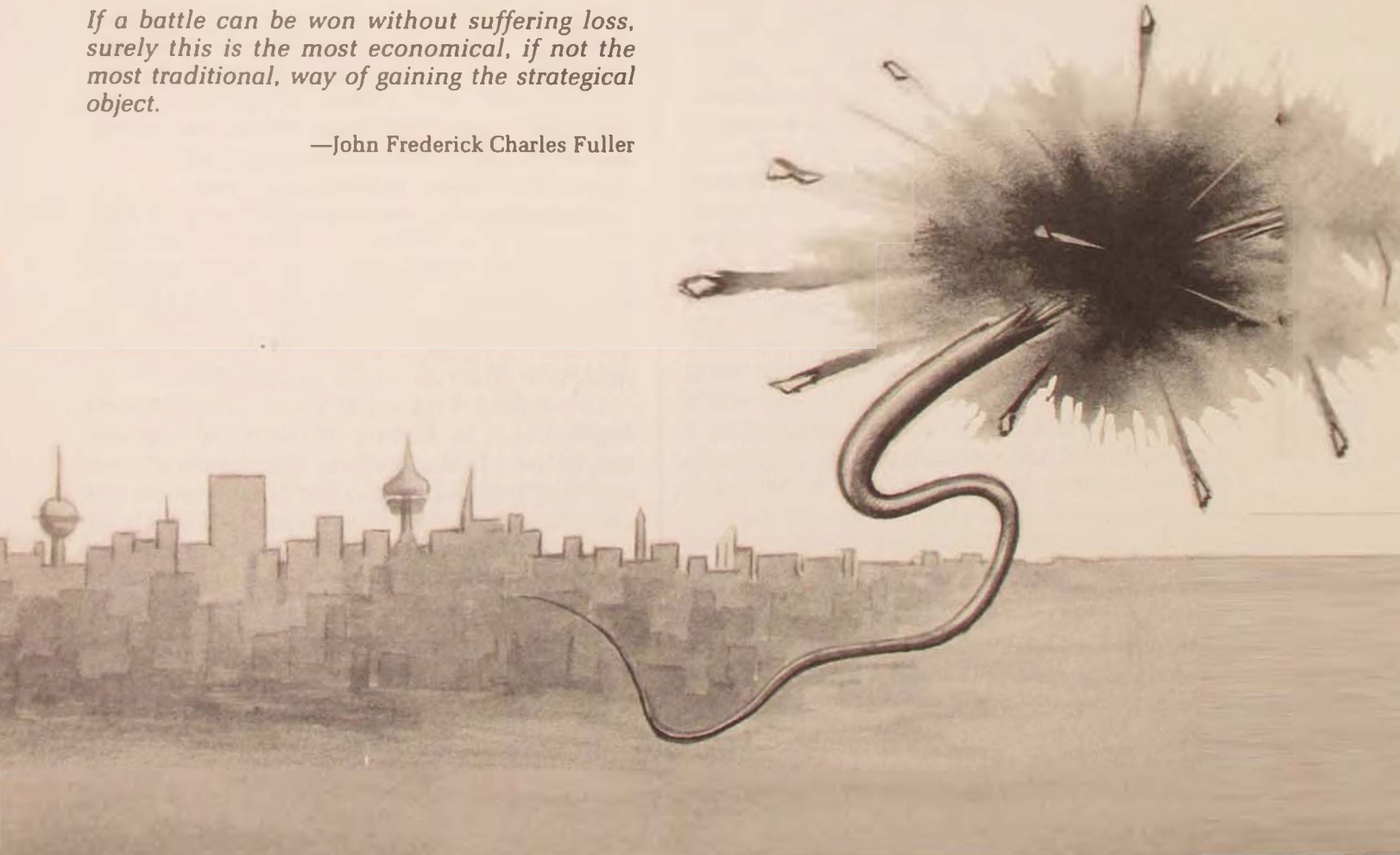
To do the greatest damage to our enemy with the least exposure to ourselves, is a military axiom lost sight of only by ignorance of the true ends of victory.

—Dennis Hart Mahan

If a battle can be won without suffering loss, surely this is the most economical, if not the most traditional, way of gaining the strategical object.

—John Frederick Charles Fuller

THE MILITARY has long sought a quick and economical decision in battle. Leaders of armed forces the world over continue to search for the perfect maneuver, the right terrain, or the ideal weapon that promises victory at the lowest possible cost in terms of blood and treasure. Is modern air power what they are looking for? Precise aerial warfare—although not suited for every conflict—does offer certain distinct advantages over the more traditional forms of



war. This article suggests an independent strategy for the application of air power—strategic paralysis—and discusses the conditions necessary for its success.[1]

Some readers will dismiss this article as just another parochial piece on air power. Be that as it may, the military can no longer afford to divide every budget and every conflict equally. True joint warfare demands recognition of the most appropriate and capable force for each situation and requires us to look hard at our future requirements and employment strategies.

The Gulf War of 1991—notable for technological achievements and the willingness to use them correctly—marked air power's coming of age. Failure to recognize air power's maturity or decisiveness in this war—or to downplay its potential in the next—is as myopic as suggesting that air power can totally replace land or sea forces.

Most military theorists agree that the objective of any military conflict is to change the enemy government's behavior. What is not so clear is the means of effecting such change and the role of air power in this process. Because strategic paralysis calls for attacking or threatening national-level targets that most directly support the enemy's war-making efforts and will to continue the conflict, this strategy holds promise for changing the enemy's behavior at a relatively low cost to both sides. Air power is the primary weapon of this strategy because only it can provide the access, mass, persistence, and simultaneity of attack needed to induce paralysis.

Strategies

Two fundamental strategies of warfare are attrition and annihilation (fig. 1).[2] On the one hand, attrition warfare seeks victory by exhausting the enemy in time, space, energy, and supplies. Because attrition warfare rarely leads to a quick, decisive victory, it is an unappealing choice for a war strategy. On the other hand, annihilation is the strategy of choice because it implies superiority over an adversary. One side seeks (or is capable of) the complete destruction of the other. But this form of war is often lengthy, costly, indiscriminate, and hard to control. Both strategies are linked by some increase in military force or war-fighting capability vis-à-vis an opponent; this increase serves to elevate attrition to annihilation. Unlike these strategies, strategic paralysis calls for precise aerial attacks against an enemy's most vital targets to paralyze his ability to continue the conflict and perhaps even break his will to do so.

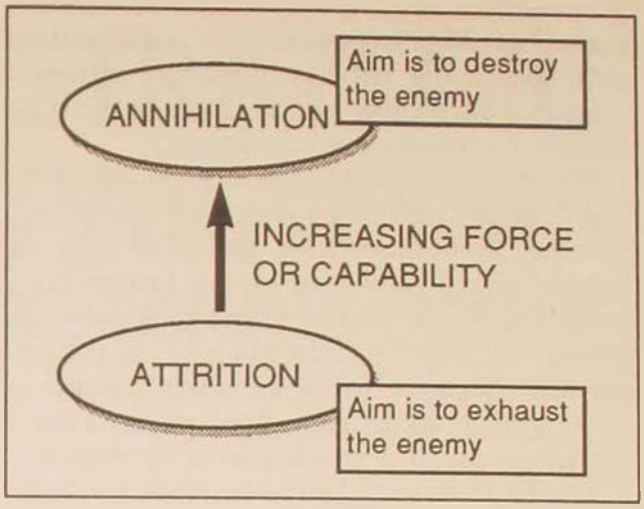
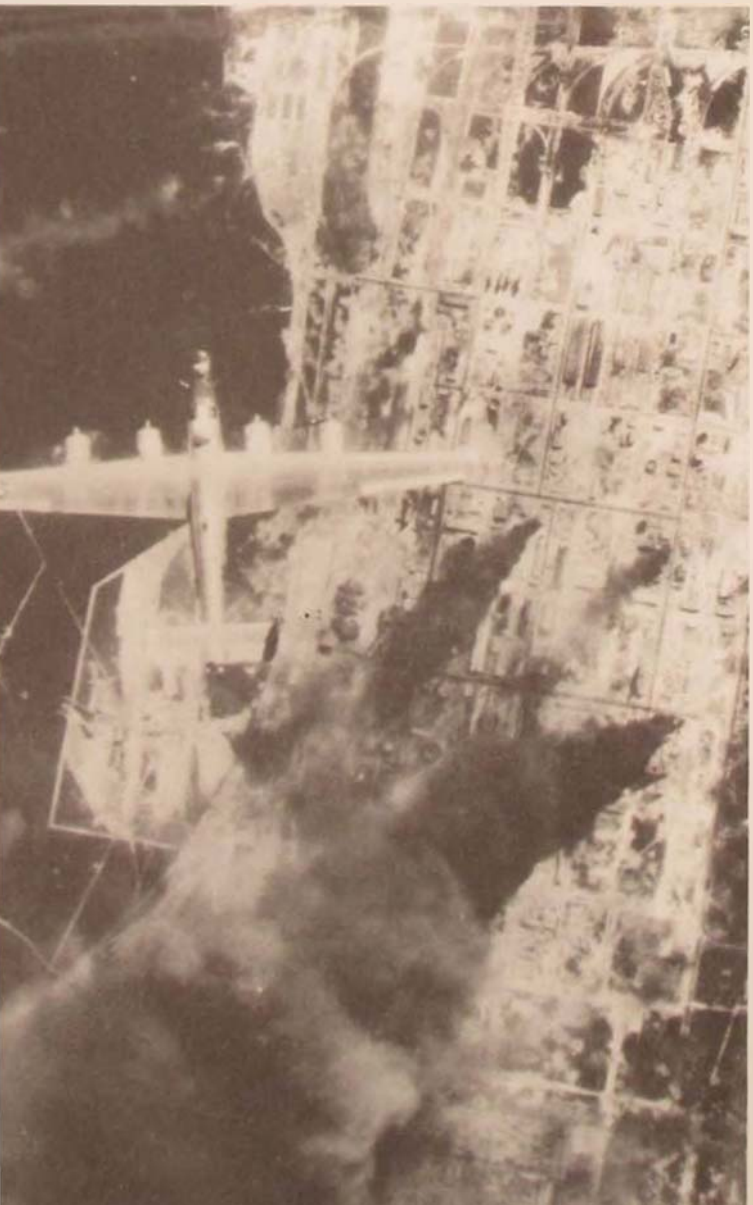


Figure 1. Traditional Strategies of War

The idea of paralyzing the enemy has many historical antecedents.[3] In the 1950s, for example, Sir Basil H. Liddell Hart saw paralyzing an enemy by air as a way to win wars at the lowest possible cost: "It is thus more potent, as well as more economical, to disarm the enemy than to attempt his destruction by hard fighting. . . . A strategist should think in terms of paralysis, not killing." Liddell Hart argued that the resulting "psychological pressure on the government of a country may suffice to cancel all the resources at its command—so that the sword drops from a paralyzed hand." His analysis of war showed "that while the nominal strength of a country is represented by its numbers and resources, this muscular development is dependent on the state of its internal organs and nerve-system—upon its stability of control, morale, and supply."[4] Liddell Hart's ideas are signifi-



During World War II, the skies over Germany witnessed a deadly battle of attrition; however, when Germany lost the air war, it lost the war. Here, a B-24 flies over its smoking target—an oil refinery at Blechhammer, Germany.

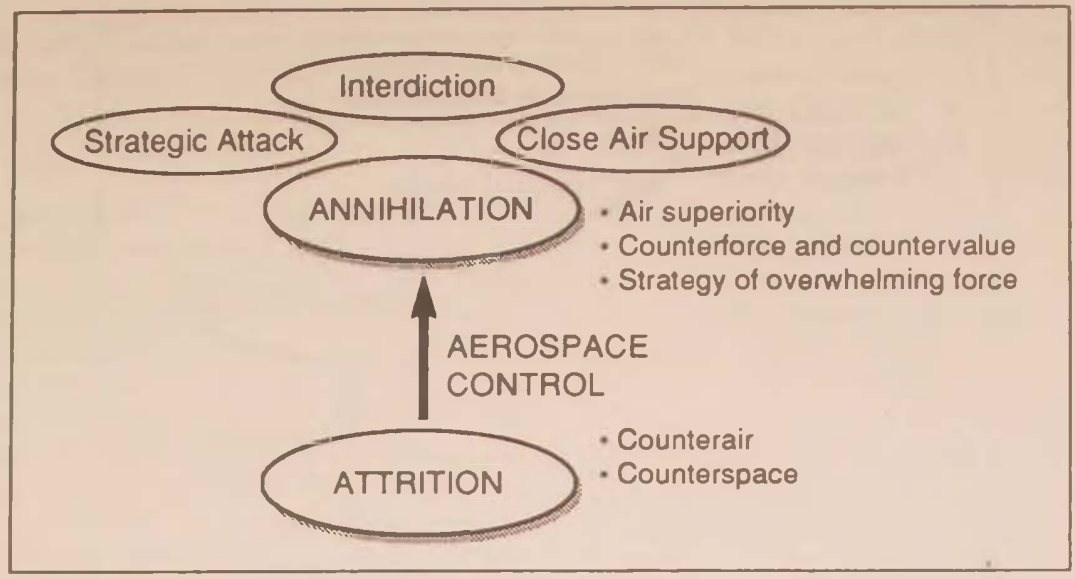


Figure 2. Air Power Framework for the Traditional Strategies of War

cant in their recognition of increasingly important levels within any government. Because strikes at the higher levels have the most impact, one can induce national or strategic paralysis by selecting targets carefully.

Strategic paralysis, then, constitutes a significant departure from the more traditional views of war. As we shall see, the success of this strategy depends upon four key elements that determine its relative strength or weakness: (1) aerospace control, (2) technology, (3) vulnerable infrastructure, and (4) vital targets.

Aerospace Control

Control of the air[5] is fundamental to any successful military—let alone air—operation (fig. 2). Although air power thinkers recognized the importance of air superiority early on, warriors often found it hard to achieve. The advent of large aerial forces in World War II did little to change this reality. Despite the high praise accorded aircraft, they did not ensure victory. Before airplanes could drop their bombs, they had to be able to reach their targets; consequently, one of the largest aerial attrition campaigns ever waged took place in the skies over Germany, as each side fought for control. Thus, the introduction of modern bombers in World War II simply moved the bloody trenches of World War I to 25,000 feet. When the Germans lost the battle for the air, they lost the war.

Neither solely annihilative nor solely attritive, strategic paralysis is distinguished by a qualitative—not quantitative—change in force or capability. That is, because one attacks the enemy anywhere, anytime, with a simultaneity and guaranteed precision that ensures few casualties,[6] the strategy holds the promise—thanks to technology—of resolving conflict at a level of destruction far short of complete annihilation.

Technology

High technology makes possible an alternative to the strategy of annihilation (fig. 3).[7] Such innovations as precision guided munitions, cruise missiles, global positioning systems, and stealthy airplanes now give air power the penetrative capability, persistence, and specialized weaponry necessary to directly attack an enemy's strategic centers with devastating accuracy.

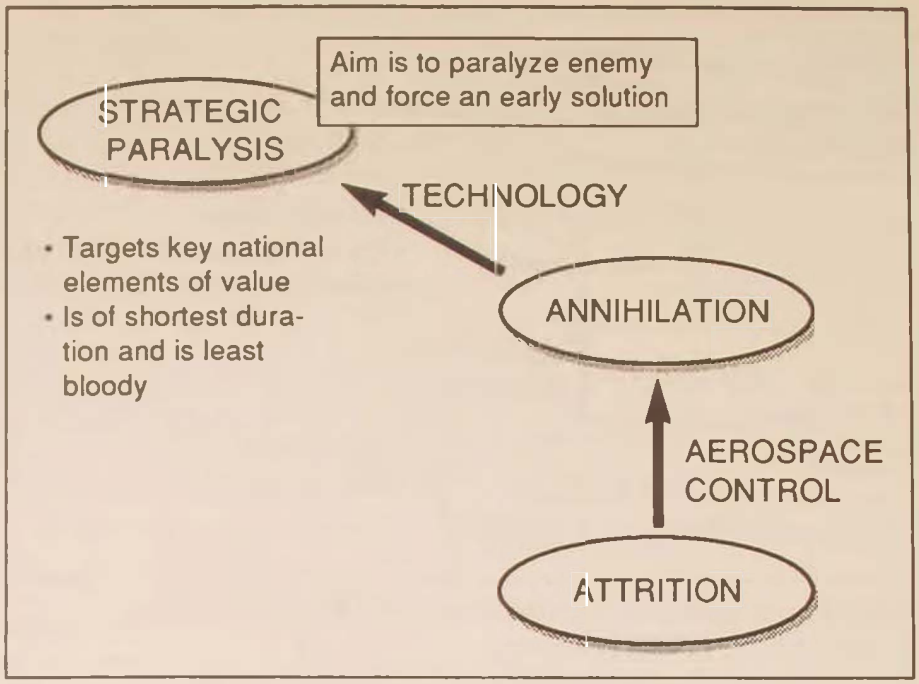


Figure 3. Air Power Framework for War Strategies

The Gulf War was not the first conflict in which the US sought to employ a strategy similar to strategic paralysis. For example, the US began World War II with a doctrine that advocated the daylight precision bombing of Germany's industrialized centers as a way to force Germany into ending the war. But the available airplanes, bombs, and navigational instruments (i.e., the technology) did not measure up.[8] Indeed, because accuracy and ordnance were so poor, targets had to be attacked heavily and often. For example, 108 B-17s were required to achieve a 96 percent probability of kill on a power-station switching yard measuring 400′ x 500′.[9] It comes as no surprise, then, that Air War Plans Division—Plan 1 (AWPD-1) called for 6,860 bombers to destroy only 154 targets. The situation was no better for B-29s in the Pacific, where "only 50% of [the] total aircraft dispatched would successfully attack a given target and . . . only 25% of the bombs dropped (or 12% of the total bombs dispatched) would fall within a 1000 foot radius of the aiming point."[10] As one writer observed about war, "You can fire small-calibre rifle bullets indiscriminately into an elephant all day, and he will still be on his feet at night. One aimed shot, however, will knock him to his knees."[11] Technology now allows us to take that aimed shot.

Vulnerable Infrastructure

If strategic paralysis is to attain quick victory by applying technologically superior air power, planners must identify important, vulnerable targets.[12] Such targets are readily found in a modern, industrialized society that relies on a fixed and vulnerable infrastructure. For example, because Iraq's bridges, communication centers, power production stations, and water plants were strategically important and extremely vulnerable to air attack, they were nearly ideal targets for a strategic paralysis campaign. In fact, the air campaign in Operation Desert Storm came as close to fulfilling this strategy as any campaign ever conducted, a fact acknowledged by Secretary of the Air Force Donald B. Rice, who noted the Air Force's "ability to paralyze our adversaries' war-

fighting ability as air power did in Operation Desert Storm."[13]

Vital Targets

Target selection lies at the heart of military doctrine and theory. If aiming your effort—as Carl von Clausewitz would say—is important for the ground commander, it is much more so for the air commander because air power is expensive and precious.[14] Air power can put an enormous amount of fire on an enemy position, but it is costly and difficult to sustain. Hitting an insignificant target with a bomb that has been flown 3,000 nautical miles is wasteful. Strategic paralysis sensibly assumes that every country has some targets that are more important than others in terms of sustaining the enemy's capability or will to wage war. Because the destruction of these targets or national elements of value (NEV)[15] can paralyze the enemy government, one should concentrate one's air power resources exclusively on those targets. Given their importance, NEVs deserve closer examination.

National Elements of Value

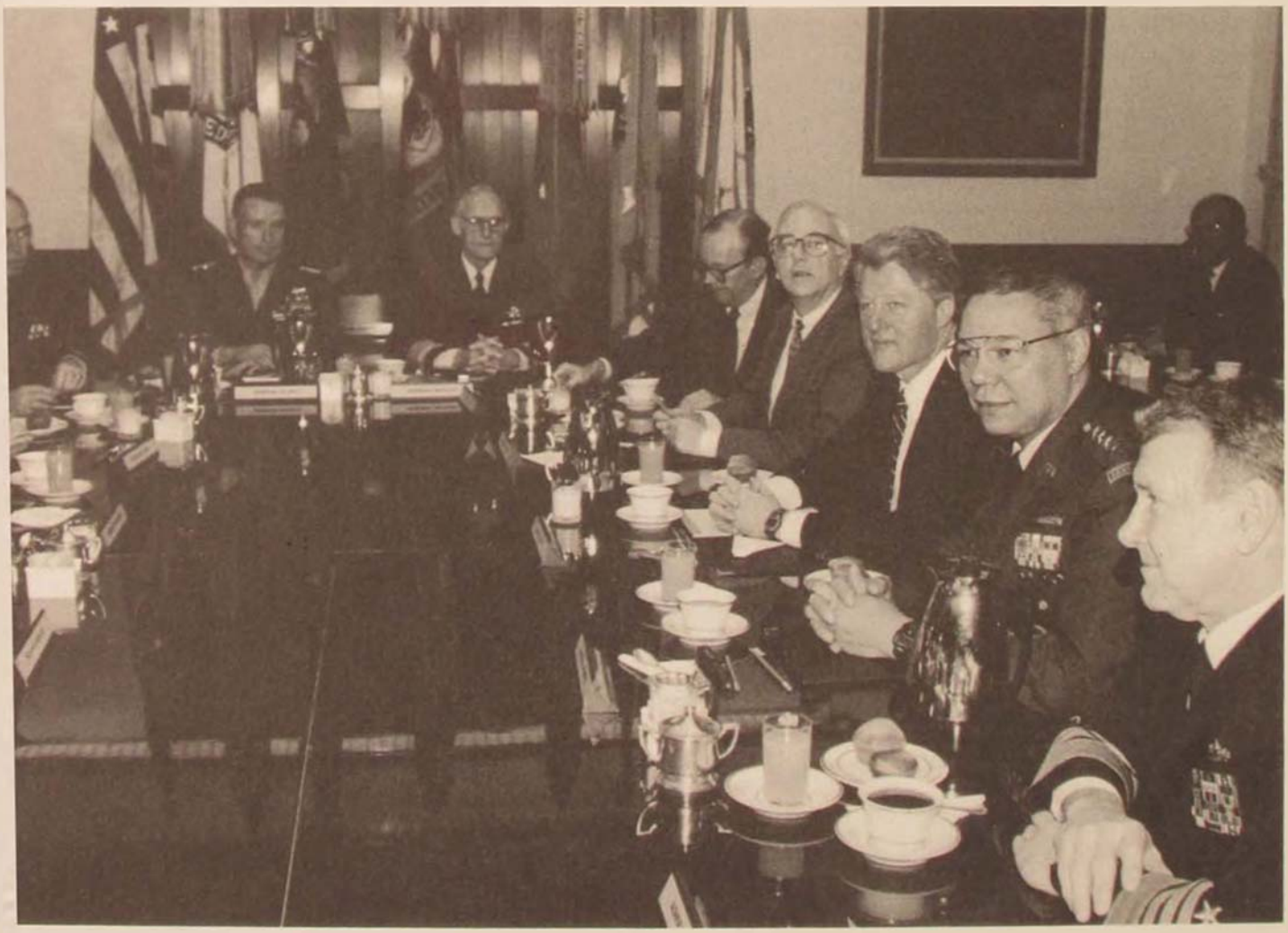
Ideally, one should direct air attacks against a vulnerable, vital element of the enemy's national structure, and this element should consist of only a few targets. Understanding and identifying these tar-

Technology allows us to move from a strategy of annihilation to one of strategic paralysis. Precision guided munitions and stealthy aircraft now give air power penetrative capability, delivery accuracy, persistence, and specialized weaponry to attack an enemy's strategic centers.

gets is as much an art as it is a science. If a country is to be considered a sovereign power, it must enjoy at least four instruments of national power or influence: political, economic, military, and informational.[16] Since some aspects of these four instruments are also sources of strength in war, they should be targeted.

These types of targets have already been identified by such people as Clausewitz, Henri de Jomini, Giulio Douhet, Gen William ("Billy") Mitchell, Liddell Hart, and Col John Warden, and by such organizations as the Air Corps Tactical School and the German Luftwaffe (in World War II). Seven NEVs in particular are noteworthy: (1) leadership, (2) industry, (3) armed forces, (4) population, (5) transportation, (6) communications, and (7) alliances. These seven are important because they delineate a country's sources of strength and identify the target sets necessary for the country's defeat. In theory, one can induce paralysis on a strategic scale by neutralizing the right combination of these elements.

It is important to understand that NEVs are interdependent and can compensate for each other.[17] One problem with the historical view of air power targeting theory is the notion that the destruction of a single target or target set can bring down



National elements of value are important because they identify a country's sources of strength as potential targets. One of our NEVs—our leadership—is represented here by President Clinton and top military and civilian officials.

entire countries (e.g., the bombing of the ball bearing industry in Germany in World War II). This premise generally has no basis in fact. A more realistic approach is to assume some sort of dynamic interaction among NEVs (fig. 4). Although a single NEV might be more important than others at a given moment, it is still affected by the others. The elimination of any NEV will destabilize the others.

Individuals important enough to be NEVs (e.g., modern-day dictators) are rare these days.[18] The destruction of one target (or target set) *could* be enough to collapse an enemy government, depending on the importance of the NEV and the speed and thoroughness of its destruction, as well as the dependence, resiliency, and speed of compensation of the other NEVs in relation to it.

This notion of replenishment and substitution (i.e., the ability of an NEV to increase in importance/size, to reposition itself, etc.) is especially important.[19] For example, if a country's industry were crippled by enemy attacks, a suitably motivated and effective leader could rally his population to work harder and thereby compensate for the loss. If the leader were killed, however, the system would have to compensate. Clearly, democratic governments with established rules of succession are more likely to survive this type of assault. But work-arounds and efforts at substitution can go only so far, especially when attacks occur across a wide spectrum of NEVs. The strategic trauma associated with such strikes cannot easily be compensated for, regardless of one's preparation. Some people have compared such wide-ranging attacks to a type of nationwide torture (i.e., "death by a thousand cuts").[20]

Thinking in terms of NEVs instead of centers of gravity offers several benefits. For instance, while every country possesses all seven NEVs, no two countries will have the same strategic target sets. If a country's NEVs can wax and wane in war, then so can its most important targets. At best, depicting something as an NEV is accurate only at the time of the "snapshot." Therefore, what might have been a critical target at the beginning of the war might not be later on. Because some elements can increase in importance (e.g., by compensating for the weaknesses of others), one must continually reevaluate them during the conflict. The same is true of alliances, whose security guarantees, communications links, shared religious and cultural beliefs, and economic ties are also likely to change during a conflict. One need only look at the complex coalition in Operation Desert Storm (and Saddam's strategy to defeat it) to appreciate the importance of understanding the value and vulnerabilities inherent in any alliance.

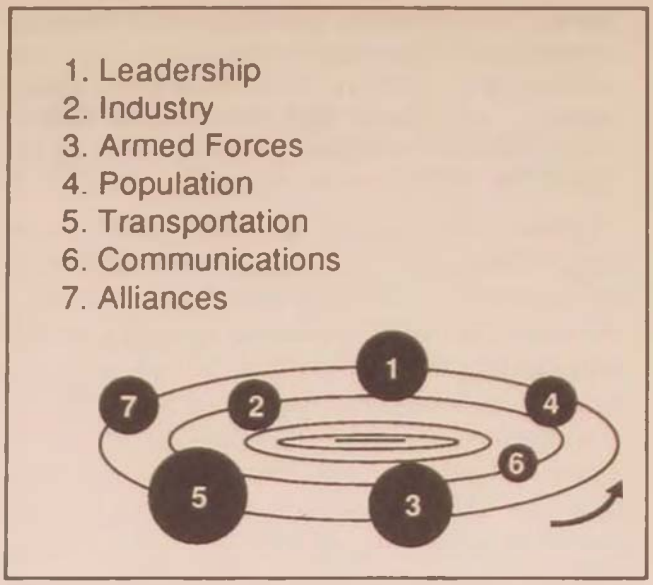


Figure 4. Model of Dynamic National Elements of Value

Although every country has the same NEVs, their relative importance changes—depending on the circumstances. Such was the view of Maj Muir S. Fairchild, an instructor at the Air Corps Tactical School, who wrote in April 1938 that

> each nation differs from all other nations, not only in its *degree* of vulnerability to air attack, but also in the *kind* of vulnerability;

> that is to say in the *elements* of its national structure that are most vulnerable to this sort of an attack. One nation is weak and vulnerable in one respect and strong in another—while the exact opposite may be true of its neighbor [emphasis in original].[21]

NEVs mirror each country's international status in industrial, social, cultural, and political development because they comprise the very elements which convey such status. NEVs may also reside outside the geographical boundaries of the country in question. During Desert Storm, for example, Saddam saw Israel's relationship with the US and other members of the coalition as a vulnerability and tried to exploit the situation by directing the majority of his Scud missile attacks not at the coalition but at Israel. Fortunately (for a number of reasons), he was unsuccessful in fragmenting the coalition, but the strategic outcome probably would have been different, had he succeeded.

NEVs are also more vulnerable when they are highly developed. Thus, the higher a country's position on the industrial ladder, the more likely its NEVs will be vulnerable to air power attack. Over 50 years ago, Maj Alexander P. de Seversky observed that "total war from the air against an undeveloped country or region is well-nigh futile; it is one of the curious features of the most modern weapon that it is especially effective against the most modern types of civilization."[22]

The characteristics of a country's infrastructure are the key to its vulnerability. For example, transportation is essential to any country's ability to sustain itself in combat. However, using aircraft to attack men and materials that are moving along jungle trails is considerably more difficult than attacking more modern rail, road, and air transportation systems. The same holds true for communications. Runners carrying messages are far less susceptible to systematic air attack than are telephone lines or microwave towers.

Another consideration that has a bearing on NEVs is the enemy's proclivity to make rational decisions. One cannot expect to exert much influence on an enemy who places no value on the targets attacked. Thus, in order to avoid wasted effort, the attacker must understand how the enemy values his assets. Air Comdr Jasjit Singh contends that "the aim of strategic air power is [the] destruction, disruption and dislocation of the enemy war-waging machine in its totality so as to . . . increase the costs of waging war to an unacceptable level." In other words, the enemy must value his costs and unacceptable levels in a way that is predictable or understandable.[23] A rational enemy will give up only when the costs of continuing the conflict outweigh any potential benefits. Air power's toughest challenge (as Douhet found out) may be in educating future adversaries in the fact that loss of the air means loss of the conflict.

