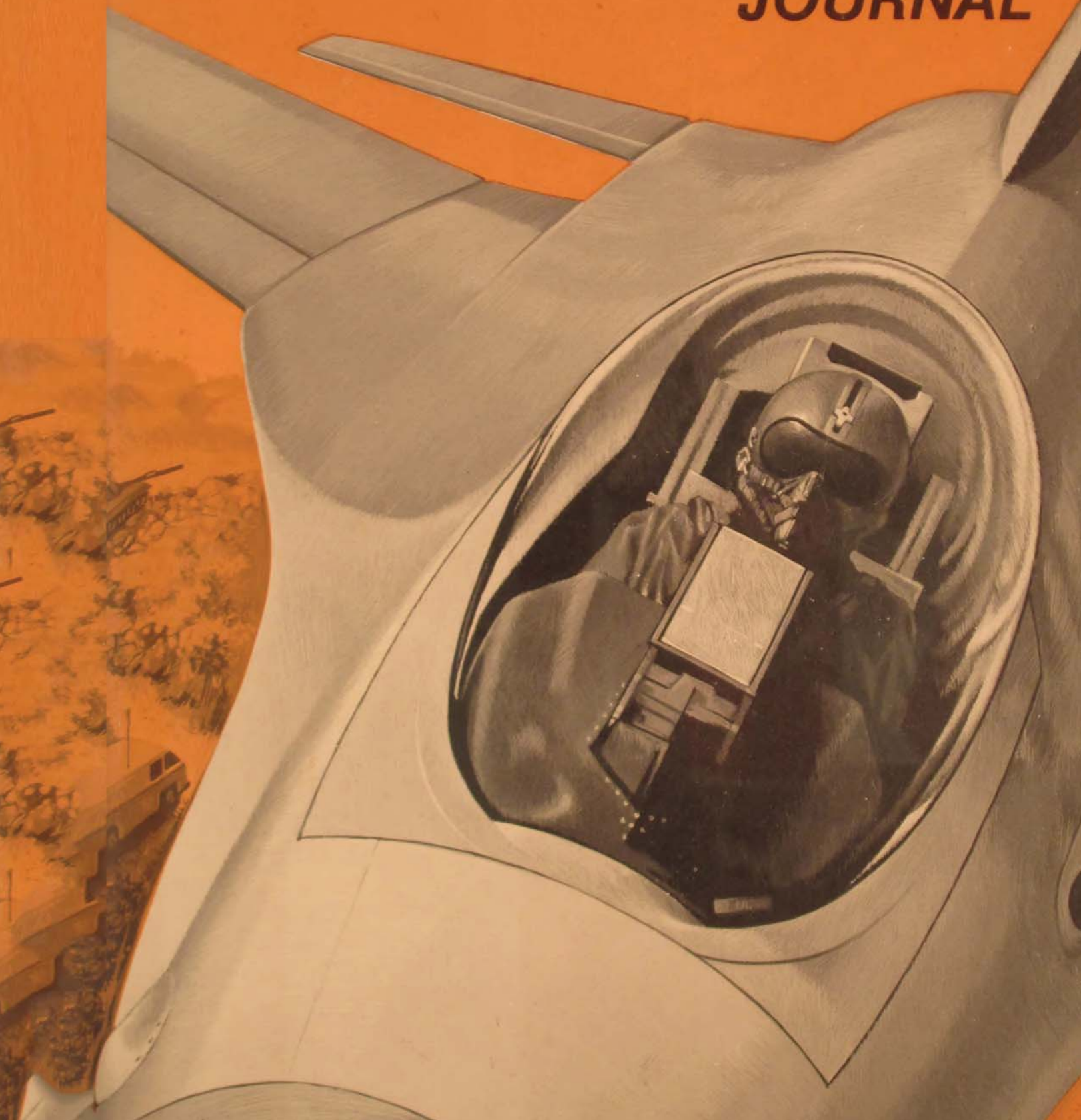


SUMMER 1987

AIR POWER

JOURNAL



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Airpower Journal

A Message from the Chief of Staff

GEN LARRY D. WELCH



I AM PLEASED to introduce the initial issue of *Airpower Journal*. This year marks the fortieth anniversary of the US Air Force and of the publication of our professional journal. *The Air University Quarterly Review* was first published in the spring of 1947 to stimulate reading, writing, and reflection on the part of Air Force members. In 1963 Air Force Chief of Staff Curtis E. LeMay reemphasized the need for "brain work" in the professional officer corps and directed increased availability of the magazine, resulting in the bi-monthly *Air University Review*.

The *Review's* successor will continue in this tradition, bringing a changed format and a revised focus to meet the challenges facing the Air Force in the 1980s and beyond. The *Airpower Journal* is a natural extension of initiatives the Air Force has already taken to stress professionalism. In the late 1970s, we became concerned that Air Force people were beginning to view our profession as just another job. Our commitment to excellence and the unique sense of dedication reflected by military service in defense of the nation requires continued total dedication to professional values. Along with continued emphasis on our professional values, there is a need for increased appreciation within the Air Force of our basic organizational objectives and concepts of aerial warfare.

Five years ago, we initiated Project Warrior to emphasize the Air Force warfighting perspective and to increase our understanding of the application of air power in combat. Properly, most of those efforts were decentralized to the base or unit level and stressed the "heart" of the warrior—the warfighting spirit. Clearly the demands and stresses of modern warfare make motivation—call it spirit, cohe-

sion, or pride—extremely important. As George Patton observed, "Wars are fought with weapons, but they are won by men."

But the other element of the warrior perspective—the "brain work" that General LeMay referred to—is also vital. Particularly in this age of deterrence, warfare exists as an intellectual as well as a physical and moral contest. The Great Captains of the past were those who could outthink, not outnumber their opponents. And with our adversaries holding a quantitative edge on most potential battlefields, the American warrior must continually polish his arms by cultivating his mind.

Airpower Journal will aid this process by speaking less of management and more of leadership. Concentration will be on the warfighting nature of our profession rather than on system acquisition and resource allocation. Professional development thrives best through the exchange of information, ideas, and perspectives as opposed to passive reading or solitary thought. The process of thinking, discussing, and writing about our profession of arms enhances our perspective and increases the range of solutions to the challenges we face. One of the key objectives of the *Airpower Journal* will be to fill the need within the Air Force to hear from and encourage the warrior-scholar. The place for his thoughts are within the pages of this journal.

Like Project Warrior, *Airpower Journal* challenges us to expand our professional perspective and warfighting knowledge. It reminds us that, when called on, our task is to fight and win. Write to your fellow airmen in this journal and tell us how to do it better. I look forward to reading your contributions to our professional development.

Headquarters United States Air Force



A THEATER-LEVEL VIEW OF AIR POWER

GEN CHARLES L. DONNELLY, JR., USAF, RETIRED

I WOULD like to present some of my thoughts on the use of air power in a theater-level war.* I have three items to discuss: the operational view of warfare emphasizing air superiority; follow-on forces attack (FOFA); and last, a challenge for all of us.

*This article has been extracted from the text of a speech that General Donnelly presented on 19 May 1986 to the National War College.

There has been a push in the last few years to study the operational art of war (i.e., the study of warfare at the level between strategy and tactics—or how to conduct overall theater campaigns). The majority of our senior military leaders have never had wartime experience commanding forces from a theater level. Because this is true, the operational art of modern war deserves our attention. This theater-level perspective of warfighting

must pervade all our thinking, military planning, training, and equipping. I want to talk about employing air power at that level.

I will start by saying air power is a theater-level concept. Air forces conduct campaigns of their own as well as support and jointly prosecute surface campaigns. Air, land, and naval component commanders translate theater objectives into joint campaigns aimed at theater goals.

Air campaigns are theater-level campaigns, all parts of air power's operational art. US and NATO doctrine holds that air power works best under the concept of centralized control and decentralized execution. These words, I am sure, are familiar to all of you. They have been standard vernacular since the end of World War II, and even earlier at the Kasserine Pass in 1943. As you remember, in North Africa in World War II, air was parceled out under the control of several subtheater commanders. Our parcels of Allied air were of little use against German air, which was employed as an entity, attacking en masse virtually unopposed.

Air power is now consolidated under a central commander. We recognized the need for unity of effort when using limited assets; and as a result, our limited air assets now have tremendous combat power. We can exploit the advantages of airplanes (i.e., speed, range, and flexibility) in a comprehensively coordinated fashion in direct support of theater objectives.

Specifically, the operational challenge for employing air is at the level of apportionment and allotment. Here we determine how many and what kind of aircraft should be used for what air missions to best meet the theater commanders' overall objectives. Since there are just not enough aircraft to go around, as we saw in North Africa, we strive to concentrate firepower at the right times and places to meet overall campaign objectives. By "the right time and places" I mean the prioritized times and places and the prioritized missions to meet campaign objectives for the theater.

Many elements influence the theater perspective. A major element is alliances. This is especially true in Europe. Allied Command Europe comprises the Northern, Southern, and Central regions.

Focusing on Central Europe, the size of opposing forces and importance of this region make it a "theater" for this discussion. As you know, we have an eight-corps front in the Central Region, with the different countries' land forces having somewhat different capabilities and equipment. These corps are arranged into two army groups—Northern Army Group (NORTHAG) and Central Army Group (CENTAG).

As the commander, Allied Air Forces Central Europe (COMAAFCE), I command an air force composed of aircraft from six allied nations. I present air power employment options to the commander of the Central Region (CINCENT), a German army four-star general. My recommendations are based on his overall theater guidance and on the needs of my two subordinate Allied Tactical Air Force (ATAF) commanders (British and German). In turn, the ATAFs base their campaign plans on coordination with their respective army group commanders. Missions include defensive and offensive counterair, interdiction, close air support, and reconnaissance. Aircraft include many different kinds and nationalities (e.g., Dutch F-16s; German F-4s; British Tornados; US F-15s, F-111s, F-16s, F-4s, and A-10s; Canadian F-18s; and NATO E-3s).

So, you see that my "operational art" requires fulfilling many different requirements using diverse multinational aircraft serving numerous mission areas, all in support of Central Region objectives. That is a mouthful, but it is important to understand this to understand the operational art of war for air power in Europe.

CINCENT, with advice from his component commanders, develops campaign strategy and objectives for all his land and air forces. Air power, in concert with land

campaigns, supports his objectives.

There are several air operations I must conduct as the air component commander to accomplish the objectives of CINCENT's campaigns. I will briefly discuss two of the prime ones: air superiority and air-land operations.

First and foremost is air superiority. Gaining freedom of action in the air allows us to accomplish all our air missions whether they be counterair, close air support, interdiction, airlift, or reconnaissance. Denying that same freedom to enemy air protects, in great depth, all friendly forces—air, land, and sea.

Air superiority is fundamental to modern warfare, and, though termed an operation, it can well be thought of as a theater-level campaign in and of itself. Air superiority requires the conduct of several simultaneous missions. It requires integrated air defenses, jointly employed in the Central Region. SAMs and guns from allied armies and air forces provide a large measure of attrition of enemy aircraft attacking on our side of the border. They complement air-to-air fighters from several nations that are rapidly employed over wide areas to provide area defense and to plug gaps in our surface defenses. We therefore exploit the readiness of surface defenses and the concentration of force made possible by the speed and range of aircraft. This defense in-depth is a formidable array of forces ready to react to enemy air attack. But reaction to attack is not enough. We must also attack enemy air forces in enemy territory to reduce their ability to generate sorties against us.

Forces we use to conduct counterair missions are the same ones we use for other missions. For instance, deep-attack, air-interdiction aircraft such as F-111s, B-52s, and Tornados are the same ones we will use for counterair in attacking airfields. Many of our ground-attack aircraft, such as F-16s, are also suited for air-to-air, and we need them in both roles.

When, where, and how much to use are questions of operational art. Much of this

art must come out as a war unfolds. Prewar planning cannot totally compensate for the fog of war. Decisions on campaigns and force management depend on the situation.

Changing from air-to-air to ground attack and designating the weights of effort applied to various mission areas are theater-level decisions. We know roughly how the decisions would go for a full-scale war in Europe. We know our force's strengths and weaknesses. We base our planning on these and on what we know of the threat and the enemy's potential objectives. But we cannot know these well until a war starts and our objectives become clearer.

Regardless, the first consideration is air superiority—gaining and maintaining freedom of action in the air and also freedom from enemy air attack. Counterair is a high priority. If we do not protect our airfields, munitions storage areas, reinforcements, and command and control centers, as well as our own troops fighting at the front, I do not think we can come close to winning a war in Europe. We must use every asset available to us to provide general air superiority over friendly territory and selected, timely air superiority over enemy territory. This provides freedom of action for our other air missions and protection from air attack for the allied armies.

This brings us to a second operation for air power, air-land combat, that would be conducted simultaneously with the fight to establish appropriate air superiority. Air-land combat operations support land battles through direct application of aircraft firepower. The missions are familiar to you all (close air support, air interdiction, and battlefield air interdiction). Joint planning in the combined alliance arena, at the component commander level, is the key to success in these missions. The planning must take into account the threat, our own air and land capabilities, and the campaign objectives for the region—"concepts of employment," if you will. The

structure of these concepts is established in peacetime planning. The timely alteration of them throughout a conflict to meet the current situation and to influence future events is more theater operational art. We need the widest range of options possible. If we have many different campaigns and concepts available, we can keep the enemy guessing. In my discussion of follow-on forces attack, I will focus on one of these air-land combat concepts and relate it to the operational level of war.

FOFA has gained widespread attention in recent years, especially in Europe. Emphasis on the need for FOFA has made us look at our current capabilities to carry it out. The development of emerging technologies increases our capability. FOFA is the epitome of a concept at the operational level. It is a new term, but the concept is not new. At least it is not new since mud-and oil-spattered aviators wearing white scarves and goggles first dropped handheld bombs on enemy troops. FOFA is and has been largely accommodated by the air-interdiction mission. The concept has caused considerable debate on what it is, how it is to be done, and how much is necessary. But the concept is simple. Let me cut through the debate and put FOFA in an operational perspective. Emphasizing FOFA is merely emphasizing a need to attack enemy forces before they can be brought to bear in battle—to attack *unengaged* enemy forces, nothing more.

The purpose is also simple: keep the enemy-to-friendly force ratios manageable at the points of contact, slow or stop the flow of unengaged enemy forces moving to battle, and allow our engaged forces to seize the initiative. Most current developmental discussions center on what is needed to enhance our capabilities: deep attack, standoff weaponry, deep-look reconnaissance, intelligence fusion, and so on. But when and how to use these capabilities as the war rages on are the operational art questions for theater or regional commanders.

Interdicting follow-on forces and attack-

ing the enemy at the front are complementary missions. Both are needed in Central Europe. Deciding levels of effort to be applied at the front, and to be applied deep behind the front, depends on the unfolding situation.

Attacking unengaged forces during war applies to more than enemy armies; it applies to air, land, and sea operations as well. Air power is the primary means a theater commander has to attack any follow-on forces. He must use the same forces against a variety of targets, balancing the attack of engaged forces against the attack of unengaged ones.

For counterair, if we were to attack airfields and reduce the enemy's ability to generate aircraft sorties against friendly forces or territory, we would not stop them all from coming. We do not have enough assets. But we can reduce the number of enemy sorties to the point that our air defenses may be able to cope.

Similarly, if we interdict second-echelon ground forces following the frontline divisions into battle, we control or meter the flow of the enemy troops, hopefully to the point where our frontline armies can cope. And if we interdict sea lines of communication or attack ports, we can help slow or, to some degree, control the flow of seaborne forces into battle. These are joint efforts, prioritized at the theater or region level so that our limited ability to attack deep targets is most effectively used.

As I said, the term *FOFA* has been used primarily in the context of land battles: slow the second-echelon armies. Indeed, in Europe we have very rightly focused on establishing increased capabilities to control the arrival of enemy troops and equipment at the front. Now is the right time and this is the right emphasis for developing the needed technologies, subconcepts, command and control, and so on, to be able to conduct FOFA against enemy land forces in Europe for the future. We must do this research, this planning, and this development to have sufficient capabilities to prosecute a war in Europe.

But the operational art requires that we know how to use the forces and the concepts during wartime. For instance, at what point will we need to use deep-attack aircraft for air interdiction of follow-on land forces, and at what point will we need to use these same aircraft to attack airfields or ports? Or when must we devote most effort to direct support at the front lines to the exclusion of attacking unengaged enemy forces?

The enemy in wartime may not look or behave like we have guessed in our peacetime planning. We must have flexible capabilities, flexible control, and flexible commanders to best use all our theater forces as the war unfolds.

Flexibility, again, is an inherent advantage of air power and must be exploited in war. The aircraft we use in the morning to attack an airfield can be used later to attack railheads where follow-on forces are gathered. The aircraft we use this morning to shoot down air threats with air-to-air missiles can be used later to attack tank columns or chokepoints in support of the maneuver of a division. The use of air must be viewed first and foremost at the theater level. What are the theater objectives and the regional campaigns?

Interdicting unengaged enemy forces before they can be brought to bear is a concept at the operational level. It is accommodated by various air power missions prosecuted jointly, requiring many decisions in multiple areas, using a vast number of inputs. These decisions must be well thought out, but many inputs needed for decision making will probably not be available until the war is being fought. All details cannot be known before the fact. Operational art sets the framework for finding and assessing those details for theater campaigns. But the true essence of the art is found where commanders act and lead as a coherent theaterwide team.

A vast array of questions must be addressed during the prosecution of a war. What intelligence information is available to land, sea, and air commanders? How

much can commanders rely on their intelligence? How quickly can we establish joint campaigns? What is the enemy's scheme of maneuver? What are his weak points? What are our capabilities, and how have these been reduced during fighting? What are the enemy's objectives? Can we afford to use forces against the unengaged enemy, or must we directly attack front-line enemy divisions, and for how long? How much can we rely on current communications and what impact will C³ losses have on joint campaigns? How prepared are our commanders to execute their wartime leadership functions?

This last question brings me to my final point—a challenge for all of us. How well can our theater/operational commanders handle their wartime leadership positions? I have centered on air power, but my points concern all our services in conducting a war. We need to think, train, and learn about war. This is a challenge for our military in general, a special concern for all of you. You need to think at the operational level, write on theater perspectives of warfare, and meld different service capabilities into joint operational warfighting concepts.

We face challenges today not greatly different from ancient warfighters, but we have added some new wrinkles. As technology has improved, distances and time have shrunk. The tempo of warfighting has increased over the last several decades; and the range, accuracy, and kinds of weaponry have greatly improved. But some challenges will never change. Commanders at all levels need to understand the enemy, to know their own forces, to establish warfighting goals and objectives, and to lead men and manage battles while suffering the fog and friction of war.

As commanders in peacetime, it is easy to get caught up in day-to-day duties. Expand yourselves! Force your thinking to higher levels. Communicate your ideas.

I know all of you were selected for senior service school primarily because you can think, communicate, and lead on

higher planes. For the next few years you will be working on operational or planning staffs in research and development or commanding forces. You will be developing bits and pieces of our total military power.

Your challenge will be to think and communicate warfighting as a priority in your lives as you perform your peacetime duties. Moreover, you especially need to project your warfighting thoughts to the theater level and higher—"what-ifing" and analyzing potential consequences of

your decisions. We need that kind of thinking to keep all the parts coherent and viable so senior commanders can use them as part of their operational art.

I have given you my thoughts on the operational art of theater air war. I challenge you to think about the intricacies of how you would prosecute a war, improvising as situations develop. By doing so, you will more effectively command and lead forces in a future war if called to do so.

Arlington, Virginia

AMERICAN AIR POWER AND GRAND TACTICS

LT GEN BRADLEY C. HOSMER

IF DETERRING conflict is the foundation of US military strategy, then air power is essential. In fact, air power will prevent many future conflicts from ever starting because of a potential

aggressor's fear that the conflict will be lost. But if such deterrence fails, American

Author's note: I wish to thank Barry Smernoff, Cols Frank Black, Sam Gardiner, Alan Gropman, and numerous others whose suggestions and comments were of considerable help in the preparation of this article.



air power can then be the key that unlocks the control of battle for our operational commanders on future battlefields. Considering the leverage of air power, no wonder each military service has its own "air force."

Of course, I need not dwell on the obvious, underlying point: no single element of our national military power can do the job alone. There are critical roles for land, sea, and air forces in most plausible scenarios, but in this discussion we are considering the air forces.

The spectrum of conflict ranges from all-out nuclear war to low-intensity conflict (LIC) and counterterrorism, and air power has significance across this spectrum. This discussion, however, focuses on what air power can do for conflicts falling *between* the use of nuclear weapons and LIC.

Constructing the Best Overall Combat Plan

In what follows, let me draw your attention to the scale of conflict on which Air Force tactics, exercises, and practice need to focus. The heart and soul of our profession is how to organize war—our special variety being war in or from the air—to achieve the national objectives of the United States.

As a service, we may need to do that better. We tend to narrow our focus on how to carry out a given combat plan, and we are very good at it. We also focus on how to spread limited resources over many plans, and we are good at that, too. However, the first obligation of military professionals to the nation is to conceive and construct the *best overall* combat plans—ones that produce victories when deterrence fails. In the world of general-purpose forces, airmen have too often left that fundamental responsibility to others.

We airmen conceive and construct excellent plans at the level of flight-lead, strike-lead, and quick-contingency action. Our tactical air schools focus at this level,

we exercise at this level (since bigger is more expensive), and we tend to work on the integration of supporting forces at this level. However, the greatest payoffs for effective air power will come through the manner in which air power plays on a *larger* scale—the combat plan or grand tactics designed and used by operational commanders whose forces include land, sea, and air elements, and almost certainly the forces of allied nations.

How Do We Get There?

The arena of large-scale combat is ever widening, and if we airmen are to earn our professional stature in the future, we need to pay close attention to four key points.

- We need to firmly grasp the *lessons of the past* that really count.
- We need to think about air power from the perspective of the *operational commander in chief* (CINC). We must understand our boss's problem in order to work it.
- We must better focus on new capabilities coming down the road. How will we *integrate* them for full effect?—a difficult exercise and an expensive one to practice, especially on the scale of an entire theater.
- We need to get the dialogue heated up over our ideas about tomorrow's air power, testing those that are testable and subjecting the rest to hot, honest, and professional discussions. (When an issue cannot be settled by trial and error, often the best test is the opinion of other professional airmen. Of course, it can be hard work to explain and defend an idea, and it can take courage to display new ideas before peers. It may require even more to voice them to the bosses. But that shouldn't slow you down.) Our predecessors in the 1930s prepared for the awesome challenges that they had the vision to foresee, and they did it by testing ideas—where they could—to see what worked and by using *energetic debate* when actual trials were not possible.

Study Lessons of the Past

In working future air power issues, we need to understand the lessons of the past—from the early days of air combat right on through the most recent operations. Reinventing wheels is a terrible waste of the intellect, and reinventing wheels in a crisis almost certainly invites disaster. We do not need to reinvent the ideas of those airmen who have gone before us. Their ideas are there in great and fascinating numbers for our instruction and use. For instance, Gen William “Billy” Mitchell taught us to try out new ideas and to be willing to go where the answer takes us. Doctrine follows ideas, and equipment follows doctrine. During World War II, Gen George C. Kenney “left airmen gasping” with his imaginative ideas for establishing advanced air bases and for integrating his efforts with those of Navy forces to cut off sea movements by isolated Japanese forces.¹ Kenney was close enough to Gen Douglas MacArthur that he could help mold MacArthur’s campaigns to take full advantage of fresh ideas. The result was a successful Pacific campaign. Contrarily, as we saw in Vietnam, fragmentation of air power inevitably reduces its value to an operational commander. Disunity of effort devalues air power.

Key lessons about air power abound. Airmen who aspire to take a hand in planning the deterrence of, or victory in, future conflicts need to know them. If you want a place to start, try Kenney’s *General Kenney Reports* and Gen William Momyer’s *Air Power in Three Wars*.²

Think Big

Appropriate points of departure for discussions of air power’s role in our military future are national security policy, grand tactics, and joint operational art. National objectives are achieved, in part, by influencing the minds and actions of our opponents through national security policy.

Since future military operations will occur under the shadow of large nuclear arsenals held both by the Soviets and by us, we can expect political restraint in conventional war. We must plan and apply air power with careful consideration given to the risks of escalation.