Last, first-class intelligence is vital to the selection of NEVs, for air power is targeting and targeting is intelligence.[24] It is especially important to a strategy of strategic paralysis because precision weapons require precise intelligence. It would be foolish to load an airplane with laser guided bombs and send it off against a city without any specific targets in mind. Without good intelligence, one will waste effort, extend conflict, and increase costs. As Charles de Gaulle observed, "A general with an excellent army most carefully deployed for battle will yet be defeated if he is insufficiently informed about the enemy."[25]

Limitations of Strategic Paralysis

Despite the appeal of a strategy of strategic paralysis, one must be aware that a diminishment of any of the four elements critical to its success—especially technology and aerospace control—could have an adverse effect on the strategy (fig. 5). A "loss" of technology, for example, could lead to a less discriminating war of annihi-

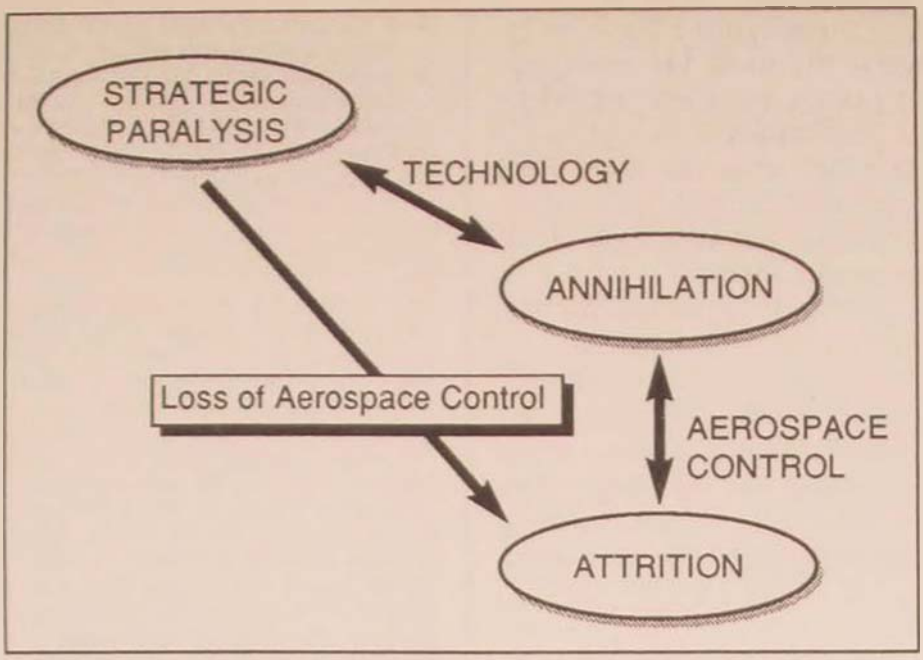


Figure 5. Losses Affecting Strategic Paralysis

lation.[26] In this instance, one doesn't lose aerospace control—only the ability to attack precisely. This situation could occur if an enemy becomes able to employ an effective countermeasure for a wide range of our precision guided munitions or cruise missiles. (In the future, this might entail nothing more than interfering with our global positioning system, on which our weapons and airplanes are likely to become more dependent.)

More serious is a loss of aerospace control, which could lead to a war of attrition. This situation could occur if an enemy becomes able to detect and destroy our stealthy aircraft, a situation that would force us to regain the skies (i.e., work through the attrition stage) before we could continue with either annihilation or strategic paralysis.

Aerospace control might also be lost by nontechnical means, including the failure to logistically maintain the precision weapons or airframes required for air superiority, or the imposition of politically motivated restrictions that limit the exploitation of our strengths or the enemy's weaknesses. Regardless of the cause, loss of aerospace control eliminates any hope of strategically paralyzing the enemy.

Conclusion

Would any country other than the United States be interested in pursuing a strategy of strategic paralysis? First, the strategy should appeal to any country seeking a quicker victory at a relatively lower cost. However, the requisite elements of high technology and aerospace control likely put the strategy beyond the means of all but the most technologically advanced and wealthy countries. Second, the strategy should appeal to any country seeking to minimize civilian and military casualties and to preserve human rights. However, such considerations are usually irrelevant to aggressor nations, who would likely perceive strategic paralysis as a strategy of weakness.

Further, strategic paralysis is not suited for every situation. A rogue country that is aggressively pursuing territory is not likely to benefit from this strategy because

the territory it desires would have to be occupied. Clearly, the need for aerospace control makes strategic paralysis an offensive strategy. One cannot imagine an attacker (certainly not after the Gulf War) allowing his opponent to gain and maintain aerospace control (or attacking at all with inferior air power assets).

But strategic paralysis *is* suited for the US military, which prefers to fight wars as quickly, inexpensively, and bloodlessly (on both sides) as possible. High-tech air power makes this strategy feasible. Attrition and annihilation are no longer the only strategies available to the military commander. Strategic paralysis has come of age. □

Notes

1. Only 16 years after the Wright brothers' first flight, Col John Frederick Charles Fuller discussed "Strategic Paralysis as the Object of the Decisive Attack," in *On Future Warfare* (London: Sifton Praed and Co., Ltd., 1928), 83.

2. See Jehuda L. Wallach, *The Dogma of the Battle of Annihilation* (London: Greenwood Press, 1986), 177. Wallach credits German historian Hans Delbruck with introducing the term *attrition strategy* and describes attrition as the opposite of annihilation. See also Hans Delbruck, "On the Contrast between the Strategies of Attrition and Annihilation," in *History of the Art of War*, vol. 4, *The Dawn of Modern Warfare*, trans. W. J. Renfroe, Jr. (Lincoln, Nebr.: University of Nebraska Press, 1985), 439–44, 108–9; and Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 384.

3. Brig Gen William ("Billy") Mitchell, Giulio Douhet, and Gen Sir Edward Bruce Hamely, as well as the Air Corps Tactical School and the German Luftwaffe (along with many others), refer to air power's ability to paralyze an enemy.

4. Sir Basil H. Liddell Hart, *Strategy* (1954; reprint, New York: Penguin Books, 1991), 212.

5. Control of the air is usually thought of as air superiority or air supremacy and is attained by sheer firepower or overwhelming force, or is inherent in the weapon system used. For example, a stealth aircraft brings its own type of air superiority to the fight and does not engage in the traditional fight for access that is normally associated with gaining and maintaining air superiority.

6. In theory, wars conducted according to strategic paralysis can end relatively early because of low costs on both sides. If losses are already high in annihilative or attritive wars, it may be much harder for the enemy to stop the conflict *and* save face than it would be if civilian casualties and damage were relatively light. As Sir Hugh M. Trenchard observed, "Air can carry much more destruction to the enemy per man with a minimum loss of life than any other form of warfare. . . . Though the cost of life and limb of the bomber crews may on occasion be heavy, the world has never known such a small rate of loss in comparison to the population of the nation, taking into consideration the magnitude of these great bombing battles and the effect they are having in shortening the war." Air Marshal Sir Hugh M. Trenchard, "The Effect of the Rise of Air Power on War," in *Air Power: Three Papers* (London: Air Ministry, Directorate of Staff Duties, 1946), 10, 12.

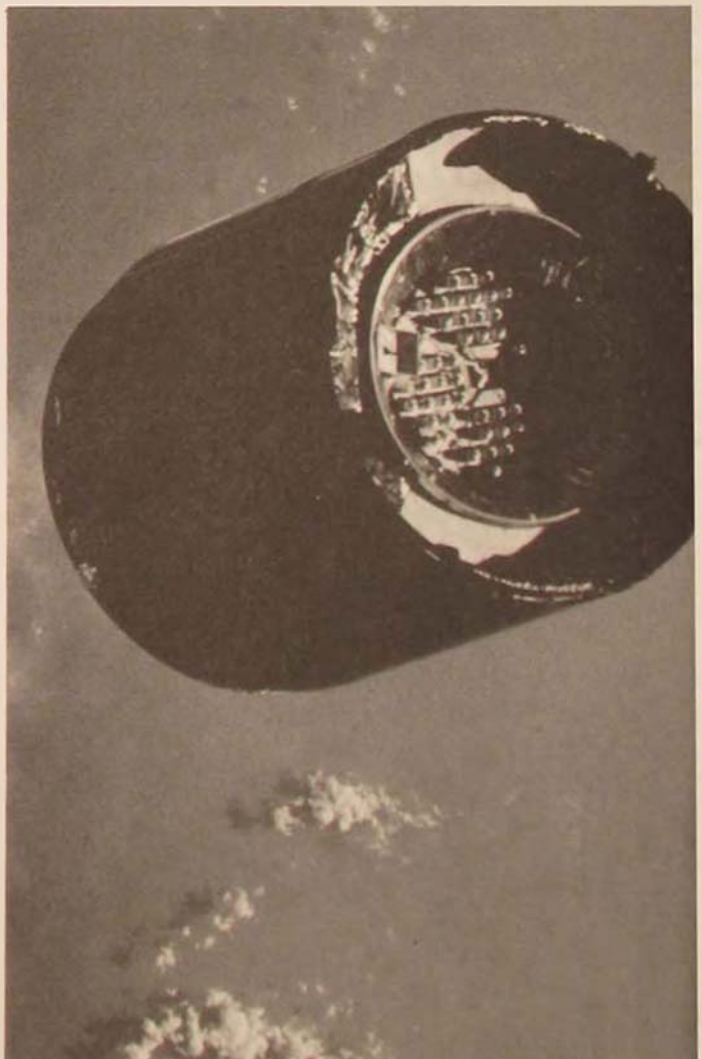
7. I am indebted to Maj Nick Clemens and Col Phil Meilinger of the School of Advanced Airpower Studies, Maxwell AFB, Ala., for helping distill and nurture this concept.

8. Although the US Strategic Bombing Survey and many air power advocates argue that we were in fact successful in our bombing strategy of strategic paralysis against the Germans, our victory required the occupation of Germany and the nearly complete annihilation of the German armed forces and economy. Certainly, this was no simple paralysis.

9. Briefing, Headquarters USAF, subject: The Air Campaign from Close to the Mirror, 9 February 1992.

10. Lt Col Thomas A. Fabyanic, *Strategic Air Attack in the United States Air Force: A Case Study*, Professional Study no. 5899 (Maxwell AFB, Ala.: Air War College, April 1976), 64, 84, 104–6; Air Marshal Sir Robert Saundby, *Air Bombardment: The Story of Its Development* (New York: Harper Brothers, 1961), 21–26; and Robert F. Futrell, *The United States Air Force in Korea, 1950–1953* (Washington, D.C.: Government Printing Office, 1983), 130.

11. William Bradford Huie, *The Fight for Air Power* (New York: American Book-Stratford Press, Inc., 1942), 261–62.



12. This is not to say that air power has no role in low-intensity conflict with countries that have no vulnerable infrastructures. On the contrary, air power offers solutions along the full spectrum of conflict. A more legitimate question would concern the role of air power in a large-scale conventional conflict against a third world nation with a minimal infrastructure, such as Vietnam.

13. Julie Bird, "Rice: New Capabilities Are Needed," *Air Force Times*, 11 November 1991, 6.

14. Clausewitz, 486. When air power resources are plentiful, target selection is easy. "However when the power resources are scarce, critical target selection is more difficult. Not only must the comparative worth of the targets be measured, but the available strike resources must be measured and allocated against them." Air Force Pamphlet (AFP) 200-17, *An Introduction to Air Force Targeting*, 11 October 1978, 9-2. Modern aerospace resources are very expensive, hard to replace, and subject to a multitude of abuses by people who don't understand them. They must be conserved by caring and competent airmen. See the note on "Economy of Force" in Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 1, March 1992, 16.

15. NEVs were called "vital centers" by Giulio Douhet, "vital targets" by Gen Curtis LeMay, "decisive strategic points" by Henri de Jomini, "panacea targets" by Air Chief Marshal Sir Arthur ("Bomber") Harris, "Achilles' heels" by Liddell Hart, "nerve centers" by Billy Mitchell, and "centers of gravity" by Clausewitz. They were all referring to the same thing.

16. Some writers describe the informational instrument of power as either social or psychological. See Joint Pub 3-07, *Doctrine for Joint Operations in Low Intensity Conflict* (test pub), October 1990, I-7.

17. NEVs are not centers of gravity. Clausewitz defined center of gravity as "the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed." Clausewitz, 596. He recognized that more than one center could exist and that nonphysical entities such as public opinion and alliances could be centers of gravity. However, Clausewitz does not address the concept of interaction between them.

18. "Non-democratic regimes usually have unreliable arrangements for the legitimate transfer of power, and doubts about how it can be accomplished smoothly may increase the longer a single leader lasts in office. There is a widespread presumption that countries ruled for extended periods by authoritarian leaders degenerate into chaos when those rulers die and their special personal status no longer holds the lid on their countries' tensions. It is, however, also possible to assume the contrary." Richard K. Betts and Samuel P. Huntington, "Dead Dictators and Rioting Mobs: Does the Demise of Authoritarian Rulers Lead to Political Instability?" *International Security*, Winter 1985–1986, 112. This article does not address the overthrow or death of the leader in a coup d'état, which is one of the possible outcomes of the strategy of strategic paralysis.

19. See Mancur Olson, Jr., *The Economics of Wartime Shortage* (1963; reprint, Ann Arbor, Mich.: University Microfilms International, 1991), 17.

20. Col John A. Warden III, "What Aerospace Lessons Should We Carry into the Future from the Gulf War?" presentation to conference on Aerospace Power's Role in American National Security, Crystal City, Va., 16 March 1993.

21. Maj Muir S. Fairchild, "The New York Industrial Area," lecture no. AF-11C, Air Corps Tactical School, 6 April 1938, 1, document no. 248.2019A-12, USAF Historical Research Agency, Maxwell AFB, Ala. See also idem, "Primary Strategic Objectives of Air Forces," lecture no. AF-14C, Air Corps Tactical School, 11 April 1938, 6, document no. 248.2019A-14, USAF Historical Research Agency, Maxwell AFB, Ala.

22. Maj Alexander P. de Seversky, *Victory through Air Power* (New York: Simon and Schuster, 1942), 101–2.

23. Air Comdr Jasjit Singh, *Air Power in Modern Warfare* (New Delhi: Lancer International, 1985), xxxi.

24. See also AFP 200-22, *Targeting: Profession and Process*, 12 May 1989.

25. Charles de Gaulle, *The Edge of the Sword*, trans. Gerard Hopkins (New York: Criterion Books, 1960), 80.

26. Theoretically, one could still paralyze an enemy with nonprecise (annihilative) weapons, but such attacks would be costlier and bloodier than those with precision weapons.

A continuous flow of intelligence is necessary for successful strategic air warfare. Here, Intelsat VI is about to be captured by the crew of the space shuttle Endeavour. *Crew members added a new motor, giving the satellite more boost and maneuverability.*

THE ART OF INTELLIGENCE, by the GENERAL

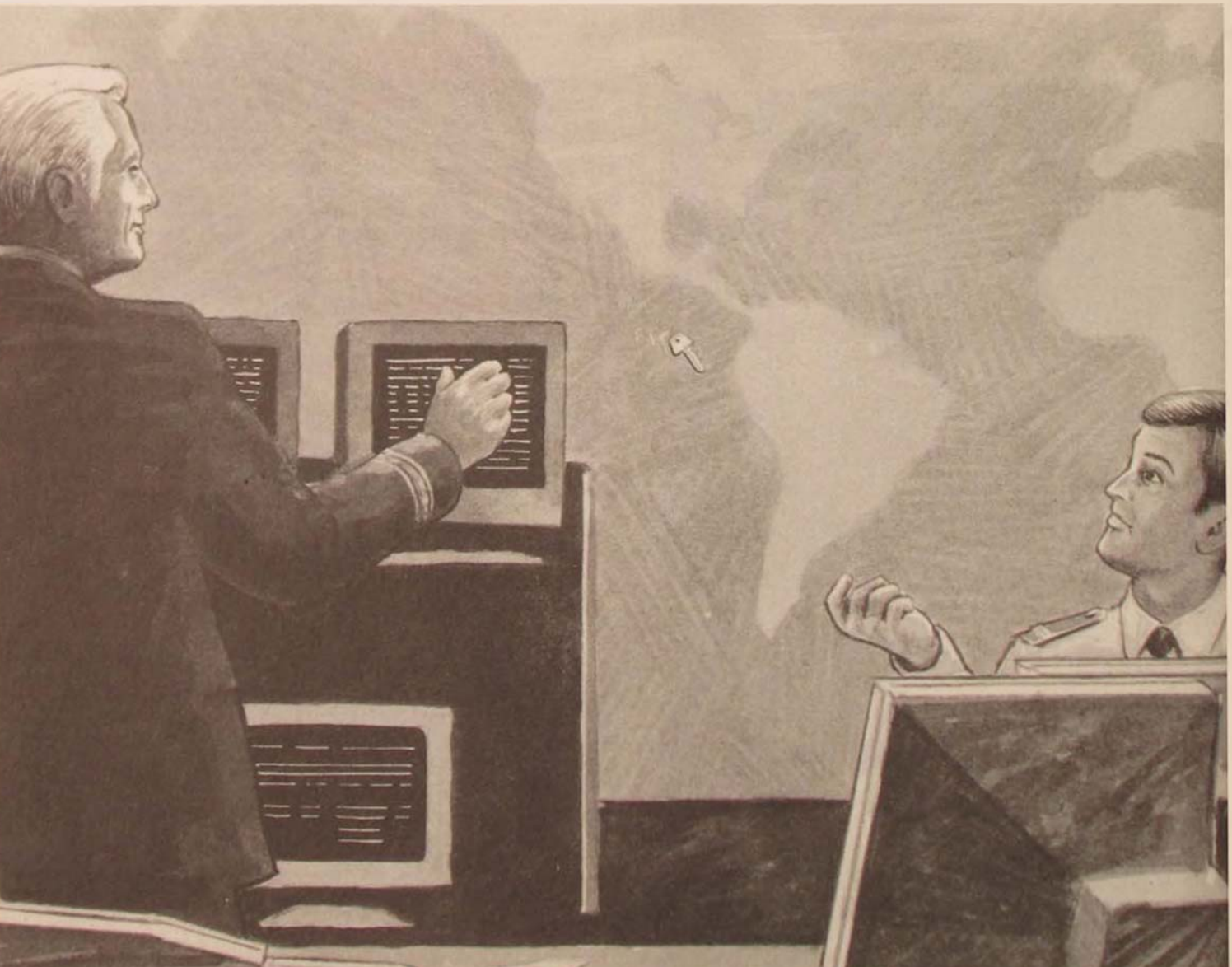
EDITED BY COL GARY D. PAYTON, USAF

Now the reason the enlightened prince and the wise general conquer the enemy whenever they move and their achievements surpass those of ordinary men is foreknowledge.

—Sun Tzu

THIS ESSAY IS the "final product" of a future deputy chief of staff for intelligence, United States Air Force. The author, an unnamed general, enjoyed an almost 30-year career as an intelligence officer spanning 1987 to the spring of 2017. Faced with the impact of the information explosion on the quantity of "raw data" available to intelligence professionals, he undertook a project to distill intelligence to its very essence. The principles and tenets described here form the fundamental truths of the art.

Styled in the manner of Sun Tzu's classic *The Art of War*, as translated by Samuel B. Griffith, and using the same technique of assertion and expert commentary, this essay describes the princi-



ples and tenets of intelligence that are universal across time and stand the test of changing technology.

BIOGRAPHY OF THE GENERAL

The ultimate objective of intelligence is to enable action to be optimized.

—Dr R. V. Jones
Chief, British Scientific
Intelligence, World War II

The general died Monday while TDY to San Antonio. His last day in the Pentagon was like hundreds of others—quick reviews of intelligence background papers for the chief, planning for the upcoming Senior Intelligence Officers' Conference, and telephone calls regarding the placement of colonels in key positions around the Air Force. Late Friday, after he stuffed the last few folders in his briefcase and turned to leave the office, he flipped the keys of his locked desk to his executive officer. "Just in case!" the general called. "Just in case," replied the exec as he caught the keys and dropped them into his desk. It was a departure ritual they had carried out countless times. This time was the last time.

He had been the best of a new breed of intelligence officers—a "generalist" skilled in intelligence operations and intelligence application. Unlike the many deputy and assistant chiefs of staff for intelligence before him, he had not progressed in a "stovepiped" discipline of signals intelligence (SIGINT), imagery intelligence, or human resources intelligence (HUMINT). Rather, the career path he followed had been envisioned by senior intelligence officers in the 1980s and codified by major changes to Air Force specialty codes in the early 1990s.[1]

Across a series of assignments that included wartime duty with an F-111 fighter wing, leadership at a major signals intelligence collection site, and joint duty on the unified command staff at US Strategic Command, the general watched and learned how intelligence supported—or failed to support—military commanders.

His experience with the 48th Tactical Fighter Wing in Saudi Arabia during Operation Desert Storm anchored his entire career. As a junior officer, he devoted months at Royal Air Force (RAF) Lakenheath in England to gaining the confidence of the pilots and weapons systems officers who flew the venerable Aardvark.[2] During the prewar buildup, he and his enlisted intelligence specialists honed their skills in building target folders, briefing and debriefing crews, and providing the wing commander with comprehensive intelligence reports on Saddam Hussein's forces. But when the air war began, nothing he could do at the unit level could get poststrike satellite imagery of the military targets into their hands fast enough. Their appetite for imagery was insatiable and could not be met.[3] Despite the many successes of intelligence in Desert Storm, a generation of future Air Force leaders convinced themselves that intelligence failed because they as pilots were unable to get timely pictures of their strike missions.

In the 1970s and 1980s, when an intelligence officer was characterized by the nature of his or her technical training (e.g., being viewed as a SIGINTer, a photo interpreter, or a HUMINTer), the opportunity to lead large numbers of Air Force people was not equally available to junior intelligence officers. When career emphasis and training shifted to a "generalist" mode, officers like him began to receive assignments to key positions across a wide range of major commands based on their leadership skills and managerial ability, not just on their past affiliation with a technical specialty. The general's future was shaped by the breaking down of these historic barriers.

As a captain, he had served as a flight commander at one of the Air Intelligence Agency's (AIA) most important overseas field sites, the 6903d Electronic Security

Group at Osan Air Base, Korea. He had been thrust into the role of leading over 40 specialists in their around-the-clock task of providing vital intelligence support to the commander, Seventh Air Force, and to the US and South Korean chain of command.

"Up close and personal" had characterized the general's leadership opportunity in Korea. He had led his flight by personal example. He motivated. He delegated. He empowered. He disciplined. His daily activities ranged from team building and goal setting to working the dozens of personal problems (caused by a year's separation from family in the States) his subordinates brought to him. And, most important, along the way he absorbed the myriad of details associated with high-tech intelligence collection. He learned the strengths and the weaknesses, and he began to ponder the enduring principles and tenets of intelligence in support of military operations.

Years later, as the US Strategic Command's director of intelligence, or J-2, the general served in Omaha as a principal advisor to his four-star commander in

In 1982 Israeli Air Force F-16s (left) were part of a successful threat against 17 Syrian missile sites that used SA-6 missiles similar to these (below). Accurate intelligence served as a powerful force enhancer.

chief on such critical issues as the Strategic Arms Reduction Talks (START) Treaty III and global weapons of mass destruction. He recognized clearly the political impact of his counsel when his military views on treaty compliance clashed with those of the Department of State or the Central Intelligence Agency. He saw firsthand how timely and accurate intelligence shaped policy on issues vital to the security of the United States.

For nearly three decades, the general served as an intelligence officer. From the aircraft shelters of Saudi Arabia to the halls of the Pentagon, he helped shape intelligence products delivered to commanders. From "bombs on target" to national security decision making, he understood the value of piercing the enemy's secrets while protecting one's own.[4]

It wasn't until Thursday, after the majority of the details for the Arlington Cemetery funeral were ironed out, that the general's executive officer opened the locked desk. Patiently, the exec separated personal items from official documents and classified messages. In the bottom drawer in a hanging folder marked "Art" that was bulging with dozens of yellow highlighted and annotated articles and clippings, he found the draft manuscript and the illustrative comments the general had asked his closest confidants to prepare on each major subject.

The following excerpts of this final product of the general, *The Art of Intelligence*, were first published four months after his death.

The Art of Intelligence

PRINCIPLES

Intelligence is an instrument of conflict. It consists of words, numbers, images, suggestions, appraisals, incitements. It consists also of truths that enlighten or mislead, or of outright falsehoods. Because it is immaterial, intelligence cannot wound. But its use has led to the killing or saving of millions.

—Angelo Codevilla

Accuracy

The general said:

1. *Accuracy* is the prime principle of military intelligence. With accurate intelligence, all aspects of strategic, operational, and tactical planning and execution proceed on the basis of fact. Without accurate intelligence on the enemy's location, capability, and intent, planning is an unfocused and wasteful exercise, and execution may result in defeat.

2. Accurate intelligence is a necessary condition for victory. It is not, however, a sufficient condition to gain the victory. Intelligence does not pilot air and space vehicles, or field armies, or sail ships at sea. Instead, intelligence supports the maneuver, the surprise, the security, and the economy of combat forces to achieve their objective.

The historian: Accurate intelligence serves as a powerful force enhancer. In the largest single air battle of the second half of the twentieth century, the Israeli Air Force (IAF) devastated the Syrian Air Force on 9 June 1982. To support "Operation Peace for Galilee," the IAF's mission was to neutralize Syrian SA-6 sites and destroy reacting enemy fighters. At every juncture, planning and execution were enhanced by accurate intelligence. In the one-year period following the April 1981 introduction of SA-6 missiles into the Bekaa Valley, Israeli military intelligence had focused on the new surface-to-air threat. Their successes allowed aircrews to rehearse the strike missions in the Negev Desert against highly accurate replicas of the missile sites. On the day of the attack, superb tactical intelligence contributed to success. Syrian airspace was scanned by E-2C surveillance aircraft flying off the Lebanese coast. A Boeing 707 signals intelligence platform monitored Syrian communications and radar activity. With F-15 and F-16 pilots flying combat air patrols, IAF F-4s armed with Shrike, standard antiradiation, and Maverick missiles, and F-16s loaded with standoff weapons and con-

ventional munitions attacked 19 SA-6 sites and several SA-2 and SA-3 sites.

In a superb example of real-time intelligence application, the IAF strike commander monitored the ongoing operation from video provided by forward orbiting Scout and Mastiff remotely piloted vehicles (RPV). On the first day of the air campaign, 17 SA-6 sites were destroyed along with several SA-2 and SA-3 installations. On 9 June, the Israelis downed 23 Syrian MiG-21s and MiG-23s. On 10 June, they shot down 15 more MiGs. By the end of September, Israeli pilots had destroyed 29 surface-to-air-missile (SAM) sites in seven raids, 85 Syrian MiGs, and had lost only two IAF aircraft to enemy ground fire.[5] Accurate intelligence contributed mightily to this successful air campaign.

Timeliness

The general said:

3. Victory in battle is gained by the side that operates at the faster tempo or rhythm. The *timeliness* of intelligence contributes directly to the commander's ability to observe, orient, decide, and act. With timely intelligence, the commander is able to act at a faster tempo, generate confusion and disorder in the adversary, and achieve victory. Without timely intelligence, the commander's observation and orientation are delayed. His decisions and actions, therefore, are slower, and initiative and leverage are lost to the enemy.[6]

The engineer: The delivery of evermore timely intelligence was a central focus of the intelligence-engineering community in the two decades following the 1991 Persian Gulf War. Our initial combat successes following Desert Storm were based on collocating the intelligence collection and communications assets of the Air Intelligence Agency with the air operations center of the Air Combat Command forces.[7] When the 366th Wing at Mountain Home AFB, Idaho, deployed to Tunisia in 1995 in response to the Libyan incursion, AIA's specialists worked side by side with the wing's own intelligence and planning staff. With an organic collection capability and on-line access to national intelligence networks, timely intelligence kept the commander's decisions and actions inside Libya's own decision cycle. Our greatest successes, however, flowed from the engineering breakthroughs at the turn of the century. When we solved the data compaction problem of the multispectral imaging satellites, we could at last take full advantage of virtual reality (VR).[8] It had all come together before the Iranian military launched the Second Gulf War in 2010.[9] Timely intelligence produced a dramatic impact on operational planning and tactical execution. In the battle cab at the Air Operations Center in Dhahran, Saudi Arabia, the joint force air component commander (JFACC) swiveled into a VR depiction of his next day's air tasking order. The image generators driven by a direct digitized satellite feed produced a detailed, three-dimensional image of the air campaign. By selecting the appropriate icons, the commander viewed Iranian air defenses, advancing divisions, and ballistic missile trajectories. He then overlaid the friendly air attacks accelerated in time.

In addition to allowing the commander to see his own air forces move across the border to attack Iranian targets, virtual reality enabled him to move in space and to have a "God's eye" view of how his incoming air and missile attack looked from the Iranian commander's perspective.[10] Not only did timely intelligence aid his observation and orientation by creating a telepresence of our attack from the Iranian viewpoint, the JFACC could "get inside the mind" of his opposing commander.[11]

Results at the squadron level were equally impressive. The virtual reality advanced planning system was based on near-real-time threat data. The imagery intelligence and signals intelligence feeds were linked with weather information and merged with the mapping data base. In short, aircrews could plan and rehearse the mission and select weapons employment alternatives based on intelligence data collected just minutes prior to takeoff.[12] Timely intelligence successfully contributed to an even faster decision-making tempo. Sustained across the first weeks of the campaign, the tempo forced the Iranian offensive to collapse into itself.[13] The remaining leaders in Tehran complied with all coalition demands for conflict termination.

Usability

The general said:

4. Intelligence must be usable to have value. If it is not tailored to meet the needs of the commander, intelligence has no *usability* and

makes no contribution to military planning and execution.

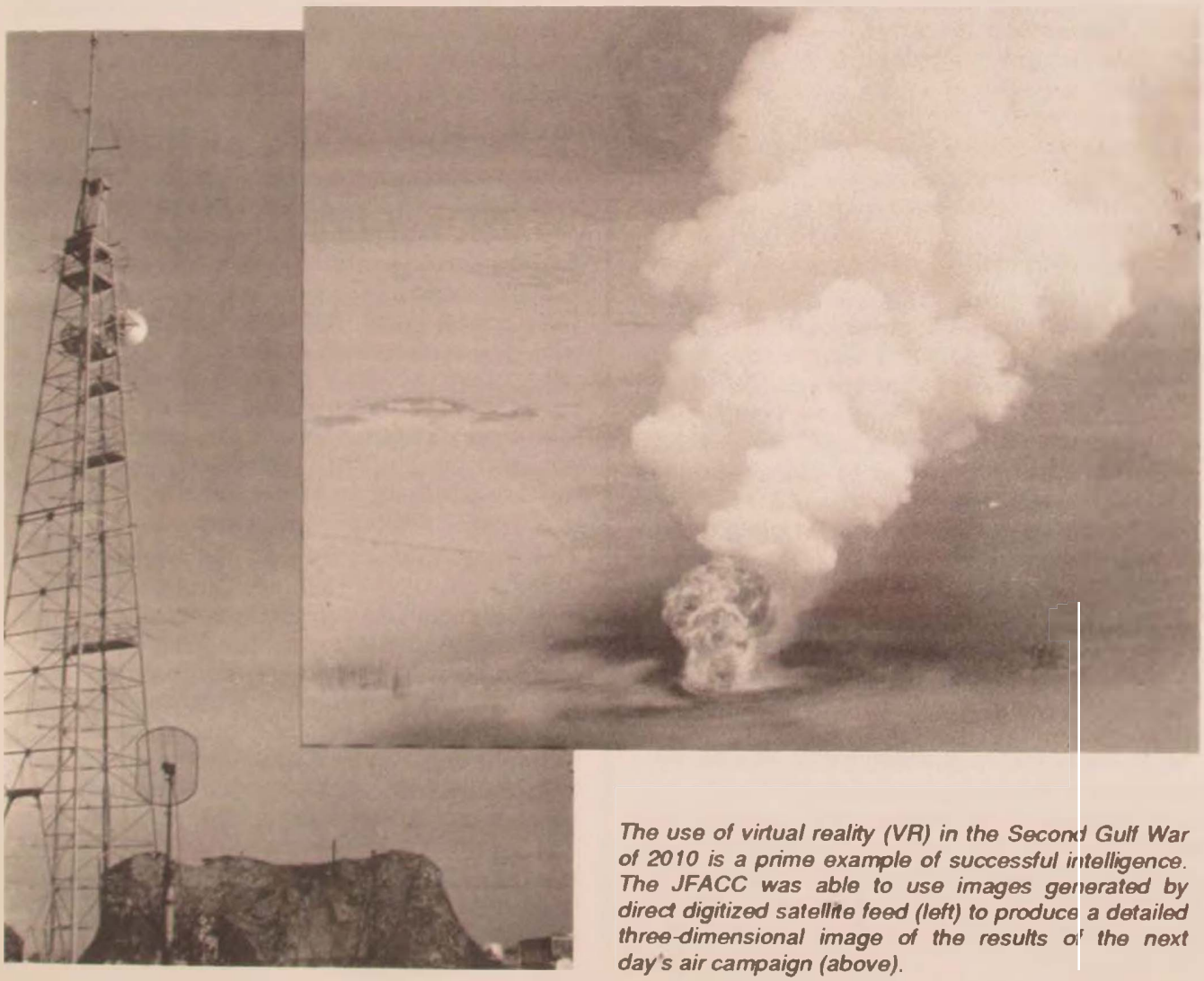
5. Intelligence is a product. Users of intelligence are customers. If the product delivered to the customer is unusable, then the customer's intelligence needs go unsatisfied, and the production costs of creating the product are wasted.