By “grand tactics” I mean the conception, planning, and highly integrated execution of joint or combined military operations across wide battle zones and for a whole campaign—whether maritime, continental, or a combination of both. To influence the enemy’s mind and actions, and to win, leaders with “winning” ideas must plan and steer effective grand tactics. Sun Tzu’s emphasis on the initiative and the significance of deception and Liddell Hart’s concept of the “indirect approach” are good examples of winning ideas that apply to nearly any military circumstance.³ Effective grand tactics are tactical cunning on a theater or global scale.

To my mind, the entire military profession in recent decades has neglected grand tactics in its pursuit of victory on the battlefield. As I suggested earlier, we airmen are particularly guilty. The Joint Chiefs of Staff agreed a few years ago to turn this situation around, and it is turning, but we still have a long way to go. Some early bright spots do exist; USAFE’s Warrior Prep Center is an example. Another is PACAF’s recent work to build a theater campaign plan keyed to the most effective use of air power.

The step-by-step execution of thoughtful grand tactics and campaigns—leveraged with smart uses of advanced technology, keen awareness of the principles of war, and generous doses of good leadership—is the key to victory when deterrence fails. Such steps toward victory are what operational art is all about—the actual direction and execution of combat tasks by an operational commander, the move-and-countermove dynamics with the opposing commander, including visible moves by which strengths and intentions may be signaled or screened.

Who are the actual operational commanders responsible for carrying out national security policy by developing appropriate schemes (grand tactics) and executing them (operational art)? They include unified commanders—USCINCPAC (Pacific Command), USCINCSOUTH (Southern Command), USCINCENT (Central Command), USCINCSpace (Space Command), USCINCSOC (Special Operations Command)—subunified commanders such as CINCUSJAPAN (US Forces, Japan); joint task force commanders; and a couple of combined commanders—SA-CEUR (Supreme Allied Commander, Europe) and USCINCCFC (Combined Forces Command).

Important roles are included for CINC-MAC (Military Airlift Command) as well. Without theater resupply and intratheater movements of forces and equipment, the other combatants might as well have stayed at home. And CINCUSAC (Strategic Air Command) is a heavy player, too, with missions including air refueling and the provision of bomber aircraft with conventional weapons. (Remember, for our purposes we are focusing on nonnuclear conflict.) Conceivably, there could also be a commander—now undesignated—operating at the global level if ever required. In any case, the arena in which these “overall” commanders vie for control of the battle is where combat air power really pays off.

If air power is successful in unlocking control of the battle, it will be through helping the operational commander fulfill and integrate his fundamental tasks:

- Maneuver forces and firepower to threaten, to control critical geography, and to deny the opponent access to areas critical to his interests.
- Concentrate the firepower of land, sea, and air forces to produce leverage.
- Deceive and confuse the opponent to multiply the value of assigned forces.
- Establish communications to hear from subordinates and to orchestrate the conflict.

- Develop an intelligence system to read the enemy's actions and intent.
- Use logistics to weight the campaign in his favor.
- Destroy the enemy's will and, if necessary, his capacity to fight.

But what happened to close air support? Interdiction? Offensive and defensive counterair? They are the missions around which we airmen rally, organize, and apply air power. However, the overall or operational commander does not focus on the battle in this way. He needs to think in terms of manipulating an enemy—getting him overextended, tricking him into defending or attacking at a great disadvantage. The operational commander integrates the tasks listed above to control his opponent's actions and mind-set. That control is the goal of the operational commander.

Can modern air power contribute? Of course it can, and massively. Airlift is just another word for the rapid maneuver of critical forces. So is close air support and interdiction, which are the epitome of rapidly maneuvering forces as well as firepower. Such maneuvering provides the most powerful operational firepower available short of nuclear weapons. And our modern-day ability to shift air firepower to where it's needed—to be directed and controlled with finesse—is unsurpassed, which is why the inherent speed, range, and flexibility of air power make it such a dominating force on the battlefield. Feints and misdirections are easily achieved in modern air operations. Moreover, aerospace's vantage point is superb for gathering timely information and for communicating.

But to bring air power's unique capabilities to bear effectively on a conflict, our air commander must help to *mold* the operational commander's scheme of attack and combat plan—to shape that operational art. The air commander must understand the joint/combined operational concepts and campaign plans of his boss so clearly that he can then design and im-

plement those plans as if he were the operational commander himself. The genius of Kenney in the Pacific and Gen Carl Spaatz in Africa and in Europe is that they helped their operational bosses, MacArthur and Eisenhower, alter the campaign to take advantage of air power's great intrinsic strengths.

The essential lesson for future air power is that *the air commander must mold the theater grand tactics so that his doctrine, tactics, and equipment can put the maximum muscle into it*, and because the air commander does this on a large scale, that is the scale our thinking, exercises, tactical doctrine, and simulations must move toward. Redirecting ourselves in this fashion will allow future air commanders to shape the future campaigns for maximum impact.

Integrate and Test New Capabilities

Just as the best theaterwide combat plan takes maximum advantage of air power's dominating force on modern battlefields, the best air plan takes maximum advantage of the fruits of advanced technology. Our service is built on innovation—trying things out to see if they work and how they can be improved to work better.

But constant innovation and new magic in the field can be tough on the air commander. He needs operational confidence in order to apply doctrine, tactics, and equipment to the basic game plan his boss and he designed together. What I mean is that the air commander must be reasonably certain that his equipment and plans work in the "fog and friction" of war—bad weather, fatigue, garbled or missing messages, imperfect logistics, and bad luck.

New technology and tactical practices to match must be developed and tested, and users need hands-on practice under near-realistic conditions such as the Team Spirit and Red Flag exercises in order to build operational confidence. Otherwise,

new technology will not be used to its best effect if we go to war.

In the future, it will be more important and harder to test, integrate, and practice with the revolutionary equipment we see on the horizon—survivable, low-observable platforms such as the advanced technology bomber and the advanced tactical fighter, proliferated and cheap antiradiation missiles, and such. We must be able to find and destroy enemy air targets and high-value vehicles and to rupture the radar nets of the Soviet air defenses quickly. But practicing with the new equipment on the scale needed may be impossible. So we will need to simulate the employment and integration of emerging capabilities, which may demand simulation and modeling beyond what we know how to handle today.

In other words, the theater air commander needs to know what works best on a large scale. Exercise and practice at that scale is hard to do now, and it will be harder as new technology is fielded. Simulation and modeling may be a substitute, but we do not know how to do that yet either!

Debate the Issues

Can air power make the difference in deterring or winning future conflicts? Sure it can—when we apply past air power lessons to future military problems, use air power to achieve the larger objectives our boss has defined, and assure that new capabilities are tested, integrated, and practiced on the right scale.

The future will be different—perhaps radically different. We will not be able to answer all the questions with tests and practice—questions such as when can air power substitute for ground maneuver forces? Or should unit air commanders be able to carry out mission orders, like their Army and Navy counterparts, as well as detailed frag orders? Or to what extent can ground forces contribute to air superiority? We must cram the pages of *Airpower*

Journal with insightful and provocative ideas about the matters outlined here, both within and beyond our ability to test by actual trial. We must debate new issues and old ones with candor and must resolve problems thoughtfully to cope with our future challenges.

We are launching this *Airpower Journal* at an auspicious time—on the concurrent

eve of the bicentennial of the US Constitution and the fortieth anniversary of the US Air Force. Our strength as a nation and our strength as a military service have been our ability as citizens and airmen to adapt to our own growth and changing capabilities. We are about to be tested again. And again.

Have at it, airmen!

Washington, D.C.

Notes

1. Gen Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan: A Memoir* (Washington, D.C.: Office of Air Force History, 1986), 148.

2. Gen George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan, and Pearce, 1949); Gen William W. Momyer, *Air Power in Three Wars*, ed. Lt Col A. J. C. Lavallo and Maj James C. Gaston (Washington, D.C.: US Air Force Asso-

ciation, 1978).

3. Sun Tzu, *The Art of War*, trans. Samuel B. Griffith (New York: Oxford University Press, 1982), 53, 66. Liddell Hart's views about the "indirect approach" are captured by his statement that "the indirect approach is as fundamental to the realm of politics as to the realm of sex." B. H. Liddell Hart, *Strategy*, 2d ed. (New York: New American Library, 1967), 18.

A Challenge to Our Air Force

BRIG GEN JOHN C. FRYER, JR.

WE AT THE Air University Center for Aerospace Doctrine, Research, and Education (AUCADRE) are proud to be ushering in our new professional publication, the *Airpower Journal*. We believe we have the right editorial and publishing talent for this significant endeavor, but "the right stuff" must come from you. You are, of course, our audience. More importantly, you are our contributors. This journal will be what you make it.

As the Chief points out (p. 2), the focus of the *Airpower Journal* is the operational art of war. We are not looking for discussions of tactics or ethereal debates about geopolitics. Many other fine publications deal with those subjects quite adequately. We want to talk about campaign planning and how we will orchestrate tactical events to produce victory; how our potential enemies think about war and what we need to do to capitalize on their weaknesses and work around their strengths; where we are going wrong in our planning, personnel policies, leadership training, wargaming, and exercising as they relate to warfighting; what is needed to make us better team players with our allies and sister services; and how we can do a better job of matching doctrine, force structure, and war plans.

This is the "stuff" of our profession, and it is the intended thrust of the *Airpower Journal*. This does not mean that we plan to ignore grand strategy or tactics. It does mean that our articles will concentrate on improving our ability to fight and think as a team across the spectrum of conflict from counterterrorism to the execution of the single integrated operational plan (SIOP). It also means that, while we will have a heavy emphasis on air warfare, you can expect to see articles on ground and mari-



time operations as well. Air wars cannot be fought alone, as air operations cannot be discussed without considering all of the people, disciplines, and capabilities that support, supply, maintain, and train our forces. The *Airpower Journal* should be a publication for all Air Force people, not just for the "ops folks."

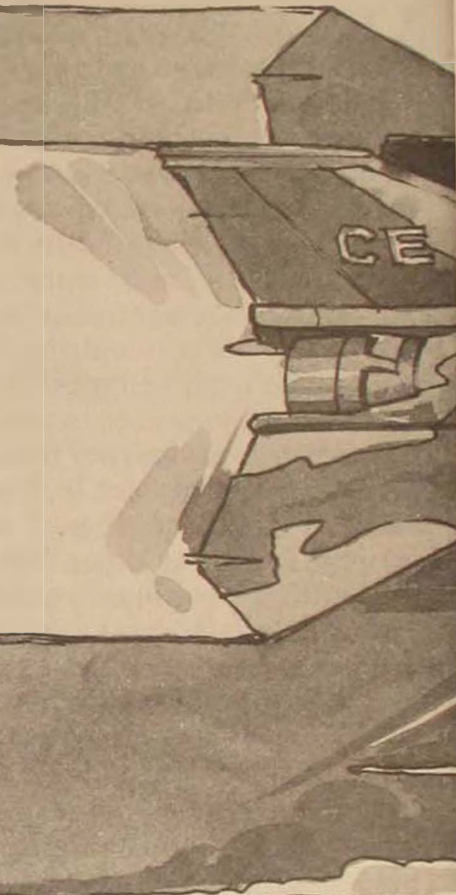
We challenge you to help us put meat on this philosophical skeleton. First, we encourage you to contribute by writing articles. What you have learned over the years in your wide-ranging specialties makes you uniquely qualified to offer thoughts for improvement. Second, we ask you to read the *Journal* each quarter and think about what you have read. Talk with your friends and associates about the ideas presented and let us know what you think. If an author has really "wound your clock," why not write a feature article of your own? Write to our editors with your opinions, pro and con, about our articles. We are willing to take the flak or the laurels.

This is your professional journal. Do not shy away from it. If we are going to grow in our professional knowledge, we need to develop, exchange, and debate ideas. We need to think about how to fight to win. As Sir William Francis Butler said, "The nation that will insist on drawing a broad line of demarcation between the fighting man and the thinking man is liable to find its fighting done by fools and its thinking done by cowards." The *Airpower Journal* is your chance to express the thoughts of fighting men and women in today's Air Force.

Commander
Center for Aerospace Doctrine,
Research, and Education
Maxwell AFB, Alabama

USE AND MISUSE OF CONVENTIONAL TACTICAL AIR POWER

LT COL WILLIAM P. STROUD III

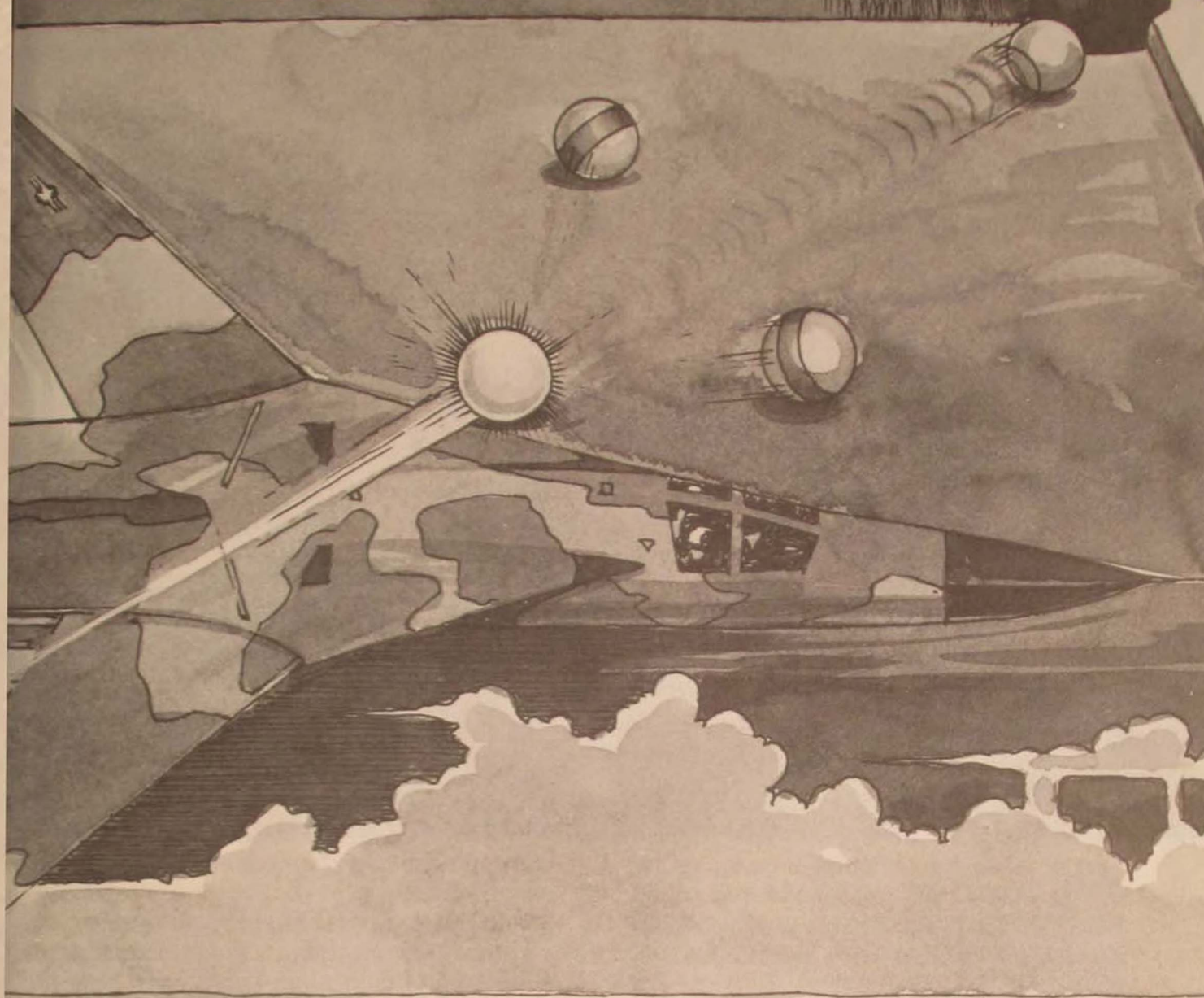


IN THE early hours of an April morning in 1986, fighter-bombers of the US Air Force, streaking from their bases in the United Kingdom, reaffirmed an idea espoused by Gen Billy Mitchell almost 60 years earlier: bombs dropped from aircraft can take out specific targets. The results in the 1920s and in 1986 were the same, but the circumstances and hardware changed considerably.

Technology has taken us from clear-weather, by-guess-and-by-golly, to all-weather, day-or-night, pinpoint-accuracy bombing, providing the destructive force of a 500-pound bomb or an area weapon meets your definition of pinpoint. Tech-

nology also allowed us the latitude to expand exponentially the means used to fight. We fly great distances at great speeds and deliver tons of ordnance with an efficiency that Billy Mitchell would not have dreamed of, although what is now reality is certainly an extension of his dream. In the end, we accomplish what he did with biplanes at 120 knots: we destroy a target. This is air power, and the essence of air power's strength is the ability to destroy an enemy's physical means to resist by destroying selected targets.

Air power also provides the flexibility to achieve objectives that range from the limited to the broad. The achievement of a



broad objective, however, is really an amalgam of limited objectives. Putting bombs on target is therefore closely allied with the choice of targets and tactical planning, which in turn are based on the scope of objectives chosen and on the decision to employ armed force. In the limited sense, if we say that air power failed in a certain instance, we should mean that the bombs did not hit the target. An example is the Thanh Hoa bridge in North Vietnam. When F-105 aircraft could not destroy the bridge in the mid-1960s, it could be said that, in the limited sense, air power failed and that when the bridge fell in 1972, air power succeeded. If the question is asked

why the bridge was struck at all, we must look not to air power but to the broader objectives and into the political decision to employ armed force.

In light of the rapid development of air power and its embodiment as the answer to all problems of surface-bound conflict, it is not surprising that distinctions have been blurred and that tactical air has been held accountable for glaring deficiencies in related but separate areas. Amid the euphoric atmosphere associated with going in one generation from World War I surplus aircraft to jet bombers, the idea of air power's omnipotence crept in. "We can go anywhere and do anything" became the



View from an F-111 approaching its target of IL-76 transports at the airport in Tripoli, April 1986, as seen by the Pave Tack laser-guided delivery system.

commonly accepted opinion. If the destruction of Libyan targets says anything, it echoes that sentiment, but it does so in total disregard of all other factors influencing air power's effective use. Moreover, omnipotence has a political corollary that uses "influence" in the place of "destroy." This corollary says that by influencing A, B will be influenced and C will be influenced by B. This may be simply stated as the Billiard Effect.

The Billiard Effect avoids clear-cut objectives on which the effective use of tactical air power is based. It is as if a surgeon were asked to "influence" a ruptured appendix. With both surgery and air power, you either take it out or you do not, and it

either needs to come out or it does not. In Libya, for example, a broad objective for the use of tactical air could have been the destruction of Mu'ammar Qadhafi's abilities to harass US naval operations in the Gulf of Sidra. To assign to air power sweeping responsibilities outside the realm of destruction of targets, such as changing Qadhafi's mind about supporting terrorism or creating sufficient internal turmoil to cause his overthrow, is a fallacy. These, or similar reasons, illustrate the greatest significance of the Billiard Effect, which is to drive the round, practical uses of air power straight into the square hole of conjecture.

The theory was tested in World War II and Korea but really came into its own during the Vietnam conflict. In World War II, the German Blitz of London and the Allied bombing of Berlin were directed at hearts and minds. They were the wrong

tools for the psychological job, and they missed the objective. As long as weapons could be manufactured and shipped to the troops, the war continued; however, with the advent of better and faster aircraft carrying bigger payloads, the lesson of the London Blitz lay lost in the rubble. In Vietnam, the targets, the theater of operations, and the surges and pauses were supposed to influence the behavior of the aggressor, with air power as the cue ball. Of course, this experiment in behavior modification played hell with fundamentals. Intangibles, such as surprise and selective targeting of appropriate military objectives—which had the potential to render the enemy defenseless—were cast ruthlessly aside. In the end, the United States withdrew amid mumblings of “Where did we go wrong?” In some circles, the answer was that air power failed, disregarding the fact that the crews put the bombs on target and those targets were destroyed. Under the Billiard Effect, arrogant assumptions had pushed pragmatic application of air power out of the picture. It became apparent that the fundamentals had been disregarded when the results of applied tactical air in the jet age did not meet expectations.

Introspection is a curious state of mind that, in the case of the post-Vietnam US Air Force, led to a fever pitch of hardware development accompanied shortly thereafter by a renewal of realistic training methods. Previous shortcomings were seen as the lack of sufficient destructive power, accuracy, and tactics. The answer was to move smartly to increase the means to destroy targets. None of this was bad in and of itself. The raid on Libya clearly showed how effective improved weaponry, well-trained crews, and superb tactics could be. Hopefully, the raid on Libya also signals a turn away from the Billiard Effect and back toward realistic, specific objectives. When national intentions are indistinct, the piecemeal use of aircraft in one brief strike should not be held culpable for what would amount to a failure to set distinct limited or broad objectives. Air

power should not be held accountable for a failure of policy.

The US Air Force may also share some of the blame for distorting the appropriate applications of tactical air. Under any circumstances, we “can do.” Blowing your own horn is fine for morale, but it leads to gross distortions when John Q. Public comes to accept boast and a positive “can-do” attitude as fact. It surprises him greatly when a stick of 500-pound bombs, dropped on a military target in an urban environment in a “surgical” strike, damages surrounding buildings and kills people on a nearby street. He begins to think that he does not want any of those “surgeons” putting a pacemaker in his chest. He is also astounded that one bombing mission does not accomplish impossible goals.

Modern tactical air power can take out a target. If that target is a bridge, the span will surely drop; if it is a building, then those that are still among the living after the walls fall down need to look for a new place to work. What the destruction of a bridge or a building cannot do is to precisely influence how the leaders or the people of any society view the world or their relation to it. This bleak thought in turn leads to the assessment that limited application of tactical air power is therefore useless. That is not so, but its limits must be realized. There are times when it is in the national interest to kill enemy soldiers, destroy a munitions factory, or accomplish other limited goals. Air power can do these things very effectively. Cases in point are the Israeli strike against the Iraqi reactor or any of the strikes against Palestine Liberation Organization (PLO) camps. These were conducted in the national interest, without expectations of a dramatic victory. Although successful, the purposes were limited and the results were limited. If you want more complete results, the broad objective must be clear and the means must match the desired outcome.

Air power is an application of force and

shares that broad definition with land and sea power. The use of any of these is subject to similar limitations. For example, witness the Soviet reactions to unrest in Hungary in 1956 or in Czechoslovakia in 1968. Those rebellions were crushed because the means and tactical applications used were more than enough to accomplish the specific goal. Contrast this with Soviet actions in Afghanistan, where the goal is less distinct and the force is therefore insufficient or misapplied.

Anything short of destroying the means to wage war cannot guarantee that the war will not continue. There are no shortcuts around this elementary fact. Evidence sug-

gests that knowing the right targets to hit but not hitting them does not awaken the sleeping lamb of reason in a determined foe, quiet world opinion, or set the stage for letting bygones be bygones. And more to the point, it is not the purpose of air power to do any of these. There is no doubt that air power can and does play a decisive role in warfare, yet the scope is narrow and practical. For this reason, there is a place for land, air, and sea forces, as well as politics.

To understand the basic purpose of air power is to realize that it is not omnipotent, nor is it an influence. It is, purely and simply, a means to knock down the bridge.

Madrid, Spain



FIGHTING THE AIR WAR: *A Wing Commander's Perspective*

COL CLIFFORD R. KRIEGER

THE WING commander is in an interesting position in terms of fighting the air war. At the tactical level of war, his role is straightforward. His primary effort is focused on generating combat sorties in the numbers and at the times required. The wing commander is fully responsible for the tactical employment of his aircraft to achieve tactical, operational, or strategic aims. At the same time, he occupies a position at the bottom fringe of the operational level of war—a level as yet undefined in official US Air Force doctrine.¹

At the tactical level, the wing commander must ensure that he has a secure base from which to fight and that he is getting the best from the available logistic support in executing his tasking. He must orchestrate the execution of the wing's tasking and he must be a leader and commander for both his flying and support

forces. He is expected to fly combat missions and at times to lead those missions. The wing commander must be leading and managing across the spectrum of his organization. If he does not, he risks failure of the wing.

At the operational level of war, the wing commander ensures that his wing is always prepared for shifts in the air campaign. These shifts can be in role or in weight of effort.² The wing commander needs to understand his own commander's concept for conducting the war, which means that he must understand the weight of effort being given to each campaign. It also means that the wing commander must advise his commander as to the ability of the wing to support each of the ongoing or expected air campaigns. At times the wing commander will be forced by circumstances to make decisions that will impact the weight of effort given to each campaign. In

any war the communication lines may be saturated and the ability of a wing commander to discuss the details of his operations with his superior may be limited. He may be on his own from time to time. At such times, his understanding of his commander's objectives will be critical to success, both for his wing and for the air war as a whole.

Setting

Some of the problems that concern a wing commander in wartime are universal. They apply whether the war is being fought on home territory or in a foreign land. They apply to both US Air Force and Soviet air force wing commanders. Other things are unique to a specific location and set of circumstances. This article is based upon an overseas fighter wing with one squadron under the command and control of the North Atlantic Treaty Organization (NATO) and another assigned to NATO, with two more dual-based squadrons assigned under the US commitment to Germany and to our other NATO allies. It discusses some unique circumstances, but given the range of US national commitments, similar circumstances could apply to any wing commander at any time.

The Wing Commander's Attention

A wing commander must divide his time between sustaining his base of operations and flying the air task order. Before he even reads the tasking messages, he needs to know:

- The status of the defense of the base against both indigenous and Warsaw Pact threats. Warsaw Pact threats include both attacking aircraft and special purpose forces (SPETSNAZ).

- The status of his aircraft, including the ability to rapidly turn aircraft to meet follow-on tasking.

- The status of his supply support, particularly the ability to sustain combat operations. This includes munitions.

- The status of his personnel in terms of numbers, health, and well-being, including their ability to operate in a chemical, biological, or nuclear environment.

Although sustaining the base of operations is a national responsibility, it is not exclusively the responsibility of the wing commander and his parent service. In the Fourth Allied Tactical Air Force (FOUR-ATAF) area of Central Europe, it also involves the US Army, German forces provided under Wartime Host Nation Support (WHNS), and German reserve forces of the German Territorial Southern Command (GTSC).

Protecting the Base

The commander of the Allied Air Forces, Central Europe (COMAAFCE), who provides the air component for NATO's Central Region, is planning on flying 3,000 sorties a day in wartime.³ The Warsaw Pact will attempt to counter this effort. The enemy will be particularly eager to attack command and control points and what he believes to be nuclear-capable assets. The 3,000 sorties a day will have to be generated by less than COMAAFCE's full force of aircraft. The first step in flying those 3,000 sorties is to ensure that each base is as well protected as possible. Base protection falls into four major categories: air defense, ground defense, passive defense, and recuperation—sometimes referred to as BRAAT (base recovery after attack).

The air defense of a base involves the integration of intelligence and early-warning information. Intelligence should be able to provide warning of the impending launch of Warsaw Pact air attacks. We are also well warned about key targets because there can be little doubt that the enemy will come for our key command and control nodes and our nuclear capability. Wing commanders supplement airborne

early warning (AEW) and ground-controlled intercept (GCI) information with approach control and airfield surveillance radars. All information is fed to the wing's mission director, who makes the decision to give air defense artillery (ADA) units free fire. The wing commander may also launch base combat air patrols (base CAPs). If communications are severed, he may elect to both CAP his base and attempt to establish communications by launching one or more elements of ready fighters. He must temper his action based upon the overall situation. The air defense sector operations center is fighting the defensive counterair part of the campaign, and any aircraft the wing commander launches on his own are sorties not immediately available to his superiors for other missions.

The defense of the base against ground threats is, in existing theater doctrine, shared between the chief of Security Police and the host nation, notwithstanding US Air Force/Army agreements. The GTSC is responsible for all defensive actions outside the base proper. Whoever has the mission, the wing commander will still be ultimately responsible for the decision to uncover his aircraft and people. The presence in the area of a SPETSNAZ unit, whose primary mission will likely be intelligence collection, will have to be considered by the wing commander. He will be as hesitant to expose his aircraft outside their semihardened aircraft shelters (HASs) when there is danger of attack by sappers or mortar units as he will be for an air raid.

After any attack, recovery is the order of the day. Our potential enemy's chemical capability and our lack of a credible retaliatory capability to deter chemical use force the wing commander to consider that each attack on his base will include chemicals until proven otherwise.⁴ Thus, the enemy gains a measurable advantage from the outset in that base personnel suffer degraded performance from wearing chemical protection clothing. As soon as

possible, sortie-producing personnel must be relieved of their chemical defense masks, hoods, and gloves. Minimal time in full chemical gear will result in more ordnance on target and with better accuracy and fewer losses.

Chemical attack is not the only major problem; bomb damage needs to be quickly assessed and unexploded ordnance found. An essential part of the recovery process is determining a workable runway, or minimum operating surface, and necessary taxi routes. Besides aircraft operating surfaces, critical utilities and facilities need to be restored. The spring 1985 air base survival demonstration (Salty Demo) at Spangdahlem AB, Germany, greatly added to our knowledge of these vital operations.⁵

Maintaining the Logistics Base

Although it is not the most glamorous of the wing commander's duties, maintaining the logistics base is perhaps the most critical. In a war in Central Europe, the ability to stop the Warsaw Pact land forces at or near the inter-German and Czechoslovakian borders is only part of the equation. That effort must be sustained by logistics. The Supreme Allied Commander, Europe (SACEUR) has on more than one occasion stated that the lack of a sustainable conventional capability will result in his request for the release of nuclear weapons "fairly quickly."⁶ No wing commander wants to accelerate the slide toward the employment of nuclear weapons, even on a limited basis.

Supply. The United States has a system for maintaining supplies at a base for 30 days of combat. However, the bins are usually not full, making support from the United States critical. Another critical factor will be the movement of supplies within the theater. In United States Air Forces in Europe (USAFE), the European Distribution System (EDS), a computer-based network for knowing what parts are where, will help. EDS movement is by

overland transportation, normal Military Airlift Command (MAC) operations, and the dispersed operations of the C-23 aircraft of the 10th Military Airlift Squadron. The concept is universal in application, and Pacific Air Forces (PACAF) is developing its own version.

But supply is more than just moving parts around. It also includes obtaining them. Interoperability allows the sharing of parts among allies and within air forces. Air National Guard F-4Ds in Europe are as likely to obtain a spare part from the German air force as from the United States. The F-16C uses certain parts in common with the F-111. Exploitation of these various sources of supply will be critical.

Sustaining the force also includes the smart use of cannibalization to sustain the maximum number of combat-ready aircraft such as the F-15 and F-16. For some aircraft, the cannibalization rate may be as high as 12 to 15 items per 100 flying hours. Knowing the smart use of cannibalization will be critical. Although cannibalization is not encouraged in peacetime, it needs to be practiced now so that maintenance managers will know what they can cannibalize and what they cannot. For the wing commander, his most important actions in this regard are in peacetime, when he encourages the maintenance leadership to develop initiative and a can-do spirit and when he ensures that the flying schedule is as much a logistics training tool as it is an operations training tool.

Munitions. The munitions motto "Ammo makes the mission" is not far off the mark. Target destruction starts in the munitions storage area. Our stocks of preferred munitions, particularly missiles, are limited, but there are a large number of iron bombs available for use. Our more modern aircraft actually make these older munitions quite effective. The trick is to know when to use what munition. At present, from a cold start it takes four hours to prepare and deliver a specific munition from the conventional ammunition storage area. A healthy reserve of munitions

can be achieved soon after starting buildup. If the production line is interrupted to introduce a new munition or fuze, up to two hours might be required to provide a usable number of the new munition.

Maintenance. Those bases open and operating will have to make up the shortfall in sorties from those bases closed by enemy action. Maintenance can generate a large number of aircraft for mass launch and then regenerate those aircraft several hours after recovery for a second launch, or it can generate an even larger number of sorties over a long period of time, working at an efficient production rate. Maintenance cannot efficiently do both kinds of launches at the same time in a single aircraft maintenance unit (AMU), although mixed operations on a single base are possible using different AMUs. While the massing of air power is less efficient in terms of maintenance production, it will be absolutely mandatory until a favorable air situation can be achieved. Once air superiority is achieved, the air commander can determine which method of employment best meets his objectives—mass launches or a smooth and continuous flow of aircraft sorties.

When aircraft must be generated for mass launches, and 20 aircraft per AMU is not an unreasonable number for the first such mass launch, aircraft will have to remain dispersed and sheltered as long as possible for protection. This means that maintenance operations will be spread out. Command and control of the maintenance force will become more difficult and can easily break down if radios and HAS telephones both go out. Supervisors will have to be constantly on the move. Aircraft-dedicated crew chiefs will have to be given specific plans, with timelines and goals. Status reporting will be very important, as generation times will provide little allowance for problems. A delay in reporting will result in unnecessary management actions being taken, thus increasing inefficiency.

The production of sorties requires a force dedicated to turning aircraft as quickly as possible. When a smooth-flow program is being used, returning aircrews report their maintenance status and are directed to the area where they can be immediately turned to fly another mission, or sent to an area where repairs can be quickly made, or sent to a "hard-broken" area for extensive maintenance. Such a sortie-production program allows maximum benefit to be gained from the easy cannibalization of aircraft such as the F-16. The quick replacement of a line replaceable unit (LRU)—often in less than an hour—will allow an aircraft to fly several sorties a day. Those aircraft that are hard broken will provide a ready source of parts for those that are quickly repairable. The turning of combat aircraft can be speeded by ensuring that what is needed is in place before the aircraft arrives. The key factors are fuel and munitions.

Today fuel is available only from fuel trucks or from hot-pit refueling. Although hot-pit refueling is more efficient in terms of fuel, manpower, and trucks, it does expose the aircraft to attack for up to 10 minutes during the refueling process. On mass launches and recoveries, only a few aircraft can be refueled on the hot pits. While those aircraft are using the pits, some 30 to 40 aircraft may be recovered; these will have to be sent to their HASs for protection and then be refueled by truck. Until refueling is available within individual HASs, fuel trucks will still be vital to generating fighter aircraft.

The other key factor in the turning of aircraft is munitions. At present, USAFE wings are working toward providing at least two sorties' worth of munitions within each aircraft shelter. Although problems with explosive quantity and distance are being dealt with, the siting of hardstands and HASs 20 or more years ago has left commanders with problems that are too expensive to solve.⁷

Within NATO the recovery and combat turning of aircraft from other bases re-

ceives high priority. Units are tasked with having the ability to provide either "gas and go" or full combat turn capability for specific aircraft, including allied aircraft. The dedication of personnel to this program will yield maximum benefits in wartime. A full program must include operations personnel for intelligence debriefing and retasking. Besides turning fighter aircraft, the base must be prepared to handle visits from MAC aircraft. Those aircraft must be recovered, unloaded or loaded expeditiously, and relaunched immediately. Large aircraft on the ground can attract attention in that they are soft targets and, if damaged, can pose a major base recovery problem.

A final area of note is the renewed interest being shown in repair of aircraft that have been battle damaged. Aircraft battle damage repair (ABDR) has recently come into its own. The development of techniques to assess damage and kits to provide the expedient repair of damage from sheet metal to aircraft canopies is moving along smartly. Development of an effective ABDR program is one more step by the wing commander to ensure that he can sustain the conventional war.

Sustaining People

Without people the Air Force does not fight, and only by getting the maximum productivity out of those available will the wing commander sustain the fight. A first step in getting the maximum from our people will be to ensure they are not worried about their dependents. This means safe and efficient noncombatant evacuation. Once he has his men and women focused on the task at hand by conducting a successful noncombatant evacuation order (NEO), the wing commander must ensure that his people can survive repeated enemy attacks and still operate. Survival must include survival in a chemical or radiological environment. A key step to base recovery after attack will be to determine when personnel can remove their hoods, masks, and gloves.

The War in the Air

This article has been a long time getting around to the war in the air. However, flying and fighting come only after the home base is secure and able to logistically support air operations.

The Commander's Objectives

The wing commander needs to know what his superiors in the chain of command have as their objectives. When that is known, he can best contribute to the achievement of those objectives. Commanders are aware that their subordinate commanders need to know the objectives and that there is also the reciprocal need for balanced information on wing capabilities to flow upward. The commander of FOURATAF is very specific on this point when talking to his wing commanders. On his visits to each of his subordinate commanders, he makes a point of encouraging them to keep him abreast of their individual unit capabilities. He wants the assessment of the wing commanders with regard to the ability of their wings to change roles. He wants to know what limitations they face that might influence future tasking.

The Planning Cycle

The air planning cycle consists of apportionment of air effort, allocation of air assets, and the tasking of units to achieve the commander's objectives. In NATO's Central Region the planning cycle starts with commander in chief of Allied Forces Central Europe (CINCENT) formulating his theater strategic objectives, which are then translated into objectives for his air and land component commanders. The air component commander, COMAAFCE, supports those objectives by providing direction to each of his Allied Tactical Air Force (ATAF) commanders and by his daily force allotments.

Once the direction from COMAAFCE is received, the ATAFs apportion and fur-

ther allot their forces. Within FOURATAF three different message types are used to provide direction to the wings. The first is an ATAF message to allied tactical operations centers (ATOCs), sector operations centers (SOCs), and wings that provides guidance for the upcoming day and general guidance out to 96 hours. This ATAF initial planning message, which is released early in the evening, lists, when possible, targets by reference to a desired mean points of impact (DMPI) catalog. The DMPI catalog is a recent innovation and a step forward in planning. It allows FOURATAF to identify a desired outcome by reference to a DMPI catalog number. This number lists a target, the desired point of placement of ordnance, and the required ordnance and number of sorties to achieve the desired probability of damage. Several hours after the ATAF message, the ATOCs release their air task orders (ATOs) for the next day. These are evolved from the proposed program given the previous day, taking into consideration changed circumstances such as aircraft losses. Finally, about three hours later the first of the air task messages (ATMs) arrive from the ATOCs. The ATMs contain the DMPIs, along with times on target and the final decision as to the number of aircraft to commit. Although the DMPI catalog is a major step forward in ordering attacks against known and fixed targets, mobile targets still require individual and timely treatment. For mobile targets, the ATMs may arrive at any time.

Timeliness is the key to successfully executing the air plan. To ensure timely execution of the initial phases of the counterair and air interdiction campaigns, DMPI assignments are provided in peacetime through specific plans. Thus, to execute a given option, a unit need only be told the execution time and what external support will be provided. Target folders are predrawn and all that needs to be done is to load the aircraft, to brief the aircrews, and to review the target folders. As campaigns evolve and intelligence provides

status updates, there is a need for more ad hoc planning. This adds time to the planning cycle.

The wing commander hopes to receive his ATOC tasking message by midnight for an early start on the mission day. For immediate tasking, he hopes to receive the ATM three hours before the required take-off time. If communications are up and the headquarters staffs are not bogged down with last minute changes, timely receipt should be no problem. If communications are down, the tasking must be obtained in other ways. For bases close to an ATOC, the use of a runner in a staff car is in order. Another option is the use of an aero club aircraft. In any event, the day's tasking must be in the hands of the wing planners, the "frag shop," by 0300 local. The limiting factor here is not the production of aircraft sorties but the planning of the mission and the loading of the correct munition.

Mission Planning and Mission Integration

With the ATM in hand, the mission planners get to work, operating in parallel at the wing operations center (WOC) and the squadron operations centers. This redundancy in planning allows errors to be caught and it also provides continuity should enemy attacks damage the operations center of either the wing or the squadron. While less efficient in terms of manpower and equipment, this redundancy increases the probability of launching aircraft soon after an attack.

The key person in mission planning is the head of the frag shop. It can be someone from intelligence, from plans, or from the weapons shop. It has to be someone who thinks fast, knows the plans, and feels free to tell the wing commander that there is a better way. The selected individual must bring the different disciplines together to ensure that the tasking is met. When the tasking cannot be met, this individual must provide sound advice to the

wing commander as to what, if anything, can be done to meet the tasking objective. The person must give rhythm to the frag shop and ensure that results are produced quickly and accurately.

Intelligence

A key factor in fighting the war will be intelligence. Major advances in the fusion of intelligence have occurred over the last decade. In Europe a prototype real-time fusion capability, the Limited Operational Capability Europe (LOCE) system, has been running for four years.⁸ The wing commander can hope to receive the results of TR-1, E-3A, E-8A, fighter reconnaissance, Electronic Security Command (ESC), and national collection systems fused and delivered in ready-to-use form. While the quality of hard-copy photography has not improved in the last 15 years, the overall ability to provide clues to aircrews has. However, the capabilities of aircraft are pushing the limits of some target materials.⁹

At the same time intelligence products are improving by leaps and bounds, intelligence is a weak link at wing level, particularly in fighter wings. The personnel coming out of technical school are not as well prepared for their work as this wing commander would like. The computerization and centralization of intelligence functions does not improve the immediate preparation of aircrews. We must develop intelligence people who can help the aircrews. The individual operational and target intelligence officer will have to be the one to make the difference. He or she will have to convince someone a grade or two senior, 3 to 10 years older, and 5 to 50 missions more experienced that what is being briefed is of value.

Once the war starts, the wing commander must ensure that aircrews provide thorough debriefings, both among themselves and to intelligence. There is a tremendous amount we do not know about the enemy's capabilities and tactics and

about our own capabilities. Each wing must go to school at the end of the first day of combat. Tactics must be adapted to exploit enemy weaknesses and friendly strengths. No matter how good our tactics are today, we will be able to improve them between day 1, wave 1, and day 2, wave 1. Intelligence should be a major player in that improvement.

Legal and Moral Issues

A wing commander who believes he conducts his operations in a legal and a moral vacuum is mistaken. The American fighting man is not prone to the excessive use of violence. Some may comment that our society is violent, but the American military does not have a tradition of killing for the sake of killing.¹⁰ In leading our airmen in this area, we naturally turn to military law but find it contains few examples of the application of the law of armed conflict to aerial warfare. Some issues are straightforward. The wing commander is not justified in ordering his aircrews to attack other aircrews in parachutes, hospitals, or forbidden targets; and civilians are not deliberately attacked.¹¹ It is when we get into issues of proportionality that the path is not well marked. We are told by AFP 110-31 that

those who plan or decide upon an attack must, in the selection of both the place to be attacked and in their choice of weapons or methods of attack, take all feasible precautions to avoid or minimize incidental injury to civilians or damage to civilian objectives. They must refrain from launching an attack if injury or damage would be excessive or disproportionate compared with the military advantage anticipated.¹²

The pamphlet then goes on to recommend that we follow traditional military doctrines.

The wing commander is the last authority with the time and information to make informed judgments about the compliance of tasking with the rules of armed conflict,

particularly the issue of proportionality. While individual aircrews are not exonerated from responsibility for their actions, they will be extremely busy and will likely not have time to fully focus on all the potential consequences of their mission. When considering targets, the wing commander—aided by his intelligence, weapons, and legal personnel—must decide if the attack is both necessary and proportional.¹³ An example of a dilemma of proportionality is a target where the selected weight of ordnance offers only a small probability of achieving the desired effects; however, expected civilian casualties are relatively high. If an increase in ordnance will produce a meaningful probability of damage with only a minor increase in already high expected civilian casualties, the wing commander should make that point to his tasking agency. To expend sorties for little likelihood of payback and to incur high civilian casualties while doing so makes no sense in terms of warfighting or international law or morality.

Putting It All Together

If the US Air Force is to have a warfighting shibboleth, it should be this: "Employ aerospace power as an indivisible entity based upon objectives, threats and opportunities."¹⁴ There are two key thoughts contained in the quoted phrase. One is that air power must be employed as an indivisible entity. The other is that when we employ air power we must consider the objective, the enemy threat, and the opportunities available or not available.

Employing air power as an indivisible entity means that it should not be committed to the fight in "penny packets."¹⁵ The air component commander runs the air war, and the wing commander contributes by ensuring that he is able to provide massed air power when called upon. The term *indivisible entity* also means that no single wing or no single type of aircraft

will win the war. The commanders of various wings will have to cooperate.

Objectives, Threats, and Opportunities

Employing air power in terms of objectives means that objectives need to be clear and that the means of achieving those objectives must be left at the lowest possible level of air command. Objectives need to be presented in terms of results to be obtained, not targets to be attacked. The threat must always be considered. In USAFE today we are beginning to explore the given that low-level penetration is the only way to overcome enemy defenses. Every weakness in the enemy's defenses must be explored and exploited. We must look for opportunities to act; and when an opening is noted, we need to move. For example, when we can achieve part of our objective by the psychological impact of our attacks, we need to do that. The wing commander may be in the best position to determine how to integrate objectives, threats, and opportunities. The US Army, having learned from the German army, can give us some pointers on delegating responsibility for mission accomplishment to the appropriate level. The concept of mission-type orders is that the subordinate is entrusted with a mission and the assets needed to accomplish that mission. Within constraints, the method of accomplishing the mission is left to the subordinate. This delegation results in the freedom to make the best use of the people and equipment available.¹⁶ The Army's concept of mission-type orders fits neatly into our concept of objectives, threats, and opportunities.

Building Upon Realistic Training

Units stationed in the Central Region of Allied Command Europe do not normally

participate in Red Flag or Maple Flag on a routine basis.¹⁷ On the other hand, taking a four-ship flight onto a European bombing range that is barely workable develops the skills and judgment that will be important if war must be fought in Central Europe under the same weather conditions. Day-to-day flying provides a demanding scenario, with low-level navigation routes planned through one or more of the German low-fly areas, where fighter units hone their low-altitude intercept skills by attacking any fast-moving target picked up visually or on radar. The GCI sites in the area participate by providing vectors to the air defense fighters. Not only is visual lookout enhanced but so is navigation. More and more large-scale live-fly exercises are being developed for Central Region units. The US Third Air Force's "Hammer" series has built the skill of planners and aircrews to develop and execute large-package attacks and has built the skill of air defense participants to defend against such actions.

No training is as realistic as war itself. One thing that is always missing is the uncertainty of weather, weapons effects, and enemy action. This uncertainty will never be completely duplicated. The job of the wing commander is to provide training situations that will duplicate as closely as possible combat and the stresses therein. On the other hand, realistic training must not be so costly that it prices itself out of existence. During the Korean War, the US Air Force was losing more F-86s in training at Nellis AFB than it was to MiG-15s over North Korea. Were the results worth the cost? Today, with aircraft production some years showing only a small gain in fighter aircraft inventory due to mishaps, training must be both realistic and safe. The wing commander sets the tone by what he demands of himself and what he allows himself. A wing commander who indulges himself while flying, or doing anything else, encourages the same actions on the part of those who work for him. The wing commander must know his

limits and live by them. He must also know the regulations and abide by them; and when he does not know the regulations, he must set the example and ask what the rules are. Most of us with time in the service know of at least one colonel who believed himself to be above the rules. We also know the impact such an attitude had on those who worked for him, especially when his unspoken motto was "Do as I say, not as I do."

Part of realistic training is to know that a lot of realistic training does not require live flying through live defenses. The German term *Kriegsspiel*, or war games, does not just mean putting large forces on the terrain and letting them go at each other. In the original concept, it included such actions as command post exercises and even roundtable talks. Although none of us like command post exercises, they are necessary and they train the wing battle staff without idling several thousand hard-working airmen. Roundtable discussions also have a place. An hour taken "what-if-ing" a portion of a scenario will pay dividends when it is encountered in a local exercise, higher headquarters inspection, or actual combat. It will also ensure that all know the mind of the commander. The

Notes

1. The concept of the operational level of war is one that has been imported into the United States by the US Army, which picked it up from the German military. It is also a concept fully used by the Soviet Union. The operational level of war falls between the strategic and tactical levels and is most easily understood in terms of land units. The strategic level is that of the theater land component commander and his superior, the theater commander in chief (CINC). The tactical level is division and below, although sometimes a corps will operate at the tactical level. The operational level is the actions of corps and army groups. For the airman, the easiest way to think about it is to equate the strategic level to the air component commander and his overall objectives in support of the theater CINC's objectives. The tactical level is the aircraft accomplishing their assigned missions. What comes off the daily frag order is the tactical level. The operational level is the campaign level. Viewed another way, it is the broad plans for achieving theater objectives upon which the daily tasking is based. For the average aircrew, the operational level of war is the quick overview of what is going on that it

members of the wing staff and individual squadron commanders need to be prepared to respond to situations in a manner that supports the overall plan of their wing commander, who in turn is supporting his commander. The mind of the wing commander is improved by exercises and by discussion. Often a better understanding can be obtained during the latter.