6. Making intelligence usable is a part of effective marketing. First, determine what the customer wants and needs. Wants and needs are not often identical. Second, tailor the intelligence-production process to create the agreed-upon product. Third, deliver an accurate and timely product in a usable format. Fourth, ask the customer for feedback on the product's usability. Fifth, absorb the feedback and begin again.

The executive officer: I first worked for the general in Omaha. He was a brutal editor, or that's what his intelligence analysts and middle managers first thought. In fact, his harsh editorial comments were consistently aimed at making the array of intelligence products more usable to the customer. He developed this simple "Usability Checklist":

1. Does this intelligence product meet the customer's needs? How do you know? How do you know you know?
2. Does it answer the question asked?
3. Is the main point "up front"?
4. Is it as concise as you can get it?

Across the spectrum of intelligence products, the general sought to make them usable to the customer. Does the draft of the National Intelligence Estimate provide a focused analysis of the issue so the National Security Council can develop a new policy option? Does the estimate of an enemy weapon have sufficient detail to enable the USAF research and devel-



The use of virtual reality (VR) in the Second Gulf War of 2010 is a prime example of successful intelligence. The JFACC was able to use images generated by direct digitized satellite feed (left) to produce a detailed three-dimensional image of the results of the next day's air campaign (above).

opment community to plan the Air Force's next-generation system? Does the current intelligence briefing provide unique insights or information to aid the commander in deciding on a course of action? Is the myriad of electronic order-of-battle information delivered in a usable format to the mission planner, the electronic warfare officer, or the pilot? Is the threat data streaming into the cockpit of the orbiting F-22 usable in aiding the pilot to conduct his or her defensive counterair mission?

A trivial example illustrates the principle of usability. The general shocked his Pentagon intelligence staff the day he directed that all written replies to the chief's questions would be limited to two data screens or one printed page. He hammered the point. The customer needed concise, to-the-point replies directly answering the question—no room to showcase personal knowledge of air and space power in the twenty-first century, and no room to provide flowing prose amplifications of supporting data. Understand the need. Answer directly. Get the main point "up front." Be concise and be done.

Fusion

The general said:

7. Fused intelligence is a finished intelligence product produced from more than one source of intelligence information. *Fusion* draws upon the complementary strengths of signals intelligence (what they said or what their radars emanated), imagery intelligence (what it looks like), human intelligence (information derived from a human source revealed through overt or covert collection).

8. Fused intelligence creates the most accurate and complete picture of what is known about an activity. In the absence of fused intelligence, products are one-dimensional. While the level of detail in single-source reports may be sufficient to meet narrowly defined customer needs, fused reports are essential to gain an in-depth understanding.

9. Because the enemy will try to deceive you, guard against placing unquestioned trust in a single-source intelligence report. What you hear, what you see, or what you are told may be a lie or a fabrication. It is far more difficult to be deceived when you rely on fused intelligence.

The historian: On 1 January 1945, the Luftwaffe conducted a highly successful attack (Operation Goldregen) against Allied aircraft located on liberated Belgian airfields. In a postattack assessment, the intelligence staff of the 12th Army Group Headquarters realized they *had* received adequate SIGINT and HUMINT reporting to have provided tactical warning to the commander. The reports, however, were not fused. Highly compartmented Ultra intercepts received before the German attack indicated Operation Goldregen was being launched. The SIGINT specialist had no knowledge from his source of an Operation Goldregen. Filed elsewhere in the headquarters, a prisoner of war interrogation report (an aspect of HUMINT) of a former Luftwaffe clerk in Berlin described aspects of Operation Goldregen—a plan to employ low-flying aircraft in large numbers. No fusion. Extensive compartmentalization. Single-source intelligence information held within "stovepiped" structures. Airmen died. Aircraft were destroyed.[14]

Relevancy

The general said:

10. Intelligence has *relevancy* if it contributes to the commander's ability to execute his mission at his level of military operation. No matter how accurate, timely, or fused the intelligence is, if it is not germane to the commander's needs, it could detract from overall mission accomplishment.

11. What is highly relevant intelligence at one level of military activity may be of limited relevance at another level. Intelligence production, therefore, must be geared to meet the distinctive needs of commanders across the full spectrum of military operations.

The wing commander: As the wartime commander of an F-125 fighter-bomber wing, I faced similar challenges in the Second Gulf War that my predecessors faced in 1991. Intelligence must be relevant to the mission it supports. If the intelligence lacks relevancy, it extracts a price in time required to read it, watch it, or be briefed on it. Twenty years ago, field commanders criticized much of the Desert Storm intelligence as being designed for high-level policymakers. It was too general, too broad-gauged. Much of what they got at the wing, division, and brigade level wasn't relevant to mission planning and execution.[15]

At my level, I wanted to know about Iranian targets. When your mission is to kill road-mobile Khomeini intermediate-range ballistic missiles at night, you need intelligence on camouflage and concealment techniques, dummy launchers, reload and refire capability, and relocation schemes. Therefore, incoming reports on international political developments and domestic reactions in foreign capitals are not my ideal of relevant intelligence. Don't get me wrong, I understand the value of such intelligence at other levels. But when you're in the thick of it, if intelligence isn't contributing to putting ordnance on target, then I don't want to hear it!

Consider what my wing's intelligence needs were when the senior Iranian military leadership relocated to the Shiite religious center of Qom. Nondestructive or "disabling" munitions were the only option to drive them out.[16] High explosives, even from our best precision guided munitions, were absolutely out of the question. The task, then, was to shut down the entire electrical grid in the city. You've heard the old adage "Precision weapons need precision intelligence."[17] We needed it. We got it. And it was relevant: precise coordinates for every power station and substation serving the city, detailed engineering reports from the Japanese contractors who built the transformers, and satellite imagery that drove the image generator in our virtual reality advanced planning system. We got it all. Then we planned the mission, rehearsed it in VR, and executed. We completely "put their lights out!" With relevant and precise intelligence contributing to mission success, the Iranian generals were driven out of the sanctuary of Qom and back to Tehran.

Intellectual Honesty

The general said:

12. *Intellectual honesty* must be a cardinal element in intelligence reporting. Accuracy and honesty are not the same. Accuracy is the absence of factual mistakes or errors. Honesty, however, is the adherence to facts and truthfulness with which those facts are interpreted and presented.

13. Moral courage is required to remain intellectually honest and to resist the pressure to reach intelligence "conclusions" that are not supported by facts. The same moral courage and intellectual honesty must extend to reporting even what you do not know, no matter how unpleasant that may be in the short term.

14. Intellectual honesty must drive the intelligence professional to distinguish for the commander those conclusions that are solidly grounded in fact and those that are extrapolations or extensions of the fact. The commander cannot be left with uncertainty in his mind regarding what is fact, what is an estimate, and what is opinion.

The mentor: My colleagues at the agency always knew I was an Air Force intelligence analyst in the Pentagon of the 1970s. Occasionally, one of them who had studied the record would ask, "Was the Air Force estimate that the Soviet Backfire bomber had intercontinental capability intellectually honest?" I have concluded over the years that the answer to the question must be no. Let me explain.

When the new supersonic bomber appeared at the Kazan aircraft plant in 1969, it validated the long-held Air Force prediction of a new Soviet bomber. In 1971, the aircraft, now designated the Backfire, was noted in aerial refueling from a tanker near the test center of Ramenskoye, just east of Moscow. The mission of the bomber, peripheral attack or intercontinental attack, now became one of the most fiercely contested intelligence debates of the cold war. The predominant view of the Washington intelligence community was that the Backfire was a peripheral attack weapon and would not play a significant role in a strategic air attack on the United States. Supporting this position was the Backfire's limited payload, modest self-defense capabilities, and anticipated difficulty in staging the aircraft from far northern Siberian bases.[18] The Air Force strongly dissented and consistently argued the Backfire *could* be used for intercontinental attack—even if the aircraft flew one-way missions.[19] The key variable was the estimate of the range of the aircraft. A series of competitive analyses to determine the range produced dissimilar results and failed to conclusively end the debate.[20]

In short, though we lacked hard evidence that the Soviet Long Range Aviation Backfires ever rehearsed intercontinental strikes, the Air Force estimate of range and intent drove our institutional position that it could and would be used in an attack on the United States.[21]

The most troublesome aspect about the "intellectal honesty" of our intelligence estimate was the connection between the threat estimate and Air Force hardware procurement. At the time, the Air Force was fighting for the B-1 as a replacement for the aging B-52. F-15 fighter production was expanding to produce large numbers of highly capable air-to-air fighters.

There is an ethical difference between "worst-case analysis" of the threat and the prudent planning and procurement that flow from the analysis and the deliberate overstatement of the threat to drive budget increases for expanded weapon buys. In the first case, intelligence serves to warn the nation's leaders in sufficient time to respond deliberately. In the second case, intelligence is prostituted to the goal of "buying more metal." While the end result may be the same, one end is derived at honestly and the other dishonestly.

Communication

The general said:

15. The power of intelligence to aid the commander in planning and executing military missions is nothing if the intelligence is not *communicated*. Knowledge of the enemy's intent, capabilities, and location has no worth until the commander receives, understands, and acts upon the intelligence.

16. It is the responsibility of the intelligence professional to choose the most effective way to inform the commander. Choosing the spoken word, the written word, the picture, or the map is a critical decision. Only by knowing well the commander whom he or she serves can the intelligence officer choose wisely.

The teacher: If my students fail to communicate, they fail to serve. Behind the delivery of an accurate and timely intelligence product is a vast, multibillion-dollar structure designed to manage, collect, process, and analyze information. Yet, decades of technological and human investment are wasted if the intelligence officer cannot communicate.

In the schoolhouse, I teach my students to think critically. I teach them to write with precision. I teach them to brief with clarity and conciseness. When the teaching stops, it is their responsibility to learn and to do. To do well is to communicate.

The intelligence officers who most effectively serve their commanders develop a persona. Some are scholars. Some are showmen. Some take on the outward appearances of the commander they serve. The particular persona that develops is irrelevant. What is important is that the style they adopt helps them communicate the intelligence.

When they engage the mind of the one they serve, they can successfully influence the formulation of a policy or plan or the execution of a dangerous mission. They can be an aid to victory and a contributor to saving lives. If they fail to communicate the intelligence well, the commander will continue toward the objective but without the full power of foreknowledge.

AFTERWARD

What is called "foreknowledge" cannot be elicited from spirits, nor from gods, nor by analogy with past events, nor from calculations. It must be obtained from men who know the enemy situation.

—Sun Tzu

The general said:

Intelligence is an art and not a science because it is a creation of people, not nature. People collect intelligence. People analyze intelligence. People make human judgments as an intelligence product is created. And, ultimately, a person communicates the intelligence to the commander.

Thus far, I have described the principles of intelligence as the fundamental truths of the art. *Accuracy, timeliness, usability, fusion, relevancy, intellectual honesty*, and the requirement to be *communicated* are all principles inherent in intelligence and are not bounded by time or changing technology. While these principles form the basics of the art, they are complemented by the supporting tenets of *politics, timing*, and the *multilevel* nature of military operations. These tenets further characterize intelligence as art.

Intelligence is a *political* process. It involves the judicious relay of intelligence from a person to a commander who is empowered to act upon the intelligence. It involves interaction between groups of people who represent powerful institutions. Typically, these interactions are between intelligence professionals and operations professionals. And, ultimately, the success of the intelligence

process may rest on the personal relationship developed over time between the intelligence officer and the commander whom he or she serves. To work best, this relationship must involve trust, mutual respect, and a shared dedication to the mission.

To have the greatest impact on the commander, the *timing* of the delivery of the intelligence is crucial. The principle of timeliness and the tenet of timing are not the same. Timing involves the calculation of when to present the intelligence to the commander. If the timing is wrong and the commander is unable to focus on the intelligence, the impact of the information delivered may be diminished. It is the responsibility of the intelligence officer to pick the best timing for the delivery of the most important intelligence.

Finally, intelligence has a *multilevel* character as it supports missions at the tactical, operational, or strategic levels of warfare.[22] When supporting tactical operations, intelligence is highly perishable. The usability of the information may be measured in hours, minutes, and increasingly in seconds. Should intelligence fail, the impact, while deadly and locally dramatic, can be offset with other local victories. At the operational or theater level, intelligence has a lengthier period of usability. With an emphasis on enemy force disposition and capability, the gravity of operational intelligence greatly exceeds that of the tactical level. Should major intelligence errors occur, the impact on the theater campaign may be disastrous and not recoverable. At the strategic level, intelligence supporting national security decision making has a much longer usability. Likewise, it must reflect the political, economic, as well as the military characteristics of the adversary nation. At this highest level, the consequences of misestimation are nationally profound.

Intelligence, then, is art created by people. And, the impact of that art on the decisions of the commander is greater than that of any other input he receives. Indeed, the "words, numbers, images, suggestions, appraisals, (and) incitements" describe the enemy and help the commander "optimize" his action to accomplish the mission. And, in the victory that follows, the commander can claim he was served well by the art of intelligence.

Washington, D.C.
19 April 2017

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Fall 1993

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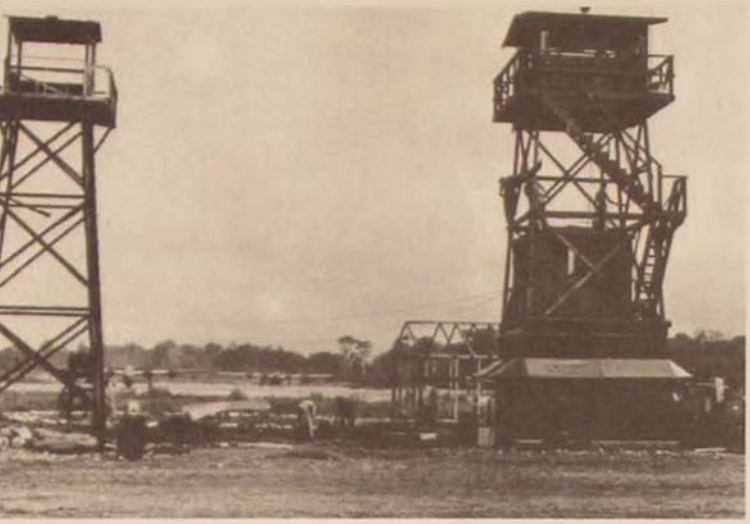
SPACE POWER SURVIVABILITY

DR COLIN S. GRAY

GEN COLIN POWELL, chairman of the Joint Chiefs of Staff, said that the United States learned from Operation Desert Storm that it had "to achieve total control of space if [it is] to succeed on the modern battlefield."[1] This statement may sound immoderate, but it actually ranks on the modest side of the stream of relevant

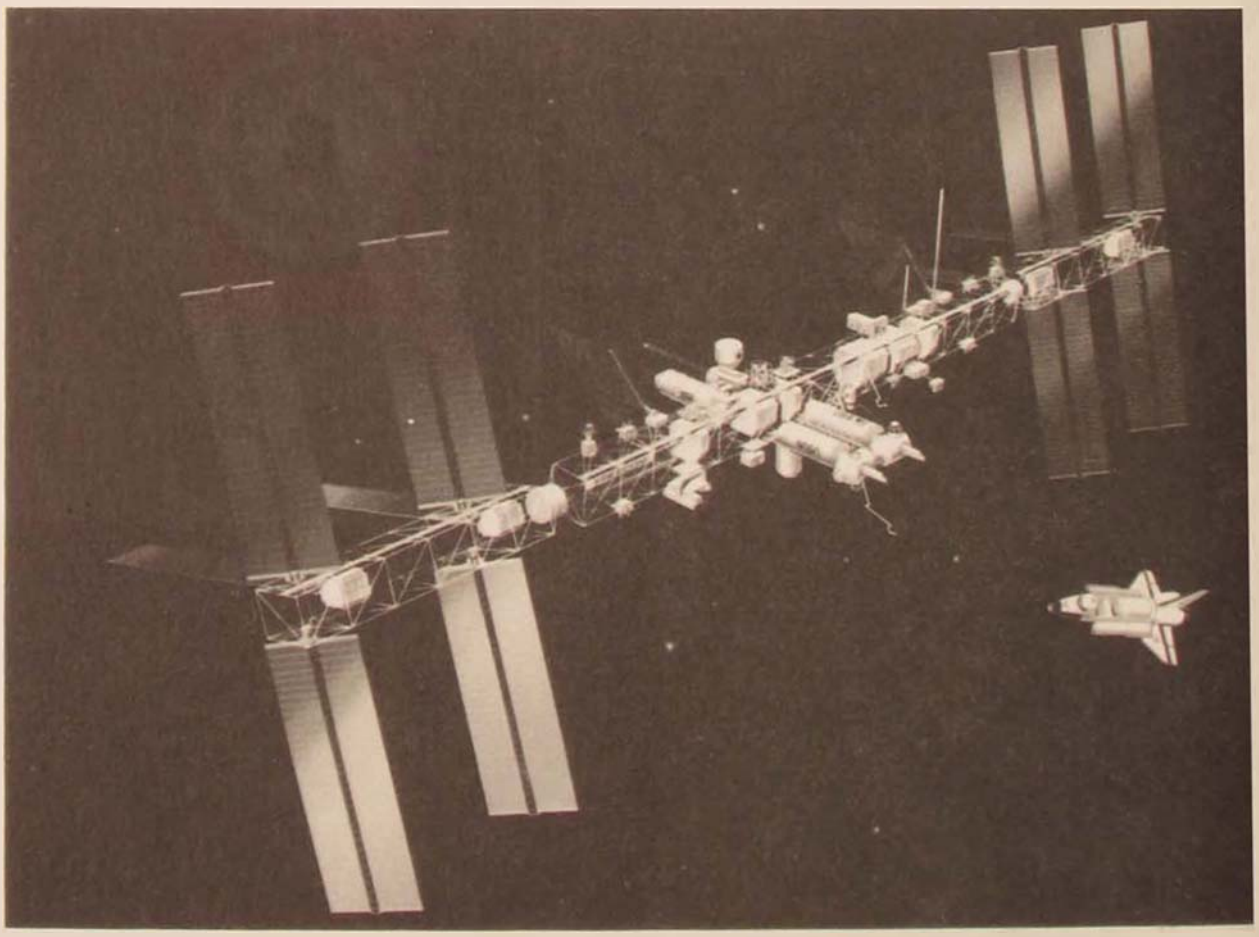


From Guadalcanal to Okinawa, the US theory of victory in the war with Japan was based on the value of superior air power. The carrier-poor US of 1942 compensated by building air bases such as Henderson Field on Guadalcanal (above). In the future, we may build our bases in space. An artist's conception (below) shows a space shuttle approaching space station Freedom.

prophecy. US policy in the 1990s is to maintain clear maritime and aerospace superiority, not mere advantage.[2] The intriguing question urgently in need of exploration is just what benefit "total control" of space yields to its possessor.

The theory and practice of US military behavior in World War II matched a less extravagant version of General Powell's claim, with air substituted for space and with the term *total* deleted. From Guadalcanal to Okinawa, the US theory of victory in the war with Japan was based upon the value of superior air power. The carrier-poor United States of 1942 sought compensation via air bases on land (e.g., Henderson Field on Guadalcanal in the Solomons),[3] while the carrier-rich United States of 1944–45 sought island bases from which the strategic air bombardment of Japan could be conducted or escorted (e.g., Saipan, Okinawa, and Iwo Jima).[4]

Prophets often have insight, but—almost



as often—zeal for anything new threatens to unbalance judgment. The past few years have seen no lack of prophecy on behalf of the military significance of space prowess. Four examples serve well enough as markers for a bold claim for the importance of space. First, writing in 1988—the penultimate year of the cold war—Simon P. Worden and Bruce P. Jackson noted that "the Soviets seem to recognize that the primary measure of national power in the decades ahead will be the ability to place large vehicles up and out of the Earth's gravity well."[5] This comment is typical of the excessive claims for new, allegedly dominant, weapons. Similar claims have been advanced in the past for gunpowder for field artillery, for naval battle fleets, for bomber fleets, and for mechanized land power.

Second, also in 1988, Gen John L. Piotrowski—then the commander in chief of US Space Command—advised that "the side that loses the space battle will very likely be unable to meet its objectives on land, at sea, or in the atmosphere."[6] This observation is plausible. Indeed, following the experience of Desert Storm in 1991, it assumes even a commonplace quality. As the US armed forces place ever heavier reliance upon space systems for communication, navigation, early warning, over-the-horizon intelligence gathering, and meteorology, Piotrowski's claim acquires the status of a self-fulfilling prophecy.

Third, though talking still very much in a cold war context in 1987, Adm Carlisle A. H. Trost—then the chief of naval operations—made an argument of enduring interest:

> Today we know that in wartime, even in a conventional war of limited duration, the two superpowers would fight a battle of attrition in space until one side or other had wrested control. *And the winner would then use the surviving space systems to decide the contests on land and sea* [emphasis added].[7]

That other superpower no longer exists, and 10 years or more may pass before it is functionally replaced by a superpower-quality foe to US geopolitical interests in Europe and Asia. Nonetheless, Admiral Trost's argument, or assertion, is inherently intriguing. Just what he meant, or could mean, by his claim concerning the *"use [of] the surviving space systems to decide the contests on land and sea"* is less than crystal clear. After all, even a mature air power has never had that degree of strategic effectiveness, though the Gulf War of 1991 might have had that character. What can be the basis for believing that space systems *themselves* could be wielded literally to decisive effect?[8]

Fourth, an Air Force Blue Ribbon Panel concluded in 1988 that space power will be as decisive in future conflict as air power is today.[9] The panel is probably correct in its argument that the loss of space cover, or of space assistance in all respects, in the future would be as debilitating for ground, sea, and air forces as loss of air cover today would be for the prospect of success in terrestrial operations. Again, the analogy of air power to space power is persuasive and warrants imaginative, yet disciplined, application. One must recognize, however, that likening air power to space power carries no detailed implications for the utility of space systems. Most emphatically, this article does not suggest that satellites can substitute for aircraft in all, or even most, respects.

Operational Thinking for a Space Campaign

Bulletproof soldiers, aircraft proof against surface-to-air missiles, and tanks immune to antitank weapons have yet to be invented. Although soldiers, aircraft, and tanks are vulnerable, they remain useful in war. The operational context is

always critical for evaluation of the utility of people-machine combinations in warfare.

Survivability and effectiveness in forces are qualities with strong policy, strategic, and tactical referents—in addition to the physical properties from which tactical and even strategic judgments have a way of flowing. The debate over space-system survivability has been conducted by some of the same people, of determinedly astrategic inclination, who argued vociferously about the modernization of intercontinental ballistic missiles (ICBM). From the ICBM debate of the early and mid-1980s, one might have inferred that a nominally vulnerable silo, or ICBM launcher, was tactically the equivalent of a vulnerable ICBM and that an enemy might believe he could wage war against the ICBM force alone.[10]

In order to avoid nonoperational thinking, one must remember the following about an enemy: he cannot assume that he will fire the first volley in a war in space; he cannot expect—even if he shoots first—that the US defensive architecture will be susceptible to instant catastrophic elimination (or fatal damage); he must anticipate that behind the shield—even the damaged shield—of our active defenses lurks a large and capable strategic nuclear offensive capability; and he is probably a careful student of Carl von Clausewitz and knows all about the composite notion of "friction" (or Murphy's Law) in war.[11] Commentators often are so concerned about being responsibly defense-conservative that they forget about an offense-conservative enemy. Fatal "what-ifs" for robust systems need to be balanced by consideration of enemy-oriented what-ifs. Although one must assume that the technical characteristics of rival space systems are important, war is not, in the final analysis, a technical enterprise.

The military space debate has seen a crude analytic reductionism whereby—neglecting the operational context in its many complementary dimensions—competing theorists write as though the survivability of space platforms will be the key to peace and war, victory and defeat, national extinction and survival. Fortunately, the operational realities of arms races, crises, and wars are far more complex. Survivability is always to be weighed on a range of criteria with reference to the functions of the systems in question, and in the context of the total war-fighting posture of the state. Otherwise, one is reduced to debating whether a bullet can kill a soldier or whether two SS-18 warheads can knock out an ICBM that a US president chose to leave in its silo. In decades past, generally intelligent people solemnly debated the "issue" of whether or not aircraft could sink large, heavily armored ships (to which, historical experience in 1942–45 answered, "Yes, but. . . .").[12]

Also, operational or campaign sense often has been absent from discussion of antisatellite (ASAT)/defense of satellite (DSAT) issues. Questions of ASAT and space-system survivability have meaning only in the context of the pace of military and political events on earth, which is not to deny that a space campaign could influence those events. As an operating medium necessarily adjunct to the land, space cannot sensibly be analyzed in isolation from the strategic context that gives it meaning. A maritime analogy is helpful here. Superiority at sea frequently has functioned strategically as an overall war-winning asset. But if an enemy can win the war on land in a matter of days, the slow pace of pressure from the sea is reduced to an irrelevancy. For example, consider the monumental inutility of French naval superiority in the Franco-Prussian War of 1870–71. This is not to say that one must analyze everything in order to analyze anything, for that would constitute a case of the holistic fallacy. But it is to claim that, as one proceeds relatively narrowly, one must acknowledge the broader contours of statecraft and war.

The space policy of the US military requires that space control be asserted and exploited. Often, space control is discussed as if the concept had some self-evident and usefully precise meaning. In fact it does not. What is more, using air or sea control as an analogy is not necessarily enlightening. What if sea control is exercised on and over—but not beneath—the surface? If enemy submarines can harass and threaten to close sea lines of communications (as did Germany's U-boats in 1917 and 1941–43), what integrity remains to claims for control—let alone for *command*—of the sea? Space control is defined here as a condition wherein friendly space forces enjoy reliable access to orbit and are able—again reliably—to fulfill their missions there, while the enemy is denied those benefits. Space control does not imply the ability to operate in space without harassment, and neither does it imply the ability totally to exclude the enemy's vehicles from orbit. By way of analogy, consider these words of Alfred Thayer Mahan:

> The control of the sea, however real, does not imply that an enemy's single ships or small squadrons cannot steal out of port, cannot cross more or less frequented tracts of ocean, make harassing descents upon unprotected points of a long coastline, enter blockaded harbors.[13]

In practice, control usually is to some degree disputed, though it is rarely in genuine dispute by rival battle fleets. Maritime control or command may be thought of as moving zones, not as permanently occupied and defended regions.[14] The military geography of space implies that access to—and relatively secure and long-enduring use of—low earth orbit would be improbable in time of war between major powers. But that same geography suggests that space denial would be much more difficult to achieve for semisynchronous, geosynchronous, and high earth orbits.[15]

Modesty is a sensible approach to the question of space control. Bearing in mind that a space campaign is not of interest except with regard to war as a whole, the key question has to be what degree of control is judged essential—as contrasted with merely desirable. The United States requires reliable access to orbit for missions that cannot be performed well enough in other ways (e.g., by high-flying aircraft or by radar picket ships). Similarly, the United States should be able to deny *mission* survivability to enemy space systems. The sky would not need to be swept clear of all enemy space platforms, but—for the purpose of prewar deterrence—the enemy should be led to expect the reasonably prompt demise of his platforms in orbit and the prompt interception of replacement (reconstitution) platforms.[16]

In the context of war—particularly war of a protracted character—space control is likely to be permanently in dispute, with both sides able to make some use of space systems. Many assets critical for space surveillance, acquisition, tracking, and kill assessment (SATKA) will be damaged and destroyed in war—especially those in known terrestrial locations—though some mobile surveillance platforms (particularly those based in very high orbit) certainly would survive. Given the variety of SATKA capabilities, at least for low earth orbit, space denial would be a more usual condition than one of space control or of disputed command and shared—*but reliable*—use. The military space community strongly suspects that space denial, at least for low orbits, would be a great deal easier to achieve than would a quality of space control that permits positive exploitation of the space ways. People of goodwill and equal knowledge disagree on this subject, for which there is no direct historical evidence.

As space systems assume greater significance for terrestrial combat, the stakes in a space campaign must rise. By analogy, in 1918 air superiority was useful but not strictly essential.[17] By 1939–45, however, winning a campaign on the ground or at

sea in the absence of such superiority had become all but impossible. Disputed command was not good enough.

If a space campaign includes a shoot-out between the orbital elements of missile defense architectures, then that campaign—in and of itself—might be able to dictate the course and outcome of a war (i.e., if defenses in an ASAT mode could destroy or fatally degrade an enemy's ballistic missile defenses [BMD] *and* retain sufficient potency to eliminate the long-range missile threat). In this case, the space campaign would wield a decisive influence over the course and outcome of a war. Nonetheless, space control is not the key to victory or defeat in war. Whatever the nominal utility of the working control of space, questions remain. What do we plan to do with such control? Can our terrestrial forces be assisted usefully from space?

The purposes of a space campaign would be both positive and negative. On the positive side, one might attempt to change the balance of relative advantage in space so that the enemy would face the prospect of fighting under permanently hostile skies. The measure of intimidation achieved by early success against space systems must depend upon the enemy's weighting of the significance of net prowess from orbit. However, one should not allow oneself to be captured too easily by 1960s-era strategic concepts. The overriding purpose served by securing an early military advantage in space would be war fighting—not deterrent—in nature.

On the negative side, one could attempt to launch a space campaign against assets believed critical for the orderly and coherent conduct of terrestrial enterprises. As an "operational *dis*integrator," a space campaign would contribute vitally to the disruption of enemy communications and the destruction of key platforms for surveillance, reconnaissance, and targeting. Needless to say, adversaries will vary widely in the measure of their dependence upon space systems and their systems' vulnerability to damage.

Opinions vary widely as to when a space campaign would be conducted. At least three clear alternatives present themselves: (1) as a precursor to war, (2) as the first campaign in war, and (3) as contributor to a long struggle conducted in all environments. One can hypothesize that in time of crisis a precursor ASAT campaign could so damage a country's ability to fight efficiently that that country or coalition would be intimidated into surrender. On balance, this possibility is improbable, if only because of the strategic warning it would provide. The damage wreaked by a war-precursor space campaign would be too modest to satisfy the operational taste of some strategic cultures (certainly the Soviet-that-was and probably the Russian-that-will-be). A more credible argument is that a space campaign would be waged promptly on the outbreak of general hostilities, as forces are deploying to their war stations and maneuvering for the first round. If a great war were protracted in time and global in scope, one should think of space systems and of space campaigning as permanent—or perhaps recurring—elements influencing the course and outcome of events.