Conclusion

Ultimately the wing commander is responsible for understanding the operational concepts and the tasking of his commander. He must understand his commander's approach so well that he can continue to function even when communications temporarily break down. For the wing commander, the mission assigned to him must be sacred. He must devote his whole mind and body to achieving it. If the wing commander takes this approach, his commander is free to delegate to him the maximum freedom of action. This delegation, in turn, will result in the most effective employment of air power in the Central Region of Allied Command Europe or anywhere.

Washington, D.C.

receives at the beginning of a flight briefing. For the intelligence, targeting, and mission-planning personnel of a wing it is the big picture into which they are trying to fit their part. For the airman, and for the soldier and sailor, the key air campaign is the counterair campaign. Until air superiority (freedom to operate with acceptable losses) is achieved, the air interdiction campaign and those other actions that can be grouped as campaigns—including providing air support to the surface forces, providing logistic support to all theater forces, and other actions such as special operations—cannot be accomplished, nor can surface forces benefit from freedom of maneuver.

2. Within NATO, roles for fighter aircraft are designed to help planners deal with various national commitment agreements. Examples are the all-weather interceptor (AWX) for radar and radar missile-equipped aircraft (F-15), clear-weather interceptor (CWI) for fighters with a radar but no radar missile (F-16), and fighter-bomber attack (FBA) for fighters with a conventional air-to-surface capability (A-10). Several fighters are committed to NATO in more than one role.

3. Speech by Gen Charles L. Donnelly, Jr., COMAAFCE, to the Air Force Institute of Technology, 1 August 1985.

4. Gen Bernard Rogers has stated: "I have always believed that all we need to do is start manufacturing the binary chemical weapons in the United States and stockpile them there. There is no need to deploy binary weapons to Europe. Beginning production would send two messages to the Soviets. One, that we are serious about being prepared to retaliate with reliable weapons systems, which helps our deterrence. Additionally, it gives us greater strength at the negotiating table." Robert Hutchinson, "NATO Ministers 'Can't abdicate CW Decision' Says SACEUR," interview with Gen Bernard Rogers in *Jane's Defence Weekly*, 27 April 1985.

5. The Salty Demo exercise has been exhaustively documented. Current OPRs include USAFE EUROPS/DESP (Lt Col George Solli) and AFSC's AD/YQ.

6. From modified excerpts of responses by Gen Bernard W. Rogers, Supreme Allied Commander Europe, in the interview with Mr Robert Hutchinson cited above, and in *Ace Output*, July 1985, published by the Public Information Office, Supreme Headquarters Allied Powers Europe. In a speech to the SHAPE Staff on 5 October 1984, General Rogers stated: "I am charged by my political authorities with requesting the release of nuclear weapons before we lose the cohesiveness of our defense—cohesiveness defined as deep penetrations on a broad scale. Under current conditions, I have to make that request under that guidance fairly quickly—in days." General Rogers then went on to talk about contributing factors, but he said that "lack of sustainability is the main one."

7. As units change aircraft and roles, they find that they cannot comply with current safety regulations and meet wartime tasking. Waivers are required and work-arounds are necessary to ensure munitions are as close as possible to the point where they will be loaded on aircraft. Quantity and distance restrictions will not apply in wartime. In fact, the danger of losing more than one aircraft to an explosives mishap will increase. This is not to say the wing commander should be unwilling to accept risk. What he needs to do is understand the risk and accept it intelligently. Whenever possible, safeguards must be found, and when risk is accepted for a time and a location, the risk should not extend, by an explosive train, throughout the flight line.

8. The LOCE system combines, correlates, and displays multisource intelligence information, including such real-time sensors as those contained in the TR-1. Information from LOCE is available to both air and land commanders, both in US national and NATO channels.

9. At this time, the standard aircrew maps (TPC/1:500,000, JOG-A:1:250,000 and 1:50,000) used for training on and near Bardennas Realis Bombing Range in Spain are not sufficient to allow high confidence in picking off coordinates. Aircrews using the F-16 loft mode of delivery, after obtaining a rough range and bearing from the visual identification point to the target, refine those numbers off actual bomb plots. This lack of accuracy will be a major limitation if it also applies to target materials in potential war zones.

10. An incident during the Vietnam War will illustrate. In late 1966 and early 1967, 366th TFW intelligence personnel noted that the enemy appeared to be storing supplies in the village on the south side of the Mui Lay ferry in North Vietnam. One evening the village was given as the alternate target for the night air interdiction missions. It was not until after midnight that a flight leader was willing to take the village as an alternate target. When the village was attacked, it produced secondary explosions well into the daylight hours. While the intelligence personnel were correct, the aircrews

were quite frank about their views. They did not like the idea of bombing a village, even if it was in North Vietnam and even if the intelligence personnel assured them that it contained the very same supplies they spend every night looking to destroy.

11. Aside from AFP 110-31, *International Law—The Conduct of Armed Conflict and Air Operations*, and AFP 110-34, *Commander's Handbook on the Law of Armed Conflict*, three other items of interest in this area come to mind. AFP 200-17, *An Introduction to Air Force Targeting*, dated 11 October 1978, provides a reasonably good layman's discussion of the issue. At a higher level of abstraction are William V. O'Brien, *The Conduct of Just and Limited War* (New York: Praeger, 1981), and Ronald Schaffer, *Wings of Judgment: American Bombing in World War II* (New York: Oxford University Press, 1985).

12. AFP 110-31, 5-10, para 5-3c(2)(b).

13. AFP 110-31, 6-1, para 6-3a.

14. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, Department of the Air Force, 16 March 1984, 2-10.

15. Air Chief Marshal Sir Arthur Tedder, RAF, made popular the phrase regarding committing air in "Penny Packets" during his early days as AOCINC in North Africa and the Middle East during the early days of World War II. As an independent air commander, he had to meet the needs of his opposite numbers in both naval and land forces, each of which wanted units committed full-time for their operations. Tedder's successful resistance ensured the effectiveness of the RAF in the Mediterranean Theater and provided the basis upon which the air war was subsequently fought after the United States entered the war.

16. The concept of mission-type orders stems from German military tradition as far back as Helmut von Moltke. The concept is designed to give the greatest freedom to the person who best knows the situation. A premium is placed upon initiative at the lowest level. This concept takes advantage of what the US military prides itself on—the initiative of the individual soldier, sailor, or airman. The following general criteria apply to mission-oriented command and control at all levels.

1. The Superior

- determines the objectives to be achieved and to this end assigns a clearly defined mission.

- ensures that the forces, resources, and the authority required to accomplish the mission are available to the subordinate.

- lays down details only to the extent necessary for coordination within a broad scope. These details usually apply to the interaction with such forces and resources not subordinate to the person executing the mission or not immediately available to him.

2. The Subordinate

- has extensive latitude in the way he executes the mission. He can use his own initiative to develop his operation plan and determine the necessary details. He has full discretion and freedom of action.

- remains, whatever he may do, committed to the substance of his mission and the concept of operations of the higher level of command. In carrying out his operation, he never forgets the goals his superior is trying to attain. The Germans would say, "The mission is sacred to him."

- combines obedience with thinking in broader terms and a willingness to assume responsibility.

17. US Air Force and Canadian live-fly training exercises.

Fighting From the Air Base



SINCE THE 1960s, Soviet military doctrine has focused on the ability to win a theater war at the nonnuclear level.¹ The Soviets believe this goal is feasible if their theater offensive has surprise, speed, concentrated effort, aggressiveness, cooperation of arms and services, and depth.² One of the most important components of such an offensive is what the Soviets call the air operation.

The air operation derives its importance from respect that the Soviets have for our technology and particularly for our air capabilities. They realize how much our ground forces depend on protection and support provided by air power. Similarly, they are well aware that Soviet ground forces also depend heavily on support provided by air power to attain and maintain a high-tempo advance. As a result, the Soviets realize that their ability to conduct a successful theater offensive depends on whether their air operation is able to neutralize quickly our theater-based air capabilities.³ Now it appears that Soviet military leaders are increasingly confident that a successful air operation is possible. Their confidence is due largely to recent technological developments, particularly in surface-to-surface missiles, which these leaders believe have "revolutionized" warfare.⁴

If a theater war occurs with the Soviets, it is very likely that they would attempt to achieve surprise by providing us with as few clear warning indicators as possible of a pending attack. One way they might try to do this is by beginning their air operation suddenly with a barrage of surface-to-surface missiles delivering improved con-

ventional munitions (some possibilities are mines, bomblets, incendiaries, and fuel-air explosives) and chemical munitions against our time-critical air defense capabilities. These missile attacks would be required to disrupt our air defenses only long enough to prevent us from generating and controlling the sorties needed to defend effectively against the waves of Soviet aircraft that would begin attacking within hours after the first missile impacts.

At the same time that they would begin launching missiles, the Soviets would also begin the more overt actions needed to generate large numbers of sorties for their follow-on wave air attacks. Accompanied by electronic jamming, their wave air attacks would be the main method for delivering intense blows to our air bases and other vital theater air installations. However, the Soviets' air operation would also include attacks by special purpose forces (SPETSNAZ), as well as airborne, airmobile, and even amphibious assault forces against air bases, communications nodes, radars, and headquarters. The Soviets believe that the use of this wide variety of methods in their air operation also increases their chances of confusing and ultimately overwhelming our defenses, preventing us from regaining the initiative in the air.⁵

As this review shows, rather than trying to beat us in the air, the Soviets think that the key to defeating our Air Force is to take the fight to our air bases and other theater installations. By preventing us from generating large numbers of timely and effective sorties, they will ensure that we have little opportunity to use our superior training and technology to fight in the air. It is because of this possibility's immense dangers that we must reassess our current capability to fight from the air base, specifically to defend the base while continuing flying operations despite enemy attacks.

We begin our reassessment by briefly reviewing where we have been. In World

War II we first became concerned with defending the air base when we saw how the Germans and Japanese made air bases a key objective in their surprisingly successful offensives. As a result, our early war plans called for 296 air base security battalions, but by 1943 the threat had failed to materialize (except in China in 1944–45). So we began to inactivate units already formed. At the end of the war, the little air base defense capability we had was lost.⁶

When the Air Force became a separate service, air base defense remained an area of concern; but because of the lack of firm guidance regarding service responsibility, we continued to have little capability until the Korean War. During that war, the Air Force developed a doctrine and limited defense capability by organizing and equipping airmen not directly involved in flight operations like infantrymen, using the Air Police as a cadre. However, as in World War II, our air bases were not seriously threatened. And so, with a reduced postwar budget, the Air Force was especially hard-pressed to justify why it needed more manpower to defend our installations than the other services needed to defend theirs. The result was a decrease in manpower and a lower priority for air base defense.⁷

Events in Vietnam again restored attention to the need to defend the air base. Gen Hunter Harris, commander in chief of the Pacific Air Forces (CINCPACAF) in 1965, noted that US air bases in Vietnam lacked reasonable protection and that there was a reduced likelihood of dedicated Army protection. He recommended that the Air Force adopt an approach similar to that of the British Royal Air Force, where all airmen had defense duties under the training and leadership of a cadre—the Royal Air Force Regiment. Although his recommendation was not accepted, the Air Force was forced to assume responsibility for internal air base defense when our Army units were used offensively instead of being tied down in passive air base defense duties. To meet this responsibility, we expanded



Personnel and equipment performing rapid postattack repairs of runways present a vulnerable target for a surprise attack by missiles, aircraft, or SPETSNAZ.

The protective equipment needed to survive in a chemically contaminated area adds to individual fatigue, degrading performance.



our security police authorizations. Despite this action, our ability to fight from our air bases remained marred throughout the war by poor training policies, as well as by gaps in our doctrine that allowed new bases in Vietnam to be sited and constructed without consideration for making the air base more defensible.⁸

After Vietnam our emphasis on fighting from the air base did not decrease as it had after World War II and Korea. This was because the successful Israeli attacks in 1967 on Egyptian air bases, Warsaw Pact measures to harden their own air bases, and the growing Soviet threat all showed us the importance of making our air bases more survivable. Initially we devoted much of our energy to building aircraft shelters, but over time our effort was broadened. Now we have reached agreements with our allies and the Army that clarify responsibilities for air base defense. The Royal Air Force Regiment will provide air defense protection for US bases in Britain, and a similar agreement with the Federal Republic of Germany will apply to our bases there.⁹ Elsewhere the Army has begun identifying forces that will be dedicated to providing ground and point air defense protection for our air bases.¹⁰ In still another important action, the Air Force conducted a comprehensive exercise to demonstrate the air base survivability capability of a generic Air Force tactical fighter wing. This exercise, called Salty Demo, took place in the spring of 1985 at Spangdahlem Air Base, Germany.

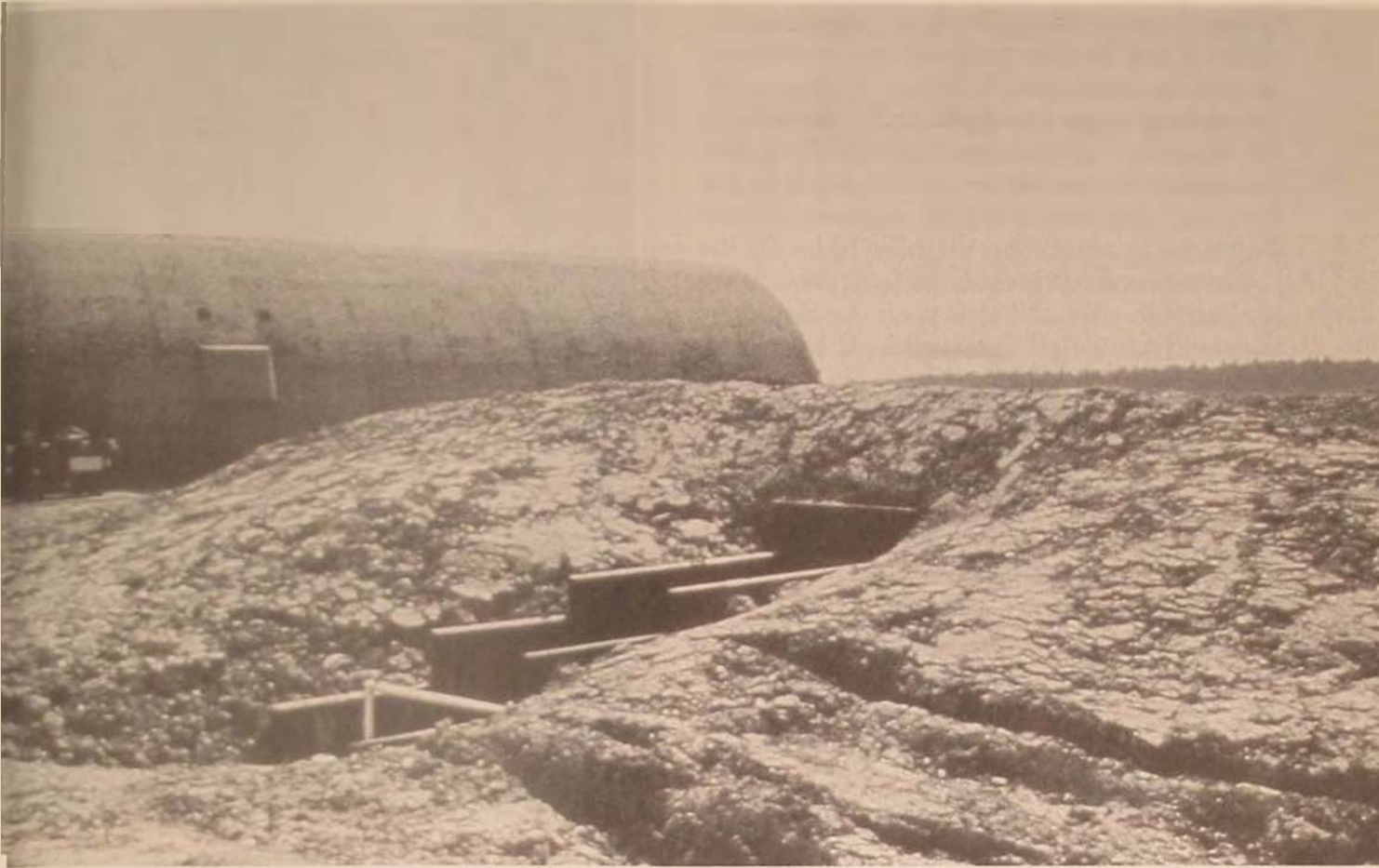
Profiting from this exercise and other activities, in December 1986 the Air Force published Air Force Regulation 360-1, *Air Base Operability Planning and Operations*. This regulation summarizes our current program for fighting from the air base. It outlines required organizational structures, assigns basewide responsibilities for planning and training, and provides guidance for carrying out the air base operability program.

In the category of active defense measures, the regulation establishes planning

factors for both air and ground defense. It makes the wing commander or equivalent responsible for local ground defense and puts forces of other services assigned to local ground defense duties under his control. To reduce the ability of an enemy to identify desired targets and to minimize damage from enemy attacks, the regulation requires the implementation of a variety of passive defense measures, including hardening, dispersal, redundancy, camouflage, concealment, deception, and nuclear, biological, chemical (NBC) defense. After an attack, it will be vital to assess and repair damage rapidly in order to return the air base to maximum operational status as quickly as possible. Under base recovery, the regulation establishes the organization and policy needed to accomplish these tasks.

Yet, despite the great progress we have made in planning and programming to improve our ability to fight from the air base, much more still needs to be done. We cannot afford to wait until after we develop and procure the aircraft that fly from the air base to begin thinking about the requirements for fighting from that air base. Instead, we must recognize that a complex interrelationship exists between aircraft and air base design and that the characteristics of one often greatly influence the combat capability of the other. Full recognition of this interrelationship would result in air base operability considerations receiving the same degree of attention as in-flight performance when we design our aircraft.

The requirement for the advanced tactical fighter to have short takeoff and landing (STOL) and rough/soft field capabilities is evidence that the Air Force is now aware of the need to address air base operability considerations during an aircraft's design phase. Unfortunately, the low priority the Air Force currently assigns to developing aircraft with short takeoff and vertical landing (STOVL) capabilities is cause for concern, given the growing possibility that Soviet air base at-



Concrete and earth provide necessary protection for people and equipment at today's theater air base.

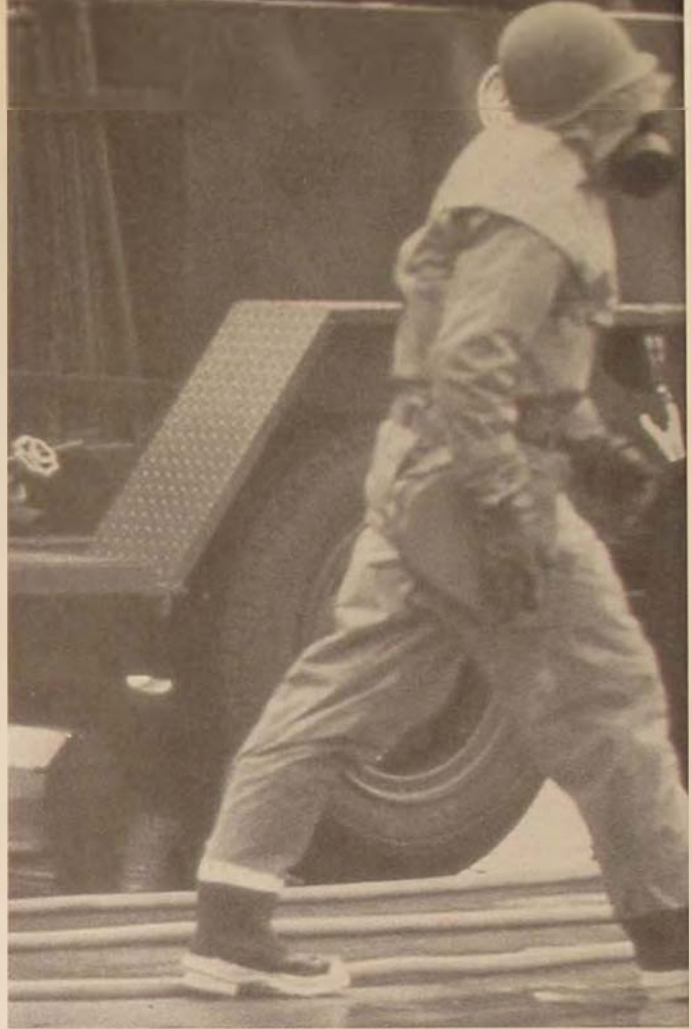
tacks would include the use of chemicals and mines. If either of these are used, particularly in combination with immediate-effect munitions, it is very likely that the only way to recover and reestablish effective, high-sortie-rate operations will be to change operating locations, moving to an

uncontaminated area to generate sorties. Compared to STOL, STOVL technology makes such movement far more feasible because of greatly decreased operating surface requirements. STOVL technology would also significantly enhance our ability to use mobility, concealment, and de-

ception measures, which in turn would make it much more difficult for an enemy to find an operating location. And even if an enemy is able to find such a location, the increased dispersion that STOVL technology makes possible could make the operating location a much less lucrative target.¹¹

Since we must be able to fight from our air bases in a theater war with the Soviets, we need to design and build all overseas theater bases as field fortifications, thereby making combat effectiveness, not peacetime operating efficiency, the only acceptable criterion. Furthermore, this criterion must apply not only to facilities directly supporting flight operations but also to mess and medical facilities and quarters. Besides giving attention to hardening, dispersal, camouflage, and concealment, we also need to design our buildings so they can be easily defended by including weapon positions that are sited to assure mutually supporting fields of fire.

Training is the area where we need to





Wartime operations at a theater air base will be very similar to Army operations. These people laying mats and repairing cables require the same skills and courage as Army combat engineers.

make our greatest effort. While we can hope the Army or host-nation forces will be available to defend our air bases, we cannot afford to depend on them. As we saw in Vietnam, theater commanders in wartime may become reluctant to tie down combat troops in defensive roles. Nor can we afford to field our own army of security police whose sole duty is air base defense. Instead, we need to follow Winston Churchill's advice and make the theater air base the "stronghold of fighting air-ground men, and not the abode of uniformed civilians in the prime of life protected by detachments of soldiers."¹²

This means that, like the Army and Marine Corps, we must demand that everyone in the Air Force who serves or could serve in a theater position, officer and enlisted alike, achieve competence in the use of weapons, medical aid, and field craft. Requiring competence in these traditional military skills not only will significantly improve our ability to fight from the air base, it will also make an important contribution to esprit de corps by removing all doubts some may have as to whether the Air Force is a combat organization or a nine-to-five "blue suit" business.

Given the nature of the threat, we should not limit weapons training to small arms but also must require that some personnel be capable of using heavier weapons like anti-aircraft and antiarmor weapons and mortars. Assignment of specific weapons in a theater would be based upon individual and unit roles in the air base's defense plan. By arming everyone in uniform, installation commanders would be able to make more effective use of their limited number of security police. Besides serving as cadre, these highly trained personnel could also be used for more demanding active defense roles such as patrolling and counterattacks.

We must recognize that fighting from an air base that is attacked by missiles and large numbers of aircraft, let alone SPETSNAZ and airborne forces, will result in casualties and in some cases very heavy

casualties. For example, a sudden Soviet missile reattack might catch many personnel in the open as they perform rapid runway repair activities. In such a situation, we cannot count on there being enough specially trained medical personnel readily available to treat all the wounded immediately. Therefore, if we are to avoid having many of our wounded die unnecessarily, everyone must be required to know basic first aid so they can care for themselves or others until medical personnel are available.

Not all casualties will involve physical wounds. Many will be psychiatric casualties of what we more commonly call battle fatigue. According to Army experience, intense combat, indirect fire, inadequate sleep, and surprise (conditions that are likely to be present during fighting from the air base) all lead to psychiatric casualties. In 1973 the Israeli military experienced 30 psychiatric casualties for every 100 who had physical wounds. They also found that if these psychiatric casualties are not correctly treated, they will not be able to return to combat and will often be chronically disabled.¹³ Given this threat, we need to take the same professional approach to the unique psychiatric dangers of war that we now take, through physiological training, to the dangers associated with flying. Therefore, to reduce the number and severity of psychiatric casualties, all commissioned and noncommissioned officers in leadership positions, as well as all medical personnel, need to be trained to know what causes battle fatigue, what its symptoms are, how to prevent it, and how to treat it.¹⁴

In addition, like the Army we must be

prepared to reconstitute those units that experience heavy casualties. This means we must determine ahead of time what losses require what kind of actions. We need to decide whether we will replace individuals or units and then make appropriate plans.

Currently most Air Force personnel at an air base rely on others for food and shelter. However, the destruction that will occur while fighting from the air base will result in many of these services being interrupted or even terminated. Restoring these services will not have as high a priority as assuring flight operations. Therefore, Air Force personnel must be trained in field craft and be appropriately equipped so that even if fighting deprives them of heated shelters with running water, electricity, food, and other amenities that we are accustomed to in peacetime, their fighting performance will not be unnecessarily impaired.

Clearly, preparing to fight from the air base requires changes that will not be popular with some. They will argue that money is better spent in other areas or that we cannot afford to make more demands on our already limited amounts of training time. We must realize that these views are shortsighted because they are a product of our past experience when we needed little capability to fight from our air bases in order to fight in the air. Unfortunately, the threat we face today is dangerously different. As a result, success in a future theater war, particularly one with the Soviets, is likely to depend on whether we can make significant changes in our priorities by putting fighting from the air base on an equal plane with fighting in the air.

Maxwell AFB, Alabama

Notes

1. For a detailed discussion of this development, see John G. Hines, Phillip A. Petersen, and Notra Trulock III, "Soviet Military Theory from 1945-2000: Implications for NATO," *Washington Quarterly*, Fall 1986, 81-137; and Mary C. Fitzgerald, "Marshal Ogarkov on the Modern Theater Opera-

tion," *Conflict Quarterly*, Summer 1986, 39-58.

2. C. N. Donnelly, "The Development of Soviet Military Doctrine," *International Defense Review*, December 1981, 1596.

3. Phillip A. Petersen and Maj John R. Clark, "Soviet Air and Antiair Operations," *Air University Review*, March-

April 1985, 36-54.

4. Brig John Hemsley, "The Influence of Technology upon Soviet Operational Doctrine." *RUSI*, June 1986, 25; and Dennis M. Gormley, "A New Dimension to Soviet Theater Strategy." *Orbis*, Fall 1985, 537-69.

5. Petersen and Clark, 42-49.

6. Roger P. Fox, *Air Base Defense in the Republic of Vietnam, 1961-1973* (Washington, D.C.: Office of Air Force History, 1979), 2-4.

7. *Ibid.*, 4-7.

8. *Ibid.*, 8-9, 25-28, 63.

9. Giovanni de Briganti, "The Defense of NATO's Airbases." *Armed Forces Journal International*, June 1985, 144.

10. Col Charles D. Cooper, "Joint Force Development—Wave of the Future?" *The Retired Officer*, October 1986, 19.

11. For further discussion of STOVL technology and air base survivability, see John W. R. Taylor, "Jane's Aerospace

Survey, 1987." *Air Force Magazine*, January 1987, 58-59; Lt Col Price T. Bingham, "Air Base Survivability: An Essential Element of Theater Air Power," *Air Force Journal of Logistics*, Winter 1987, 2-5; "Air Base Survivability and V/STOL Aircraft: A Gap in Air Force Doctrine?" *Air University Review*, January-February 1986, 51-57; and "Improving Force Flexibility Through V/STOL," *Air University Review*, January-February 1985, 72-87.

12. Winston S. Churchill, *The Second World War*, vol. 3, *The Grand Alliance* (Boston: Houghton Mifflin Co., 1950), 776-77.

13. Lt Col Gregory Lucas Belensky, USA; Lt Col Shabtai Noy, Israeli Defense Force; and Maj. Zahava Solomon, Israeli Defense Force, "Battle Stress: The Israeli Experience." *Military Review*, July 1985, 29-30.

14. Maj Greg Lande, "Emotional First Aid," *Infantry*, November-December 1986, 40-41.



SCORES OF PILOTS, CLOUDS OF PLANES

WARREN A. TREST

FROM THE heights of today's aerospace industry, it is almost humbling to look back just 70 years ago to when American pilots were fighting their first air battles in the open cockpits of borrowed planes. Unweaned when we entered the First World War in 1917, the US Army's fledgling air arm had only a handful of assorted flying craft, none of which was worthy of combat. Until US industrial furnaces were cooking at wartime heat, the newly formed American Air Service was forced to borrow combat planes and know-



how from our Allies—the British, the French, and the Belgians.⁶

When war came to Europe in 1914, the United States had already fallen from the pinnacle of Kill Devil Hill, where the Wright brothers had first mastered powered flight, to the low rung of leadership in military aeronautics. When asked the reasons for this 50 years later, early air pioneer Maj Gen Benjamin D. Foulois attributed it simply to the lack of congressional funding. From the Army's acceptance of a \$25,000 bid in 1908 to pro-

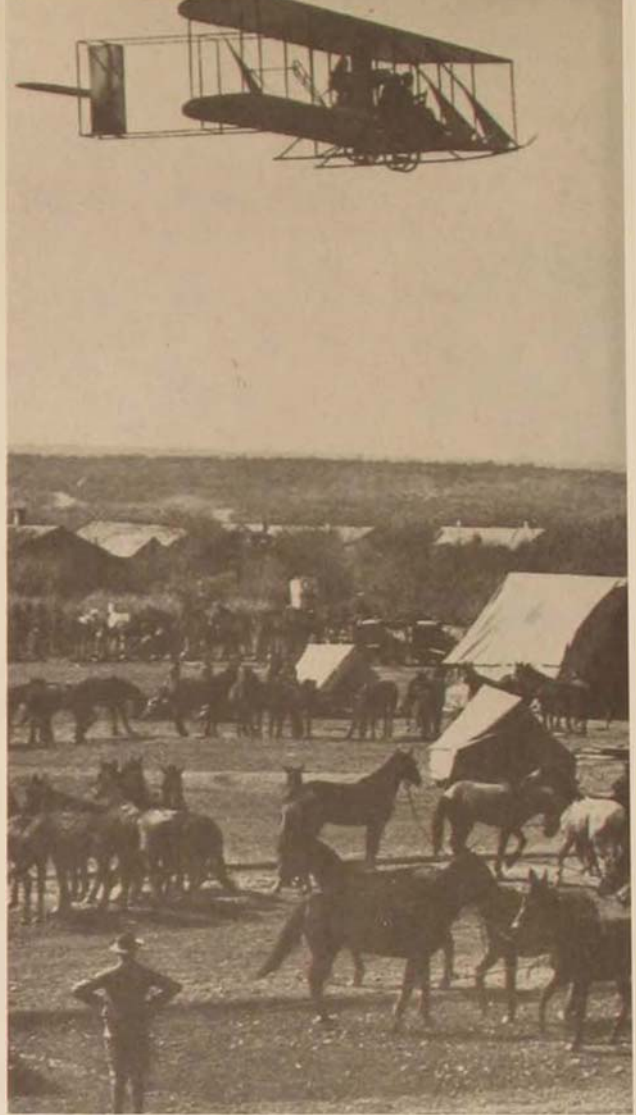
Capt Benjamin D. Foulois (left), squadron commander of the 1st Aero Squadron during the punitive expedition into Mexico, 1916. American air and ground crew members of the 91st Aero Squadron (above) pose with their French-built Salmson 2 aircraft in France, 1916.

duce a military Wright Flyer until the war started, the United States had spent only \$435,000 for military aviation. This was far lower than the amounts spent by other major industrial powers, even slightly less than some minor ones like Bulgaria, Spain, and Brazil.⁷

The underlying reason for this neglect was the failure by both civilian and military leaders to grasp the potential of military aviation. A typical congressional reaction in 1908 to "all this fuss" about buying military planes was "I thought we already had one." Three years later, in October 1911, the air arm retired its first obsolete aircraft when "Aeroplane No. 1" was "so far gone" that it became a museum piece at the Smithsonian Institution.³

The War Department's attitude was no better. The Army set up a few primitive flying schools before the war, but the misadventures of the 1st Aero Squadron in support of the punitive expedition against the Mexican outlaw Pancho Villa in 1916 showed just how backward American aviation really was. Mack Sennett might have written the script for this comic experience, which even had the squadron commander, Captain Foulois, being arrested and jailed by Mexican police. Although this debacle helped publicize the sad state of Army aviation, it did little to change the general lack of appreciation for the airplane's potential. The lack of funds and interest by the Army brass continued long after the Great War. One veteran pilot observed that interest in aviation did not "turn the corner" in the War Department until "we finally convinced them that airplanes were more than just substitutes for carrier pigeons."⁴

Even after the war threatened American interests, there was an uphill battle to overcome the deficit in aviation technology and production. Congress sought to improve the situation in 1915 by establishing an independent scientific group (the National Advisory Committee for Aeronautics) to foster aviation progress, but few inroads were made because of the neutrality that had been ordered by President Woodrow Wilson. President Wilson and the American public are said to have been appalled to read newspaper headlines in 1916 that the armed forces were engaged in contingency planning for possible American involvement in the war. The



Captain Foulois flying over Ft. Sam Houston, Texas.

outcry was quieted by War Department assurances that no more than mobilization planning for national defense was involved.⁵

On the eve of America's entry into the war, Foulois was called to Washington to oversee the drafting of a program to expand the air arm. Years later, Foulois said that he thought this program, which Congress passed two months after President Wilson declared war, was his greatest contribution to military aviation. At a cost of \$640 million, the approved legislation called for producing 22,625 planes, 6,210 trained pilots, 45,000 aircraft engines, and a large store of spare parts. Although this laid a solid foundation for postwar needs, it proved to be much too ambitious for the time left in the war.⁶



American manufacturers contracted to produce the British-designed de Havilland DH-4 reconnaissance bomber (above) in quantity. The American version was powered by the mass-produced Liberty engine. Brigadier General Foulois (far right), commander of all air forces in the AEF, visits with members of the 135th Aero Squadron in Ourches, France, August 1918.

Impetus for projecting such a high level of production came from the Allies, who requested the United States to assist in the campaign of 1918 with an air force powerful enough to enable them "to win supremacy of the air." The Allies were relying heavily on fresh American troops to turn the tide against the kaiser's army, but they also needed the great industrial capacity of the United States to close the production gap resulting from three years of attrition on the battlefield. Unfortunately, the clouds of American planes that



the Allies hoped would darken the skies over Europe never materialized.⁷

By all accounts, the response by US industry to the emergency was abysmal. Only our development and mass production of the Liberty engine could be cited as a noteworthy industrial contribution to the air war. Without suitable American designs, aircraft manufacturers were moved to concentrate on building British de Havilland (DH-4) biplanes. By the signing of the Armistice in November 1918, more than 1,200 American-made DH-4s had been shipped to combat units, but not a single plane of US design had gone to war. Until Air Service squadrons began operating at the front in the spring of 1918, American pilots fought with British and French units, using their planes. Even after American DH-4s began arriving in quantity in the summer of 1918, many US pilots continued to fly Nieuports, de Havillands, and other borrowed aircraft.⁸

Admittedly, the problem of developing the approved air program was unique. It was recognized by the War Department as being "one of the great problems of the war." The United States had built warships and had fielded ground armies, but there was no aviation industry in America and there were virtually no professionally trained aeronautical engineers or designers. Given the state of the nation's unpreparedness, it might even be considered an achievement that the United States produced nearly 12,000 airplanes—roughly half what Congress had funded—and 30,000 aviation engines by war's end.⁹

Criticism of the wartime production record was not just a phenomenon of aviation, however, for the Allies had some unkind words for our total industrial performance. In his *War Memoirs*, British Prime Minister Lloyd George's observations about the American industrial contribution bordered on the contemptuous:

No field guns of American pattern or manufacture fired a shot in the War. The same applies to tanks. Here one would have thought that the nation who were the greatest manu-

facturers of automobiles in the world could have turned out tanks with the greatest facility and in the largest numbers, but not a single tank of American manufacture ever rolled into action in the War.¹⁰

The wartime buildup in manpower was an equally frustrating experience. There was no dearth of volunteers for the flying training programs, for stories of the air war in Europe had fired the imagination of America's youth. But having to expand the existing programs to accommodate the massive influx of people was an almost insurmountable problem. In 18 months the air arm burgeoned from a force of less than 1,400 officers and enlisted men to one of almost 200,000 people. At the outset, there were only two active flying fields available to the Army to accommodate this expansion.¹¹

Leading educational institutions across the nation were called on to handle the ground-school phase of the air training program; and by the end of the war, they had graduated more than 17,500 flying cadets. The number of Army flying fields had expanded to 27 in the United States and 16 in Europe, but much of the wartime flying and technical training had been carried out at French and British airfields and factories. Although there were problems with the quality and the responsiveness of the training pipeline, this combined wartime complex got the job done. At the close of the war, there were 58,000 officers and men in the Air Service in France, and thousands more were on their way.¹²

So, the Allies got their scores of American pilots, though not their clouds of planes. Despite our shortcomings in mobilizing for the war, the extra muscle of American military power at the front, with the promise of more to come, spelled victory for the Allies. As Gen Carl Spaatz recalled years later, aviation in its primitive state "made but slight contribution to the ultimate decision."¹³ Yet American aviators could be justifiably proud of their combat record in the war. The destruction of 756 enemy airplanes was in itself a mir-



Gen Carl A. Spaatz (above) in his earlier flying days. The plane is a Boeing P-12B. The lower picture shows an LB-5 (foreground) and an O-2 during maneuvers over Ft. Bragg, North Carolina, 1927.



ror of their magnificent performance in this baptism of aerial warfare.¹⁴

The Air Service's brief activity at the front in World War I remained the only American experience of aerial warfare for more than two decades. Such a lengthy hiatus between world wars was enough time for the aviation industry to redeem itself, but there were still obstacles to overcome. Perhaps the greatest encumbrance was the political anathema that continued to hound peacetime military preparedness for much of the interwar period. For Billy Mitchell and other proponents of air power, their greatest disappointment must have been the obstruction from their own superiors, the die-hard traditionalists in the War and Navy departments. Other setbacks came with the Great Depression following the stock market crash of 1929. The problems the Army Air Corps had in the airmail fiasco of 1934 highlighted the extreme neglect of military aviation and helped to educate the Congress and the public on the need for improvements.¹⁵

This last episode coincided with the be-



ginning of Franklin D. Roosevelt's presidency and his New Deal programs that started the American economy, including the aviation industry, on the road toward national recovery. Five years later, the world was at war. American neutrality was even more short-lived than it had been in World War I. Alarmed by the Wehrmacht's blitzkrieg victories in Europe and Japanese aggressions in Asia and the Pacific, Americans rallied behind their president's directives for rearmament in 1940 and 1941. Well before Pearl Harbor, Roosevelt called for an air force of 50,000 planes, supported by a 50,000-plane an-

nual production capacity. He did not propose to build up just the American air power but wanted to strengthen the British and other Allied air forces as well. This was later spelled out in the Lend-Lease Act of 1941.¹⁶

On the eve of America's entry into the war, the Army Air Forces' mobilization requirements were defined more exactly in a hastily prepared Air War Plans Division document, AWPD-1. To meet the global demands of simultaneous war against Germany and Japan, this plan envisioned the buildup to a peak of just under 63,500 aircraft, a projection that was not far off the



A formation of P-26s (left) from the 20th Pursuit Group over San Diego. The forerunner of the B-17 was the XB-15, shown above with a P-26.

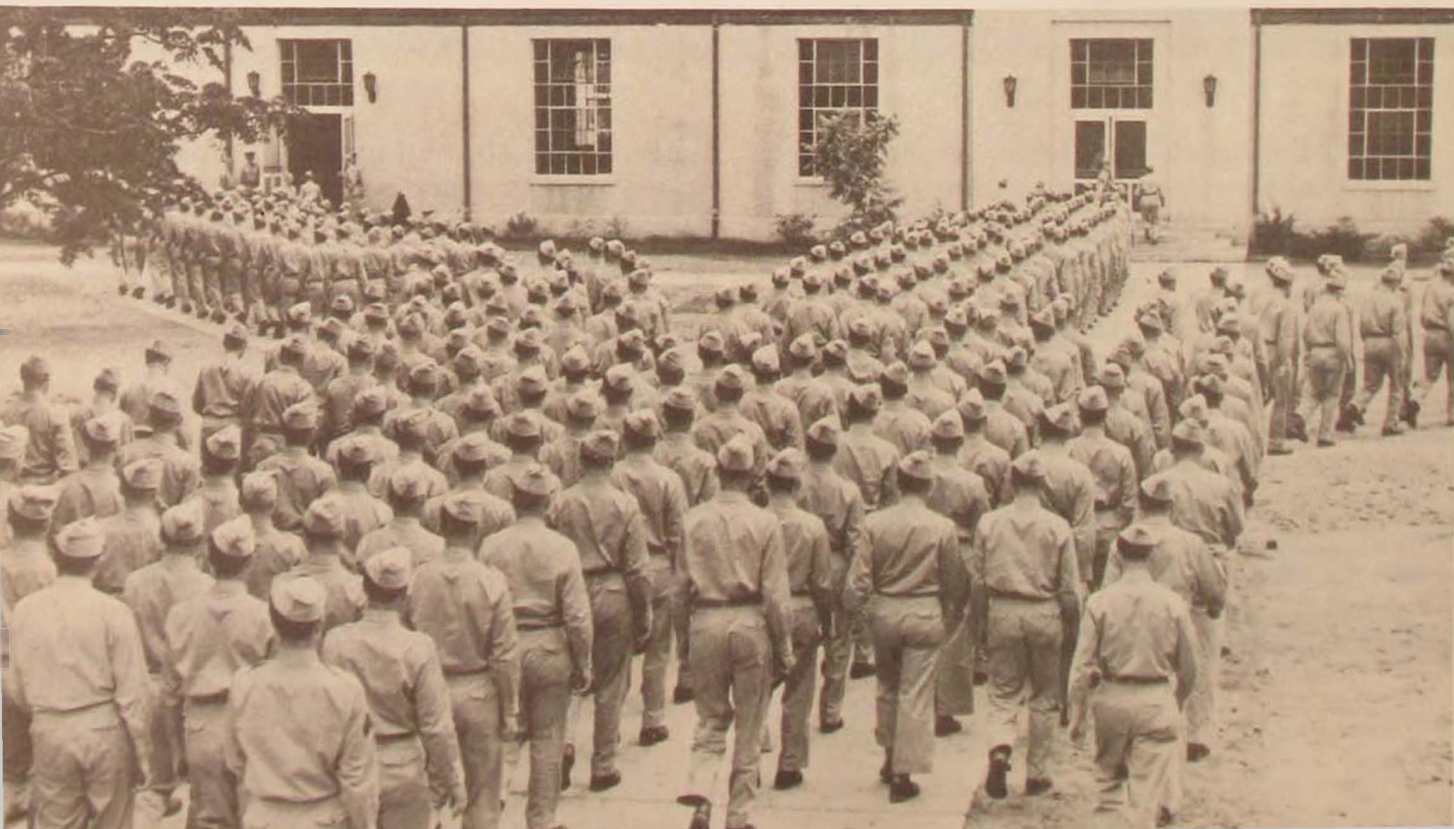
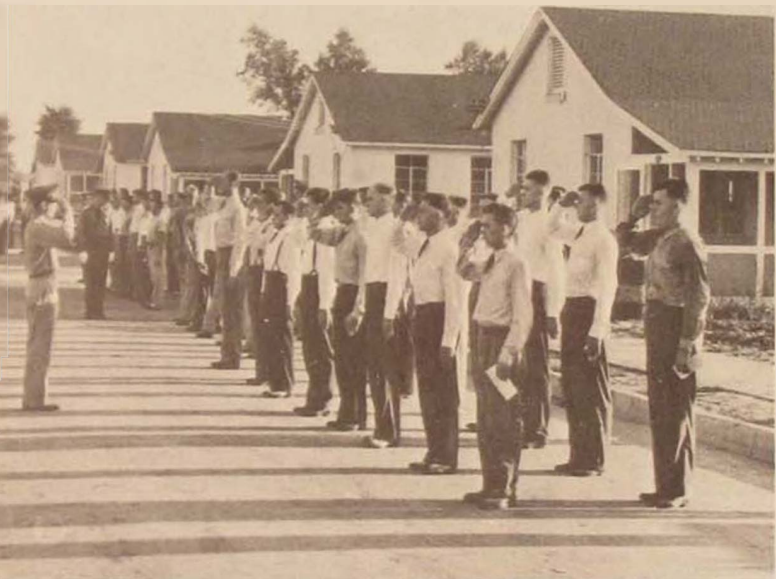
mark. At its peak the Army Air Forces never possessed more than 80,000 planes. During the course of the war, the air mobilization requirements in AWPD-1 and subsequent plans became the blueprint for one of the truly remarkable industrial success stories of the twentieth century.¹⁷

Conditioned by the hardships of the Great Depression and fired by images of a ruthless and hated enemy, the will of the American people was mobilized along with our vast reservoir of natural resources, manpower, and industrial machinery. President Roosevelt gave the War Production Board the power to get the job

done,¹⁸ and the American people responded. For Americans on the home front, the ration card became a badge of honor that was almost the equivalent of the "fifty-mission cap" and the "Ruptured Duck" to those who served. From the factories, "Rosie the Riveter" became a household name as well known, although not nearly as loved, as "Willie and Joe." After Pearl Harbor, the whole nation went to war.

Mobilization reached its zenith in World War II. The wartime industrial output became the heartbeat of America, with the aviation industry succeeding even be-

Prospective flying cadets (below) report for preflight school at Maxwell Field, Alabama. The buildings in the background are now family housing. Preflight cadets (bottom photo) march into the cadet mess hall at Maxwell Field. This building, now Brown Hall, is the headquarters for the Air Force's ROTC program. A flying instructor and student (right) in their PT-17 during the primary phase of pilot training.





President Franklin D. Roosevelt and his entourage (above) inspect the flying training facilities at Maxwell Field, August 1943.



yond the wildest dreams of the Billy Mitchells two decades earlier. Clouds of American-designed and American-made bombers (Mitchells, Fortresses, and Superfortresses), fighters (Warhawks, Mustangs, and Thunderbolts), and transports (the indomitable Gooney Birds) filled the skies, not just over Europe but around the globe. For the industrial birth of this global air force, the government spent \$45 billion. It received in return nearly 300,000 military aircraft for the Army, Navy, and Allies. By V-J Day, the Army Air Forces had accepted 158,880 aircraft, including 51,221 bombers and 47,050 fighters. By war's end, the annual production rate was almost 110,000 planes.¹⁰

The wartime buildup in manpower was just as incredible. From an elite corps of 20,000 regulars in mid-1938, the air arm grew to a peak force of more than 300,000 officers and 2,000,000 enlisted men before

Link trainers (left) provide flight simulation for ground training.