Threats to Space Systems

Although space-system survivability—hence availability—is a fundamental issue, the rather abrupt demise of the cold war in 1989 has lowered the position of this issue on the priority list of official concerns. Nevertheless, how should one characterize questions of space-system survivability over the long term? (For today's US defense planner, the long term begins arbitrarily—as well as symboli-

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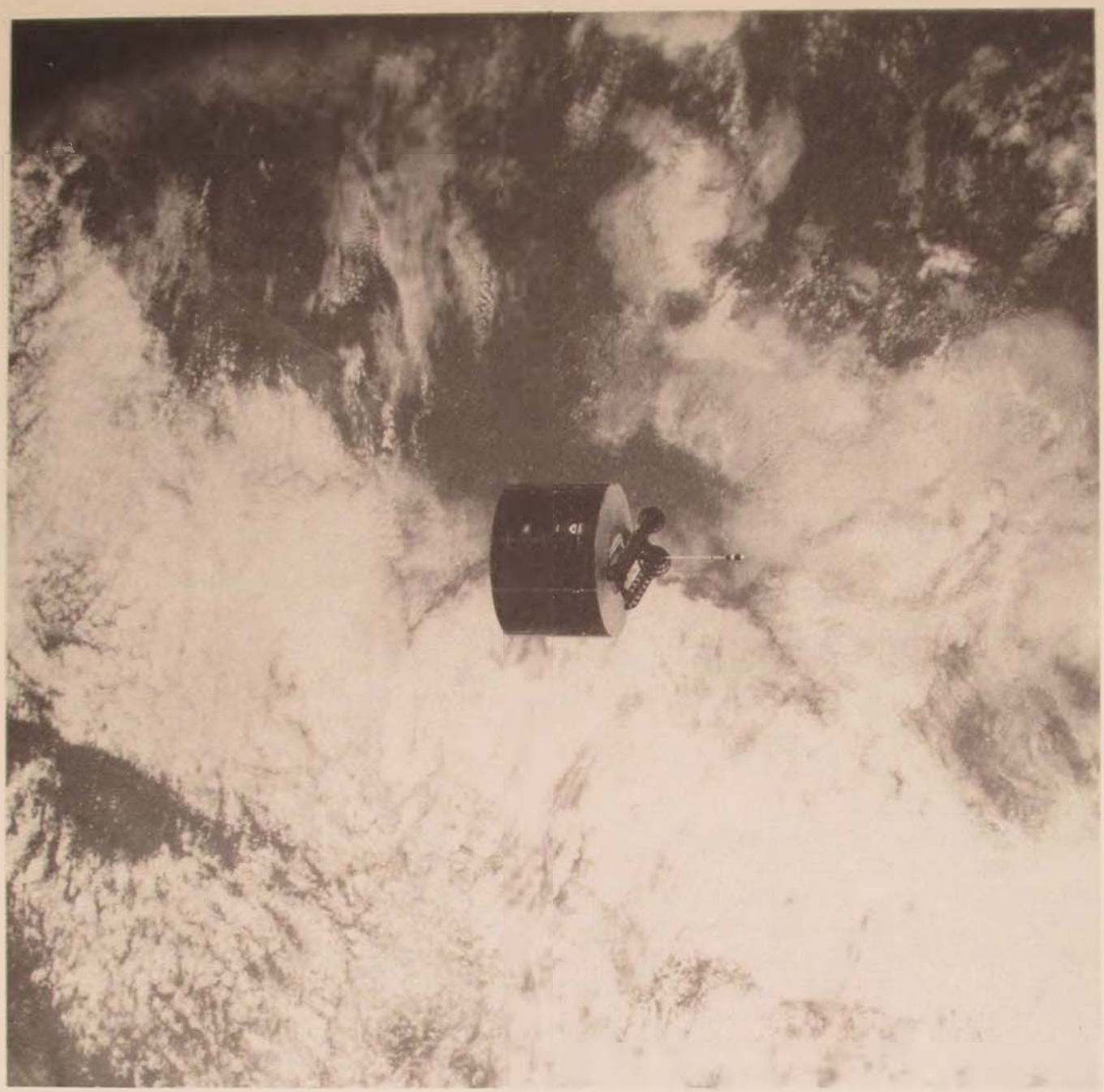


The US military's space policy requires that space be controlled and exploited, even though that concept does not have a self-evident and precise meaning. But satellite communications—both military and civilian—are certainly part of space control. Here, the Syncom IV-5 communications satellite orbits over West Africa.

cally—in the year 2000.) Such questions include survivability to do what, for how long, and with what benefits-to-costs. Notwithstanding the strategically permissive context of the 1990s, what do we believe we understand about the terms and conditions of actual combat in and from the space ways? What is encompassed by ASAT and DSAT capabilities? How do the two relate to each other? Bluntly posed, what would war in and for space be like, and how much would it matter for the course of war elsewhere? Could two sides' space systems suffer some attrition yet coexist in an important sense? After all, rival navies and air forces, albeit often in clear relations of superiority-inferiority, frequently have

coexisted. Or, because of the very nature of the space environment, must one party be able to succeed in sweeping the space ways? Does the inherently global and featureless character of space yield all-or-nothing stakes to space warfare? Perhaps one should pay particular attention to the likely terms of coexistence for superior-inferior space forces.

For active missile defenses, a strategic issue of concern is not whether space platform A or B—or even whether space-platform constellation A or B—could survive in some absolute sense. Rather, the question is whether the space-based and space-dependent elements of a multilayered (possibly ground-, sea-, air-, and space-based, or rapidly space-deployable) architecture of strategic defense could survive *in their essentials* long enough to perform the deterrence—or war fighting for deterrence and denial—missions for which they were designed. What is the context for space combat? Is it precrisis maneuvering, harassment, and raiding? Crisis-time attrition of geographically isolated, important military assets? Regional or global nonnuclear or nuclear war (far distant though some of these dreadful possibilities are from the political conditions of the early 1990s)? Is the launching of an ASAT campaign a coordinated step in the immediate execution of a plan for general war? What are the stakes in space—stalemate or victory? In the latter case, does an ASAT assault have as its immediate goal the rough equalization of the strategic balance for reciprocal counterdeterrence (in a hypothetical context of superior US BMD capabilities) or the achievement of a major military advantage?

Impregnable defenses have never been constructed. The function of defenses—whatever the geographical environment and whatever the historical period, level of technology, and polities in hostile contention—is to complement the offense for positive goals in war.[18] Defenses may work well enough if they delay an attacker, compel him to devote a disproportionate expenditure of scarce assets to unrewarding assault, and generally unbalance him for the defender's riposte.

The worth of space-based military assets must always be a value relative to assets otherwise deployed. The less the unique value of space-based or space-dependent systems, the less the potential value in assaulting them. Space systems for BMD functions, for example, would be protected if—*in enemy campaign prediction*—friendly forces are postured competently. Enemy war planners would have to calculate how an ASAT/DSAT duel likely would proceed, how the outcome of that possibly protracted duel would influence the result of an "exchange" between offensive forces, and—to make policy sense of the entire enterprise—how the combat in and for space and the strategic exchange would translate for war termination into a tolerable political outcome.

Plainly, this article does not speak to the new world regional disorder of the 1990s, but it does address what can be termed key structural aspects of war in and from space in the future. Threats and issues of space-system mission survivability have a whole-war context, regardless of specific historical circumstances. Missile defenses erected to anticipate regional problems in the 1990s (for protection against limited strikes)[19] cannot fail to have investment value for the return of major balance-of-power struggles in the twenty-first century.

Both small- and large-scale errors in defense plans, posture, and military doctrine are inevitable. It is not useful, however, to postulate worst-case threats involving an improbably supercompetent foe and extraordinarily foolish Americans. Most things are possible, but history tells us that military success attends the side that can best recover its balance from past errors, since both sides will err. Some overexcited rhetoric in the Strategic Defense Initiative (SDI) debate of the 1980s produced truly superhypothetical threats in the face of which no US space-

based BMD architecture possibly could survive. For example, how can one consider space-based boost or early midcourse BMD if the enemy is permitted a sky-sweeping first ASAT volley by some mix of space mines on active trailing station and directed-energy weapons? This is the never-never land of what-if. In a similar vein, alarmists postulated the blitzkrieg assault that unraveled (beyond recovery) NATO's central front in a week; the "first salvo" at sea that reduced the US Navy to a coastal defense force; and the strike that paralyzed command, control, communications, and intelligence (C^3I), thereby precluding the national command authorities from issuing emergency action messages.[20]

The United States endeavors to design systems—not individual platforms—to survive, and to survive in a functional sense, which is the only sense that really matters. System effectiveness will degrade over time, as ammunition or power supply is depleted in some cases and as enemy action takes its toll. Precedents have been set with the planning of the defense satellite communications system (DSCS) III, navigation satellite timing and ranging (NAVSTAR), and military strategic and tactical relay (MILSTAR) satellite constellations (involving such survival technologies as proliferation of platforms for redundancy, substantial autonomy of operation, choice of orbits distant from threats, variety of orbital planes, hardening, ASAT attack-warning sensors, and irregular phasing in orbit). Further, the US defense community has only begun to plan for space deployments on the assumption of a hostile environment (an assumption difficult to sustain now that the Soviet Union has collapsed). It is, therefore, premature to assert axioms concerning what can and cannot be done to ensure the tolerably graceful degradation in effectiveness of critically important space-system architectures.

Unless there are excellent grounds for arguing that space warfare would be a one-salvo battle rather than a campaign, one should allow that such warfare—and associated measures—would be a two-way street. Space-based BMD capability, for example, would be designed to function synergistically with ground-, air-, and sea-based system elements, as well as with the actions of offensive forces (of many different kinds). An enemy's attack planners have to consider such questions as, What might or would the other side do? Even if we do well, how well do we do? How badly might events proceed? What might be the consequences? Unless a superpower has been extravagantly unwise in making defense preparations, it is not going to be functionally disarmed by adverse ASAT action (unless one adheres to a simpleminded "King of the [Gravity] Mountain" or "Lord of the Gravity Well" theory of victory).

Questions of space-system survivability all too often attract dramatic judgments of the worst reductionist kind. The mindless assertion that there are no places to hide in space jostles with claims to immortality for platforms in distant orbits. In the absence of any historical experience of space campaigning and in the face of so much technical, tactical, and strategic complexity, the debate on space-system survivability is not easy to subject to analytical discipline. Indefinite survivability of every unit in every space system important in wartime is neither possible nor necessary. Policymakers have to consider how much survivability they need, for how long, and with what confidence. With few exceptions, the debate over space-system survivability has been conducted via the method of contrasting "Chinese menus."

The problems are threefold, at least. First, in the wise—if unhelpful—words of a 1985 report by Congress's Office of Technology Assessment,

> Whether the means of protecting satellites will be adequate to ensure the survivability of particular space-based BMD systems will

> depend in part on the kind of systems deployed and in part on future Soviet antisatellite capabilities. *Insufficient information is now available to resolve the survivability question* [emphasis added].[21]

If the evidential base was insufficient in 1985 in the context of a known adversary, how much less satisfactory must it be in the 1990s, when the adversary is unknown?

Second, there will be a never-ending technological, tactical, and strategic dialectic between ASAT and DSAT measures. For every menu offering in the threat column, innovative and imaginative engineers and military operations planners can devise or invent a counter.

Third—remote though this point may seem from the imaginative technical debate on ASAT/DSAT—the subject is war writ large, not only war in and from space. At the level strictly of technical and tactical possibilities, there can be no absolute showstoppers for the wartime utility of space platforms, provided no true technical shortfalls appear. In principle, at least, by far the most formidable ASAT weapons would be space-based particle-beam battle stations or space mines. But even these all-function debate stoppers over ASAT and boost and early midcourse BMD possibilities have their vulnerabilities. A direct-energy ASAT weapon would require command and information from the ground, as well as external SATKA assistance. Interference with the C^3I net for space-based weapons should render them harmless and vulnerable to assault.

The humble space mine (whether designed to destroy by conventional explosion, kinetic impact, or nuclear detonation) would need to be active—indeed, very noticeably active—in quite large numbers. It is difficult to believe that a country willing to assign critical wartime missions to space platforms would acquiesce passively in the face of unmistakable notice that enemy space mines (or unidentified *maneuvering* objects in orbits not easily explained) were in the process of prepositioning themselves for a comprehensive assault on key elements among those platforms.

At the barest minimum, five levels of challenges and responses affect the survivability of space systems: (1) technology, (2) tactics, (3) operational art, (4) strategy, and (5) policy. Public debate, analysis, planning, and material preparation can acquire an unhealthy and unnecessary fixation upon one or two of these levels at the expense of the others, with the result that valuable synergies and alternatives are neglected. Space-system design and operation, as well as campaign plans or arms control policy, for example, inadvertently can be required to exceed reasonable expectations of performance if the true structure of the subject—hence, the scope for assistance—is not well appreciated.

Help for space-system survivability—let alone assured help of the required quality and quantity—cannot be secured reliably at each of the five levels alone. Indeed, recognition of the theoretical availability of all five levels may be important precisely because technology or perhaps policy cannot accomplish much towards alleviation of a particular problem. As the focus shifts from technology—through tactics, operations, and strategy—to policy, the *context* assumes ever greater importance. For example, one would look for different kinds of answers if the problem at hand were the survivability of a tank; an armored brigade or division; tanks as part of a combined-arms team on campaign missions; or the feasibility of achieving deterrent or war-fighting goals via a military instrument with a significant tank component.

Technology can provide physical hardening, stealthy design, and the means for some agility in tactical functioning (table 1). Strictly speaking, technology drives *tactics*, but tactical imagination also can direct technology. Making decisions on how, when, and where an individual space

Table 1

Technical-Tactical Options

Ground Elements	*C^3 Links*	*Space Platforms*
Diminished reliance, satellite autonomy, and internetting	Electronic countermeasures	Electromagnetic pulse shielding
Proliferation for redundancy	Frequency agility	Neutron hardening
Mobility	Extremely high frequency and superhigh frequency	Attack warning sensors and prompt shutdown
Security precautions	Redundancy of relay nodes	In-orbit spares
Hardening	Message authentication and encryption	Ground-based spares for reconstitution
Launch flexibility	Satellite autonomy and internetting	Autonomy and internetting
Payload integration (with launch vehicle and ground facilities)		Platform proliferation for redundancy
		Stealth characteristics
		Reflective coating/shielding
		Armor hardening
		Maneuver
		Active defense
		Flares
		Distance/remote orbits
		Decoys

platform or space system would be used is the realm of tactics. Prospective ASAT/DSAT combat of all kinds, embracing all three segments of space systems (i.e., ground uplink, ground downlink, and orbital) is the immediate subject for tactical choices. The technological decisions incorporated in system design must be critical for tactical feasibility. Similarly, the technical-tactical mission for which a space system has been designed must impose more or less severe restrictions upon the range of practicable technological and tactical choices (table 1).

Many of these survival aids and techniques would be militarily infeasible or

prohibitively costly for particular space systems. Design for the survival and effectiveness of space assets must deny an enemy prompt, cheap shots that would have a major unfavorable impact on the balance of military power. Enough of the military space assets must be sufficiently effective to perform their missions for the time span of relevance for those missions. Beyond passive protection (deception, hardening, maneuver, proliferation, reconstitution, autonomy, and the like), spacewar planners must consider more active measures and the space campaign as a whole in conjunction with the war in other environments that the space campaign is intended to influence. In the best tradition of systems analysis, one should seek to avoid becoming locked into a problem/solution fit that is focused upon how space systems might achieve mission survivability in the face of an imaginative, skillful, and well-funded enemy. In addition, one should be open to the possibility that the answer—or a part of the answer—may be in the joint realm rather than with truly super space systems.

The term *operations* refers to the theater level, insofar as land power and "tactical" air power are concerned.[22] Because the near-earth space environment is by definition a global envelope, the ideas of operations and operational art can be applied only with great care. In practice, the whole of near-earth space is the space theater of operations, even though military space systems would have their effect upon particular terrestrial theaters. There is nothing novel about that point. After all, both air power and sea power have their effect upon the course and outcome of war via their effect upon land operations in distinctive theaters. But the campaigns for control of the air and the sea take place according to a rhythm unique to the air and sea environments. So must it be for the space environment also.

With *operational*-level choices, a state will select the complete architecture of its military space assets. Technological-tactical decisions will be made in the clear light of operational-level understanding of the missions to be accomplished from space. Indeed, according to the classical formula, tactical matters will have meaning only in relation to the total operational performance of the space architecture. Operational success can be built only on the basis of tactical success, but some percentage of tactical failures in military engagement—as always happens, in all environments—is inevitable and predictable. At the operational level, decisions will be made on such subjects as whether and when to take active measures of different kinds against different elements of enemy space systems. Considerations of space control will loom large, but strategic demand from terrestrial theater commanders for space denial will help shape the conduct of space operations in real time.

The importance of, and scale of challenges to, space-system survivability must be influenced massively by *strategy* writ large and by *policy*. Policy choices—what we seek to achieve—substantially determine the ends in the means-ends nexus that is strategy. The character of those ends (deter an attack on Saudi Arabia, defeat and punish Iraqi military power, defend Israel, and so forth) specifies what is required of military space systems, as well as how much and for how long. The probability of combat to, in, for—and one day even from—space is a variable largely determined by the total context for a conflict provided by policy and strategy.

Mission survivability overrides system survivability. Consequently, wherever it can usefully do so at reasonable cost, the United States duplicates in terrestrial systems some of the functions performed by space systems. Redundancy in the ability to accomplish the mission acts as a survivability measure. Clearly, all systems and all missions are not equally important. The more important the mission and the more important the system to the accomplishment of the mission (in theory at

least), the greater the attention paid to system survivability. Since all systems are not equally important, it follows that all do not require equal attention to survivability. As a consequence, many programs do not include specific survivability measures. US space policy explicitly recognizes this logic. For example, a 1988 White House statement mandated that

> the DoD must provide for the survivability of selected, critical, national security space assets (including associated terrestrial components) to a degree commensurate with the value and utility of the support they provide to national level decision functions, and military operational forces across the spectrum of conflict.[23]

Survivability measures apply to those parts of the system that are earth-based—the uplinks and downlinks between the ground and satellites and between satellites—as well as to the satellites themselves. The most effective approach is to apply redundant survivability techniques to each part of the entire system so that systems cannot be defeated by a single countermeasure and so that if they should fail, they will fail gracefully—not catastrophically. In this way, it is possible that mission accomplishment can be ensured, even with degraded systems. Broadly speaking, threats to the mission survivability of space systems can be categorized as physical or electronic in kind, and—with particular regard to the orbital segment—these threats invite different responses at semisynchronous or geosynchronous (as contrasted with low) altitudes. Above all else, perhaps—though far from exclusively—space-system survivability reduces to a set of problems in the conduct of defensive electronic warfare. Efforts to achieve the actual physical destruction or disablement of critical elements of space systems—while always possible—have some distinctive disadvantages, most noticeably that of lead time.

Arms Control: Problem, Solution, or Just Irrelevance?

The arms control community has pressed for a variety of ill-considered ASAT control measures. As a general rule, these measures have failed every test that a prudent US national security policy has posed. The arms controllers have had an open agenda item of seeking to protect benign space platforms (i.e., those performing surveillance, early warning, and communication functions) and a barely concealed agenda item of complicating life for strategic defense by denying space basing to some BMD platforms. Critics of ASAT arms control have stressed the substantial overlap of ASAT and BMD capability, which is to say that if a state has even a modest exoatmospheric BMD capability, it should have—as a bonus—an excellent low-earth-orbit ASAT. The interface between ASAT and BMD capabilities is subject to constant movement as technologies evolve.

The United States needs to protect ASAT deployment options for the prospective value of those options as active DSAT—possibly, though improbably, to deter attack on US spacecraft but more likely to help deny an enemy reliable access to critical orbits. For the long term, regardless of whether or not the United States proceeds to deploy some space-based elements of a BMD architecture, it will be vitally important that any enemy be denied working control of space. Ground-, sea-, and air-based ASAT weapons would not likely be a fair match for the active and passive self-defense capabilities of a space-based BMD system. Moreover, if any enemy could bid seriously to be "King of the Mountain" with space-based weapon deployments, he should stand a better-than-even chance of being able to deny the United States the reliable ability to enter orbit (*any* orbit, that is). Analysts have speculated on the

possibility of devising an ASAT arms control regime that would prohibit weapon deployments potentially threatening to satellites in high earth (including geosynchronous) orbit. Specific suggestions include prohibition of the deployment of directed-energy weapon platforms at an orbital altitude in excess of 1,000 kilometers; defined "keep-out" zones around space platforms (vis-à-vis possible space mines); and a variety of "rules of the road" for space operations to avoid or minimize perceptions of threats (and their consequences).[24]

On balance, the prospects for ASAT arms control are distinctly dim, even in these post-cold-war years. Great powers do not bar themselves from being able to do something that could be very important militarily. Space is a geographically distinctive environment but is dominated militarily by the same policy impulses that produce conflict on earth. The incentive to cheat on agreements would likely be matched by the ease with which cheating could be effected. The more critical space becomes as a field of competitive military endeavor, the greater the incentives to avoid legal constraints on (peacetime) behavior. The massive overlap between civilian and military space technologies (e.g., common transportation systems) and space activities would complicate any endeavor to write arms control treaties. Also, opinions vary as to the quality of space surveillance that will be available at different times in the future. Suffice it to say that there would be a problem in verifying space activity/capability exceeded in severity only by the traditional difficulty of a democracy in designing and executing a sanctions policy for noncompliance with treaties.

Notwithstanding the politically permissive international climate of the 1990s, space arms control is unlikely to succeed for many of the same reasons that foredoom naval arms control. In the geographical realms of both sea and space, the United States is not seriously threatened at present but recognizes a prospectively permanent need for military superiority.

Facing the Future

The argument that space power will be as important as sea power or air power is likely to be true one day. As with all such assertions, however, it has to refer to specific situations between specific enemies in a specific period. The US armed forces could accelerate the trend to dependence upon space systems, but if they do that, they need to be well satisfied with their space control. By analogy, dependence upon seaborne supply is ill advised without sea control. Also, one should not forget that air power's visibility and audibility have an effect on enemy morale that space power cannot duplicate. The absence of reliable air cover would be particularly devastating to a US Army that—except briefly in the Solomon Islands and in North Africa and Sicily in 1942–43—has never known that condition and whose tactical style is airland in character. For space power to begin to approximate air power in strategic effectiveness, space systems for *force application* would need to be added to the familiar space-based *force enhancement* assets. Quite aside from military, technological, and economic arguments, the political dimension of long-range (nonnuclear) force application from orbit is unlikely to be trivial.

Eventually, space will witness a full transition from being a convenient place to perform useful force-enhancement tasks to being key to mission accomplishment. As with the maritime environment in the sixteenth and seventeenth centuries and with air in this century, the space environment will not be reliably usable in future major conflict unless it is first secured for the passage of friendly vehicles. The ending of the cold war has slowed the pace of the military exploitation of space, but it cannot redirect the historical course of technological change in its relation to physical geography.

Overall, planning for space-system effectiveness and survivability to date has focused heavily not upon providing an architecture of space assets and forces organized and commanded for a combat environment but upon individual space systems (for example, NAVSTAR global positioning system [GPS]). The arrival of political peace among the superpowers, followed by the new status of the United States in the 1990s as the solitary superpower, threatens to slow prudent adaptation to the space age. The purse strings in democracies are held by people who tend to be moved only by the arrival of a danger that is both clear and present. Although the Gulf War of 1991 showed skeptics the value of space systems in war,[25] it did little to encourage realistic thinking or planning for a strategic context wherein *both* sides would enjoy access to orbit.

The space environment is different from the other environments, and that difference matters for technology, tactics, and operations. But space power, no matter how different, is of interest only because it can contribute strategic effectiveness to the deterrence or conduct of war as a whole. More and more defense professionals and commentators are coming to appreciate that the right to use space will need to be fought for, no more and no less than the right to use the sea and the right to fly. However, the US defense community is not used to thinking of space as a theater for combat, just as it is not used to overlaying space campaigns upon terrestrial campaigns for a coherent view of war.

A great deal can be learned from the military history of war on earth (on land, at sea, and in the air), but some of what is on offer could mislead. The theorist and military planner for space power need to know how space resembles, and how it differs from, the other environments. The era of great, simple assertions remains alive and well with respect to the survivability of space platforms and the mission survivability of space systems. (Only to those people who are truly reductionist in their approach is space-system survivability a simple set of issues.)

The defense enjoys a major advantage over the offense at very high altitudes. The great distance that the offense has to cover, not to mention the multidimensional costs of climbing out of earth's gravity well, yields critical initiative for defensive technology and tactical choices. However, the claim that the defense is the stronger form of war in geosynchronous orbit may well be only a relatively brief, technology-driven operational judgment and not a lasting truth. □

Notes

1. House, *Prepared Statement by Gen Colin L. Powell, Chairman of the Joint Chiefs of Staff, before the Committee on the Budget*, 102d Cong., 2d sess., 5 February 1992, 23.

2. "Achieving and maintaining preeminence in the air, in space, and at sea is key to our continued success as a global leader. In peace, maritime and aerospace superiority enhance our deterrence capabilities. In war, they are critical to the conduct and successful termination of conflict." Colin L. Powell, *National Military Strategy of the United States, January 1992* (Washington, D.C.: Government Printing Office, 1992), 9. The concept, or shotgun marriage, of air and space that is rendered as *aerospace* remains controversial. Geographically speaking, the composite superenvironment of aerospace certainly lacks integrity. See Maj Grover E. Myers, "Aerospace Doctrine: We're Not There Yet," *Air University Review* 37, no. 6 (September–October 1986): 91–93; and Lt Col Frank W. Jennings, "Doctrinal Conflict over the Word *Aerospace*," *Airpower Journal* 4, no. 3 (Fall 1990): 46–58.

3. See Richard B. Frank, *Guadalcanal: The Definitive Account of the Landmark Battle* (New York: Penguin, 1992), 16, 499, 606.

4. A reliable recent treatment of the war in the Pacific is Dan van der Vat, *The Pacific Campaign: World War II, the U.S.-Japanese Naval War, 1941–1945* (New York: Simon and Schuster, 1991).

5. Simon P. Worden and Bruce P. Jackson, "Space, Power, and Strategy," *The National Interest*, no. 13 (Fall 1988): 50.

6. Gen John L. Piotrowski, "Space Warfare Principles" (Unpublished paper, 1988), 39. At the time, General Piotrowski was commander in chief of US Space Command.

7. Adm Carlisle A. H. Trost, "Antisubmarine Warfare: The Challenge in Space," *Vital Speeches of the Day* 53, no. 18 (1 July 1987): 552.

8. For this claim for the potential decisive effect of space power to begin to be plausible, that power would have to be of the "full-service" variety. Specifically, it would have to include some capabilities for force application from space, which is to say terrestrial bombardment. Needless to add, perhaps, terrestrial bombardment from orbit long has been an extraordinarily politically sensitive topic. In the mid-1980s, Soviet spokesmen routinely claimed that the United States was seeking to acquire "space-strike weapons" via its Strategic Defense Initiative.

9. This verbal formula has been blessed by repetition over the years. For example, see House, *Prepared Statement by James F. McGovern, Acting Secretary of the Air Force, and Gen Larry D. Welch, Air Force Chief of Staff, before the Committee on Appropriations, Subcommittee on Defense*, 101st Cong., 1st sess., February 1989, 15.

10. For details of this issue, see Colin S. Gray, "ICBMs and Deterrence: The Controversy over Prompt Launch," *The Journal of Strategic Studies* 10, no. 3 (September 1987): 285-309.

11. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 119–21.

12. When the tactical issue was as stark as that posed by British surface vessels against German aircraft in the Mediterranean, or Japanese aircraft off Malaya, there could be no doubt that ships were vulnerable. But when surface vessels multiplied their antiaircraft artillery, were protected by friendly fighter forces, and were available in large numbers, the "issue" began to acquire its due complexity. In theory, any individual ship might be vulnerable, but the power-projection capability of a whole fleet or navy need not be.

13. Capt A. T. Mahan, *The Influence of Sea Power upon History, 1660–1783* (Boston: Little, Brown, and Co., 1890), 14.

14. "The aim of maritime strategy is therefore not so much to establish complete control of all sea communications, which would be an ideal hardly attainable until final victory was almost won, as to develop the ability to establish zones of maritime control wherever and whenever they may be necessary. . . . And a zone of maritime control means no more than an ability to pass ships safely across an area of water which may be quite small in extent or may cover many thousands of square miles of ocean." Capt S. W. Roskill, *The War at Sea, 1939–1945*, vol. 1, *The Defensive* (London: Her Majesty's Stationery Office, 1954), 3.

15. On the question of space-system survivability, see Col Robert B. Giffen, *US Space System Survivability: Strategic Alternatives for the 1990s*, National Security Affairs Monograph Series 82-4 (Washington, D.C.: National Defense University Press, 1982).

16. See Capt Lawrence A. Cooper, "Assured Access to Space: The Dilemma of Reconstitution and Launch-on-Demand," *Airpower Journal* 6, no. 2 (Summer 1992): 47–56.

17. The author of an excellent recent history of the airplane in World War I concludes that its "role was not a major one." Lee Kennett, *The First Air War, 1914–1918* (New York: Free Press, 1991), 220.

18. This argument is explored in detail in Colin S. Gray, *Weapons Don't Make War: Policy, Strategy, and Military Technology* (Lawrence, Kans.: University Press of Kansas, 1993).

19. See Keith B. Payne, *Missile Defense in the 21st Century: Protection against Limited Threats, Including Lessons from the Gulf War* (Boulder, Colo.: Westview Press, 1991).

20. For a classic example of how a good idea (ensure secure command and control) can become a much less good idea (worry about fine-tuned, supercompetent threats), see Bruce G. Blair, *Strategic Command and Control: Redefining the Nuclear Threat* (Washington, D.C.: Brookings Institution, 1985).

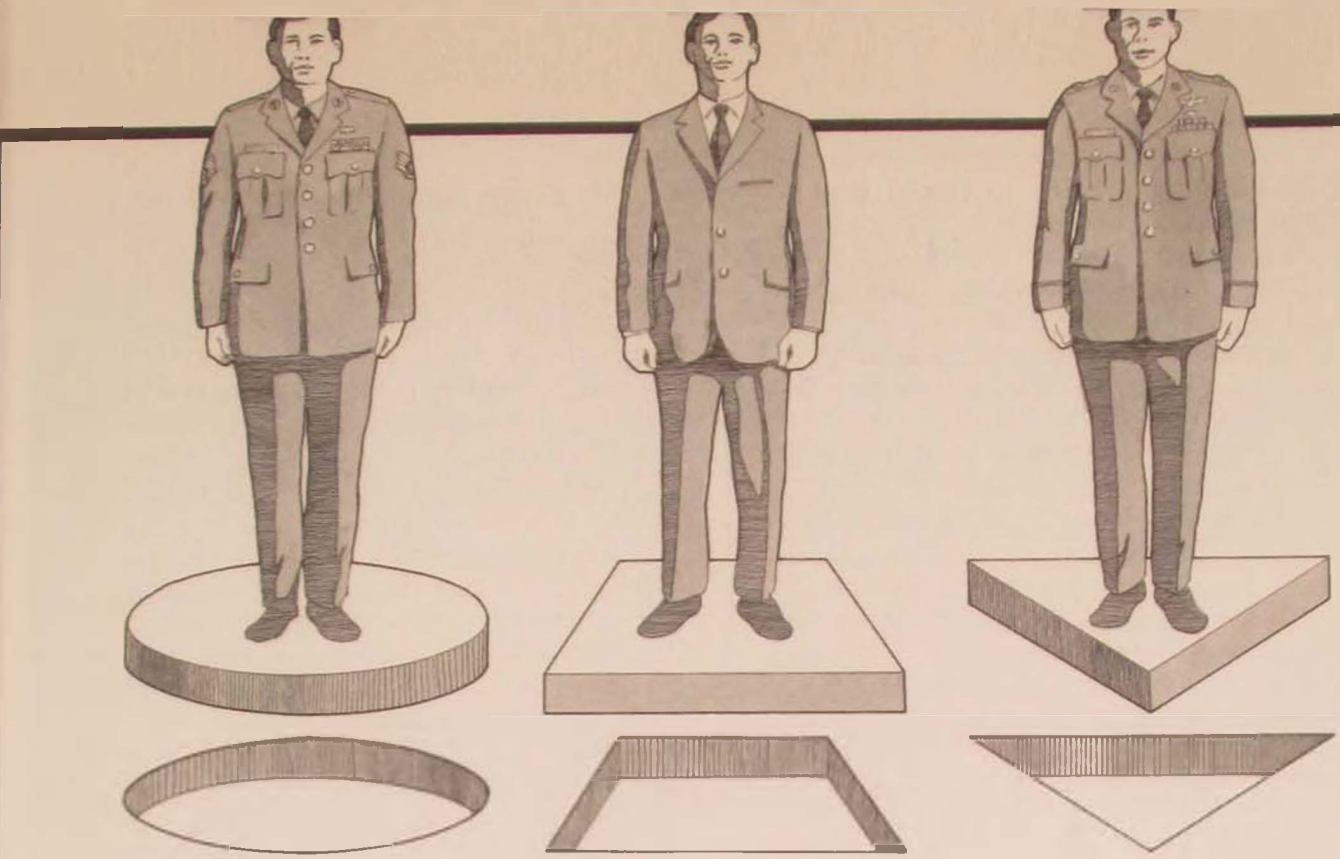
21. US Congress, Office of Technology Assessment, *Ballistic Missile Defense Technologies*, OTA-ISC-254 (Washington, D.C.: Government Printing Office, September 1985), 26.