Gens H. H. Arnold and Omar Bradley at Lawson Field, Ft. Benning, Georgia, 1941. The photo on the facing page shows B-24 Liberators on the assembly line in Ft. Worth, Texas, 1942.

the war was over. Unlike the industrial expansion, "the task of training thousands of young men in highly specialized skills required for military aviation . . . was borne entirely by the limited resources of the [service] itself."²⁰

Hundreds of new bases and schools were opened around the country to handle this crash effort, but the War Department had much to learn about managing them. Before consolidating all of the training programs under a single command in the summer of 1943, the Army Air Forces was roundly criticized for its fragmented management of these activities. One general officer believed "the flak" was deserved, explaining that wholesale waste had resulted early in the war from shuttling men back and forth across the nation to train them and send them on to new assignments. The newspapers had accused the service of moving six million men around, the general said, when in fact "we have moved one million men six times."²¹

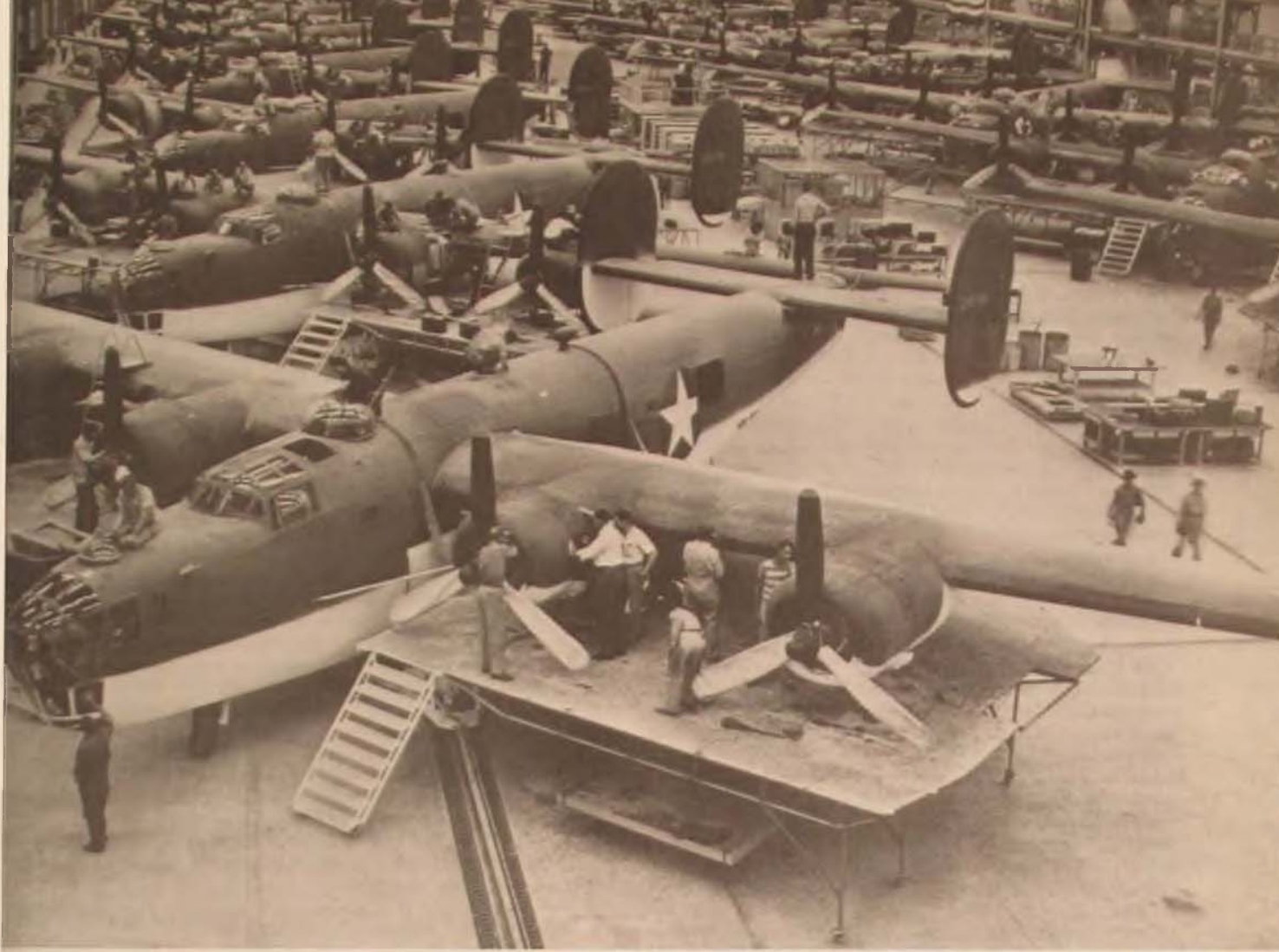
Scientific and technological skills like those that helped shape the Army Air Forces into the mighty force it became were infinitely more valuable than they had been in earlier wars. Even contributions that were less decisive than the atomic bomb oftentimes bordered on wizardry. Gen Dwight D. Eisenhower said in his postwar salute to scientists and inventors that they literally "transformed the face of the war."²² Eisenhower was ahead of his peers in recognizing that "the extraordinary and growing influence of the airplane in the waging of war" was "foremost among the military lessons" to be learned from World War II.

Gen Henry H. Arnold recognized in November 1944 that scientific advancement was inextricable from the decisiveness of air power when he established the AAF Scientific Advisory Group to create a long-



range research and development program. Hap Arnold knew from his own experience of air power that "the weapons of today" were becoming with frightening frequency "the museum pieces of tomorrow."²³

Hap Arnold also sought assurance that the postwar air force would be ready to carry out the global responsibilities that had been thrust upon the American people by victory in World War II. The Scientific Advisory Group's report, *New Horizons*, which was published in December 1945, charted the Air Force's future research and development requirements for meeting these responsibilities.²⁴ In remarks made at Harvard University on 6 September 1943, Prime Minister Winston Churchill's allusion to America's part in the Grand Alliance and its new role in the world was



more than just a placebo for the bitter pill we had to swallow from Lloyd George's memoirs two decades earlier. Churchill said:

The price of greatness is responsibility. If the people of the United States had continued in a mediocre station, struggling with the wilderness, absorbed in their own affairs, and a

factor of no consequence in the movement of their world, they might have remained forgotten and undisturbed beyond their protecting oceans: but one cannot rise to be in many ways the leading community in the civilized world without being involved in its problems, without being convulsed by its agonies and inspired by its causes.²⁵

Maxwell AFB, Alabama

Notes

1. James J. Hudson, *Hostile Skies: A Combat History of the American Air Service in World War I* (Syracuse, N.Y.: Syracuse University Press, 1968), 2-3; Alfred Goldberg et al., *A History of the United States Air Force, 1907-1957* (Princeton, N.J.: D. Van Nostrand, 1957), 15-16. Hudson's book is a highly readable account of the Air Service's experience in World War I.

2. Oral history interview of Maj Gen Benjamin D. Foulois by Dr Alfred Goldberg (Washington, D.C.: Office of Air Force

History, 9 December 1965), 28-29, United States Air Force Historical Research Center (USAFHRC) K239.0512-766; AAF Historical Study No. 50, *Material Research and Development in the Army Air Arm, 1914-1945* (Washington, D.C.: AAF Historical Office, 1946), 12; USAFHRC 101-50. At the two ends of the spending curve, Germany spent \$28,000,000 and Brazil \$500,000 on military aeronautics during the five years prior to 1914.

3. Goldberg, *A History of the United States Air Force*, 5, 6.

4. *Ibid.*, 10; Robert Frank Futrell, *Ideas, Concepts, Doc-*

Trine: *A History of Basic Thinking in the United States Air Force, 1907-1964* (Maxwell AFB, Ala.: Air University, 1974), 9; Oral history interview of Lt Gen Kenneth Wolfe by Robert Piper, Space Systems Division History Office, June 1966, 5, USAFHRC K239.0512-788. Some so-called flying schools before 1914 had only one airplane.

5. Goldberg, *A History of the United States Air Force*, 13.

6. Hudson, 5; John F. Shiner, *Foulois and the U.S. Army Air Corps, 1931-1935* (Washington, D.C.: Office of Air Force History, 1983), 8.

7. Hudson, 4-7; I. B. Holley, Jr., *Ideas and Weapons: Exploitation of the Aerial Weapon by the United States During World War II: A Study in the Relationship of Technological Advance, Military Doctrine, and the Development of Weapons* (New Haven: Yale University Press, 1953; reprint, Washington, D.C.: Office of Air Force History, 1983), 43-44. Professor Holley's classic history of the development of World War I weapons cites discrepancies in the French request for assistance.

8. Hudson, 17.

9. *United States Army Aircraft Production Facts* (Washington, D.C.: Government Printing Office, 1919), 4-10, USAFHRC 168.6502-5.

10. Lloyd George, *War Memoirs* (London: Odhams, 1936), 1830-33, as cited in John Terraine, *To Win a War* (Garden City, N.Y.: Doubleday, 1981), 5. Lloyd George chided Americans for their arrogance and slowness to learn from the British and French experience in the war. American industrialists regarded themselves as "masters of all the manufacturing arts," and at first "would have none of our aeroplanes nor of our cannon." On the other side, the British and French have been criticized for their reluctance to share their secrets with the United States.

11. *United States Army Aircraft Production Facts*, 4-10, USAFHRC 167.601-1D; Hudson, 26, 27. Professor Hudson's book says there were only three pilot training schools in the country, one of which was used to train national guard units.

12. Hudson, 24-43; Goldberg, *A History of the United States Air Force*, 22, 23.

13. Gen Carl Spaatz, "Evolution of Air Power," *Military Affairs*, Spring 1947, 4.

14. USAF Historical Study No. 133, *U.S. Air Service Victory Credits, World War I* (Maxwell AFB, Ala.: Aerospace

Studies Institute, 1969), 2. This study is the official record of aerial victories; other accounts vary. For instance, Goldberg's history (p. 27) cites confirmed claims of 781 enemy planes, while a brief history prepared by the Air Corps Tactical School in 1927 (USAFHRC 248.211-612) credits the destruction of 491 enemy planes confirmed and 354 unconfirmed, a total of 845. This is but another warp to the myth that morning reports might have better served the preservation of statistical history than have computers.

15. For the history of the Air Corps between the wars, see John F. Shiner and a forthcoming book by Maurer Maurer, *Aviation in the U.S. Army, 1919-1939*, scheduled to be published by the Office of Air Force History in 1987.

16. Goldberg, *A History of the United States Air Force*, 47, 48.

17. *Ibid.*, 49. For a full discussion of AWPD-1 and subsequent planning, see *The Strategic Air War Against Germany and Japan*, a memoir by Haywood S. Hansell, Jr., published by the Office of Air Force History in 1986.

18. *Ibid.*, 91.

19. *Ibid.* For study of the mobilization of aircraft industries by all belligerents in World War II, see R. J. Overy, *The Air War, 1939-1945* (New York: Stein and Day, 1980), 191-231. This does not mean the aviation program was without problems. The Truman Committee took the "chaotic" war production effort to task for its "red tape and bureaucratic waste." See *Year of Decisions*, volume 1 of Harry S. Truman's *Memoirs* (Garden City, N.Y.: Doubleday, 1955), 174-81.

20. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 6, *Men and Planes* (Chicago: University of Chicago Press, 1955), 427-28.

21. Lloyd H. Cornett, Jr., *Air Training Command Organization, 1943-1974* (Randolph AFB, Tex.: History and Research Division, 1974), 4, 5.

22. Dwight D. Eisenhower, *Crusade in Europe* (Garden City, N.Y.: Doubleday, 1948), 452-53.

23. *Ibid.*; Herman S. Wolk, *Planning and Organizing the Postwar Air Force, 1943-1947* (Washington, D.C.: Office of Air Force History, 1984), 40.

24. *Ibid.*

25. Robert E. Sherwood, *Roosevelt and Hopkins. An Intimate History*, rev. ed. (New York: Harper, 1950), 749-50.

AN AIRMAN'S QUINTET

DR ALAN L. GROPMAN

AIRPOWER JOURNAL asked me to recommend a quintet of essential books for early and midcareer Air Force officers. Easier asked than accomplished, I found out. Many conversations about this task with other operators, planners, and historians led to no general agreement. There are tens of thousands of midcareer officers with dozens of specialties, thus the difficulty in finding broadly gauged books.

Three criteria came to mind. First, the US Air Force is a professional fighting organization; therefore, the quintet should not stray far from the combat ethos. Second, despite the diversity in officer specialties, all five books must appeal professionally to the great majority of officers. Third, all the books must be available. This last criterion ruled out such first-class entries as Robert Frank Futrell's *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964* because there is little sense in suggesting books people cannot readily find.¹ Futrell has revised his admirable study, and we all eagerly await its publication. Enough prologue. Utility and breadth of subject for warriors being the aims, the chosen books were in the military philosophy, strategy, doctrine, and history genre.

The one book nearly all my colleagues agreed upon is the great philosophical classic *On War*, by Carl von Clausewitz.² No book better prepares Air Force officers for their profession of arms than *On War*, because Clausewitz best expresses the critical relationship between policy and war (and the essential subordination of the latter to the former), best articulates the real nature of war, and best understands the requirements for leadership.

Clausewitz maintained, and history

fully supports him, that "war is only a branch of political activity that . . . is in no sense autonomous Policy is the guiding intelligence and war only the instrument, not vice versa. No other possibility exists, then, than to subordinate the military point of view to the political."³ The disastrous results for states that turned this principle on its head—Germany in World War I, Japan in the 1930s and 1940s, and numerous Central and South American countries in this and the last century—prove Clausewitz's point.

Clausewitz, veteran of numerous bloody campaigns and a serious military historian, also understood the nature of war. He wrote, "Essentially war is fighting, for fighting is the only effective principle in the manifold activities generally designated as war. Fighting, in turn, is a trial of moral and physical forces through the medium of the latter."⁴ Clausewitz here used "moral" in the eighteenth-century sense, not relating it to principles of right or wrong but rather to principles of character. He argued that "moral values cannot be ignored in war" and that "military activity is never directed against material force alone; it is always aimed at the moral forces which give it life, and the two cannot be separated."⁵

Also regarding the nature of war, he wrote that "danger, physical exertion, intelligence, and friction [are] the elements that coalesce to form the atmosphere of war, and turn it into a medium that impedes activity."⁶ The concept of friction, which Clausewitz said made "action in war . . . like movement in a resistant element," is his great gift to the operator and planner. Friction, he argued, is the "only concept that more or less corresponds to the factors that distinguish real war from war on paper."⁷ Awareness of friction is

the element that prevents wise operators and planners from expecting precision in military operations.

Clausewitz believed that a military force overcomes friction through experience and hard training, certainly, but mainly through effective leadership. He knew the necessary ingredients of military genius. To Clausewitz, high intelligence is an essential prerequisite for military leadership, but not the sole one. "War," he said, "is the realm of danger; therefore courage is the soldier's first requirement." Clausewitz feared that without "fortitude of mind and character," "the mass" would "drag" the commander down "to the brutish world where danger is shirked and shame is unknown." He knew too that strength of character meant more than strong emotions; it meant "maintaining one's balance in spite of them." Clausewitz knew that "there is no activity like war to rob men of confidence in themselves and in others, and to divert them from their original course of action."⁸

Clausewitz's *On War* forms a solid foundation for airmen for the aforementioned reasons and also because the author wrote brilliantly on the subject of strategy (the use of the tools of power to achieve objectives). On that subject, however, late twentieth-century officers would probably find Bernard Brodie's *Strategy in the Missile Age* more germane. Brodie, a lifetime student of Clausewitz, provides readers an admirable historical précis of the foundation for modern national and military strategy. His most meaningful material, however, is his excellent treatment of the realities of the nuclear age.

Nuclear weapons have dominated national and military strategy since the summer of 1945, and Brodie's major contribution to thinking in our era is his formulation of deterrence strategy. Rejection of "preventive war," he argues, forces planners to accept a strategy of deterrence. Deterrence, he writes, is based on the absolute invulnerability, despite the costs in dollars, of an overwhelming retaliatory

force. He asserts, furthermore, that military planners have to ensure this survivability regardless of the mind and mood of the government: "A military planner ought not to rely for the security of his forces on governmental decisions and actions over which he has no real control."⁹ Brodie argues in words he italicizes for emphasis:

Known ability to defend our retaliatory force constitutes the only unilaterally attainable situation that provides potentially a perfect defense of our homeland. Conversely, a conspicuous inability or unreadiness to defend our retaliatory force must tend to provoke the opponent to destroy it; in other words, it tempts him to an aggression he might not otherwise contemplate.¹⁰

Brodie recognizes that the Soviet Union would not tolerate for long the existence of US strategic missile and bomber forces if the Politburo believed it could destroy them with impunity.

He recognizes, moreover, that "warning is the key to the entire defense problem If we could count with *high confidence* on having two or three hours' warning of an impending strategic attack, and if the enemy knew that we had that confidence and that it was justified, we should practically have eliminated the possibility that he would attack."¹¹ Equally important is the fact that warning must be both "*reliable and unequivocal*" if it is to be acted upon. An unequivocal warning "measured in hours or even quarter-hours is far more valuable than equivocal indication received much earlier."¹²

Brodie, often called the father of deterrence strategy, also writes that deterrence could fail and that it is essential to develop war-winning strategies too—more so in the nuclear age than in previous eras. "*So long as there is a finite chance of war, we have to be interested in outcomes; and although all outcomes would be bad, some would be much worse than others.*"¹³ In other words, if deterrence fails, plan and fight to win.

Throughout his important volume, Bro-

die writes understandingly of the indispensable role of doctrine in shaping military capabilities. An officer must know doctrine—basic, operational, and tactical—if he or she is to affect tactics and strategy meaningfully. However, officers should know more than just the official doctrine; they must also know the dominant role it plays in operations and also in weapons procurement. Bad doctrine is a killer, as it was with the French (and others) on the Western Front in World War I and during the unescorted bomber raids into Germany in World War II. Inadequate doctrine will also cause poor weapon systems development as it retarded the development of escort fighters in the late 1930s and very early 1940s in the United States. No military historian has written more incisively of the central nexus between doctrine and force structure than I. B. Holley, Jr., in his *Ideas and Weapons: Exploitation of the Aerial Weapon by the United States during World War I: A Study in the Relationship of Technological Advance, Military Doctrine, and the Development of Weapons*.

Holley tells us that wars “are governed not by the development of weapons but by such fractions of that development as have been recognized and incorporated into approved military doctrine.”¹⁴ He elaborates:

It has probably more often happened that new weapons have been adopted and even used to a certain extent, but that their full potential has remained unexploited because higher policy making echelons have failed to modify prevailing doctrine to embrace the innovations. New weapons when not accompanied by correspondingly new adjustments in doctrine are just so many accretions on the body of an army.¹⁵

Holley has numerous examples of such idea failures, such as the bow and arrow and the machine gun; but most germane to Air Force officers is his demonstration of the way the development of the airplane was delayed in the United States in World War I because the officers who managed the Air Service could not see the airplane's

versatility, flexibility, and value even though the British, French, and Germans were exploiting the aviation state of the art before their eyes.

So blind were the Americans to the potential of offensive air that had the war continued into 1919, the United States planned for reconnaissance aircraft to constitute 50 percent and bombers only 20 percent of total air strength (as compared to 10 percent and 54 percent, respectively, for the British). No fighting power bought as few bombers or more reconnaissance aircraft in 1918 as the United States, and nobody planned to buy fewer bombers or more reconnaissance aircraft in 1919 than this country. Why? Because United States Army official written doctrine said explicitly that airplanes were strictly reconnaissance vehicles. If the doctrine does not specify a role for bombers, few can be built. Holley correctly argues that the “systematic formulation of doctrine . . . [is] essential to successful development of air weapons.”¹⁶

Clausewitz, Brodie, and Holley all rely heavily on military history to make their points. Clausewitz, although he recognized the extreme value of combat experience and understood the merits of rigorous training, believed everything an officer needed to know could be taught through military history. Napoleon, in fact, said military history is the only school for the soldier. In that vein, I am recommending two military histories to round out the quintet, one to familiarize American officers with their heritage and the other to dissect key aspects of fighting a major air war.

Regarding the former, *For the Common Defense: A Military History of the United States of America*, by Allan R. Millett and Peter Maslowski, is an admirable entry. The authors give proper weight to all of the crucial elements—domestic and international politics, strategy, tactics, logistics, and mobilization—and they organize their book around the constant themes that have animated United States military history:

● "Rational military considerations have rarely shaped [US] military policy and programs."¹⁷ Fighting two land wars in Asia in the past 40 years bears out this thought.

● "American defense policy has traditionally been built upon pluralistic military institutions, most notably a mixed force of professional soldiers, citizen-soldiers, and anti-military and pacifistic citizens."¹⁸ The complexion of US fighting forces in all wars, especially before the 1960s; the hostility of many citizens to all wars in the eighteenth and nineteenth centuries; and the Korean and Vietnam wars in this century support Millett's and Maslowski's thesis.

● "The armed forces have become progressively nationalized and professionalized . . . Although civilians ultimately control military policy, the professionalization of officership has had important consequences for the conduct of military affairs, since career officers . . . have progressively monopolized high command positions."¹⁹ Observant midcareer officers will have no difficulty seeing this truth.

● "Industrialization has shaped the way the nation has fought. In particular, the United States has used increasingly sophisticated technology to overcome logistical limitations . . . and to match enemy numbers with firepower."²⁰ The victory of the United States in World War II and the way we fought in Vietnam bear out this idea.

● "Policymakers have done remarkably well in preserving the nation's security. For most of American history, they wisely realized that geographic distance from dangerous adversaries, the European balance of power and growing material and manpower mobilization potential were powerful assets . . . However, mobilizing simultaneously with war's outbreak has extracted high costs in terms of speed and ease of each new mobilization."²¹ On this point the past speaks clearly, but the future looms dangerously.

The authors carry the story through the Vietnam War, forcing readers to come to grips with the consequences of defeat: "The United States failed to win its political objectives in Vietnam, and it paid such a high cost that it mortgaged its will and ability to use military force anywhere else in the world."²² The war inflicted enormous fiscal and moral losses, reducing the capability of the United States to defend itself and its allies. We live in more perilous times in the 1980s than in the 1960s because we squandered our resources and will in Southeast Asia for more than a decade. The authors are equally trenchant regarding all of our wars.

In addition to United States military history, Air Force officers need to understand air warfare. A superb history, one that deals with much more than tactical and strategic operations, is R. J. Overy's *The Air War, 1939-1945*. Overy not only writes about "the few" who fought so bravely in the Battle of Britain and the bomber crews who fought their way into deepest Germany in 1943 without fighter escort, but he also examines all the economic and technical factors that made victory possible.

Success in the air war and in the wider context was in a very real sense a test of "modernity." What was tested was not simply the service itself and the strategy of its leaders but also industrial potential; the flexibility of the social structure; the competence of the administrative machinery; and the degree of integration of scientific life into military and governmental affairs.²³

Overy also covers the critical role "accurate intelligence" played in the Allied air victory during World War II. Furthermore, the author illuminates the problems the Japanese caused for themselves by their utter failure to force their ground, naval, and air forces to fight jointly.

Overy explores each of these themes and comes to wise conclusions based on serious treatment of the evidence. He contrasts the narrow approach taken by Axis

countries regarding their air power and the general approach taken by the United States and the United Kingdom. A general air strategy required air forces coequal with other services and an industrial and scientific commitment commensurate with this status. Because of the American/British approach and the economic and technical energies these two peoples were able to muster, the Allied air forces were able to gain air superiority over the European continent, shatter the enemy war-making capacity, help win the Battle of the Atlantic, and provide critical support for the advance of the land armies. Overy provides profound insights for both aviators

and support officers.

Such is my airman's quintet. Of course, no one would want to stop with these five works, all of which, especially the last two, come complete with suggested readings. Readers disappointed that no Vietnam War books appear on the list will realize that a comprehensive volume on the air war that rivals Overy's book on World War II has yet to be written. I recognize that my quintet is weighted with "idea" books that demand thought, but that was done consciously because the profession of arms is a thinking person's life.

Washington, D.C.

Notes

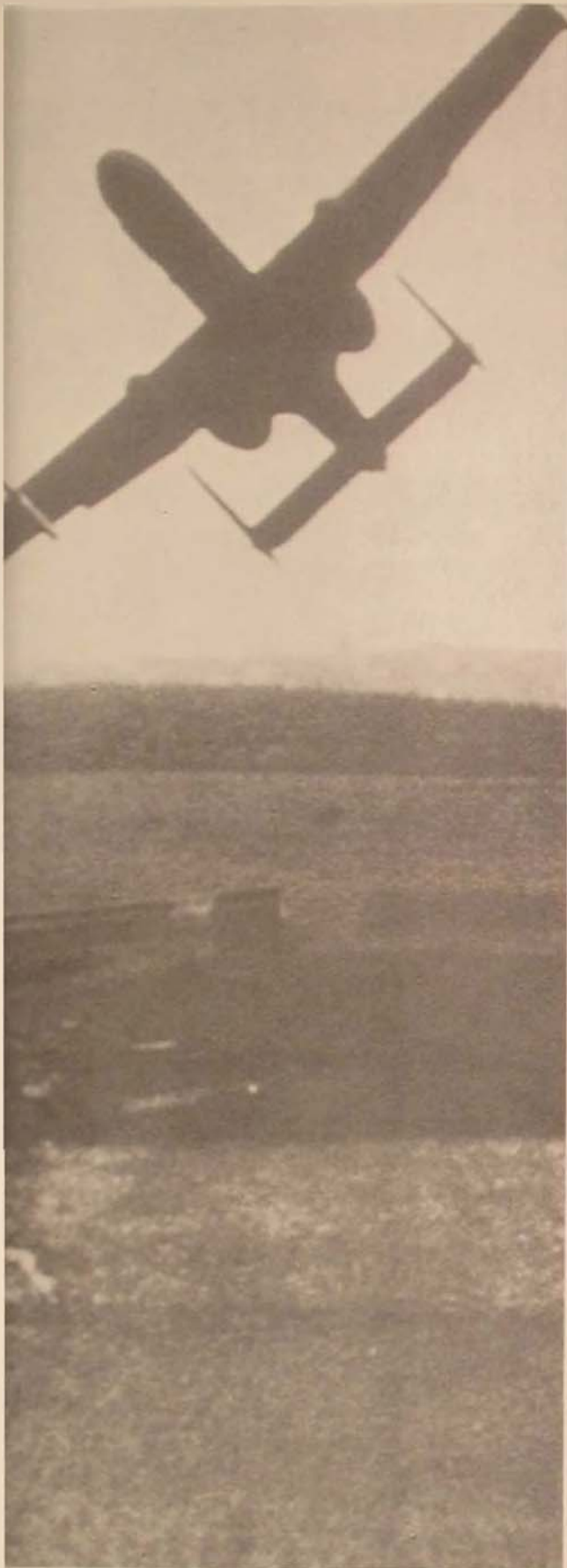
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THE NEED FOR BATTLE MANAGERS IN THE TACTICAL AIR CONTROL SYSTEM

MAJ THOMAS H. BUCHANAN





THE TACTICAL air control system (TACS) has been evolving since World War II in a rather benign environment. The United States has had both air and ground superiority, and the enemy has used relatively few measures to counter or destroy it. But the TACS can no longer be expected to operate in such a benign environment. Current and evolving Soviet doctrine places great emphasis on degrading our command and control system either through electronic means or by direct ground or air attacks executed with surprise and speed. Therefore, it is extremely unrealistic to assume that all elements of the TACS would be operational or in communication with each other the first few days, or even hours, after the outbreak of hostilities with the Soviets. This different environment, coupled with the concepts of fog and friction in war, will have a great impact on the successful operation of the TACS.