22. See Edward N. Luttwak, *Strategy: The Logic of War and Peace* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1987), for a generally compelling conceptual treatment of the different levels of conflict (all, according to Luttwak, united by the distinctively paradoxical behavior that uniquely characterizes "strategic" effort). It is agreeable to note that the US Air Force in the 1990s has abandoned its near-half-century-long organization by purportedly "tactical" or "strategic" duties.

23. "Presidential Directive on National Space Policy" (Washington, D.C.: Office of the Press Secretary, the White House, 11 February 1988), 8.

24. For a sampling of the literature on space arms control, see Ashton B. Carter, "Satellites and Anti-Satellites: The Limits of the Possible," *International Security* 10, no. 4 (Spring 1986): 46–98; H. Guyford Stever and Heinz R. Pagels, eds., *The High Technologies and Reducing the Risk of War* (New York: New York Academy of Sciences, 1986), pt. 1; and Paul B. Stares, *Space and National Security* (Washington, D.C.: Brookings Institution, 1987), especially chap. 6.

25. See Sir Peter Anson and Dennis Cummings, "The First Space War: The Contribution of Satellites to the Gulf War," *RUSI [Royal United Services Institute for Defence Studies] Journal* 136, no. 4 (Winter 1991): 45–53; and Vice Adm William A. Dougherty, "Storm from Space," US Naval Institute *Proceedings* 118, no. 8 (August 1992): 48–52.



WHERE DOES the AIR FORCE NEED OFFICERS, or

WHY SEND an OFFICER to DO an NCO'S JOB?

MAJ J. C. CANTRELL III, USAF
MAJ HENRY L. ANDREWS, JR., USAF

To command, make war-fighting policy, and be accountable for accomplishing the Air Force mission.

—ACSC Officer Requirements Study

HISTORICALLY, military force reductions have ravaged the combat capability of the armed services (recall the "hollow force" of the post-Vietnam era). These reductions affect the basic building blocks of combat capability: weapon systems, technology, logistics, and, most importantly, people. People, as the most perishable component of our war-fighting capability, require fundamentally sound nurturing for them to fulfill the defense needs of our country. Ill-advised execution of manpower cutbacks will profoundly retard our ability to succeed on the battlefield. The objective Air Force, the "one-base, one-wing, one-boss" concept, and composite wings are Air Force efforts to manage the end strength drawdown through organizational restructuring. Meanwhile, the "base

force" has fallen victim to fiscal restrictions, and budget reductions are pushing Air Force end strength to drastically lower levels. This turmoil directly affects our war-fighting capability.

As a result, in October 1992, Gen Merrill A. McPeak, Air Force chief of staff, asked Maj Gen Glenn A. Profitt, then the Air Force director of manpower and organization, to examine some basic officership issues, key among them being what does the Air Force really need its officers to do. This article describes the results of an Air Command and Staff College (ACSC) study (see sidebar on page 45) that took a "clean-sheet" approach with no preconceived product and focused on the things that must be done by officers and developed a method for placing officers where they can do them.

From the study came a mission statement for the Air Force officer corps: "To command, make war-fighting policy, and be accountable for accomplishing the Air Force mission."[1] The study also developed a model that turns the three discrete criteria of the mission statement into a method the Air force can use to distinguish officer billets.[2]

This study was not merely a paperwork exercise. It answered an Air Staff tasking generated by the political realities of today's budget-cutting environment. Congress is concerned about the Air Force costing more than other services in terms of personnel expenses (e.g., Sen John H. Glenn, Jr. [D-Ohio], often says the Air Force's officer-enlisted ratio is far too high when compared to the other services, especially the Marine Corps). Some believe that the Air Force, when compared with the other services, is underutilizing its officers in supervisory roles. Even if this belief is unfounded, we must move the system to respond in dramatic, proactive ways or have the "answers" dictated to us by legislation. The academic freedom of ACSC provided a unique environment in which to design an unbiased, pragmatic solution to a real-world problem Air Force senior leaders address every day.

Thesis

If we accept the requirements inherent in the above mission statement for the Air Force officer corps, we logically conclude that only officers should fill billets that satisfy the mission statement. But, the question remains, Who will accomplish the many essential tasks not encompassed in the mission statement but currently done by officers? The possible responses are noncommissioned officers (NCO), reservists, civil servants, and contractors.

Recasting the NCO's role is essential. There is a need to assign more responsibilities to those in the grades of E-5 through E-7 and to provide the opportunity for senior and chief master sergeants to do more middle management tasks. Today, many of our company grade officer billets are filled by "process experts." During the continuing drawdown in force structure, these billets will transition to other manpower categories (in most cases, enlisted members). The NCO corps is ready, willing, and able to tackle these duties.[3] Yet, there may be critical training questions to answer down the road as we incur a responsibility to better prepare these NCOs for the staff duties that were once the specific domain of the company grade officer.

Enlisted members daily shoulder an increasingly higher share of the responsibility for mission success. In the early 1970s, the Air Force required an officer to recode the targets in a Minuteman II missile; NCOs now do it. Today's enlisted members come in the service better educated than ever before. We take these bright enlistees and train them to a very high standard. Over time, incremental changes in who we are as a service and what we ask our people to do have blurred some of the traditional distinctions between many

Team Composition and Methodology

ACSC FORMED the study group in December 1992 with Lt Col Frederick B. ("Rik") Gervais, ACSC director of plans and programs, serving as facilitator.* The group consisted of 79 members of ACSC. The accompanying figure depicts the distribution of study team members by career functional area. Additionally, a seminar of the Air Force Senior Noncommissioned Officer Academy (AFSNCOA) researched the same issue, provided inputs, and reviewed the work of the ACSC team.

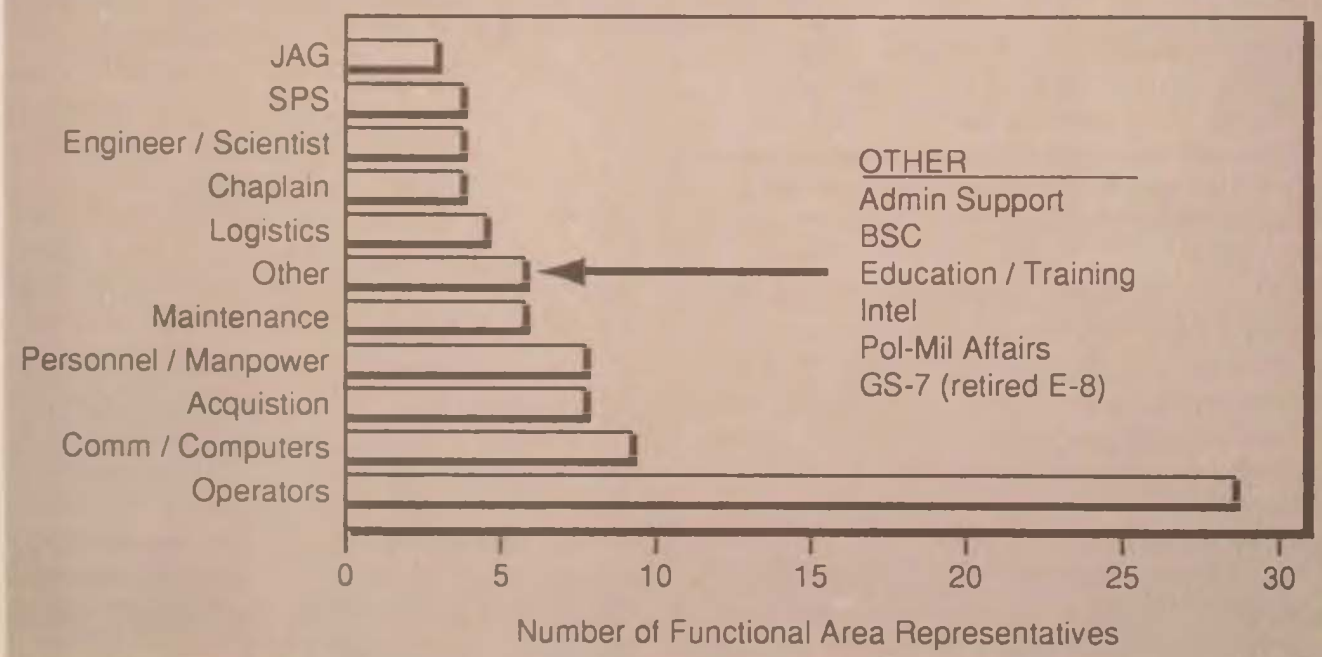
The large group was divided into five- to seven-person cells, occasionally assembling in one large forum to share ideas and insights. In late January 1993, two dozen members formed an "executive committee" to move from thematic work done in the small cells to a method by which programmatic decisions could be made by the Air Force. Senior field grade officers of the Air War College and the Ira C. Eaker College for Professional Development reviewed the briefings, as did manpower experts at Headquarters Air University. In April 1993, the team briefed General McPeak, who approved the products of the study and urged the Air Staff to "press hard" toward full implementation.

The study group had to make certain assumptions in order to provide a reference point for those who would use the products of the project. The first assumption was that this effort should complement similar work already done by the Air Force. For example, the team closely scrutinized recent studies that resulted in the Air Force decisions to put general officers back in the field as wing commanders and the "colonel requirements study."

While the group recognized that some regulations would probably need to be changed to affect full implementation of the study results, most of the necessary policies for personnel management and compensation are already in place (although some might need to be applied in creative ways to meet new requirements). The group targeted no specific AFSC, but focused on the entire officer corps. This nonparochial approach was maintained so the results would be applicable to all officers.

Although over the long term money will certainly be saved by having a higher percentage of the force populated by enlisted members, the study team was not tasked to save money. The final assumption was that even 79 members of ACSC wouldn't have all the answers and that waivers for appropriate situations would be necessary when changes generated by this study were implemented.

*Now a full colonel and commander of the 45th Logistics Group, Patrick AFB, Florida.



officer billets and enlisted billets. This blurring does not imply there is no difference between an E-8 and an O-3, but it is a fairly safe assertion that there may not always be dramatic differences between many of their duties and responsibilities.

Traditional Drivers

Although there are many qualities we desire in all our personnel, there appears to be four dominating traditional factors that drive officer *requirements*. First and foremost is the need to provide officers who command units and exercise Uniform Code of Military Justice (UCMJ) authority over their subordinates. Putting just anybody in a command billet doesn't satisfy this requirement. People must be prepared for command responsibilities. Every experience and opportunity the Air Force gives to an officer on the way to being a commander shapes the officer's ability to do the job well. Beyond the issue of whether combat leaders are made or born, the essential point is that our future leaders' ability to lead is shaped by the experiences we provide them. Thus, the Air Force must ensure that every billet an officer is assigned to on the way to command will properly prepare the officer to be a war-winning leader.

Protocol is another driver. One of the best examples of the protocol requirement is in the joint and international arenas when our sister services or other countries' military services supply an officer of a particular grade and we feel obligated to do the same. We do this to ensure our service interests are clearly heard in these important forums. If we don't meet such protocol requirements, portions of our war-fighting capability could be inadvisably sacrificed at some headquarters conference table.

The third driver, compensation, is important because, in the broadest sense, sometimes the easiest way to attract and retain people of a particular skill (e.g., engineering) has been to pay a competitive salary. Despite the availability of various types of financial incentives, the way we frequently attract needed skills is to offer commissions.

The final traditional driver is risk/accountability. "Risk," in this sense, is not only laying one's life on the line—after all, enlisted pararescue specialists and many others take such risks every day. As warriors, all military members readily accept this type of risk. Quintessentially, however, "risk" represents entrepreneurial risk, taking the chances that go along with making the tough decisions that allow any portion of the Air Force to operate effectively. The "accountability" side of this driver, on the other hand, indicates the officer's ultimate culpability for all activities going on under his or her purview, whether or not he or she was personally aware of the specific issue in question. For instance, regardless of which aircraft maintenance production superintendent was on duty and signed off an airplane later involved in a mishap, the squadron maintenance officer will also be held accountable for any mistakes. The bottom line here is that if it goes wrong, the officer responsible will be called to task for the results.

Defining the Air Force Officer

A second question must also be addressed: What do we want officers to be doing in the Air Force today? The response requires a philosophical construct upon which to base programmatic decisions. A central concept is the notion that we are not operators, maintainers, or medics. Rather, we are officers in service to our nation. We must consider the duty engendered by our oath and commission before we consider our allegiance to a specific Air Force career field.

The mission statement "To command, make war-fighting policy, and be accountable for accomplishing the Air Force mission" represents the challenges posed to and accepted by Air Force officers upon commissioning. The statement includes the three things that, in their ultimate definitions, can be done only by Air Force officers. If these duties are not properly discharged, we can no longer guarantee to the American public war-fighting successes like Operation Desert Storm. Rather, it's not unlikely we could repeat the postwar drawdown fiascoes with results similar to those we experienced during the summer of 1950 in South Korea.[4]

A Logic Tree

From the mission statement, we can develop a way to categorize Air Force officer billets. In an ideally structured Air Force, officer slots should fall into one of three categories: commanders, war-fighting policymakers, and the remainder of the accountable decision makers.

Commander billets are reserved for the commanders who exercise UCMJ authority and have an "A" prefix on their Air Force specialty code.* This construct excludes many positions we now call "commanders," like aircraft commanders or flight commanders within a flying squadron. War-fighting policymakers include those billets filled by noncommander, executive-level leaders who are making war-fighting policy at their level of the Air Force where the function must be exclusively the province of the military professional. In this construct, we look to the differences between the Air Staff and the Air Force secretariat. In the secretariat, we have placed a senior officer "blue suit" presence in major functions, but those functions are actually run by civilian appointees. However, when it comes to war-fighting areas like the plans and operations community, there are no civilian counterparts, thus revealing the distinc-

Several factors drive officer requirements. One is the protocol requirement in the joint or international arena where we feel obligated to match officers assigned by sister services or foreign militaries (top) with an Air Force officer of equivalent grade. Another factor is compensation, such as offering commissions to doctors, which makes it possible for the Air Force to attract and retain sufficient numbers of people in critical skills (below).

*This was scheduled to be changed to a "C" prefix on 1 October 1993 as a result of AFSC restructuring.

tion between a policymaker and a "war-fighting policymaker." Finally, we must clearly define the accountable decision-maker billets. Officers in these slots exercise essential military leadership, oversight, decision making, and accountability in their daily duties, all factors whose consequences increase the higher a billet is placed in the organization. Further, these billets prepare officers for more responsibility and authority. These slots sustain the "pipeline" that ensures the Air Force has an adequate supply of officers who will eventually fill positions in the commander and war-fighting policymaker categories.

Figure 1 depicts a logic tree for ensuring that officer authorizations are of the type we ultimately want to retain in a smaller Air Force. As shown in the diagram, any officer authorization fitting one of these three definitions (e.g., commander, war-fighting policymaker, or a remaining accountable decision maker) is retained.

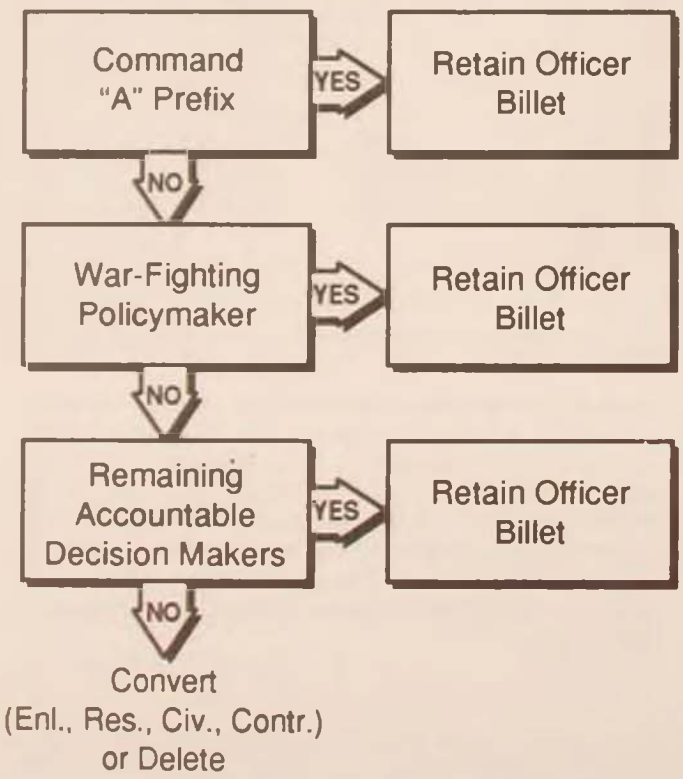


Figure 1. Logic Tree for Ensuring Officer Authorization

Those slots meeting none of these tests are candidates for deletion or conversion to another manpower category. Alternative manpower categories include enlisted, reservist, civil servant, or contractor. This very simple logic tree represents an endgame for officer authorizations; however, it is not sufficiently developed to account for the complexities of progressing to that endgame. We need a more sophisticated vehicle for AFSC functional managers to use in reaching that vision.

Implementation Model

We can incorporate the logic tree as the three entering questions of the implementation model in figure 2. The intent is for an AFSC functional manager to use the implementation model and the 38-series Air Force directives governing organizational structure to assess the need to retain the officer billets they control. As in our earlier discussion of the logic tree, many billets will fall into the three entering categories (commander, war-fighting policymaker, or remaining accountable decision maker) already discussed. On the other hand, other billets will immediately become candidates for conversion or deletion.

Tagging billets as commanders, war-fighting policymakers, or remaining accountable decision makers is only the initial step of the review represented by the implementation model. When this first step is complete, AFSC functional managers must then use the model to generate more information by which the Air Force can make further judgments about the billets that remain in a smaller officer corps. While the initial categorization of officer slots as commander, war-fighting policymaker, or remaining accountable decision maker will cause many authorizations to be deleted or converted to another manpower category, further scrutiny holds the possibility of finding even greater economies. These economies

are located in billets that today pass the model's tests, but do so only on the margin. In the course of this examination, we will not quarrel with the need to do a function, but we must ask who should be doing a particular task. We do this in a series of questions that first review the propriety of command billets. Then we identify slots that are assistants to other officers and exercise meaningful oversight of subordinates. Finally, we determine if another manpower category (enlisted, reservist, civil servant, or contractor) could do the same job. These questions are then summed up in an overall validation process for each officer authorization.

For instance, when looking at the "Command 'A' Prefix" block in figure 2 and considering command billets in a downsizing environment, can we afford to have officer squadron section commanders (billets which today have an "A" prefix and could otherwise pass the logic tree's simplified test)? By tasking functional managers to validate their command requirements, we gather data that helps make this determination. Logically, most "A" prefix billets will validate during this test; those that don't are subject to further review.

For the noncommander billets ("War-Fighting Policymaker" and "Remaining Accountable Decision Makers" blocks [fig. 2]), we gather additional data on the authorizations in these categories. The first question ("Assistant?" block) determines whether the authorization under review is an "assistant" billet. An "assistant" is one officer serving under another officer at the same level of the organization and overseeing the same portions of the organization. Group deputy commander authorizations, for

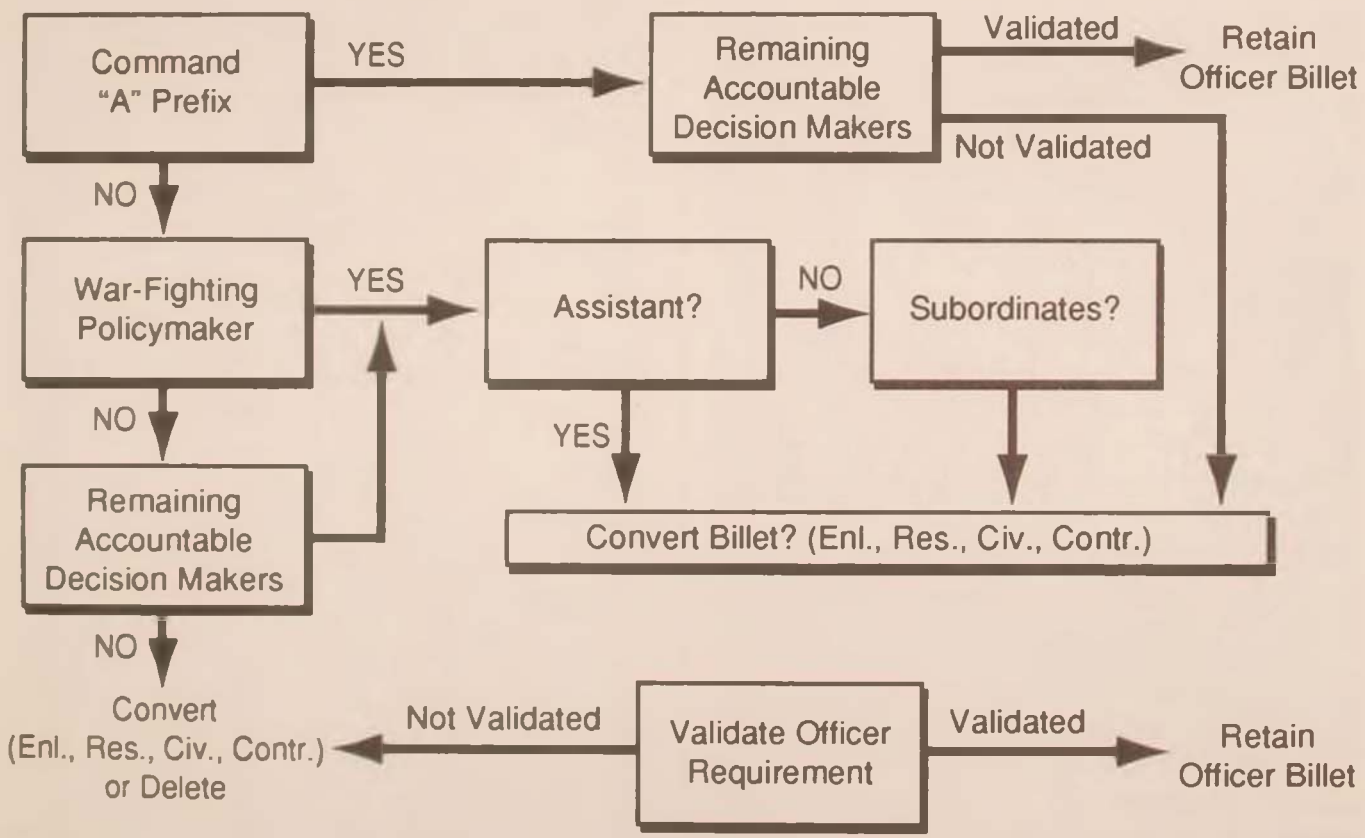


Figure 2. Implementation Model

instance, are one example of officer slots a smaller Air Force may elect to forgo.[5]

A further test ("Subordinates?" block) of the officer requirement for a particular billet is whether the position has any meaningful subordinates. Referring back to the definition of an accountable decision maker, officers exercise "essential military leadership, oversight, decisionmaking, and accountability" (e.g., having no subordinates or supervising only the squadron information management specialist may not qualify). Note, however, that the route out of the "Subordinates?" block in figure 2 is the same, regardless of the answer to this question. Asking the question not only ensures the gathering of the data on this characteristic of the officer billets under review but also allows the functional manager to recognize that officer positions without meaningful subordinates are sometimes necessary, even though billets not satisfying this test may be impractical in the even leaner times ahead.

To this point, the functional manager for a given AFSC has generated data in three areas: finding "A" prefix officer slots where the command requirement is not valid, determining if the officer slot is an "assistant," and reviewing the quality and quantity of oversight of subordinates attributed to the officer billet. In figure 2, the information gleaned from each of these three reviews is brought together for the functional manager to answer the fourth and most basic question (the "Convert Billet?" block): "Can another manpower category perform this function?" In other words, can the Air Force convert this billet to an enlisted person, reservist, civil servant, or contractor? One basis for answering this question comes from examining whether more than one category of manpower does the same job today, as can be found in some disciplines. As with the "Subordinates?" block in figure 2, the route out of the "Convert Billet?" block is the same, regardless of the answer to the question. This ensures that the AFSC functional manager addresses this subject, thereby gathering data about an officer slot that may never before have been captured.

After the "Convert Billet?" block in figure 2 generates the fourth and final data point asked for in the portion of the model that addresses those officer slots presently on the margin, all this information is then considered by the functional manager in making the retention decision. The "Validate Officer Requirement" block in figure 2 brings the invalid command slots, assistant, subordinates, and billet conversion data together into one final discussion on the wisdom of retaining any particular officer slot. Included in these functional manager deliberations must be an overarching priority to retain enough officer authorizations to ensure the sustainment of the pipeline as discussed earlier. Out of this process will come a final recommendation to retain, convert, or delete the officer billets.

To ensure consistent treatment of every AFSC, senior Air Force leaders must provide a clear charter for the AFSC functional managers to follow. It must include specific AFSCs to focus on or to avoid as well as to give guidance on how vigorously to apply the model. The following factors helped define the bounds of the overall review.

In discussing the need for an officer to do a particular job, proponents of the pro-officer side of the question frequently lean on tradition or the oft-quoted "You have to have an officer to do that job" when defending certain billets. In a drastically downsizing Air Force, the obvious question is why. Therefore, we must identify where personnel and compensation policy are inadequate to support institutionalizing the changes which could come from using the implementation model. In addition, we must find those public laws that restrict Air Force options in making the choices necessary to use the implementation model effectively. The bottom line here is to not let present policies or laws interfere with making the correct recom-

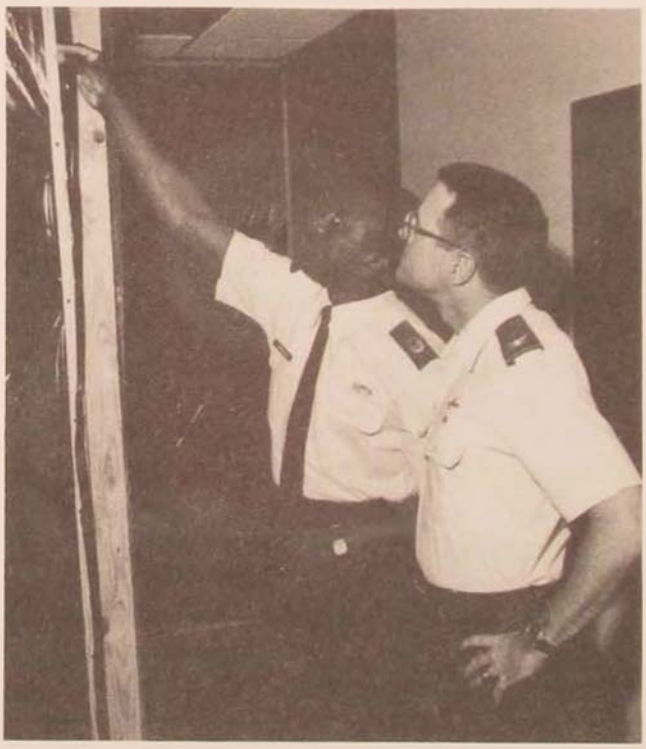
mendation on the retention, conversion, or deletion of an officer slot. If regulations or laws need to be changed, the Air Force can tackle that later by using the information gained in implementing this system.

It is clear that as the Air Force deletes officer authorizations or converts them to enlisted billets, senior and mid-level NCOs will be assigned broader duties. We have discussed how officers and NCOs alike feel today's NCOs are ready to assume this new mantle of responsibility. To ensure a smooth transition to this new division of labor, we must determine what additional training opportunities are needed to allow NCOs to effectively step into traditionally officer-held authorizations.

When it comes to defining "Remaining Accountable Decision Makers," there could be differences in this category between each officer career field. As the experts, AFSC functional managers will play a critical role in assessing the characteristics of essential military leadership, oversight, decision making, and accountability in their career fields. They must also meet the need to sustain the pipeline to the "Command" and "War-Fighting Policymaker" billets in their specialty. Further, they must determine how these traits fit into their specific AFSC's duties and responsibilities.

During the last three years, the Air Force has witnessed a dramatic restructuring under the objective Air Force banner. The implementation model described here applies directly to today's objective Air Force. However, AFSC functional managers must recognize that other organizational changes are possible outgrowths of using this model. Functional managers must identify where these changes are needed in the organization. This is especially so if further consolidations of AFSCs become necessary to "keep the doors open" as an individual AFSC when wide-scale slot conversions or deletions leave too few authorizations in an AFSC.

Because no review of Air Force personnel of this magnitude happens in a vacuum, today's senior leaders must provide guidance to the AFSC functional managers. Specifically, it would be useful to identify the "low-hanging fruit" in the officer trees where such measures as an inflated officer-enlisted ratio or unusually narrow spans of control are clues to possibly dysfunctional officer billets. Additionally, we should not ignore opportunities in the Department of Defense (DOD) agencies and joint arenas. In these organizations, not only does the Air Force provide an inordinately high percentage of the officers assigned (when compared to the other services), but the definitions of officers providing essential military leadership, oversight, decision making, and



Using the logic tree, the Air Force can reserve commander billets for the commanders who exercise UCMJ authority and have an "A" prefix (now "C") on their AFSCs. These billets must always be the exclusive province of the military professional.

responsibility clearly are being overlooked.

Again relying on AFSC functional manager expertise, the Air Force must define how it can restructure some offices into a team concept. The "team" approach can be visualized when you examine a notional Air Staff office with a dozen lieutenant colonels, majors, and captains in it—all, or most, in "one-deep" jobs. When these billets are run through the model one at a time, it is conceivable that all could fail the tests of being an assistant, having no meaningful subordinates, or having a job that another manpower category could do. However, if we restructure this notional office into a three-team organization, each team with an officer leader and the enlisted or civilian process experts necessary for that particular function, three officer billets would pass the model tests because they now exercise "essential military leadership" and possess the other characteristics of accountable decision makers.[6] AFSC functional managers must craft a basic (or minimum) "team" composition below which we should not go because the officers leading the team would not meet the characteristics inherent in the "Remaining Accountable Decision Maker" definition. Conversions of this magnitude may require other changes. For instance, although the objective wing structure may have removed some excess officer billets from the traditional wing/base structure, more can be done at this level. (An example will be discussed later.) However, as this model winnows down the "process expert" officers who have traditionally moved to headquarters staffs as midgrade or senior captains, the candidates for headquarters jobs will be the E-6 to E-9 NCO process experts. We must prepare to incorporate this new NCO expertise into the various staffs. The "team" concept described above is one way to approach this issue.

A big question concerns whether officer slots in the scientific/engineering/acquisition AFSCs should be converted to civilian or enlisted positions. The primary problem on the civilian side of that equation is the internally imposed cap in civilian end strength (which the Air Force already exceeds by about 7,000 people); converting officer billets in these areas would make that situation worse. On the other hand, while conversions to enlisted slots would not exacerbate the civilian end strength issue, the Air Force would find itself wondering whether a sufficient number of retainable or recruitable enlisted personnel have the education and training to perform some of the highly technical tasks associated with these AFSCs. Therefore, we must determine if the internally imposed civilian end strength cap will soon be overcome by events (e.g., civilianization of the acquisition corps), allowing us to be more flexible in using the civilian manpower category than we presently anticipate.