The question is, what happens to the TACS if, for example, its nerve center—the tactical air control center (TACC)—is destroyed or the air component commander (ACC) loses communications with subordinate TACS units? This article examines that question by looking at the validity of the centralized control concept in the TACS. It then suggests that the United States consider training battle managers below the TACC level to make the important decisions in a degraded wartime environment.

The Advantages and Disadvantages of Centralized Control

The concept of centralized control/decentralized execution is the basic premise around which the TACS is structured, and it offers some obvious advantages. The main advantage is that the air component commander has the ability to allocate and reallocate his limited resources as he sees



Hardened tactical air control center at Osan Air Base, South Korea.

fit to support the objectives of the joint force commander. But the effects of fog and friction in war will probably require some decisions now made at the air component commander level and in the TACC to be delegated to lower levels.¹

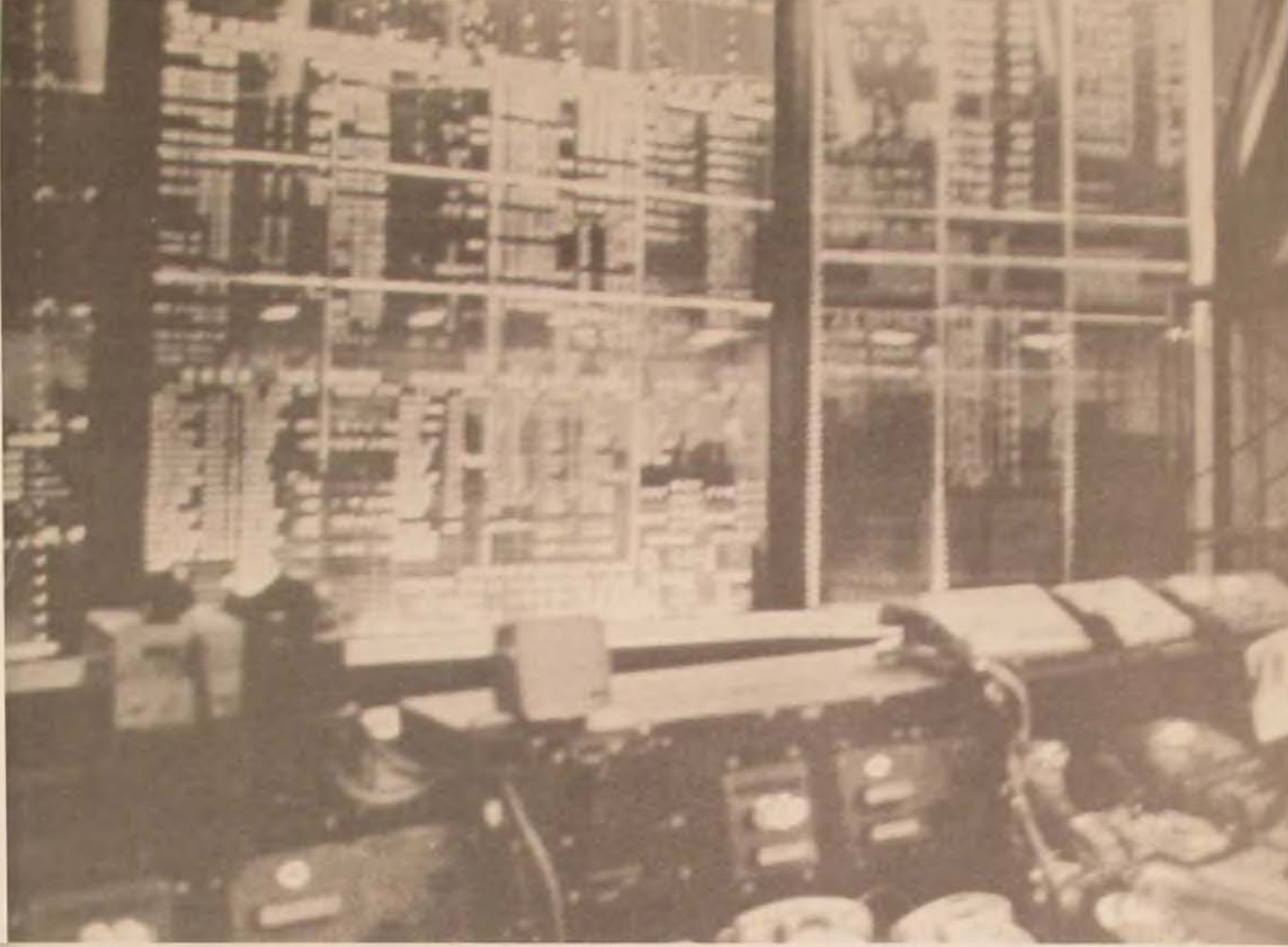
Fog and Friction

The concepts of fog and friction were developed by Carl von Clausewitz in his book, *Vom Kriege (On War)*, published in 1832. Clausewitz defined four sources of friction in war: the paralyzing, visceral impact of danger in war; the extraordinary demands for exertion that combat imposes; the irreducible distortions and uncertainties inherent in the diverse infor-

mation on which action in war must be based; and the inevitable obstacles to action that arise from the play of chance and the enemy's unpredictability.² These four elements, according to Clausewitz, form the "atmosphere of war."

Sometimes this atmosphere of war is so intense that the effects of uncertainty and chance are greatly increased and can make simple tasks impossible. Therefore, no matter how much one prepares and plans for war, things will never go as expected, and there is no conceivable way to build enough safeguards into war plans to cover every situation. Even if there were, the plan would be too cumbersome and complex to execute.

Fog in war is normally associated with



Interior of a tactical air control center.

the idea that many things on the battlefield are unknown and will remain unknown. Therefore, decisions will never be based on perfect information and commanders will have to cope with much uncertainty during war.

An Air Force Institute of Technology (AFIT) paper titled "Training Tomorrow's Commanders to Manage the Fog of War" outlined very well what the decision environment in future battles will be like and how fog and friction will come into play. It projected that the future battlefield will be characterized by great turbulence and much activity. Some of the many events that will be going on will be preplanned, but most will not be. The tempo of activity will be high, with many things happening

in a relatively short period of time. An observer might assume that all these activities are related when, in reality, they may or may not be. Information describing all the activities going on will be available to the commander, but it may arrive in such volume that its usefulness is impaired. Additionally, the information will go through a filtering process as it travels up the chain from the various sensors to the commander. How much information and what kind of information the commander gets will therefore depend on the structure and procedures of the organization. It will also depend on the environment and on the internal procedures for processing the information. (Another danger that the paper did not mention is that much of the

information could be wrong—both intentionally and unintentionally.) Getting the information from the area of battle to the decision maker could be delayed or, in the worst case, impossible. Alternate communications channels will become saturated as the primary channels are destroyed or degraded. This could result in too much information from some areas of the battlefield, none from others. Additionally, the transmission of instructions will be affected by the loss or degradation of communications. Because of all this, decisions will need to be made at lower levels. "This *de facto* decentralization will put increased demands on lower level commanders who will be forced to make decisions without guidance from higher levels and with only those resources that are currently available."³

In general, then, the commander may prove to be ineffective in decision making due to either the delay, overload, or lack of information. This will be especially detrimental in the effort to provide air support to the ground commanders, whose units will be constantly moving.

Other Disadvantages of Centralization

Another factor that cannot be ignored is that with improvements in technology and the deployment of more advanced command and control equipment and communications, the ACC will often have instant access to lower elements in the TACS. As a result, the ACC and other high-level commanders will face the temptation to "micromanage" the activities and responsibilities of commanders at lower levels. This micromanagement will encourage lower-level commanders to "seek guidance," some of which may be time critical, in order to "cover their butts." The overall result, then, will be rigidity in command and control, something that has been criticized as a weakness in the Soviet command and control system.⁴

Another possible problem is the effect of friction on span of control. An air compo-

nent commander, far removed from the battle area, may not be the best qualified person to exercise detailed control of unit employment. He would probably be more effective in monitoring the overall situation, planning future courses of action, and assigning general tasks and resources to subordinates.⁵

Additionally, the evolution of electronic warfare leads one to be skeptical about the new "secure" and "jam-resistant" technologies that are supposed to provide instantaneous and continuous pictures of events in the air and on the battlefield. Command and control technologies of the future may well be effective in the short-term, but a way to counter them will almost certainly be developed; and even if not, the asset will be a high-priority item on the enemy's target list.

Perhaps the biggest problem with centralized control is the danger that the TACS is vulnerable at the apexes of control. Because the air component commander and other agencies within the TACC must make many decisions, the loss of this element alone could cause chaos in the TACS.⁶ We must therefore make sure that we take every step necessary to ensure that the TACS degrades gracefully, not with a Bang!

What to Do

Given the nature of the Soviet threat, it would appear that the disadvantages of centralized control in the TACS outweigh its advantages. The concept, as articulated in Air Force TACS doctrine, has some serious flaws that need immediate attention. The way to correct these flaws is to decentralize control lower in the TACS chain. One advantage of such a measure is that it gives a commander more time to study and analyze "the big picture." It also allows his subordinates to act quickly in certain cases because they are not delayed in taking action while waiting for the information to get to the commander, for him to make the

decision, and for the decision to get back down to the subordinates. The subordinates would also have enough flexibility to act according to how they judge the situation. Morale would increase ("The commander must have confidence in me"), as would initiative and determination. Lastly, decentralization would prepare subordinates for higher levels of responsibility in the future.⁷

The specific tasks that need to be decentralized, and how this decentralization will be accomplished, must be determined in each respective TACS structure before the outbreak of hostilities, and must be practiced in peacetime. For example, if the TACC is destroyed, it may be necessary for the battle managers in the control and reporting centers (CRCs) to develop the air tasking order for specific aircraft units. (This was the way the TACS operated prior to the World War II fiasco in Tunisia at the Kasserine Pass, and it may become a necessity again. Given proper training, however, battle managers should not make the same mistakes made in World War II.)

More attention must also be paid to developing independent decision-making and command judgment ability in our officer corps. For in the Air Force as a whole, our highly developed technical systems will most certainly be degraded or rendered inoperative in a war.⁸ The Army has already taken steps to correct similar problems in this regard. The Army now believes that, despite technological advances, the only way to adapt quickly to battlefield uncertainty is to decentralize decision-making authority. However, to avoid creating confusion, these decisions must be made within a specific operational framework. Therefore, decentralized decisions are made based upon how well they support the operational level objectives. This means that those making tactical decisions must be thoroughly familiar with the operational objective and must share the same way of thinking about how to attain that objective."

Brig Gen Wayne A. Downing, US Army,

has outlined his thoughts on correcting the Army's deficiencies in the way it thinks about and trains for combat. The recommendations he makes can easily be applied to the Air Force and the TACS. The first step is to make sure the commander's intent is known. This is necessary for planning how to support effectively that intent and how to take advantage of unforeseen opportunities when they present themselves. A two-sentence commander's intent section should be included in all operations and fragmentary orders to tell the lower echelons what the commander wants to accomplish in the long-term.¹⁰

Second, subordinates should receive training in when to violate specific instructions in order to accomplish the unit's mission and support the commander's intent. However, superiors must be kept informed of intended actions. If the intentions cannot be communicated, then an after-the-fact report must be made as soon as possible. After all, the commander is not granting lower-level commanders license to run around the battlefield "like an undisciplined mob."¹¹

Units must also be conditioned to expect the unexpected. General Downing argues that canned scenarios are acceptable in the early stages of training but cannot be carried forward to advanced training. Additionally, perfect intelligence about the enemy must be avoided in training because, as General Downing notes, there is one thing we cannot control—the enemy.¹²

Although the United States Air Force tries to get the most out of its training dollar by including everyone and everything during exercises, it is unrealistic to believe we will have the luxury of all necessary equipment and units, operational and in one piece, at our disposal. Therefore, "monkey wrenches" (scenarios designed to increase fog and friction) should be thrown into exercises and operational readiness inspections to train people to come up with alternatives to get the mission done. Although these "monkey

wrenches" are put into exercise scenarios to some extent now, they should be given much more emphasis. And because there is no right answer in dealing with these "monkey wrenches," they should not be considered when calculating the unit's performance rating in an exercise or inspection. In other words, was the mission accomplished in spite of the "wrenches"?

Air Force officers, especially in the TACS, must be trained in making decisions and in the art and science of war. "To be true masters of our trade," says General Downing, "we must be both skilled craftsmen (the science) and crafty artisans—and we must pass on this same division of skills to our subordinates, to include our NCOs."¹³

We must also learn to live with chaos and disorder on the battlefield. General Downing argues that it is far better to accept chaos and disorder in battle than to create a management system that pipes all information into a central decision-making point for analysis and decision. He argues that commanders must develop "nerves of steel" and must let subordinates fight the battle. All must continue on with the mission in the face of great uncertainty. In other words, the commander must trust the system he works in and the subordinates and superiors he works with.¹⁴

Additionally, we must learn intelligent risk-taking.

Risk is rewarded in grand style only when you are correct. Risk has a converse effect when you are wrong as it heavily penalizes the taker for a mistake. A group of aggressive leaders prowling the battlefield who will take every seeming opportunity presented will be a disaster. The key is the experience to feel and read the situation and act accordingly—what Carl von Clausewitz calls a "talent for judgment."¹⁵

We must also learn to accept mistakes. We need nonthreatening feedback from senior leaders to junior leaders. Senior leaders must also be able to accept criticism from a subordinate. They, too, make

mistakes. In this way, a frank and open interchange can take place during a review of what happened in training.

Last, problem solving, not solutions, must be taught. "One of the greatest mistakes we can make in training is to teach our subordinates what to think as opposed to how to think."¹⁶

Selection and Training of Battle Managers

Because of the problems inherent in centralized control in the TACS, there is a need for battle managers below the TACC level. Let us now define battle management and take a look at battle manager selection and training.

Battle Management

Battle management at the joint force and air component commander levels can be defined as the process of planning, tasking, deploying, directing, or controlling combat, reconnaissance, and support forces. Simply put, it is force employment.¹⁷

TACR 55-45 defines battle management, for the purpose of the TACC, as those decisions and actions taken in direct response to the activities of enemy forces.¹⁸ This type of battle management is needed below the TACC level as well. The responsibilities of the joint force commander and the air component commanders are far too broad to delegate below the TACC. These commanders are concerned with an extremely large picture, whereas units below the TACC are dealing with the war as it happens. Battle managers below the TACC level must make decisions quickly to adapt plans to counter enemy actions. They must cope with fog and friction while supporting the overall objective laid out by higher authority.

Essential to this battle management function is the ability of the TACC to accurately perceive and understand the current tactical



The E-3 Sentry (above) and the OV-10A Bronco (right) can support a variety of tactical air support missions.

situation and to make timely and effective decisions for the employment of tactical air assets. The battle management function is the most critical activity in the TACC and may ultimately decide the success or failure of the theater forces to achieve their assigned objectives.¹⁹

This is equally as true when the term TACC in the preceding passage is replaced with TACS, or with any element of the tactical air control system.

What Does Today's Battle Manager Need to Know?

Battle managers at TACC level and below need to have a wealth of knowledge in many areas: enemy and friendly doctrine, force capabilities, and tactics; radar theory; electronic warfare; development of ATOs; Army AirLand Battle concepts; maritime operations; command, control,



communications, and intelligence capabilities of all the services; how the services can interoperate; how to make decisions; strategy; tactical deception; the art and science of war (Sun Tzu and Clausewitz, for example); airspace management; how to deal with stress; risk-taking; and how to cope with uncertainty. This is only a partial list, of course. The point to be made is that a battle manager has a full plate of

things to know—and to know extremely well.

Let us examine how the Air Force currently trains one important segment of the TACS officer corps—the weapons director—to see what changes in training are needed, if any, to produce the battle managers needed for the radar units in the TACS.

Current Weapons Director Training

Weapons director training courses, with a few exceptions, devote a great deal of time to honing the aircraft control skills of weapons directors and to familiarizing them with the various systems they will be working with in their next assignment. The fundamentals course, conducted at Tyndall AFB, Florida, is the first exposure all new weapons directors get to the career field. Designed to provide background training for entry-level weapons directors, it includes studying air mass problems, air defense and tactical missions, aircraft control and warning activities, and other aircraft-controlling agencies, as well as working with other aircraft control and warning personnel (officer and enlisted).²⁰ Although students are introduced to command and control and battle management, 75 percent of the training day is spent in the laboratory performing simulated and live air-to-air intercepts and simulated refueling missions.²¹

The next school attended depends on the type of system to which the new weapons director is assigned. Controllers being assigned to manual systems, such as a forward air control post (FACP), will go directly to their units for upgrade training. Controllers going to an automated system will attend one of the automated systems courses. These courses concentrate almost entirely on operating the systems and controlling aircraft with them. Upon graduation, the controllers are sent to functional units. They will be certified mission-ready after demonstrating their ability to control and their knowledge of such things as lo-

cal procedures and local airspace restrictions.

With the exception of the airborne battlefield command and control center (ABCCC) controllers, the academic time devoted to battle management areas of knowledge is limited in the initial training of weapons directors. Lectures devoted to such areas are very general in nature and short in duration and are intended to only familiarize the student with the subject. Table 1 lists the courses and hours devoted to what can be considered battle management areas at the Basic Automated Systems Qualification Course. Only 30 of the 294 course hours are devoted to these areas. The rest concentrate on control of aircraft and automated console familiarization. This is not to condemn this particular course or, for that matter, the lack of hours devoted to battle management. These courses were designed to train weapons directors to do scope work and to integrate quickly into their new units with a minimum of training time; and they do a good job.

Table 1. Battle Management Courses Taught at the Basic Automated Systems Qualification Course

Electronic Combat	6
Adversary Tactics	6
Intelligence	4
Air Defense Exercise Briefing	4
Weapon Systems	10
Total Hours	30

The Exceptions

The ABCCC courses do not deal with radar control of aircraft. ABCCC is not a radar platform but an airborne command post. Therefore, ABCCC training covers more in the command and control arena. A vast majority of ABCCC training is devoted to subjects a battle manager needs to know. ABCCC courses, therefore, are a good source of information for developing a battle management training program.

There are other weapons director

courses that devote time to battle management areas, but they come later. These are the Fighter Weapons Instructor Course, the Counterair Tactics Awareness Training Course, the Adversary Tactics Controller Course, and the Staff Officer Course. While the first three are heavy in honing controller techniques, they do devote more hours to what a battle manager needs to know. For example, of the 241.5 classroom hours at the Fighter Weapons School Instructor Course, all but 83 are devoted to battle management-related areas of knowledge (e.g., friendly and enemy aircraft and munitions capabilities, the TACS, enemy defenses, and penetration aids). The Counterair Tactics Course has only 40 hours of classroom work, but over half are devoted to battle management areas of interest. The adversary tactics course that trains aggressor controllers includes 88.5 hours of class work, a good majority of which is devoted to Soviet aircraft and tactics. The Staff Officer Course also devotes some time to these areas.

Other Training Available

There are other opportunities in the Air Force for a weapons director or other TACS officers to gain battle manager knowledge. One such opportunity is the Air Force Institute of Technology, which offers a graduate program in strategic and tactical sciences. This program is designed to provide officers with analytical and decision-making skills and, among other things, is designed to confront future commanders with the various types of uncertainty that future wars could present and to challenge the student to minimize such uncertainty.²²

Another good source of battle management training is the Air Force Air Ground Operations School's (USAFAGOS) Battle Staff Course at Hurlburt Field, Florida. This three-week course places considerable emphasis on the employment of joint air and land forces, including the information required to support decision mak-

ing, assessment and dissemination of information, the systems and procedures used to control forces, and the formulation of options to provide the most effective use of tactical forces in joint operations.²¹

The Combined Air Warfare Department of the Air University Center for Aerospace Doctrine, Research, and Education (AUCADRE) at Maxwell AFB, Alabama, offers a Combined Air Warfare Course (CAWC) that could also be very useful in battle manager training. The aim of the four-week CAWC is to increase the effectiveness of officers serving on battle and support staffs throughout the Air Force. It utilizes a computer-assisted war game called Theater War Experience to familiarize students with the decision-making process of employing air power at the theater level.

There is also a new initiative being developed at the Air Force Human Resources Laboratory, Wright-Patterson AFB, Ohio, which could prove very useful in battle manager training. The project, called WARNET, will use flight simulators to simulate small- and large-scale air battles. WARNET will use local and satellite communications networks to tie all the simulators together. The plan calls for nodes in WARNET to represent bases with tactical aircraft and weapons directors. Each of these nodes would have a four-aircraft simulator, and some nodes would also contain a ground-controlled intercept (GCI) capability.²⁴ WARNET, wargaming, and other forms of simulation could prove to be invaluable aids in battle management training.

The Battle Management Course

In summary, current weapons director training does a fine job in preparing controllers to work their equipment and control aircraft. It seriously lacks emphasis in any of the battle management areas of knowledge mentioned earlier, and what is provided is piecemeal in nature. The building blocks for developing an exten-

sive, and necessary, course to train battle managers are available in the existing 17XX training program and in other agencies such as AFIT, AUCADRE, and USAFAGOS. Rated personnel who are assigned to the TACS face the same shortfalls in their training because they may not have the extensive command and control and other expertise required of a battle manager. Therefore, a battle management course is needed to pull all the pieces together and train the battle managers of the TACS.

To make this proposal for a battle management course cost-effective, an existing course will probably need to be deleted or revamped. Current training courses will need to be rank-ordered in importance, and the one that falls out the bottom of the list would be designated as the one for the trade-off. Once this is done, it would be beneficial to have the battle management school collocated with the Fighter Weapons School (FWS) at Nellis AFB, Nevada, because the instructors who teach much of the battle management areas of interest at the FWS could be incorporated into the TACS battle manager course. The exact location of the course, and the one-for-one swap that would need to be made in order to meet monetary constraints, would have to be determined by a working group called together for the purpose of setting up and developing the course.

It also would be beneficial if this were a joint-service school as well. Although battle managers in the sister services may require expertise in areas outside the scope of that for Air Force battle managers, there is still a lot of commonality in areas of required expertise. Additionally, such an environment would help battle managers learn what the capabilities are of the other services and how the respective command and control systems can be interconnected during joint operations.

Battle Manager Selection

It is safe to assume that future battle man-

agers will need the same talents, skills, and character that previous commanders had. They will also need a firm background in intellectual, technical, and analytical skills.

The complexity of future wars will severely challenge those with normal intellectual, technical and analytical skills. Clausewitz, in discussing military genius, advises that security of the nation should be entrusted to "the inquiring rather than the creative mind, the comprehensive rather than the specialized approach, the calm rather than the excitable head." Further, he argues, "war, though it may appear uncomplicated, cannot be waged with distinction except by men of outstanding intellect."²⁵

If we are to have battle managers in the TACS with "outstanding intellect," as Clausewitz puts it, then there may be a need to look at developing stringent selection criteria for these positions. We must ensure that our future battle managers have the "smarts" and "coolness" to make decisions quickly under pressure.