The Air Force could restructure some offices into a team concept, each team with an officer-leader overseeing the enlisted or civilian process experts necessary for that particular function.

Special duty assignment (SDA) officer requirements should also be addressed. You may ask how the levy of SDAs affects the various AFSCs. The issue here is one of who has the stick. It is safe to say that a given AFSC functional manager knows exactly what is being done by an officer working within his or her primary AFSC

(PAFSC). Unfortunately, it may be difficult for the AFSC functional manager to accurately ascertain how an officer from any AFSC is being utilized when, for example, he or she is filling an assignment in a recruiting squadron, an Air Force Reserve Officer Training Corps (AFROTC) detachment, or a teaching position at Air University. This means that experts from the special duty assignment areas must also be charged with using this model to determine if the officer authorizations in their particular areas meet the tests in the implementation model. The Air Force must identify methods by which SDA managers, who presently levy requirements on AFSC functional managers, are told to address implementation of the model and officer utilization within their specific areas. If reductions in some SDAs are made, there is the possibility of complementary reductions in primary functional areas, since fewer officers will be working outside of their PAFSC in SDAs.

Finally, no matter how you slice it, mission essentiality is a critical concern. Using the expertise of each AFSC functional manager, the Air Force must decide what the war-fighting measures of merit should be in each specific career field. In other words, what must the war-fighting commander bring to the fight from each officer specialty to get the job done both effectively and efficiently? This acid test of the officer slots retained after the implementation model is used will help determine if the model's results meet the test of mission essentiality. War-winning remains the ultimate objective. The most important measure of merit is whether, when the work is done, the war-fighting commander has the necessary expertise in sufficient numbers to meet essential mission requirements. There should be no detriment to getting the wartime mission done due to fewer officers in the force structure. In fact, the results should actually be better because the officers we throw into the fray would be better prepared to execute their duties. They'll have occupied a succession of billets specifically designed to prepare them for that crucial point in their military lives—combat.

Model Application

The application of these concepts may have already affected your AFSC. For example, during one of the "tests" on an AFSC with a particularly heavy officer presence, six units were evaluated. All units considered had varying missions throughout the spectrum of possible duties in this career field.[7] Of nearly 90 officer authorizations represented in the test, 26 slots were retained as officer billets, 18 slots were converted to enlisted billets, and the remaining 46 or so positions were converted to civil service.[8]

This "test" proved an interesting exercise, but reality was even more startling. Recently, an Air Force major command scrubbed its own billets in the same AFSC. This command examined 54 officer authorizations in this AFSC using a practical application of the criteria defined in the implementation model. The results: the command determined that 27 of these billets required officers, 26 others were recommended for conversion to a different manpower category (as yet undetermined), and one was deleted.

In this actual application, squadron commander billets were retained as officer authorizations, although squadron section commander slots are being reviewed for conversion. Among other billets retained as officer authorizations were "deployable" officer slots used in wartime duties and various flight commander billets. These accountable decision-maker positions sustain the pipeline to the "A" prefix commander authorizations and war-fighting policymaker billets. Among those jobs chosen for conversion were authorizations vacant for at least six months, "peacetime only" slots, slots in this AFSC which in

reality function as executive officers, and some detachment-level billets.

In Pursuit of the "Endgame"

As AFSC functional managers on the Air Staff strive to implement these tools, it's important to look ahead to what the Air Force officer corps can become under this system. We see a stronger, more focused officer component with higher effectiveness and efficiency. Officers in the future will have more expertise functioning at the "system level" rather than being "process experts"—a role more clearly compatible with the oversight and leadership aspects of their mission. As we continue to downsize and restructure, we must make every effort to ensure that our officer authorizations are carefully placed throughout our organization to remain the most effective combat force the world has ever known.[9] □

Notes

1. Air Command and Staff College Officer Requirements Study, staff study, Air Command and Staff College, Air University, 10 May 1993, 7.

2. Ibid., 9.

3. Both the ACSC study team and SNCOA seminar group independently reached this conclusion.

4. Clay Blair, in his book *The Forgotten War: America in Korea, 1950–1953* (New York: Times Books, 1987), says that the post–World War II condition of the American Army made it unprepared for the North Korean invasion of South Korea in June 1950. He states that "for various reasons, it [the United States Army] was not prepared mentally, physically, or otherwise for war. On the whole, its leadership at the army, corps, division, regiment, and battalion levels was overaged, inexperienced, often incompetent, and not physically capable of coping with the rigorous climate of Korea" (page xi).

5. Of note was the study team's conclusion that the Air Force has a cultural tendency to rely on "assistants" more than our sister services.

6. One caveat in "team" formation is that all office teams must be able to properly discharge their "protocol" duties as defined in this study.

7. During the coordination phase of the study, Lt Gen Billy J. Boles, Air Force deputy chief of staff for personnel, asked the team to provide examples to demonstrate how the model might be applied. Each Air Force member of the study group tested the model against the unit or staff organization to which he or she was assigned before coming to ACSC. To date, the official "reception" of this study's products has been overwhelmingly positive.

8. Ibid.

9. This study has the potential to improve the war-fighting capability of every Air Force officer on active duty today and for the foreseeable future. The study results would not have been possible without the substantial contributions of 79 Air Command and Staff College students of the Class of 1993, faculty, and staff members. Moreover, all who participated are grateful for the thoughtful assistance and valuable insights provided by the Senior NCO Academy, Air War College, Ira C. Eaker College for Professional Development, and the Air Staff's manpower, personnel, and programming communities. In the end, though, everyone who played a part in this project owes a great debt of gratitude to our facilitator, Lt Col "Rik" Gervais, who epitomizes "essential military leadership."

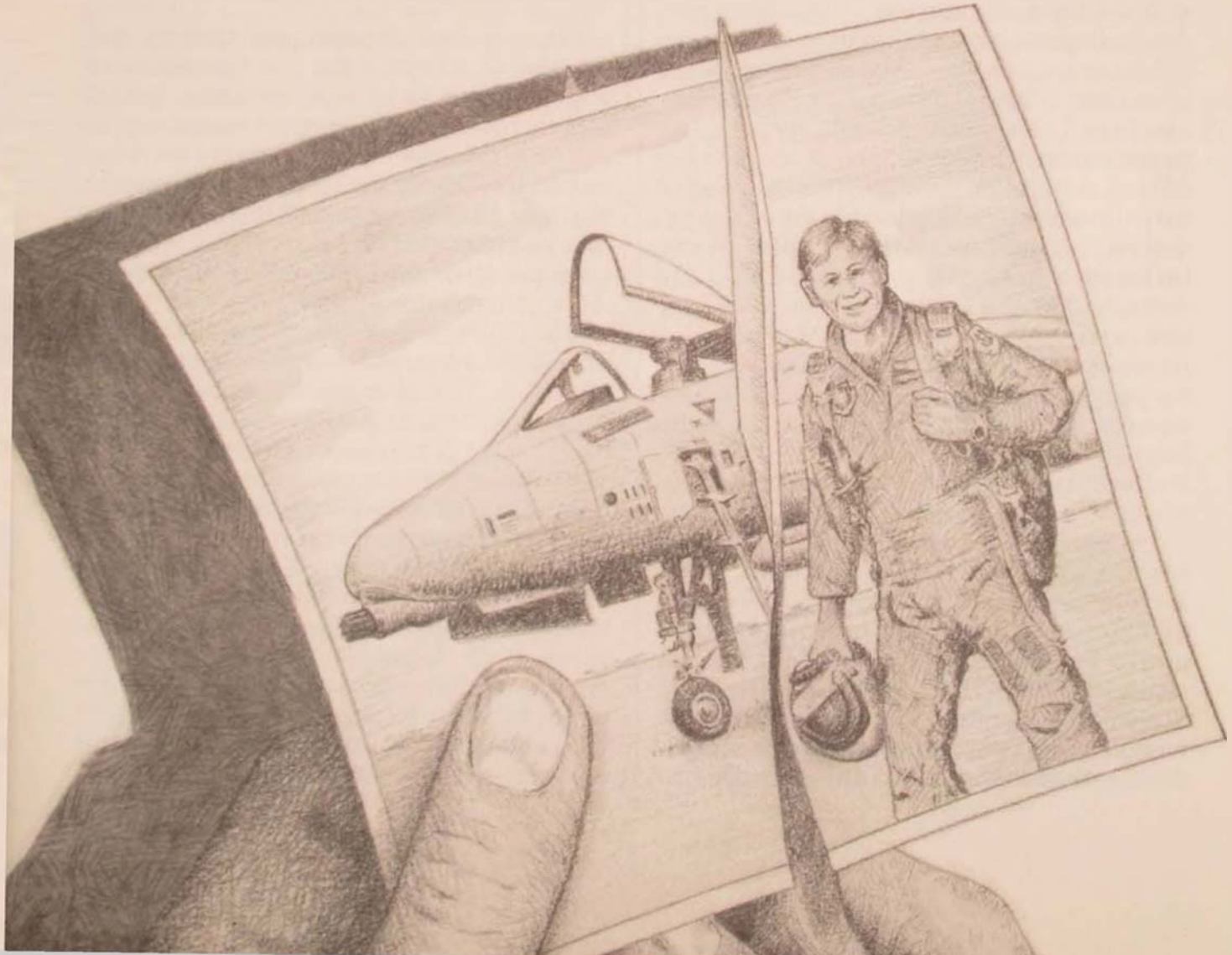
ANNULLING MARRIAGES

REFRAMING THE ROLES, MISSIONS, AND FUNCTIONS DEBATE

COL RICHARD SZAFRANSKI, USAF

THIS ARTICLE is about annulling marriages, but not the marriages that bind people to people. Rather, it focuses on the "marriages" that bind the military departments, the services, to their declared need for specific weapons for combat. Even so, both types of marriages have some similarities. The observer can see the similarities by viewing human marriage from afar—objectively and in the abstract. Viewing it from within, the observer interacts with the thing observed to the degree that perceptions are often inaccurate.[1]

In the abstract, the function of secular human marriage is to promote social order by facilitating the orderly transfer of property, and it has nothing to do with love, passion, or procreation—all of which are not essential to marriage because all can exist without marriage. We do not, however, experience marriage in the abstract. On a more personal and less abstract plane, marriages function to formally and legally bind human beings in relationships with other human beings. At a very personal and concrete level, marriage recog-



nizes, seals, and sanctions the intimacy that, for example, "Pat" shares with "Chris."[2] Pat and Chris may not recognize that their intimate bond fulfills the social need for the more orderly conveyance of property. They may not realize this unless their circumstances change, forcing them to contemplate the dissolution of their personal marriage. Only then may they see and admit that abstract marriage is and was about the ownership and conveyance of concrete property.

Like human beings in relationships with one another, the services enter into relationships—"marriages"—with the instruments of warfare. At the higher levels of abstraction, these instruments exist to provide the capability to fulfill specific functions. There is, for example, a perceived need for the capability to strike an enemy from long range with a large number of weapons arriving at one time. This requirement for warfare is detached in the abstract from any service. Yet, sometimes through good sense, romance, tradition, habit, or negotiation, the services personalize their relationships with both requirements and capabilities. When they do, the requirement or capability takes a very specific and intimate form. The requirement for a long-range, high-volume weapon delivery system transforms itself into the intimate relationship between the Air Force and the B-2, between the Navy and the carrier battle group, or between the Army and the attack helicopter. Unless the environment changes or their circumstances change, the services can remain happily wed to their personal, intimate, and concrete forms for satisfying abstract needs.

Things *have* changed. The environment *has* changed. The changes continue. This article argues that dramatic changes demand equally and appropriately dramatic responses. To respond to the changes in ways that preserve our capacity to serve our country, we must go through a mental process, using John Boyd's words, of "destructive deduction" in order to allow "creative induction."[3] By mentally dismantling the relationships and structures that exist today, we can be led to discover the new relationships that a changed environment demands. With this aim in mind, this article proposes ways to reframe the roles, missions, and functions debate that can guide us toward making positive changes. It argues that we now need to annul some old "marriages" to form new and better relationships between the services and their instruments for future warfare. These new relationships affect each of the services as the operational media of air and space become more important to present and future war fighting. A commitment to answer the still-unanswered question What is best for our country? underpins these arguments.[4]

Changes and Continuity

For over four decades, our country and most of us accepted the fact that we were engaged in a cold war with the Soviet Union. Adopting George Kennan's proposed strategy of containment, we contained the Soviet Union and it collapsed.[5] Yet, our victory surprised us, as many of our victories do. We apparently did not presume we would succeed in this "war." As a consequence, the heralded "new world order" is, as Secretary of Defense Les Aspin observed, more new than it is orderly.[6] The changes unleashed by the disintegration of the Soviet Union will reverberate for decades. If we lacked a vision or a plan to capitalize on our victory in 1990, we should not wait until 1995 or 1996 to acquire or to craft one. If we wait much longer, we are more likely to be victims of chaotic change than agents controlling, moderating, and reordering its effects.

When dramatic changes occur in the environment, the organic systems within it—human beings, armed forces, nations—must adjust. According to Ilya Prigogine's

theories regarding order and chaos, living systems can respond to major changes in the environment in one of two ways: they can escape to a "higher order" by reorganizing or transforming themselves, or they can collapse.[7] Some kind of order emerges from chaos, but absent our initiative, it may not be the kind or order we expect or want.

When the United States emerged as the sole victor of the cold war, it became the planet's only superpower. We are now in "first place" with the next closest competitor many places behind. Our cold war victory led to a strategic pause, an interval during which our country has no clear and present military threats to its vital interests.[8] Like any war, the cold war fatigued the nation. Our citizens crave rest, domestic improvements, and changes in their economic condition. These popular goals do not translate into increasing military appropriations. Yet, the uniformed leaders of our armed forces are only slowly and painfully realizing the unwillingness or inability of our citizens to sustain large forces, or the wrong forces, just because we have them, plan to build them, or have begun to build them. To most of our citizens, "right sizing" clearly means "downsizing." We will have fewer and smaller forces. How can we fulfill the obligations of a democratic superpower with smaller forces?

We can fulfill our obligations with smaller forces if form follows function and reason and logic dominate the process of reordering and reconstituting our armed forces. Toward that end, our civilian leaders have issued a mandate to our nation's military leadership: define and evaluate the fundamental functions the armed forces must fulfill in the future and organize and arm these forces in the ways that best and most thoughtfully and economically fulfill those functions.[9] Explicit in this mandate is the call to eliminate costly duplication and unnecessary redundancy. Management reforms—including such things as centralization, regionalization, and streamlining—resonate (if not in harmony, at least in chorus) with the mandate. The edict to reorganize and reform the armed forces promises continual and cascading changes for the services. How have our military leaders responded?

The Air Force proclaimed its post-cold-war role first and commenced reorganization well ahead of the other services. Each of the other services then answered the call to reform by producing its own new and revised statement of purpose. Each service's statement asserts the unique and continuing contributions that only that service, preserved in its present form, can make to our nation's security.[10] All of these documents also assert the ascendancy of and the critical need for specific technological solutions—programs, hardware, and organizational forms—required to meet the expected demands that future enemies are likely to place on what today are our Army, our Navy, and our Air Force. Viewed from afar—objectively and in the abstract—each of these documents contains more advocacy than analysis, more declaration than proof. Shortly thereafter and in compliance with the law, the chairman of the Joint Chiefs of Staff submitted the required biennial review of the roles, missions, and functions of the armed forces. It proposed some changes but stimulated the secretary of defense to order a more thorough review.[11] In the tumult of changes in the environment, the services at least provided one element of continuity—the apparent unwillingness to make major changes.

Roadblocks and Challenges

We will change if only because we cannot avoid changing. Change is difficult but not impossible. There are only two impediments to change within the armed

As an abstraction, secular marriage has nothing to do with love, passion, or procreation. Though husband and wife may not believe their intimate bond (above) fulfills the social need for the orderly conveyance of property, the fulfillment of that need is symbolized by the rings they wear (right).

forces: romance and tradition. A third impediment exists outside of the armed forces: selfishness. That roadblock, erected by those who control and profit from controlling the means of weapon production, is not present if they are sworn to always put the country first. Each of these three impediments can be overcome if we are willing to understand them in the abstract and to grapple with them in the concrete. Logic and the commitment to do what is best for our country provide countermeasures to romance and tradition. Even so, romance and tradition are powerful. We need to understand the influence that romance and tradition exert. Romance sparked the marriages that exist between the services and their instruments of warfare today. Should logic threaten romance, tradition may intervene to sustain these marriages.

To begin with, we have romanticized the profession of arms. By "romanticized," I mean that in living the military profession, in immersing ourselves in our personal responses to the call to arms, we may have lost sight of the objective characteristics of armed force. In the abstract, our profession requires organized and more-or-less controlled killing and destruction to serve political objectives. Akin to hunting, it formerly required the physical strength and stamina necessary for stalking and killing.[12] Technology now allows much killing and destruction for a very small investment of strength. In some force elements, killing and destruction also require very little stamina. Air forces provide an example. The limits of technology originally demanded the human sensory abilities, muscle, computational capability, and the stamina to drive and operate aircraft effectively. Romantic notions of warfare originally stipulated that males must do this work. That has changed. Romance and tradition now argue that humans should do it. That can change. Air forces today may suffer from

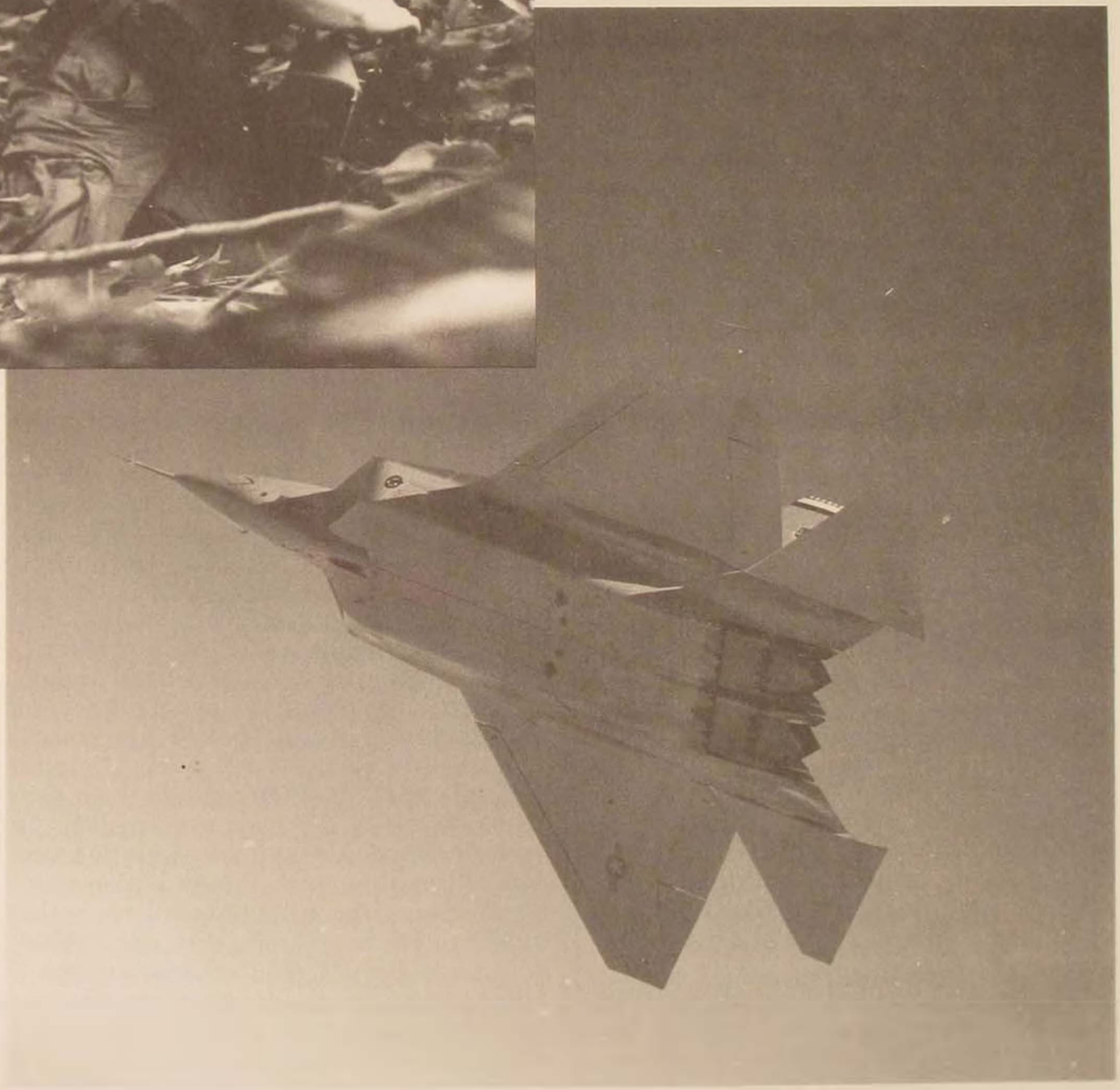
the same myopia that afflicted their cavalry forebears: technology altering warfare more quickly than warriors can see the need to outgrow romance.

The services have also romanticized their roles, enshrining them in tradition. In the past, distinctive operational environments imposed different demands on the armed forces, and differentiation occurred. Armies, navies, marine forces, and air forces are one way of organizing forces. Over time, effectiveness demanded and technology allowed commonalities in capabilities among the differentiated force elements. Only romance and tradition argue that we preserve the differentiation among our forces in those areas where technology has illuminated the fact that we are preserving distinctions without a difference. Again, air forces provide an example. Each force element found its effectiveness enhanced by control and exploitation of the air or space. Hence, each force element created its own air force, then its own space force. Each service realizes that the air and the space media are to present and future war fighting what the carbon molecule is to life itself. Armies cannot operate effectively without freedom from observation and attacks by air. Naval forces cannot operate without freedom from observation and attacks by air. Someone, something, some capability, or set of capabilities must exist to control the air and the space media so as to see, hear, target, and touch the enemy. Tradition would seem to require that Air Force pilots, flying aircraft, do most of this work. Logic suggests that this is but one alternative. Even so, the traditions of our separate armed forces, the decades and decades that they operated autonomously even while building systems and acquiring capabilities that mimicked one another, are now a powerful roadblock to change.

The shackles of tradition will be difficult to break, especially where the resource allocation process has institutionalized tradition. Tradition begot a process wherein each service could count on its fair share of the defense appropriation and was relatively free to spend it to pursue its own force structure, readiness, and modernization programs. Analysis of needs at the service level often took the form of advocacy. The quest for "jointness," for the more thoughtful integration of capabilities, had to be resisted, and was, because it imperiled the autonomy of the services. The pace of the resource allocation cycle, the existence of analytical-advocacy agencies within each service and among its hired consultants, and—until recently—the stimulus provided by the Soviet Union all worked together to keep service budgets large and relatively constant. On occasion, some people may even have employed foot-dragging, slow-rolling, and staff guerrilla warfare.

This process also enshrined numbers: the 600-ship Navy, 15 carrier battle groups, 100 B-1B aircraft, and the long-lost 70-bomb-wing Air Force. These numbers could be compared to the numbers required or consumed in World War II to demonstrate that World War II could not be refought in the same way without the same numbers. During the heyday of the cold war, planners could array Soviet, Chinese, North Korean, and Warsaw Treaty Organization numbers and, where ours were fewer, could argue the need for "more" for our side. That the numbers were somewhat meaningless benchmarks was lost on all but a few. Even today, force structure numbers are the basis of arguments that dominate service polemics. Although numbers are not a reliable indicator of capability, they pervade the sometimes tautological arguments involved in assessing capability and may be little more compelling than such things as the number of oceans, the miles of coastline, or the numbers we had three years ago. What does an esoteric "fighter wing equivalent," for example, communicate about sorties-per-day, targets-per-sortie, functional effectiveness, or systemic capability? Perhaps it was for these and other reasons

On a fundamental level, the military requires organized and controlled killing and destruction to serve political objectives. Services have a tendency to overly romanticize certain functions such as special forces (left), which, like hunting and most military functions of the past, require the physical strength and stamina necessary for stalking and killing. Technology inherent in the F-22 (below) and other modern weapon systems, however, alters warfare quicker than warriors can outgrow their romantic notions about their profession.



that even the celebrated "base force" has been relegated to the dustbin.[13]

Romance and tradition are powerful motivators to those of us fighting from the trenches. They help ordinary people accomplish extraordinary feats. Even so, we must see romance and tradition as a form of bias. They should have little influence in the force-structuring and resource-allocation process. In these arenas, we must give logic and reason the dominant place. We must also respectfully distance ourselves from any inclination to put a service or a system ahead of our country's best interests. And we should not feel guilty or behave as if we were guilty because we reached this point in history and are struggling to cope with the changes we helped unleash. We also would do well to keep in mind that romance and tradition afflict political parties and the critics of the military as much as they afflict the military. The debates over upgrading the B-1B provide one example. There is, for example, neither guilt nor blame accruing to those who advocated the B-1B bomber and brought it into the operational inventory. We built it exclusively to penetrate the multiple rings of defenses that protected the "evil empire" and to strike it with devastating nuclear force. The B-1B can be adapted at some cost to fulfill other functions, of course. Yet, objectivity demands that it compete as *one* technological solution to the problems posed by the target sets of the future. It should not be discarded as the "Republican bomber" or the "Reagan bomber," nor should it even be modernized if 30 or 50 more B-2 aircraft or some other capability provides a better and more economical form of technological solution.

The same is true for new carrier-based and land-based strike aircraft. We have not avoided the influence of romance and tradition nor reached the appropriate level of abstraction or analysis if we only ask, How many? or, What characteristics do these aircraft require? Rather, we must use "deductive destruction" to ask, Why carriers? and, Why not unmanned or remotely piloted vehicles? The functions demanded must determine the form, not the familiar numbers advocated or the traditional modernization expected. Do we really need *aircraft* for the "defensive counterair" or the "offensive counterair" functions? Can we protect ground forces with better and more economically organic and ground-based area and point defense technologies? Do solutions to the defensive problems posed by battlefield ballistic missiles pave the way for defense against intercontinental land- or sea-launched ballistic missiles? Are we advocating solutions even before we define or understand the problem?

Continuing in this vein, must "fire-and-forget" antiaircraft missiles be fired by an aircraft? Why must the aircraft that fire them have a human being on board? For example, what essential future functions will the F-22 or the later series of B-2 aircraft fulfill that absolutely require human beings on their flight decks? Which of the technological solutions to the problems posed by space operations have utility for solving the problems posed by atmospheric or terrestrial warfare? Might we already have enough platforms for "things" even though we lack smarter and better weapons for the platforms to carry?

One of the areas overripe for review is "close" air support. The function of close air support can and will continue to be fulfilled by forces formed within and organic to the force elements that employ them. The battlefield must be viewed through a panoramic *macro*scope—not as we are used to looking at it, through the lenses of separate service *micro*scopes. What are the logical and essential differences between an A-10 and a Blackhawk? Propulsion? Ownership? The bonds of matrimony? A series of integral bottom-to-top reviews likely will illuminate other traditional air and aerospace functions that may, over time, have become or been misplaced or malassigned. One can thus

expect the heretical questions posed about to be asked and answered in the continuous processes of review and rationalization. One can also expect the services, even though affected by romance and tradition, to answer the questions posed honestly. Can one also expect the weapons-producing industries to do the same?

World War II was good for business. The weapon producers garnered large profits during the Vietnam era. The whole cold war was profitable for them.[14] Can they now participate as unselfish partners in a series of functional reviews and studies conducted every summer? Can they help with analysis that is divorced from advocacy? As long as there is a military-industrial marriage to the old notion of "surge" and "the prolonged war," we will be inadequate unless we have continuously operating military shipyards and aircraft production lines, a surplus of depots, and huge inventories of the stores necessary to refight and rewin World War II. The notion of the "defense-industrial base" goes hand in glove with extant but antiquated notions of brute force warfare.[15] The future demands more attention to the "defense technology base." Can industrialists annul their marriage to the advocacy for brute force warfare? Can they divorce themselves from the support of unchanging or unchanged services and the arcane tools of a bygone era? Yes, they can, and for three reasons.

First, they are patriots too. Second, functional reviews focusing on the generation of the best technology to solve the problem sets of the future ultimately will require them to build this technology. There is money to be made there. Third, these solutions can spawn ever-increasing technological sophistication, better commercial competitiveness, and even more production. In the "high-low" mixes that are likely to emerge as the candidate force structures of the future, the "low" is profitable because it will be procured and produced in mass. The "high" is profitable because it is usually wonderfully complex, sophisticated, and costly. And, of course, we undoubtedly will preserve the essentially brute-force forces necessary to take and hold the land. A costly tail of beans, bullets, bandages, and bottled water inevitably follows these forces.

As romance, tradition, and selfishness are set aside, tremendous opportunities emerge for our country and for our friends and allies. It would be unwise to make changes for the sake of change, to eliminate or add functions without compelling reasons, or to craft architectures or forms that only result in providing aid or comfort to future enemies. Nonetheless, if the best organizational forms require radical alteration of existing, traditional forms, so be it. It is clear that our armed forces must and will change. This is a consequence of a new paradigm. That these changes be made intelligently and sensitively is the challenge before us. We are required to meet the challenge.

An Agenda for Reframing

One agenda we may wish to consider has five steps: (1) deduce the essential functions and capabilities required by armed forces, (2) generate candidate technological solutions that fulfill those functions, (3) jointly select the best solutions, (4) commit the resources necessary or available to field the best solutions, and (5) embrace the organizational forms that use the best technological solutions to best fulfill the functions.

An analysis of our national security needs defines the functions of armed force. The functions determine the best form/forms that our forces should take. It will be difficult for us to define the objective functions of force in the abstract. It will be even more difficult for us to make the courageous decisions necessary to select the right forms.

We must rely on our civilian leadership, the Joint Chiefs of Staff (keeping in mind that each chief is also the head of a sepa-

However we organize, we must prepare for threats from enemy systems. An understanding of these systems illuminates essential functions of forces and capabilities required. For example, mere numerical strength is not an authentic measure of merit. A mismatch in operational capabilities might give one F-15 the advantage over three or more enemy aircraft.

rate and sometimes parochial military department), the Joint Staff, and the commanders in chief (CINC) of the unified commands to be our honest brokers as we redefine essential functions and appropriate forms. Since we can expect that honest brokerage will occur, the agenda proposed will satisfy the call to reform and re-form our armed forces. If it cannot or does not occur, change will continue, but it will be full of unnecessary surprises. At some point, someone or something will compel us to stop insisting that we can put the same familiar square pegs into new round holes.

Analysis of the campaign plans of the CINCs provides the key to meeting the agenda. The campaign plans describe the operational geography of each area of responsibility in rich detail, stipulate the capabilities of potential enemies and enemy coalitions within the region, and describe what is required to incapacitate adversary systems—and, most importantly, the adversary as an organic system—within the area of responsibility.[16] Campaign planning capitalizes on the "total quality" revolution by allowing us to see the generation of offensive or defensive force as the "process" of a "system." As

we come to better understand total quality and better describe and improve our own processes, we learn much about adversary processes and vulnerability. Key nodes—essential interdependencies between "customers" and "suppliers" and the vulnerability created by transportation, information acquisition and distribution, capacity, inventory, and throughput—all reveal themselves. This process-oriented approach can allow us to improve our own national combat capability—our own campaign plans—if we can see that capability as the holistic product of more effectively integrated, organized, and networked activities. Analyses of the enemy and enemy processes can also allow us to discern the functions of force within a geographical area of responsibility.

Yet, we should anticipate problems if we discover that our organizational structure for commands is flawed. The land is the seat of purpose, so most commands are organized for operations within a geographic area. Analysis of needs may suggest that future commands be organized to operate *in time*, not in geographic space. In this review process, we will also have to confront the problem posed by extraterrestrial space. If "space" is not a mission but is instead a place, then it too will be an area of responsibility, a strategic zone, or part of a very large extraterrestrial area contiguous to the areas of responsibility assigned to the CINCs. As air power and space power shrink the globe, geographic areas of responsibility logically will become larger in size and fewer in number.[17] However we organize, we must be prepared for threats and dangers from enemy systems.

Understanding enemies as organisms or systems illuminates the essential functions of force and the capabilities required by force elements. It also helps us better understand our own force-production and force-employment schemes. For example, if an enemy possesses an air arm with 400 MiG-29 aircraft, we might believe we need 400 F-15 or F-14 aircraft to defeat it. Yet, if we learn that there is a significant mismatch in operational capabilities because of logistics factors (mean time between maintenance, sortie-generation rate, time to rearm and relaunch, dependence on avionics systems with high failure rates, and so on) or because of operations factors (vulnerability of communications systems, shortage of trained pilots, insufficient training experience in night flying, lack of current intelligence, limitations in airborne warning or control capabilities, and so on), the mismatch in numerical strengths can be to our advantage with only 100 F-14 aircraft or perhaps even 25 F-15 aircraft. That we made much of the fact that Iraq, for example, had the world's fourth largest land army and sixth largest air force may say less about comparative capabilities than it does about our fondness for numbers and our unwillingness to discover or appreciate authentic measures of merit.[18]

Moreover, in the rigorous analysis of enemy capability and the authentic search for the functions we must execute to defeat it, we will learn that there are other possible technological solutions that defeat the utility or function of enemy capability than merely opposing symmetrical capabilities.[19] In the case of the MiG-29 above, perhaps F-15 or F-14 aircraft are not the best solution. Perhaps long-range, precision guided ground- or sea- or space-launched runway-cratering munitions in sufficient numbers to destroy all the enemy's runways simultaneously might be a better solution. Another solution might be an aerial umbrella created by ground-launched antiaircraft missiles. There are, in short, more alternatives to defeating the effectiveness of 400 aircraft than merely opposing them with 400 of our own. Yet, if the ownership or operation of F-15 or F-14 aircraft is seen by the aviators in the separate services as more valuable than alternative ground-based systems that have the same or greater effectiveness against a specific threat, we will continue to generate "air" solutions to what we will

continue to insist are—by tradition, doctrine, and budget—Air Force problems.

As the combined CINCs analyze their campaign plans and "black world" capabilities are shared, we will learn that numbers count less than the nearly perfect employment of the right technological solution to the systemic challenges posed by an enemy. Moreover, some breakthrough and breakaway technologies—the best solution to some problems—may provide the foundation, the important first step, in solving other—more complex—problems. The nonnuclear cruise missile was one of these breakaway technologies. There are others. If, for example, we develop the capability to solve the defensive counterair problem in a relatively small area of responsibility without manned airborne systems, will we not be better prepared to solve the analogous problem when the area to be protected is our larger homeland? In so doing, would we not have or preserve authentic technological "super" power?

Technological solutions that pivot on our aerospace superiority and its preservation ensure that we will retain super power. Aviation, air power, and aerospace operations are at the heart of the present roles, missions, and functions debate. Aerospace operations are the nexus of war fighting today and will be in the future. Command of the electromagnetic spectrum, knowledge of the enemy, global synchronization in time and space, the coup d'oeil, and effective decision making are not possible without the control and exploitation of air and space. Even so, one must be suspicious of air-alone solutions to the problems posed by enemy forces. The land is and will continue to be the seat of purpose. "No-fly" zones can sweep the skies, but control of the skies is merely a prerequisite to a solution and should not be viewed as *the* military solution for most problems.

Whose responsibility it ought to be to control the aerospace and who is to possess and operate aerospace instruments of force are the central issues in the present debate. Technology provides an ever-growing range of candidate solutions to the problems posed by enemy capabilities. Any service can press the buttons of the weapons of the future. Who ought to possess these weapons and press these buttons is the question that must be answered. The Air Force asserts that it ought to have that role. Others assert that "air" and "space" are "places" in which all force elements need to operate. There is no "aerospace," they argue, no compelling reason that the Air Force should be given the lead and the resources to dominate it. The truth is that the Air Force has organized, trained, and equipped itself to be the leading force in both air and space. The truth is that the Air Force intends that leadership to continue. What is best for our country?

We must reframe the debate in terms of what is best for our country with an authentic willingness to annul the marriages that are no longer appropriate. It is good that we continue to engage in the process of review, that we strive to understand the capabilities of potential future enemies. It is good that we generate possible solutions to the problems posed by enemy capabilities. It is wise to recall that in the heyday of their respective technologies—their solutions—the horse-mounted fighter, the gunsmith-artillerist, the entrenchment-wise engineer, and the human pilot first dominated, then became just another contributor to the science and art of warfare.[20]

As technologies became assimilated into warfare, warfare became less linear, asymmetrical, and a multimedia activity. Combined arms logically evolved into joint arms. Joint arms evolve into integrated arms. Integrated arms can beget unified arms. Today we "unify" arms, or think we unify them, within an area of responsibility or around a function assigned to a CINC. Keep in mind that, although this is one way and our traditional way to unify arms, it may not be the best way. A differ-

ent way may be to have an air force and a surface force providing forces to the CINCs of a rapid response force and a sustainment force. Different, however, is not necessarily better. It may be that a kind of natural selection governs the process of evolutionary changes in organizational forms. If the environment is changing and our armed forces are adapting inadequately, they will pass from history along with the Red Army that long defined them. It may be that the failure to envision and imagine is the most serious threat we face.[21] There are other threats or "dangers," of course. Super power can keep these irritants manageable.

The post-cold-war world is an unstable world. It is a world of sovereign nations competing for scarce resources. Strangely, in the world that is emerging, one nation's enemy will inevitably be another nation's valued customer, supplier, or market. Treaties, agreements, and an awareness of interdependency may provide increasing constraints on the use of force for conflict resolution. Even so, renegades may emerge in the lesser-developed nations. On balance, however, the armed forces of the lesser-developed nations lack the military capabilities that the great powers and the recently great powers possess. They also lack the intellectual and doctrinal architecture necessary to employ these capabilities to greatest effectiveness. As organisms, their nations and their armed forces, lethal and technologically sophisticated though these forces may be, are primitive and simple when compared to ours. Exploitable vulnerabilities exist in their warfare-supporting transportation infrastructures, production, communications, logistics movement and resupply systems, training, and sustainability. Even though their numbers may be large and their hostile will powerful, many lack the total capability required to pose a real threat where coalitions oppose them. Diplomacy can effectively hold many of these potentially renegade nations in check, but others may have to be smashed. Among the first to be smashed might be those insistent upon enslaving atomic energy for warfare and those given to disruptive opportunism and adventurism beyond their borders.

Many of these nations have immature military architectures even though they possess modern weapons. Their capabilities are "lopsided," and we have the wherewithal to unbalance them and defeat their centers of gravity. Their armed forces are well behind ours in the evolution from combined arms to joint arms and on toward unified arms. We should neither regress in our own evolution—in our progress to better integrate the capability of our own ground, air, and maritime forces—nor surrender the capability to achieve military objectives by failing to use any of the war-fighting media effectively.

Even so, it is also possible that a review will determine that the future requires more of one kind of force than another kind. In their days, Rome, Carthage, and France were land powers, and Portugal and England were naval powers, as befitted their national objectives.[22] Oceans and coastlines neither make a nation a "maritime power" nor require that a nation fancy itself one. On the other hand, cannot one argue that any nation that regards itself as an authentic air and space power is *automatically* a maritime power? Air and space enshroud the planet. The oceans only surround the continents. The question of "power" must focus on the kind of power and the functions of the force required to meet the nation's objectives. The characteristics of opposing power are no less important. Consider the potential national security consequences if some nation organized as a corporation developed an affordable pollution-free vehicle and the means to produce it in large numbers. Would we threaten this nation/corporation with our F-22s and B-2s to prevent the collapse of our own automobile manufacturers? By reframing the debate as a broad search to

define the functions that should determine our forms, we may come to agreement on what is best for our country.

None of this is possible if we remain wed to the past. None of this is possible if we continue to be married to the processes, structures, and forms of a bygone era. Our country and our country's leadership call us to change, to undertake the process of re-forming and reforming our armed forces. It is time to annul some marriages, and the time is running out. This strategic pause will not last forever. These are, in the worse and likely case, merely the new interwar years. We can prolong them by reforming our armed forces. We have everything it takes to emerge victorious from whatever future fights our capability cannot deter. The essential first step is the willingness to annul the marriages of the past. □

Notes

1. Gary Zukav, *The Dancing Wu Li Masters: An Overview of the New Physics* (New York: Bantam Books, 1980), 111–14.

2. These androgynous nicknames were chosen to suggest the complexity of relationships in the last decade of the twentieth century. If relationships characterized by affection are complicated, imagine the complexities in relations affected by competition.

3. John R. Boyd, "Destruction and Creation," August 1976.

4. Sen Sam Nunn, "The Defense Department Must Thoroughly Overhaul the Services' Roles and Missions," *Vital Speeches* 20 (1 August 1992): 717–24. This speech was given in the US Senate on 2 July 1992. See also Barton Gellman, "Senator Nunn Questions Military Duplication," *Washington Post*, 3 July 1993.

5. "X" [George Kennan], "The Sources of Soviet Conduct," *Foreign Affairs* 4 (July 1947): 575–81.

6. Secretary of Defense Les Aspin, "Four Challenges to the New World Order," *Defense Issues* 8 (1 February 1993): 2.

7. Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos: Man's New Dialogue with Nature* (Boulder, Colo.: New Science Library, 1984), 171–76, 297–313.

8. Les Aspin, *The Bottom-Up Review: Forces for a New Era* (Washington, D.C.: Department of Defense, 1 September 1993). "Threats" to national security have been replaced by "dangers."

9. Nunn, 623.

10. Respectively, these are *Land Warfare in the 21st Century* for the Army, *From the Sea* for the Navy, and *Global Reach—Global Power* for the Air Force. See Tom Donnelly, "Services Outline Their Futures in High-Stakes Era," *Army Times*, 26 April 1993, 25.

11. Barton Gellman, "Aspin Gently Criticizes Powell Report," *Washington Post*, 30 March 1993, 6.

12. Rick Fields, *The Code of the Warrior: In History, Myth, and Everyday Life* (New York: HarperCollins Publishers, 1991), 5–17. See also Robert L. O'Connell, *Of Arms and Men: A History of War, Weapons, and Aggression* (New York: Oxford University Press, 1989), 20–29.

13. A comparison of the forces emerging from the "Bottom-Up Review" and those formerly judged to be the "base case" show that we now have a new floor or base. The 1999 "Bottom-Up" force structure, cited above, establishes the requirement for 11 active Navy carriers and 13 active Air Force fighter wings. Unlike Air Force wings, every carrier wing is a small "composite" wing. The number of fixed- and rotary-wing aircraft in the armed forces probably led to the assertions by Senator Nunn and others that our country has several "air forces." Secretary of Defense Aspin asserts that the suggestion that our country has more than one air force "makes a wonderful sound bite but distorts the facts." See Secretary of Defense Les Aspin, "Chairman's Report: A First Step," *Defense 93*, issue 2 (July 1993), 24–25. The *Defense 93* article was derived in part from a letter Secretary Aspin sent to the chairs of the Senate and House Armed Services Committee on 29 March 1993. See also "Navy Wins Out in Bottom-Up Review," *Navy News & Undersea Technology*, 6 September 1993, 1.

14. William W. Kaufmann and Lawrence J. Korb, *The 1990 Defense Budget* (Washington, D.C.: The Brookings Institution, 1989), 9–13. Although difficult to calculate with precision, over $8 trillion (in 1989 defense dollars) were spent between 1951 and 1991.

15. John Ellis, *Brute Force: Allied Strategy and Tactics in the Second World War* (New York: Viking Penguin, 1990). Ellis suggests that the Allies, led by the production giants of the US and the USSR, inelegantly bludgeoned the enemy to defeat. Brute force warfare requires a commitment to prolonged wars and a defense industrial base to support them. It is arguable that the Congress or the people will support a large, prolonged war or even a "major regional contingency." See also John D. Morrocco and David A. Fulghum, "Saving Industrial Base Key in Bottom-Up Review," *Aviation Week & Space Technology*, 6 September 1993, 24

16. John A. Warden III, *The Air Campaign: Planning for Combat* (Washington, D.C.: National Defense University Press, 1988).

17. Ronald J. Wright, Kevin D. Stubbs, and Joseph J. Muniz, "The Soviet Concept of a Theater of Military Operations: Implications for Outer Space," in Jacob W. Kipp et al., *Soviet Views on Military Operations in Space* (College Station, Tex.: Center for Strategic Technology, 1986), 221–43.

18. Department of the Air Force, "Reaching Globally, Reaching Powerfully: The United States Air Force in the Gulf War," a report (September 1991), 3–5.

19. O'Connell, 296, 301–7.

20. Ibid.

21. Gen Merrill A. McPeak, "Flexibility and Airpower," an address presented at the Air Mobility Command dining in, 12 June 1993, in Department of the Air Force, "Air Force Update," June 1993, 4.

22. Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987). Col John Warden, the commandant of the Air Command and Staff College, suggests that air and space forces will occupy an increasingly important role in the conflicts of the future.

THE AIR FORCE ROLE IN UNITED NATIONS PEACEKEEPING

DR STEVEN METZ

IT IS EASY to assume that the end of the cold war changed only the key actors in global politics but left fundamental concepts and relationships intact. Such an assumption would mean that American national security professionals need only find ways to adapt old techniques to new circumstances—not an especially taxing procedure. But the truth is that the essence of military power is also changing, a fact that presents new intellectual challenges of dramatic proportions for security professionals and that demands creativity on a wide range of topics. None of these challenges is more complex than discovering an effective role for United States military power in multinational peacekeeping operations.

Although the US historically supported international peacekeeping and often paid a substantial portion of the costs, it accorded this task minimal strategic significance. Common wisdom held that neutrality was a prerequisite for peacekeeping. Since the US was seldom neutral, other nations were better suited to provide peacekeeping forces.

Furthermore, most of the recent international peacekeeping operations were under the control of the United Nations (UN), an organization that was decidedly hostile to the US by the 1970s.[1] Indeed,

the UN General Assembly and the US had such starkly divergent views of global security that there was little ground for consensus. From the American perspective, the UN jettisoned any veneer of neutrality through actions such as the General Assembly resolution of 10 November 1975, which claimed that Zionism is a form of racism and racial discrimination.

By the 1980s, many Americans questioned the continued participation of the United States in the UN.[2] Charles Krauthammer probably captured widespread feelings when he wrote, "On war and peace, whether in Afghanistan, Nicaragua or the Persian Gulf, the United Nations is irrelevant. . . . Dominated by its automatic Soviet bloc-Third World majority, the United Nations is one of the most important instruments of anti-Western diplomacy."[3]

As a result of this impasse, US success in peacekeeping came outside the UN, most notably with the Multinational Force and Observers in the Sinai.[4] In general, though, fiascoes such as the bombing of the US Marine barracks in Lebanon—combined with ideological bias and incompetence in the UN—led us to conclude that peacekeeping operations brought risks and costs out of proportion to the political payoffs. As a result, our national security strategy and military doctrine talked of peacekeeping, but we did not take it seriously.

Now the impasse is broken, and peacekeeping is—according to Laurence Martin—a "growth industry."[5] In fact, the UN dispatched more forces since 1988 than it did in the previous 40 years combined.[6] Blue-helmeted troops are on the ground in a dozen operations from El Salvador to Western Sahara to Cambodia. This frenzy of activity, which is a direct result of the end of the cold war, has strained the UN's capabilities. After their external support was cut off, many third world conflicts were resolved diplomatically with some form of UN involvement. The ability of the UN to monitor and implement diplomatic solutions, however, lagged far behind its skill at negotiating them.[7]

At the same time that UN peacekeeping underwent a renaissance, hostility toward US involvement in third world conflicts lessened. This phenomenon is due in part to a new American attitude. Specifically, after the demise of the Soviet Union, we no longer viewed regional conflict through the narrow, often paralyzing confines of the cold war. Today, many belligerents recognize that the US has no imperial ambitions and that no peacekeeping operation can succeed without American backing (if not direct participation). Thus, they now welcome our involvement instead of shunning it.

This confluence of trends provides strategic opportunities. According to Richard Connaughton, "The time for a new military strategy of peace for the world based on the UN in general and the Security Council in particular has never been more propitious."[8] UN Secretary-General Boutros Boutros-Ghali has attempted to take advantage of this opportunity by constructing a framework for the resuscitation of the UN. In his widely praised report of June 1992 entitled *An Agenda for Peace: Preventive Diplomacy, Peacemaking and Peacekeeping*, he wrote that "an opportunity has been regained to achieve the great objectives of the Charter."[9] In the secretary-general's vision, the

cold war was only an interregnum in the movement toward a system of global security that transcends the persistent violence of the traditional one. However, this movement requires not just an increase in the extent of traditional peacekeeping but totally new forms of UN activity.

Unfortunately, the US military is not fully prepared to play an active role in the evolution of peacekeeping. Our post-cold-war national security and military strategies have not fully accommodated basic changes in the form and utility of military force, particularly in such rapidly changing areas as peacekeeping. Landmark documents such as the *National Military Strategy of the United States* of January 1992 and the *Chairman of the Joint Chiefs of Staff Report on the Roles, Missions, and Functions of the Armed Forces of the United States* of February 1993 barely mention such changes.[10] Although joint doctrine, policy, and procedures are being developed, without a solid foundation in the wider framework of military strategy, they will have only a minimal effect on training and planning. This situation would leave us poorly prepared to face new security challenges. Put bluntly, there is a great need for serious study, intense debate, and sustained analysis on the role that the US can play in constructing a post-cold-war global security system in which multinational peacekeeping is an effective element of conflict resolution. This fact is especially true for the US Air Force since, by bringing unique capabilities to multinational operations, it can be a vital—perhaps essential—component of future success at peacekeeping.

Peacekeeping, Old and New

The first step in crafting effective procedures, plans, and doctrine for the use of American aerospace power in peacekeeping operations is understanding the nature and associated problems of these operations. Although the type of peacekeeping described here is a recent phenomenon, the notion of inserting an outside, neutral force into a conflict to allow a cooling-down period, to facilitate negotiations, and to help assure adherence to a diplomatic settlement has been present throughout history. What is unique, however, is the ongoing institutionalization of the process under the aegis of the UN, as well as regional international organizations such as the Organization of African Unity and Organization of American States.

Collective security and the peaceful settlement of disputes were two of the primary functions of the UN from its inception. But the UN charter assumed that threats to security after World War II would take the traditional form of interstate aggression. The framers of the charter did not foresee that ideological struggle and the often-violent process of decolonization would dominate the postwar global security system. Thus, the charter did not mention peacekeeping as it later developed but assumed that a permanent military force created and manned by the great powers would keep the peace.[11]

The charter notion of international security quickly proved unrealistic, leaving the UN to seek innovative ways to perform its mandate. Peacekeeping was one of these innovations, and troops were first dispatched under the authority of the Security Council to the Middle East in 1948. Under the energetic and creative leadership of Dag Hammarskjöld, UN secretary-general from 1953 to 1961, and others, such as Canadian Prime Minister Lester Pearson and longtime UN official Brian Urquhart, peacekeeping developed into a useful (if limited) element of conflict resolution.[12] In essence, traditional peacekeeping was a form of military activity "organized by the U.N. on an *ad hoc* basis to act as an interposition force following a cease-fire, but prior to any

agreement resolving major issues in a dispute."[13]

UN peacekeeping operations followed a common pattern.[14] The Security Council or the General Assembly created and established guidelines for a specific operation but exercised little actual direction over the operation. The secretary-general named the force commander, recruited the force from member nations, and wrote rules of engagement and procedures that were subject to approval by the Security Council or General Assembly. The commander then took command of a multinational force that almost always excluded American or Soviet troops and usually those from NATO or the Warsaw Pact.[15] The peacekeepers operated with the consent of the parties to the conflict, attempted to remain rigidly neutral, and—since they were to act as observers, stabilizers, confidence builders, and buffers rather than as enforcers—carried only light arms. The force did not require or even seek military effectiveness.[16] Clearly, the conditions under which traditional peacekeeping could succeed were limited.

The end of the cold war, however, provided the opportunity to expand the utility of multinational peacekeeping. The question is, How? Initially, it might seem logical to pass the peacekeeping mandate to some international organization or organizations *other than* the UN, but shortcomings of regional organizations are even greater than those of the UN.[17] Similarly, the most militarily efficient solution—having the US act unilaterally as the agent of the UN—is politically infeasible. The answer, then, is strengthening the UN, but at present there is no clear consensus on the extent or nature of this process.

Some adaptations of the traditional model are being made "on the fly" as the UN responds to crises with intrusive, nontraditional activities, many of which involve US forces. For example, US Air Force F-15s and F-16s participated in enforcing the Bosnian "no-fly zone," and a reinforced infantry company from the Berlin Brigade was part of a preemptive deployment to Macedonia.[18] Other actions have been considered, including UN monitoring of the border crossings between Serbia and Bosnia to prevent the military resupply of Bosnian Serb militias.[19] The US has also encouraged the UN to send a multinational police force to Haiti to reestablish order and ease the transition to democracy. This UN peacekeeping force would be the first one inserted into a situation not involving civil or international war.[20]

Beyond these reactive steps, Secretary-General Boutros-Ghali has actively attempted to craft a conceptual and strategic foundation for post-cold-war peacekeeping. To expand the UN's capabilities beyond the traditional model, he called for a new category of UN forces to be called "peace-enforcement units."[21] These trained volunteer troops would be more heavily armed than traditional peacekeepers and would be made available to the Security Council on a permanent basis by member states. Peace-enforcement units could intervene without the consent of the local parties when the Security Council approved and, by implication, could abandon neutrality when one party clearly posed the major threat to peace.[22] In other words, these second-generation peacekeepers could be more intrusive and aggressive than traditional ones.

To augment the flexibility and speed of peacekeeping operations, the secretary-general asked for improved training for UN police contingents and for prepositioned military supplies.[23] Recognizing that all peacekeeping is grounded in diplomacy, Boutros-Ghali also emphasized *peacemaking* (bringing hostile parties to agreement through peaceful means) and *peace building* (identifying and strengthening support structures solidifying peace).[24] In Boutros-Ghali's vision, the UN would transcend the limitations of traditional peacekeeping and develop the capability to play an effective role in a

range of conflicts from relatively simple observer missions through the protection of safe havens to full-scale enforcement activities such as Operation Desert Storm.[25] Most importantly, these actions could take place without the consent of the antagonists in a conflict. In this way, the vision of the charter would be realized half a century after its signing.

Other analysts have proposed even more radical expansions of peacekeeping. James Meachem, for example, supports creation of a brigade-size standing UN force to serve as a rapid-reaction element for crises that cannot wait for the building of a traditional peacekeeping force or to serve as the first echelon of a larger UN contingent.[26] In an even more innovative vein, J. S. Bremner and J. M. Snell envisage a role for UN forces in new types of security threats, including environmental peacekeeping and international anticrime operations.[27] This proposal is well in accord with Boutros-Ghali's holistic view of economic, social, and environmental problems as security threats coequal with military conflict.[28] Given this trend, the UN may eventually consider other functions, such as the intrusive enforcement of a nuclear, biological, or chemical nonproliferation regime or the restoration of democratic governments.

Although official American policy has not been nearly this forward thinking, President George Bush did embrace Boutros-Ghali's *An Agenda for Peace*. In a speech to the UN, Bush called for multinational efforts in five key areas:

- Developing and training national military units for peacekeeping operations and humanitarian relief.
- Developing multinational planning, training, and field exercises.
- Providing adequate logistical support for peacekeeping and humanitarian operations.
- Developing planning, crisis management, and intelligence capability for peacekeeping and humanitarian operations.
- Ensuring adequate and equitable funding for UN and associated peacekeeping operations.[29]

Clearly, the UN's role in peacekeeping is changing in a way congruent with US national interests. This trend has serious implications for the US military and particularly for the Air Force.

Air Force Missions

In order to succeed at the type of intrusive activities proposed by Boutros-Ghali, the UN must be able to perform, organize, or coordinate a range of military missions. According to a study by a group of US military officers, these missions range from simple assessments to joint and combined campaigns in major regional conflicts (table 1). These missions, in turn, require a range of military capabilities:

A. Intelligence
   1. Indications and Warnings
   2. Strategic Assessment
   3. Tactical Intelligence
B. Integrated Military Command, Control, and Communications (C^3)
   1. Planning
   2. Operations
   3. Training and Simulation
   4. In-Place Regional Command Structure
   5. Area Specialization
   6. Global Communications
   7. Precision Locating
C. Aerospace Power
   1. Aerospace Control
   2. Precision Munitions Delivery
   3. Survivable Deep Attack
   4. Theater Missile Defense
D. Maritime Power/Sea Control
   1. Countermine
   2. Countersmuggling
   3. Protection of Escorts/Sea Lines of Communications
   4. Refugee Control
E. Forcible Entry
F. Strategic Mobility
   1. Airlift
   2. Sea Lift

Table 1

Possible UN Military Missions

PEACEMAKING	PEACE BUILDING	PEACEKEEPING	ENFORCEMENT
Assessments	Assessments	Assessments	Assessments
Monitoring	Monitoring	Monitoring	Show of force
	Counterterrorism	Counterterrorism	Counterterrorism
	Observers	Observers	Free passage
	Law and order	Law and order	Blockade
	Humanitarian assistance	Humanitarian assistance	Air/naval campaign
	Disarming/ demobilizing	Hostage rescue	Limited major regional conflict
	Organizing/training	Protection of enemy prisoners of war	Major regional conflict
	Protecting elections	Noncombatant evacuation	
	Reconstruction	Preventive peacekeeping	
	Environmental protection		

Source: Martha Bills et al., *Options for U.S. Military Support to the United Nations* (Washington, D.C.: Center for Strategic and International Studies, December 1992), 5.

G. Global Logistics Support
H. Land Combat Power
   1. Light Infantry Force
   2. Armored Force
   3. Heliborne Force
I. Unconventional Warfare
J. Nation Building
   1. Engineering
   2. Civil Affairs
   3. Psychological Operations[30]

Because many of these functions are far beyond the UN's current capabilities, the US—in view of its extra-UN global military commitments—should focus on those functions that other member states cannot provide. Specifically, aerospace power is just the sort of task that the US can provide quicker, more effectively, or more efficiently than other nations.

The central role of air power in preserving a UN-engineered peace is not new. As Eric Grove points out, "The Charter is explicit in considering air forces the most appropriate weapons of first resort against potential aggressors."[31] Today the speed, power, and flexibility of aerospace power can be decisive, both as a deterrent and an actual counter to aggression. The UN desperately needs aerospace power but has none.

The US Air Force can support UN operations in a number of areas:

- Provision of joint planners to the Joint Staff and the staffs of the unified and specified commands; these planners understand the special requirements of peacekeeping operations.
- Provision of planners to multinational planning staffs involved in UN operations.
- Training of multinational planning staffs.
- Provision of strategic, operational, and tactical mobility and resupply for deployed UN peacekeeping forces.
- Provision of command, control, communications, and computers (C^4), especially air traffic control.
- Provision of basing and repair facilities for use by peacekeeping forces.
- Training of non-US air components of

Since the cold war ended, the UN has engaged in a frenzy of peacekeeping operations. UN leaders see their goal as maintaining international peace and security, as well as securing justice and human rights.

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UN forces, especially intelligence and support elements.

- Refueling of UN aircraft and those of other members of peacekeeping forces.
- Search and rescue.
- Medical evacuation.
- Intelligence, reconnaissance, and surveillance support for UN peacekeeping forces and crisis management teams, especially support derived from space platforms, including both data and interpretation.
- Provision of weather information.
- Provision of certain types of special operations support.
- Suppression of air activity or establishment of air exclusion zones in areas of peacekeeping or enforcement operations.
- Traditional air power applications and air campaigns in support of multinational enforcement actions.

Implications

What would it take for the US military, especially the Air Force, to provide more effective support for UN military actions? It would *not* require any radical force structure changes above those already planned because the crisis-response and contingency forces called for in the new national military strategy—in conjunction with the planning and intelligence resources of the unified commands—would suffice.[32] Although the inherent flexibility of composite wings would make them especially useful, the unique nature of the new UN operations should persuade senior leaders to consider the formation of a dedicated unit in the US military for this type of activity. In addition, the Air Force should advocate and pursue change in three key areas.

Attitudes

Above all else, the Air Force must take peacekeeping seriously by valuing the preservation of peace as much as victory in the traditional sense. The military services must give peacekeeping its fair share of resources in terms of intellectual energy, talent, and training time—something that can happen only when the attitudes of senior leaders change.

Such a change in attitude does *not* imply abandoning the war-fighter ethos that the American military worked so hard to create and sustain. But the fact remains that peacekeeping and war fighting have fundamental differences, including divergent objectives. Further, peacekeeping occurs in the fuzzy area between war and peace, where military force is directly subordinate to diplomatic efforts. The traditional American approach to conflict, however, draws a rigid distinction between peace and war and can be dysfunctional in the area of low-intensity conflict or—to use the more current phrase—military operations short of war (including peacekeeping). Approaching all conflict as war can be dangerously counterproductive. We must, therefore, recognize the limitations on the appropriateness of the war-fighter ethos lest we find ourselves in a situation in which our own attitudes erode opportunities to forestall war.

Peacekeeping requires a unique form of leadership, especially by junior and noncommissioned officers.[33] They must understand that there is a time and a place for war fighting—and a point at which a war fighter's attitude must dominate, even in peacekeeping. Service cultures and systems for the cultivation of leaders must find a way to make leaders understand this fragile and rapidly changing relationship.

Training and Education

Because attitudes and service cultures germinate in the service educational systems, all levels of professional military education (PME) should include the fundamentals of peacekeeping, including the distinction between peacekeeping and war

fighting.[34] Further, PME should look for instructors from nations with extensive involvement in peacekeeping operations. Canadians, for example, have wide experience in traditional UN peacekeeping, and the broad similarities in the Canadian and US militaries would make for a logical relationship between the two, once Americans accept the notion that they are the students and not the teachers.

Peacekeeping operations require that planners and field commanders acquire extensive cultural and political sensitivity—traits that must be acquired far in advance of deployment. A combination of civilian and military educational institutions must provide courses in these areas. For example, basic and intermediate PME (e.g., Squadron Officer School and Air Command and Staff College, respectively) can provide a basic foundation that must be augmented by more detailed regional studies at civilian universities or the Air War College. These institutions should offer courses in ethnicity, history, and cultural factors, which must in turn be augmented by staff and unit exercises involving joint, interagency, and combined operations in support of the UN. The Air Force should also consider establishment of a formal peacekeeping institute such as the one at the US Army War College.

Doctrine and Planning Procedures

We have joint doctrine for US military involvement in peacekeeping operations, but it focuses on traditional, first-generation activity. Joint Pub 3-07.3, "Joint Tactics, Techniques, and Procedures for Peacekeeping Operations" (revised final draft), for example, defines *peacekeeping* as "operations, conducted with the consent of the belligerent parties, designed to maintain a negotiated truce and help promote conditions that support the diplomatic efforts to establish a long-term peace in areas of conflict."[35]

Similarly, Joint Pub 3-07, *Joint Doctrine for Military Operations Other than War*, notes that "the single most important requirement of a peacekeeping operation is consent to the operation by all the parties in the dispute," a sentiment echoed in Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*.[36] Obviously, US doctrine has not captured the sense of radical change in the notion of peacekeeping and needs refinement in order to retain relevance in the world of more aggressive and intrusive UN actions. This observation is particularly true for the portions of the doctrine that deal with the air component.

The US should assist in the development of UN doctrine, staff, and planning procedures for multinational peacekeeping operations. Currently, no such doctrine exists; instead, the UN has a combination of case-by-case rules of engagement and a "protodoctrine" compiled by a private organization that supports UN activity.[37] Likewise, the UN's ability to plan and direct a military operation is limited. Although articles 46 and 47 of the charter established a Military Staff Committee composed of the military chiefs of staff of the permanent members of the Security Council acting through day-to-day representatives,[38] the cold war stalemate destroyed the effectiveness of this construct, so most planning was ad hoc (and inefficient).

Today, many experts argue (without reaching a consensus) that the UN needs doctrine, rational planning procedures, and a trained staff to provide clear, strategic guidance that the peacekeeping force commander and his staff can translate into mission statements.[39] Marrack I. Goulding, former UN under secretary-general in charge of peacekeeping, feels that the creation of a "war room" for operational planning would distract from the essentially diplomatic nature of UN missions.[40] As a compromise, the US, Great Britain, France, Canada, and the Scandinavian countries added military advisers to their UN missions to aid in planning—a halfway step at best. A more systematic

plan calls for (1) a US-sponsored multinational UN military school to train planners, (2) the formation of a strategic plans and policy cell at UN headquarters led by a flag officer, and (3) establishment of a high-tech UN communications unit by the US.[41]

In addition, the US should refine its own methods for planning peacekeeping operations. As John Mackinlay and Jarat Chopra point out, a model exists in our planning procedures for counterinsurgency,[42] a form of conflict—like peacekeeping—characterized by political and psychological factors and by severe limits on the use of military force. Hence, American doctrine and planning procedures for counterinsurgency could be adapted to peacekeeping.[43]

The US must refine several other elements of planning if it is to provide more effective support to UN peacekeeping. For example, we need better methods for establishing air exclusion zones or air quarantines. Key issues would include nondestructive methods for suppressing hostile air movement, appropriate steps for suppression of air defenses, and techniques for identification friend or foe (IFF) and the identification of military and nonmilitary air traffic in the peacekeeping environment. US planners must also consider the impact of peacekeeping operations on the budget and on personnel rotation and assignment during the ongoing force drawdown. Peacekeeping operations will usually not require large numbers of US forces but may require a protracted US presence. Finally, US intelligence capabilities can be of great utility to UN peacekeeping, but our services and intelligence agencies must develop guidelines for intelligence sanitation and procedures for dissemination prior to an operation.

Obstacles to Success

Without a doubt, the US has both the human and material resources that are necessary for the Air Force to assume a more active and effective role in support of UN peacekeeping. Shortcomings in doctrine, training, and—most importantly—attitude can be transcended, but only if the national command authorities unambiguously commit the nation to greater effectiveness in peacekeeping. Currently, it is impossible to tell how serious we are about peacekeeping. On the one hand, Bush's speech to the UN—cited earlier—and numerous other policy statements linked peacekeeping with the US national interest.[44] The former president's valedictory national security strategy called for renewed American efforts to improve the effectiveness of the UN in conflict prevention, peacekeeping, and peacemaking.[45] Similarly, the Clinton administration expressed support for a strengthened UN along the lines suggested by Boutros-Ghali. During Senate confirmation hearings, Clinton's UN representative, Madeleine K. Albright, said, "President Clinton has spoken about the impor-

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Under Dag Hammarskjöld—UN secretary general from 1953–61—and other leaders, UN forces would enter an area following a cease-fire and keep the peace until warring countries settled their dispute.

Although UN troops are still involved in traditional peacekeeping, providing relief to starving populations (above and below) is now one of their major functions.

tance of creating a [UN] rapid deployment force, or a force that would be available to deal with problems."[46]

In line with its general strategy of moving from the unilateral to the multilateral application of force, the Clinton administration in June 1993 made public a plan that would dramatically enlarge the role of US military personnel in UN peacekeeping.[47] A draft policy review document known as PRD-13 advocated US involvement in planning and implementing peacekeeping operations whenever US interests justified such involvement rather

than whenever the US could make a unique contribution. This policy would constitute an endorsement of many of the ideas espoused by Boutros-Ghali in his report on *An Agenda for Peace*.[48]

On the other hand, actual policy indicates that obstacles may still outweigh imperatives. For good reasons, the US remains deeply suspicious of the UN's ability to control and direct military activity, just as many other nations complain of amateurism in UN peacekeeping operations.[49] But American resistance is more serious than that of other nations, given our power to augment the UN's effectiveness. This fact is reflected in the debate between opponents and proponents of strengthening the UN. During discussions of an expanded peacekeeping presence in Bosnia, for example, the Clinton administration insisted on NATO control.[50] When he was unable to engineer a consensus among our European allies, the president turned toward old-fashioned unilateralism.[51] Similarly, the UN's assumption of command of Operation Restore Hope in Somalia caused congressional and public unease, as was the case with the deployment to Macedonia, despite the fact that both commanders were from NATO nations (Turkey and Denmark, respectively).[52] Only after extensive debate during the Clinton administration's review of the US role in UN peacekeeping did American military leaders drop their traditional insistence that US forces always be kept under US command.[53]

In general, enthusiasm for expanded UN peacekeeping follows the traditional liberal/conservative split in American politics, with liberals far more supportive of the process than are conservatives. Laurence Martin, writing in the influential journal *The National Interest*, expresses the unease of many people on the political Right:

> As more usual than not in political matters, the purposes are admirable, even compelling. There are, however, increasing grounds for concern about the practicality, prudence, and even morality of the means which some enthusiasts want to adopt. Cautionary notes need to be sounded, not least because bureaucratic euphoria, coupled with empire building, increasingly tempts the UN establishment.[54]

Because of these mixed signals, efforts on the part of the Department of Defense and the military services to refine strategy, doctrine, training, education, or force structure have been slow in coming. Senior leaders, faced with the crushing complexity of retaining military prowess during dramatic downsizing of the American military, have been extremely cautious in assuming new tasks that would entail additional demands for personnel, money, and time. As a result, our mistrust of the UN's capability is self-fulfilling: because we mistrust it, we do not take it seriously; and because we do not take it seriously, it stands little chance of improvement.

If this confusion ends and if our national security leaders do decide that more effective US support for UN peacekeeping is a worthy element of our strategy, then aerospace power will be a vital component of our contribution. No other nation can match the speed and efficiency of aerospace power that the US could contribute to UN efforts. Thus, the Air Force should at least begin preparing for the changes in attitude, doctrine, organization, and training that such a contribution would require once our strategy becomes clear. □

Notes

1. See Daniel Patrick Moynihan, *A Dangerous Place* (Boston: Little, Brown, 1975), especially 95–255; and Jeane J. Kirkpatrick, *The Reagan Phenomenon and Other Speeches on Foreign Policy* (Washington, D.C.: American Enterprise Institute, 1983), 79–108.

2. The Heritage Foundation provided the most sophisti-

cated and persistent critique of the UN. See, for example, Burton Yale Pines, ed., *A World without a U.N.* (Washington, D.C.: Heritage Foundation, 1984).

3. Charles Krauthammer, "The U.N. Corrupt Impostor," *Washington Post*, 27 September 1985, A25.

4. See Mala Tabory, *The Multinational Force and Observers in the Sinai: Organization, Structure, and Function* (Boulder, Colo.: Westview Press, 1986).

5. Laurence Martin, "Peacekeeping as a Growth Industry," *The National Interest* 32 (Summer 1993): 3–11.

6. Paul Lewis, "U.N.'s Top Troop Official Sees No Need for War Room," *New York Times*, 27 December 1992, 12.

7. John Mackinlay and Jarat Chopra, "Second General Multinational Operations," *Washington Quarterly* 15, no. 3 (Summer 1992): 116.

8. Richard Connaughton, *Military Intervention in the 1990s: A New Logic of War* (London: Routledge, 1992), 72.

9. Boutros Boutros-Ghali, *An Agenda for Peace: Preventive Diplomacy, Peacemaking and Peacekeeping*, Report of the Secretary-General Pursuant to the Statement Adopted by the Summit Meeting of the Security Council on 31 January 1992 (New York: United Nations, 1992).

10. For example, *Chairman of the Joint Chiefs of Staff Report on the Roles, Missions, and Functions of the Armed Forces of the United States* recommends that responsibility for support to UN peacekeeping be given to a to-be-created expanded Atlantic Command (page III-5), and the *National Military Strategy of the United States* mentions in passing that the *National Security Strategy of the United States* lists strengthening international institutions like the UN as a national objective. The section on collective security focuses solely on Desert Storm-style coalitions operating under the auspices of the UN but led by the US (pages 8–9). Colin L. Powell, *Chairman of the Joint Chiefs of Staff Report on the Roles, Missions, and Functions of the Armed Forces of the United States* (Washington, D.C.: Department of Defense, February 1993); idem, *National Military Strategy of the United States* (Washington, D.C.: Government Printing Office, January 1992); and George Bush, *National Security Strategy of the United States* (Washington, D.C.: White House, January 1993).

11. Augustus Richard Norton and Thomas George Weiss, *UN Peacekeepers: Soldiers with a Difference*, Headline Series no. 292 (New York: Foreign Policy Association, 1990), 9. Germane elements of the charter are chapter 6, which deals with the peaceful resolution of conflicts, and chapter 7, which deals with collective security.

12. Lewis, 12; and A. Leroy Bennett, *International Organizations: Principles and Issues*, 5th ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1991), 140.

13. Paul F. Diehl, "Institutional Alternative to Traditional U.N. Peacekeeping: An Assessment of Regional and Multinational Options," *Armed Forces and Society* 19, no. 2 (Winter 1993): 209.

14. Patrick J. Garrity, "The U.N. and Peacekeeping," in Pines, 139–40.

15. Canada and Poland were exceptions.

16. Mackinlay and Chopra, 113.

17. Diehl, 209–10.

18. John Pomfret, "First U.S. Troops Arrive in Balkans," *Washington Post*, 6 July 1993, A1, A11.

19. Paul Lewis, "U.N. Near Accord on Plan to Watch Serbian Frontier," *New York Times*, 13 May 1993, A1, A6. Serbian president Slobodan Milosevic later reneged on his promise to allow international border observers. Craig R. Whitney, "Belgrade Reneges on Verification of Ban on Arming Bosnian Serbs," *New York Times*, 26 May 1993, A1, A6.

20. Howard W. French, "U.S. to Push for a U.N. Police Force of 500 for Haiti," *New York Times*, 10 May 1993, A3. In late May, the Haitian military government rejected the plan. Idem, "Leaders in Haiti Spurn Police Plan," *New York Times*, 25 May 1993, A4.

21. Boutros Boutros-Ghali, "The 38th Floor: An Agenda for Peace," *UN Chronicle*, September 1992, 2–3.

22. Boutros-Ghali did not discuss this form of enforcement in *An Agenda for Peace*. He did mention it in the article "The 38th Floor." Detailed analysis is found in United Nations Association of the United States, *Partners for Peace: Strengthening Collective Security for the 21st Century* (New York: United Nations Association of the United States, 1992).

23. The secretary-general was not specific on the nature of these stocks or the military advantages of prepositioning for the UN.

24. Boutros-Ghali, *An Agenda for Peace*, 11.

25. Mackinlay and Chopra, 117.

26. James Meachem, "From Peacekeeping to Peacemaking: United Nations Faces a Changing Role," *International Defense Review*, March 1992, 218.

27. J. S. Bremner and J. M. Snell, "The Changing Face of Peacekeeping," *Canadian Defense Quarterly* 22, no. 1 (1992): 6–11.

28. Boutros Boutros-Ghali, "Setting a New Agenda for the United Nations," *Journal of International Affairs* 46, no. 2 (Winter 1993): 290–91.

29. George Bush, "The United Nations: Forging a Genuine Global Community," *US Department of State Dispatch*, 28 September 1992, 721–24.

30. Martha Bills et al., *Options for U.S. Military Support to the United Nations* (Washington, D.C.: Center for Strategic and International Studies, December 1992), 13.

31. Eric Grove, "UN Armed Forces and the Military Staff Committee," *International Security* 17, no. 4 (Spring 1993): 173. For a detailed plan for the use of aerial surveillance in support of UN operations, see Michael Krepon and Jeffrey P. Tracey, "Open Skies and UN Peace-Keeping," *Survival* 32, no. 3 (May/June 1990): 251–63.

32. Powell, *National Military Strategy of the United States*, 21–23.

33. For an excellent explanation of the attitudes required for peacekeeping, see International Peace Academy, *Peacekeeper's Handbook* (New York: Pergamon, 1984), 373ff.

34. This process is under way. The National War College, for example, offers an optional advanced study course on peacekeeping, and individual lessons have been devoted to it at schools such as the US Army Command and General Staff College and the Air War College.

35. Joint Pub 3-07.3, "Joint Tactics, Techniques, and Procedures for Peacekeeping Operations," revised final draft, 10 August 1992.

36. Joint Pub 3-07, *Joint Doctrine for Military Operations Other than War*, November 1992, IV-I; and AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 2, March 1992, 59.

37. See International Peace Academy, *Peacekeeper's Handbook*.

38. Grove, 175.

39. Bills et al., 21; Mackinlay and Chopra, 121–24; and Norton and Weiss, 29.

40. Lewis, "U.N.'s Top Troop Official," 12. The current under secretary-general for peacekeeping is Kofi Annan.

41. Bills et al., 22–23.

42. Mackinlay and Chopra, 119.

43. For example, candidates for adaptation include Joint Pub 3.07 and Army Field Manual (FM) 100-5/Air Force Pamphlet (AFP) 3-20, *Military Operations in Low Intensity Con-*

flict, 1 December 1990. See also Steven Metz, "Counterinsurgent Campaign Planning," *Parameters* 19, no. 3 (September 1989): 60–68.

44. See also John R. Bolton, "UN Peace-Keeping Efforts to Promote Security and Stability," *U.S. Department of State Dispatch*, 30 March 1992, 245.

45. Bush, *National Security Strategy of the United States*, 7, 19.

46. Quoted in Paul Lewis, "Peacekeeper to Peacemaker: U.N. Confronting New Roles," *New York Times*, 25 January 1993, A10.

47. R. Jeffrey Smith and Julia Preston, "U.S. Plans Wider Role in U.N. Peace Keeping," *Washington Post*, 18 June 1993, A1.

48. Ibid.

49. Richard Bernstein, "Sniping Is Growing at U.N.'s Weakness as a Peacekeeper," *New York Times*, 21 June 1993, A1. For a detailed analysis of the UN's problems, see Adam Roberts, "The United Nations and International Security," *Survival* 35, no. 2 (Summer 1993): 3–30.

50. Michael R. Gordon, "20,000 U.S. Troops May Go to Bosnia, NATO Admiral Says," *New York Times*, 4 May 1993, A1, A6.

51. Steven A. Holmes, "U.S. May Attack Serbs Even without NATO," *New York Times*, 2 August 1993, A3.

52. "A Big Second Step in Somalia" (editorial), *New York Times*, 4 May 1993, A14.

53. Smith and Preston, A1.

54. Martin, 3.

Ricochets

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example, a land commander might want to prevent an enemy regiment from entering a battle. A single company can't do it, but a battalion (three to four BAUs) could, and a brigade (nine to 12 BAUs) could push the enemy regiment back. If we take those experienced brigade and battalion commanders out of the operational C^2 loop, then the theater or division commander has to be the on-scene commander over every group of companies, in addition to all his or her other duties.

Each level of command in the Army looks at a different amount of land, a different duration of time, and a different mix of weapons. Each also coordinates operations with logistics and intelligence. That's a lot of work for the next higher or lower level to take over.

The US Army has already experimented with removing layers of command and increasing commanders' span of control. The 101st Airborne Division was converted to pentomic configuration in the 1950s. The reorganization cut one layer of command and gave each commander five identical subordinate units. It was far less extreme than what Lieutenant Vincent envisions, but the Army abandoned it. If a division commander can't control five "battle groups" (which replaced battalion and brigade levels), then he or she can't control about 40 rifle and tank companies plus supporting units.

When I read Vincent's article, I envision pilots taking off with a load of iron, joining swarms of other flights (BAUs), and then selecting interesting missions from a data-link smorgasbord of enemy targets. In theory, it would be similar to the current officer assignment system, in which individuals try to match capabilities and desires with the Air Force's needs. In reality, I don't think it would be either that simple or that effective for several reasons. First, airplanes sitting on the ground wouldn't be in the link. If flight commanders get all their information from the data link, then they don't have any reason to take off until after they take off. For planning purposes, every squadron would need its own ground-based Joint Tactical Information Distribution System (JTIDS) terminal. The air component commander would need to task squadrons—not BAUs. Second, pilots can't just take off with whatever their ground crew hung on the wings and go after the first available target. Before they step out to their airplanes, aircrews spend a significant amount of time planning. They take into account mission requirements, threats, tactics, weather, armament carried, and so forth. Aircrews, ground crews, and intelligence personnel all need at least a basic idea of where the planes are going.

Lieutenant Vincent deserves credit for identifying problems in C^2 and for prescribing a look at the overall system. However, I must disagree with his specific solutions. Rather than discarding interim headquarters and C^2 nodes, I would prefer to use them properly. Give everyone access to modern communications and computers; push responsibility down to lower levels; and use mission orders, commander's intent, and good doctrine. Let the AOC stop trying to do everything itself. It should concentrate on overseeing what everyone else does.

Lt Ken Pascoe, USAF
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My hat is off to 1st Lt Gary Vincent for his article on command and control (C^2) in the Summer 1993 issue. I'm not saying this because I agree with all of his points (actually, I agree with very few) but because he succeeded in getting me to think about our Air Force's C^2 processes as I never have before.

My biggest concern with the article is that Lieutenant Vincent confuses the verb form of C^2 with the noun form—as in *C^2 network*. For example, he says "the point of C^2 is to get information as rapidly as possible from the providers to the users." Actually, this is the point of C^2 networks. The point of C^2 is to direct aerospace operations towards the national command authorities' objectives. Similarly, he discusses the "two major challenges confronting C^2—survivability and speed." While these are valid challenges for C^2 networks, it's important to realize that the fastest, most survivable network in the world is useless unless it combats the challenges confronting C^2 itself. Unfortunately, the massively parallel design does not sufficiently combat these challenges.

The first C^2 challenge I will address is resource allocation. For example, much of the C^2 in Air Mobility Command is concerned with getting the right airlifter or refueler connected with the right cargo or aircraft at the right time. In Air Combat Command, C^2 is concerned with getting the right aircraft to the right target with the right weapon at the right time. And Air Force Space Command C^2 is concerned with getting the right launch vehicle with the right payload or reentry vehicle to the right place at the right time.

In Lieutenant Vincent's massively parallel design, "basic action units" (BAU) act independently and can access the entire battlefield model and pull out the information they need to accomplish their objectives. This works fine for ants, which work independently but towards common objectives (e.g., gathering food). However, the resource allocation problem is relatively small for ants. It's no big deal to an ant if another ant picks up the piece of food it was planning to get; it just walks to the next piece. On the other hand, it's *definitely* a big deal to a pilot if another pilot attacks his or her target, especially after sneaking or fighting through air defenses! Resource allocation becomes even more of a problem when one tries to exercise C^2 over very scarce resources, such as those needed for search and rescue, electronic combat, surveillance and reconnaissance, and so forth.

Another C^2 challenge is the difficulty of trying to absorb and act on the overwhelming amount of data generated during modern war. The massively parallel design increases, rather than decreases, the amount of data in the hands of BAU commanders. This situation is analogous to the one involving the air tasking order (ATO) in Operation Desert Storm, as described in the October 1992 issue of *Military Review*:

> Although the use of the computer allowed for the generation of the ATO and permitted central management of coalition air forces, the product was immense, consisting of a thousand pages of text. The limited time available to read it and plan air operations forced the air wings to concentrate only on the data that specifically applied to them. The air operations planning staffs often were unaware of other missions in the same area that might have affected their plans even though that information was buried in the ATO. (Page 38)

Closely related to the "information overload" challenge is the question, Is every BAU commander really prepared to handle the entire battlefield model? I don't think so. The reasons have little to do with motivation and training, but with a lack of time to examine the entire model and—often—with no real need to know every battlefield detail.

Finally, I question the practicality of the massively parallel design. First, network connectivity would be dependent on radio because landlines aren't mobile enough for modern war, and I'm not sure enough bandwidth is available in many high-threat areas (particularly Europe and the Korean peninsula). Second, I question the survivability of the system because of the sheer number of users. If at all possible, users will physically locate themselves close to one another to access logistical support and communications infrastructure. This efficient peacetime placement could easily prove disastrous in war.

So what is the answer? Regrettably, I don't have a complete solution either. Clearly, our current C^2 structure is not ideal for many tasks (e.g., hunting Scuds, putting target imagery into cockpits, and flying close air support). Improving C^2 and the associated C^2 networks for these tasks is an imperative. But massive parallelism is not the answer because it would cause a glut of information all over the battlefield instead of just at the top. I think the answer lies in improving the C^2 capabilities of intermediate control units. I see two important C^2 roles for them: (1) perform resource allocation functions for the BAUs under them and (2) make sure the BAU commander is getting the part of the battlefield model he or she needs. Only with a focused effort on the second role will inter-

mediate units be more than a "pipeline to funnel information up and orders down."

Finally, regarding the editorial in the Summer 1993 issue, if *APJ* keeps printing articles like Lieutenant Vincent's, I don't think you'll have to worry about complaints that the *Journal* is "just another vehicle for communicating 'the Air Force party line'!"

Capt Clayton B. Perce, USAF
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Command and control (C^2) in any service branch is an issue of survivability and mission attainment. The layers of command that 1st Lt Gary Vincent highlights in his article on C^2 in the Summer 1993 issue are a very real hindrance to effective execution of the overall battle plan. These levels are not incompetent, but they use precious time during their decision cycles. Anything that can decrease the decision/command cycle would benefit the engaged forces.

Lieutenant Vincent introduces the term *basic action unit* (BAU). If he wants a baseline for individual combat or combat support units, he could have used the term *unit tasking code* (UTC). The deployment of many units that participated in the Persian Gulf War was based on their UTCs. The UTC—a basic unit of contingency planning—can be a person, an entire ship, or a fighter wing.

The author is not up to speed on modern Army battlefield control measures. He believes that his "massively parallel design" would eliminate unit boundaries and phase lines since they "are better suited to a static battlefield." These control measures are intended for coordination between all the parts that make up an army in the field during any type of battle (offensive and defensive). These control measures not only depend on *who is where* but—more importantly—*who is responsible for where*. The massively parallel design will not answer the question of *who is responsible for where*.

The intermediate levels of C^2 process support equipment and personnel that are not found at the direct combat level. For example, an armored divisional brigade has heavy equipment transporters (HET) but not enough to move an entire brigade over a long distance. However, the division level has additional HETs that can be shifted around to the battlefield to support the combat brigade's short-term needs. This allows the brigade to move all its combat equipment in one seamless move. The brigade performs a similar service for the battalions.

Each progressive level of command has some service, equipment, or personnel that are not found at the lower levels. These levels service more than one combat unit, but they cannot service all their assigned combat units at one time. Where and when these people go is determined by the commander's intent. The lower the level, the more combat power is available and the more support is needed for beans, bullets, bombs, and fuel. Combat power is found at the upper levels, but its primary mission is direct and indirect support of the lower-level combat forces. For example, Patriot missiles are controlled by the corps (if one is in-theater) and not by the combat brigade or battalion UTCs.

Lieutenant Vincent has not given the Air Force credit for its planning and execution process. He states that

> the command unit [i.e., tactical air control center (TACC)] issues only the letter of its orders and not the spirit of its intent. . . . In this system [i.e., massively parallel design], the command unit does not issue explicit orders but instead identifies mission objectives and a focus of [the] main effort.

The key word here is *intent*. Any Air Force commander, from theater level to the four-ship, flight-lead level, is able to express—in terms of explicit and implied tasks—his or her assigned mission. The commander's intent is the *common model* that Lieutenant Vincent describes, and it is the guiding focus that supports the overall battle plan during joint operations. When the plan execution doesn't occur as planned, the commander's intent (the known explicit and implied tasks), tempered with judgment and experience, will keep the combat forces focused on the mission objectives. This will be accomplished without command-unit (depicted as TACC-level) involvement since it is most probably inside the decision cycle of the command unit (i.e., it's a done deal before the command unit can complete its decision cycle).

Vincent says his system is not *centralized control/decentralized execution*, which is the backbone of Air Force employment doctrine. He prefers *centralized command/decentralized control and execution*, a concept which has merit but is really no different. Coordination—whether one calls it control or command—is one characteristic that the author does not mention in his article, but it is the keystone of service and joint operations. Coordination—a form of control—makes or breaks an operation, and it is a characteristic that must be consid-

ered during tactical operations. Coordination is a function that C^2 staffs are really good at.

The C^2 massively parallel design could be better used as an information net to support combat units. Flow of information is a problem. Getting information into usable intelligence form creates a real-time bottleneck that can hurt an operation at the tactical level. This is one area in which Lieutenant Vincent's design could produce great results but not in the C^2 function.

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apj

NET ASSESSMENT

SCIENCE AND TECHNOLOGY

The Origins of SDI, 1944–1983 by Donald R. Baucom. University Press of Kansas, 2501 W. 15th St., Lawrence, Kansas 66049, 1992, 256 pages, $29.95.

Donald Baucom was the official historian for the Strategic Defense Initiative (SDI) Office starting in 1987, and his access to both the program's records as well as the players involved is apparent in this history of ballistic missile defense in the United States. Meticulously footnoted, this account of the politics, technology, and strategic situations that led to President Ronald Reagan's historic decision on strategic defense gives a firm foundation for understanding why and how our leadership came to embrace this concept. *The Origins of SDI* chronicles the history of ballistic missile defense (BMD) from initial plans to counter the German V-2 rocket in World War II with antiaircraft artillery to the high-technology defenses that made President Reagan's 1983 speech embracing BMD possible.

The history begins with the dawn of the missile age—German V-2 attacks on England in 1944—and how BMD was originally just another defense against a new weapon. First attempts in BMD were as a selective defense against the Soviet intercontinental ballistic missile (ICBM) threat, with capabilities against "Nth-country" threats such as the People's Republic of China. Programs were developed in the 1950s and early 1960s, but technology proved to be inadequate to provide more than a "thin shield" defense of several cities or ICBM fields. This, coupled with an unwillingness of the American people to have such nuclear systems deployed near their homes, led the US to plan for a limited BMD system to protect our ICBMs, enhancing their survivability. The idea was to preserve US security using deterrence through offensive weapons. Such decisions led the way to the arms control decade of the 1970s.

Part 2 of *The Origins of SDI* deals with the 1970s: the "age of SALT (Strategic Arms Limitation Talks)." During this time, the US attempted to tie negotiations for offensive and defensive strategic weapons together in order to reduce both. Instead, the Soviets succeeded in separating negotiations for these two types of weapons, limiting BMD while maintaining their ability to modernize their strategic offensive forces. The end result, Baucom shows, was the "institutionalizing" of the concept of mutual assured destruction (MAD) and severe restrictions on BMD.

These restrictions changed the course of American BMD. The only US operational BMD site was closed (as it was no longer effective as a bargaining chip to reduce offensive systems), and BMD programs were reoriented toward research and development. Although progress was made in new technologies (including directed-energy [laser] weapons), this was the time that the strategic balance (in Baucom's opinion) shifted to the Soviet Union. This new offensive threat would set the stage for the rebirth of strategic defense.

The Origins of SDI then goes on to describe this "crisis" and how the proponents of strategic defense redeveloped the concept of BMD to

ensure US security. Factors in the resurgence of BMD were our inability to agree on a survivable basing mode for the MX missile, the efforts of the "High Frontier" organization to publicize the capabilities of potential BMD systems, and the rise to power of Ronald Reagan, whose staff had strong ties to several BMD proponents. Baucom details these influences and shows how these factors combined to allow the creation of the Strategic Defense Initiative.

This review gives just a glimpse of this extremely detailed insider's view of the history of SDI. Baucom uses statistics, anecdotes, and a wealth of background material (including over 51 pages of notes on 16 interviews and innumerable reports, official histories, books, and personal memoirs) to bring life to this topic. The only flaw in his presentation is an overemphasis on the case *for* SDI. The reader can tell that Baucom is an SDI advocate. Even so, this book is a good look at the conditions, personalities, and technologies that led up to 1983, and accomplishes Baucom's goal of providing a "reasonably complete account of President Reagan's decision."

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AUTOBIOGRAPHY, BIOGRAPHY, AND MEMOIRS

It Takes One to Tango by Edward L. Rowny. Brassey's, Inc., 100 Front Street, Box 500, Riverside, New Jersey 08075, 1992, 273 pages, $23.00.

When Lt Gen Edward Rowny told a famous American aphorism to Col Gen Ivan Beletsky, his Soviet counterpart in the SALT II negotiations, Beletsky told him it was not true, insisting that "it only takes one to tango." Explaining himself, Beletsky noted that, as in the West, young Soviet women and men tend to segregate themselves by gender at school dances. Rather than ask a girl to dance, the future Soviet general would tango with a chair to see whether he could secure an approving nod or smile before requesting the young lady's favor. "It is the same in our dealings with you," he continued. "We simply keep repeating our positions, expecting that one of you will smile or nod approvingly."

Rowny took this tale to heart, spending "almost twenty years . . . trying to resist the temptation to smile or nod at my Soviet 'dancing partners'" (page ix). Sometimes said to be "to the right of Attila the Hun" (page 136), Rowny represented Department of Defense interests in the highest councils of our strategic nuclear arms talks under five presidents, from Nixon to Bush. This book presents the memoirs of a tough-minded cold warrior who pulls few punches when dealing not only with presidents, but also with diplomats like Henry Kissinger and Cyrus Vance.

Central to *It Takes One to Tango* are 10 negotiating guidelines—as well as prescriptions for future negotiations—that Rowny developed while he studied at Yale in the late 1940s. The book's title emphasizes one of the most important of these points—that one must always "take into account the cultural sensitivities of those on the other side of the table" (page 256).

But surely this volume will best be remembered for its critical analysis of presidents and their advisors. Of the chief executives, Gerald Ford receives the highest accolades—Jimmy Carter and George Bush the lowest. In fact, his critique of Bush could have been effectively utilized by the Democrats in the last presidential campaign.

In addition to anecdotes, Rowny also provides numerous insights into the personalities and policy-making worlds of Geneva and Washington:

- "Many of our most difficult negotiations took place not with the Soviets but among the members of our own team" (page 49).
- When Ambassador U. Alexis Johnson "realized after the first several sessions that the Soviets could hold their liquor and their tongues better than we could, he decided not to serve alcohol" at the informal sessions (page 51).
- "Over the years the United States and Soviet Union had developed an entire lexicon of terms to obfuscate the true character of ongoing negotiations" (page 232).

For anyone about to enter the higher levels of command and staff service, this volume could be an eye-opener on the realities of life among the high, the mighty, and the devious.

David Curtis Skaggs
Bowling Green, Ohio

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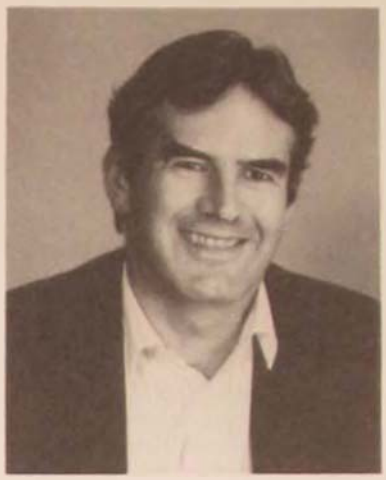

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