The Need to Act

If implemented, the recommendations made in this article will help burn through the fog and reduce the friction within the TACS that will certainly be encountered in a large-scale conflict. These recommendations would prepare TACS personnel to cope with chaos, and they would train battle managers at positions below the TACC level to take over the air battle without hesitation should contact with the TACC or higher echelons be lost.

These recommendations would be easy to implement. All that is required is a change in thinking. There can and must be a much better and more thorough training program for our TACS officer corps. Keep in mind that although the TACS has been evolving since World War II, it has never been put to the test where things could "go to hell in a hand-basket" very quickly. Let us take these simple steps now to prepare

TACS personnel for the next conflict, hoping all the while that the TACS will never have to face that big test.

Maxwell AFB, Alabama

Notes

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2. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 103-38.
3. Col Michael J. O'Connell and Maj James R. Coakly, "Training Tomorrow's Commanders to Manage the Fog of War" (Paper presented to the HQ USAF Long Range Planning Conference on Command and Leadership in the 21st Century Air War, Maxwell AFB, Ala., October 1984), 300-1.
4. Lt Col Harry R. Borowski, "Leadership to Match Our Technology," *Air University Review*, May-June 1984, 33.
5. Bingham, "Battlefield Air Interdiction," 8.
6. Maj Howard L. Dixon, "The Impact of Technology on the Future Tactical Air Control System" (ACSC study, Maxwell AFB, Ala., 1973), 23.
7. Bingham, "Battlefield Air Interdiction," 9-10.
8. Borowski, 33.
9. Lt Col Price T. Bingham, "Operational Level Warfare

and Its Implications for the US Armed Forces" (Unpublished paper, Center for Aerospace Doctrine, Research, and Education [CADRE], Maxwell AFB, Ala.), 6.

10. Brig Gen Wayne A. Downing, "Training to Fight," *Military Review*, May 1986, 21.
11. *Ibid.*, 22.
12. *Ibid.*, 22-23.
13. *Ibid.*, 24.
14. *Ibid.*, 25.
15. *Ibid.*, 24-26.
16. *Ibid.*
17. Col Kenneth A. Kirkpatrick, "Thoughts on Battle Management Training and Evaluation" (Paper presented to the Symposium on Information Processing and Decision Making for Battle Management, Wright-Patterson AFB, Ohio, 11-12 March 1980), 322.
18. TACR 55-45, *Tactical Air Force Headquarters and the Tactical Air Control Center*, 26 October 1984, 4-1.
19. *Ibid.*
20. "Evaluation of Air Weapons Control Fundamentals Course E30BP1741X1 001," training evaluation report (Keesler AFB, Miss.: 3300 Technical Training Wing, January 1986), i.
21. *Ibid.*, 3.
22. O'Connell and Coakly, 309.
23. Workbook, Battle Staff Course, USAFAGOS, Hurlburt Field, Fla., October 1986.
24. Russell M. Genet and 2Lt Roger W. Basl, "WARNET—A Multilevel Tactical Combat Training System" (Unpublished paper prepared for the Air Force Human Resources Laboratory Operations Training Division, Williams AFB, Ariz.), 7.
25. O'Connell and Coakly, 307-8.

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ON SPEAKING OUT

The September-October 1986 *Air University Review* contained a letter critical of Air Force policy review. The author stated that we apparently do not approve of our officers airing views that differ from established positions and that it should be acceptable for a writer to disagree with Air Force policy as long as it is stated correctly.

He is almost right on track with this headquarters' views governing information proposed for public release. We do not object to differing views. In fact, current Air Force policy is to foster, not quell, nonconformist ideas for strategy, tactics, and concepts.

Further, DOD's position on personnel publicly expressing their views—an individual is free to debate policy so long as it is not misrepresented—was stated in a February 1985 OASD (PA) letter to the commander, Air University, and other service counterparts. As an example, it is acceptable for an individual to state, "The official US or NATO policy is . . . , but I disagree. Let me explain why. . . ." It is not acceptable for an individual to misstate policy and then attack or defend that misrepresentation.

The Air Force security and policy review objective is to clear for public release maximum information with minimum delay. To help, we have delegated clearance authority to the lowest level of competence with HQ USAF review required only on subjects that must be cleared by OASD (PA).

I have looked at our security and policy review process and believe the objective is being met. Only 1.4 percent (32) of the 2,177 non-congressional inputs received at this headquarters in calendar year 1986 were denied clearance for policy reasons. Twenty-four were denied by OASD; eight by Air Force. In each case, our written denials provided an explanation and also reminded the submitter of appeal procedures.

Security and policy review officials on this staff have made a conscious effort for some time to guard against capriciousness by Secretariat/

Air Staff reviewers. They will continue to do so.

Brig Gen Michael P. McRaney, USAF
Director of Public Affairs
Washington, D.C.

OFF THE MARK

I would like to comment on the critique of *The Wild Blue: The Novel of the U.S. Air Force* by Maj. Alan J. Parrington in the November-December 1986 edition of the *Review*. Major Parrington in his first sentence says, "The *Wild Blue* is a fictional account." He then seems to forget that it is just that, fiction. I had read the novel a month or so before I read the critique. Had I read the critique first, I might not have been tempted by the title to check the book out of the library. I enjoyed the book for what it was, a novel.

At first the book was a little confusing as it tried to put the people in place, but I thoroughly enjoyed the novel once that little chore was done. I did not feel that the book was too long or that it rambled on. I spent nine and one-half years in Asia from 1969 to 1979 in both the Marines and the Air Force. Although the book is fiction, most of the situations in the book involve real-life actions. The book was written for entertainment, not as a history of the US Air Force.

I recommend this book to people who would enjoy a good novel and not expect a "real Air Force" story.

SMSGT (selectee) David W. Hall, USAF
4th Weather Wing
Peterson AFB, Colorado

ON TARGET

In his November-December *Air University Review* article, *The Human Factor: The United States Versus The Soviet Fighter Pilot*, Col. Mike Press is on the right track but challenges only the tip of the iceberg. "Renewed high-

level interest and a moderate infusion of money" will do little to change the level of combat effectiveness of our fighter units. If we are serious about optimizing our fighter forces, we will have to make some very serious, very difficult decisions about our basic written and unwritten Air Force philosophy.

First, we will have to vigorously dispel the notion that every new second lieutenant is a potential general officer. It simply is not true. There will have to be a leveling within the promotion system, one that promotes on experience, performance, and leadership—not on position or familial ties. Early promotion must be abolished as it only serves to perpetuate this notion and denies advancement to others.

Second, we will have to recognize, as Colonel Press does, that the days of the "universal man" are long gone. Many aircrew personnel have no desire to advance beyond the grade that will sustain their standard of living and are more interested in flying than serving on a staff at a MAJCOM. We will have to make provisions for a professional aircrew force much the same way the RAF does. Our continuation program does this now, but a formal program will be needed to show Air Force commitment to this philosophical change.

Third, assignments of aircrew will, by necessity, have to be made within weapon systems for longer periods of time—12 to 14 years longer for those who opt for professional aircrew.

Fourth, it will cost. Military pay will have to increase. Increments for years of service will have to be greater but should be more than offset by increased aircrew retention and decreases in undergraduate aircrew training. Flight pay would have to remain constant once the maximum is reached regardless of years of officer service.

There is much more to the "iceberg" than a letter can cover. The question to be answered is how much [of the iceberg] will the senior Air Force leadership recognize and act on.

*Lt Col Patrick Caldwell, USAF
National Guard Bureau
Washington, D.C.*

DISEASE AS AN ALLY

With reference to Col Lloyd T. Moore's fine piece in the November-December issue of the

Review concerning our perceptions of the Soviets ("The Danger of Mirror-Imaging"), I would like to add a note about his comments concerning the Aztecs.

The Spanish would have indeed had a more difficult time gaining a foothold in this hemisphere had the Aztecs been aware of what motivated the European invaders. Of course, at the time it was impossible to have such intelligence. But pestilence was one ally the invaders had that is often overlooked. Smallpox was a powerful ally, as much (if not more) responsible than horses and firearms for Cortes's remarkable victory against the Aztec empire. Natives by the millions died as the result of smallpox in New Spain (Mexico) as well as in the Inca empire, which became the viceroyalty of Peru. Spaniards had either had the disease or were immune to it.

Thus, in the course of fifteen years, two great Amerindian societies were devastatingly assaulted by a relative handful of Spanish adventurers. These appalling events were the most incredible of the sixteenth century—and surely among the most incredible in world history.

*Capt William C. Rynecki, USAF
Howard AFB, Panama*

net assessment

Deep Black: Space Espionage and National Security by William E. Burrows. New York: Random House, 1987, 401 pages, \$19.95.

Although the title is quite apt, the subtitle may lead some to dismiss this book as just one more self-styled "exposé" in a seemingly endless parade of attempts to capitalize on the inevitable aura of mystery that surrounds the high-tech world of space-borne reconnaissance systems. One hopes that the size of any audience thus lost is small, because this work deserves both a wide readership and critical acclaim. Put simply, William E. Burrows has produced a highly readable book that successfully traces the evolution of the US strategic reconnaissance program from an early post-World War II reliance on bomber and cargo aircraft fitted with special sensor systems to today's heavy reliance on space-based systems.

The book is not about "espionage" or "spying," as the title would imply. Although it is not uncommon for the popular media to refer to reconnaissance satellites and aircraft as "spy satellites" or "spy planes," the correct term is "reconnaissance," an activity recognized as legitimate and one conducted, for the most part, in strict conformity with the rules of international law. On the other hand, "spying" or "espionage" is an extralegal activity and may involve the deliberate violation of national sovereignty or other acts that would earn the perpetrator rightful approbation among the international community.

To his credit, Burrows accurately characterizes the US collection of intelligence information by space satellite and aircraft as reconnaissance or surveillance rather than "espionage." Only the title is inaccurate in this respect, a minor deficiency that must be ascribed, I suppose, to the publisher's desire to stimulate sales.

Material for the book is drawn entirely from unclassified sources, no mean task when one considers the degree of classification characteristic of the field. In addressing the issue of security classification, the author recognizes a legitimate need for protecting from disclosure information that could compromise the effec-

tiveness of intelligence collection. Yet, he is highly critical of the current system's "pervasiveness and often arbitrary nature." His point that "to classify almost everything is to classify almost nothing" is proved by the seeming ease with which he penetrates the supposedly opaque cloak of secrecy covering strategic reconnaissance programs. Much of the information deduced from unclassified sources is remarkably accurate, but it is not the type of information that seems likely to compromise reconnaissance effectiveness. Of course, the argument can always be made that every piece of information revealed contributes to the completion of the full picture, and thus is potentially damaging. In any event, Burrows's information is not invariably accurate. The errors that do exist, however, are not significant to the overall picture of the reconnaissance program, and therefore do not degrade the integrity of the work.

Nevertheless, the book is subject to valid criticism on another account. In his preface, the author states that the US reconnaissance system "virtually eliminates the possibility of a surprise attack by the Soviet Union." This is an opinion apparently strongly held by Burrows, but it is not supported by the objective evidence presented in his work. Even if one accepts totally his assertions about the effectiveness of the reconnaissance-collection system, his sanguine conclusion about the possibility of surprise attack is unwarranted in view of the historical record. This record shows that surprise can usually be achieved despite near-perfect intelligence information. In fact, perfection for the system is not claimed by the author, and he concedes that "great quantities [of data] have to be stored without analysis" simply because the sheer volume of information collected exceeds the analytical capacity of the system.

However, Burrows's primary point in addressing the issue seems to be to argue that the United States possesses an adequate technical capability to verify arms control agreements, a position at odds with the current administration's insistence on the necessity of on-site inspection. His case for this proposition is

somewhat better, but certainly not unassailable. He does present a relatively balanced view of the issue in the body of the book, using twin interviews with former CIA director William Colby and Maj Gen George Keegan (USAF, Retired), who have opposing views.

Although he apparently does not fully understand the inherent limitations of intelligence collection and analysis in preventing or limiting strategic or tactical surprise, the author has accomplished his stated purpose. This is a highly credible, very readable account of US strategic reconnaissance programs in the atmospheric and space environments. Notwithstanding the author's tendentiousness regarding the verification of arms control agreements, the book is highly recommended as a basic survey of strategic reconnaissance systems, their capabilities and limitations.

Lt Col Harvey J. Crawford
Maxwell AFB, Alabama

Patton, The Man behind the Legend, 1885-1945 by Martin Blumenson. New York: William Morrow and Company, Inc., 1985, 320 pages, \$17.95.

Gen George S. ("Old Blood and Guts") Patton is unquestionably one of the most fascinating yet enigmatic characters of the US Army. Like George Armstrong Custer (whom he resembles in many ways), George Patton and his career are a never-ending source of interest and debate. Martin Blumenson's new work has done much to illuminate and clarify many obscure and difficult points in Patton's life and its attendant legend. His unrivaled knowledge of the Patton Papers and other personal sources, as well as his incisive literary style, have succeeded in producing the best biographical treatment of Patton to date. Particularly valuable is the sensitive account of Patton's youth, the crucial role of his parents and wife, his unobtrusive yet unrelenting reading and study, and his vital (but often neglected) pre-1939 military career. The judicious use by the author of Patton's extensive diaries and personal correspondence vividly creates a painfully clear view of a stormy, sometime fatalistic, inner life, which goes far to explain the complexities of a turbulent public career. Blumenson's writing is also well paced and lucid, barring an occasional wordy and woolly sentence.

Yet such virtues unfortunately have their

corresponding vices. If anything, Blumenson is too familiar with his subject. This closeness may have contributed to the omission of any formal documentation of sources, which is a great pity for the development of a future scholarship. A more serious flaw is Blumenson's lack of detachment regarding Patton. We are too often given accounts of significant and controversial events in Patton's life from only his point of view. Blumenson, for example, over-emphasizes the role of dyslexia in Patton's post-1916 career. On the other hand, he fails to appreciate sufficiently the effect of Patton's (and his wife's) wealth in the development of his independent, idiosyncratic behavior and unquenchable professional ambition. One of the richest men in the Army, Patton could socialize with the highest echelons of his superiors and regard his career with a degree of detachment (and even risk) that was beyond an Eisenhower or a Bradley. Perhaps Patton's single-minded military victories would not have occurred if relative penury had previously forced him to conform more to protect his career. Or maybe Patton's somewhat unpredictable personality and comfortable style of life caused more distrust and estrangement from his colleagues than just being "too d-- military," as he put it. There are also a number of minor but irritating errors throughout the book: Bavaria is in southern (not northern) Germany (p. 269); the picture on page 51 is of Patton's aunt (not his sister); the picture on page 205 is of Patton attending a briefing in France or Germany (not Sicily); finally, the index has some inaccurate references.

Hopefully, someone will undertake a thorough "life and times" examination of Patton and his career. Until then, Blumenson's work will stand as the most complete and perceptive character study of one of the most complex, flamboyant, and highly successful leaders of our Army.

Dr Richard E. Morse
Maxwell AFB, Alabama

A Short History of Air Power by James L. Stokesbury. New York: William Morrow and Company, Inc., 1986, 313 pages with index, \$18.95.

A Short History of Air Power by James L. Stokesbury is a fine addition to his growing list of military history surveys. Readable and brief,

this volume highlights the major events of military aviation from 1903 to 1982. More important, it effectively argues its thesis; namely, that air power has never quite fulfilled the promises made by its legendary advocates. Frequently viewed as an inexpensive alternative to the senseless and futile slaughter going on in twentieth-century land warfare, air power built an illusory reputation for self-contained decisiveness.

Stokesbury documents the ultimate failure of air power to deliver on its primary "war-winning" goal, while suggesting that air war, like land warfare, became a bloody struggle of attrition:

It was supremely ironic that Douhet's alternative to the endless endurance of warfare on the ground had now become the same sort of endurance in the air. (p. 228)

Stokesbury's narrative moves along swiftly. Even so, his analysis is sound. Beginning with an overview of World War I, he surveys the early years of aircraft development. World War I was significant not only for laying the cornerstones for fighter and bomber technical progress but also as the breeding ground for future visions of air power. Despite relatively slow technological progress during the interwar years, this was the time that the doctrinal shape of air power was truly formulated. Stokesbury seems to agree that there have been few fundamental changes to Douhetan theory since that time.

In the lengthy section on World War II, for example, the author suggests that airmen of almost all the major belligerents went to war thinking they possessed the best weapons to shorten it. This was true despite the nationally unique doctrines and structures of the world's air forces in the 1930s and 1940s. Even in the face of determined enemy resistance, crippling losses, and the failure to destroy the enemy's will, many airmen left World War II confident that prewar promises had been fulfilled.

Subsequent air operations clearly make this conclusion questionable. For a variety of reasons, air power did not become the decisive weapon in cold-war confrontations in Korea and especially in Southeast Asia. Stokesbury adequately describes the almost impossible restrictions levied on the use of US air power in both wars.

Ending his analysis with a description of the Arab-Israeli confrontations and the 1982 Falk-

lands encounter, Stokesbury will make airpower enthusiasts happier. Continuing a theme picked up earlier in the book, the author suggests that tactical, and not strategic, air power has indeed become the decisive element in combined-arms ground warfare. One of its more interesting impacts is to speed battlefield events, making them look like "an old movie when the film runs at the wrong speed and things happen faster than they are supposed to."

None of Stokesbury's book should be viewed as particularly contentious. Long-time students of air power will find little new. Not footnoted itself, the book has a bibliographic essay that contains most of the standard works in the field. Stokesbury's efforts will be useful as a quick and handy background reference. It should find its way to undergraduate courses on air power.

Maj Mark K. Wells
Maxwell AFB, Alabama

Herbicide Warfare: The Ranch Hand Project in Vietnam by Paul Frederick Cecil. New York: Praeger, 1986. 289 pages, \$29.95.

Between 1961 and 1971, the US Air Force operation code-named Ranch Hand flew hundreds of missions and dropped 11 million gallons of chemical herbicides over millions of acres of South Vietnam and to a lesser extent in Laos and Cambodia. A total of 1,206 Air Force volunteers serviced and flew the spray planes during the nine-year history of this little-known and later controversial operation. Flying unarmed, obsolescent C-123 aircraft at slow speed and treetop level, the crews were subject to ground fire. One estimate lists that Ranch Hand aircraft took more than 7,000 rounds of ground fire, one celebrated plane taking more than 600 rounds. This made the sprayers the most fired-upon Air Force unit in the Vietnam War; yet only nine aircraft were shot down and 26 lives were lost. By the late 1960s, herbicide warfare was under severe attack by academic, private, and governmental studies; and one of the chemicals, Agent Orange, had become very controversial. Agent Orange was banned in 1970, and all Ranch Hand activity was terminated in 1971. In 1975, President Gerald Ford renounced American first use of herbicides in war. If this policy stands, then the

Ranch Hand experience will be a unique one in American military history.

Lt Col Paul Cecil, USAF (Retired), flew more than 1,000 combat missions in Vietnam, many in the Ranch Hand program. He traces the history of the project in an interesting book that resulted from his doctoral dissertation at Texas A&M University. After a brief introduction that treats "indirect" warfare in previous wars and some discussion of insect and foliage control during World War II, Cecil systematically addresses the stages of development of the Ranch Hand program. His final two chapters deal with the critics of herbicidal warfare and the Agent Orange controversy. Cecil is obviously favorable toward Ranch Hand, but he is fair with the critics.

Based upon extensive questionnaire, oral interview, and correspondence material from Ranch Hand personnel, and a thorough command of government sources and the extant literature on the program, the book is a fine piece of research. It is also most readable in explaining a very technical subject to the general audience. The work has one glaring oversight. Despite its exhaustive bibliography, no mention is made of William A. Buckingham, Jr.'s *Operation Ranch Hand: Herbicides in Southeast Asia, 1961-1971* (1982), an excellent volume in the Air Force history project. Since Cecil extensively employed Air Force materials, he could not help but have been aware of Buckingham's pioneering work. The failure to cite Buckingham is curious, and it raises serious questions in the knowledgeable reader's mind.

Still, Cecil has written a very good book that I recommend highly.

Dr Joe P. Dunn
Spartanburg, South Carolina

Soviet AirLand Battle Tactics by William Baxter. Novato, California: Presidio, 1986, 269 pages. \$18.95.

Lt Col William Baxter, US Army (Retired), has written a provocative book with a controversial title and a challenging thesis. Some readers will still quarrel with the use of those buzz words "AirLand Battle," because it risks a mirror-imaging of US and Soviet tactics and operational art. Baxter admits that AirLand Battle is not a Soviet term but one derived from current doctrinal ferment in the US Army. He jus-

tifies this usage as nothing more than an Americanization of the Russian term *obshchevoiskovoi* (combined arms) and portrays this as the heart of the Soviet way of war. Baxter's emphasis on combined arms seems well taken. Baxter repeatedly invokes Sun Tzu's admonition that victory in war belongs to the side that knows itself and its adversary. Why, then, burden Soviet tactics with American nomenclature? One suspects the answer lies in Baxter's intended audience, US military officers, who are now trying to come to grips with AirLand Battle doctrine themselves.

Baxter has set for himself the task of describing "how the Soviet Army thinks about itself, and how it intends to perform on the battlefield." (p. 1) The author freely admits the difficulties of addressing so broad, complex, and formidable a theme. He advocates a more realistic assessment of its military capabilities than templated models of Soviet tactics provide. Unfortunately, Baxter's chapters on Marxist-Leninist laws of war, military personnel, staff and command, offense, defense, supporting operations, artillery, and logistics are of uneven quality and not well integrated.

Several weak spots undermine the volume's utility for its independent audience. Although Baxter does strive to provide a sociopolitical and cultural context to the Soviet Army, the book's format and lack of historical depth defeat the intent. The roots of modern Soviet tactics and operational art can be traced through the evolution of Soviet military art from the theory of deep battle and successive deep operations of the 1930s, through the practice of the Great Patriotic War, down to the current concept of the theater-strategic operation. Such historical ties are not developed here. It is symptomatic of the volume that the author mentions Victor Suvorov but ignores Generalissimo Prince Alexander Vasilievich Suvorov, incorrectly attributing his famous dictum "Train hard, fight easy" to Marshal Mikhail I. Kutuzov. (p. 60) Although the final chapter is titled "Prognosis and Predictions," readers will be disappointed if they expect a treatment of such pressing questions as a Soviet conventional offensive option in Europe, the impact of precision guided munitions (PGMs), recon-strike complexes, and other emerging technologies on Soviet tactics and operational art. These are salient issues for a work addressing Soviet military art in the context of AirLand Battle. The author does not discuss the growing

volume of literature on AirLand Battle to be found in Soviet military periodicals.

Dr Jacob W. Kipp
Ft Leavenworth, Kansas

Nuclear Crisis Management: A Dangerous Illusion by Richard Ned Lebow. Ithaca, New York: Cornell University Press, 1987, 226 pages, \$24.95.

Richard Lebow introduces yet another important area of consideration for strategic analysts who are concerned with crisis management. His book focuses on what he calls "the single most important component of crisis management," the human factor. His basic premise is that our political leaders are not prepared to cope with the demands that our strategic force structures, supporting C³I systems, and employment strategies will make on them in a crisis situation.

The book does an excellent job of laying out the dilemmas of crisis management. Of particular interest is Lebow's use of history to show how world leaders of the past have reacted to their moments of crisis. Events of both World War I and World War II are used to show how the natural defense mechanisms the human psyche uses to cope with stress caused the political leaders of those eras to react to their crises in ways that would lead to a total breakdown of present-day strategies.

Although I do recommend *Nuclear Crisis Management*, I cannot endorse the recommendations Lebow offers as solutions to the problems he describes. They do not seem to be well thought out. The problems he describes are inherent in the vulnerabilities of present-day force structures and will not go away until our force structures are made less vulnerable. For example, Lebow suggests that current leaders would be under less stress in any particular situation if they devoted more time to practicing crisis management and became more aware of the dilemmas it entails. He likens this to pilots practicing emergency procedures and points out that knowing how to cope with an emergency makes the emergency less stressful. What he does not consider is that if crisis management is a true dilemma, its success depends on factors beyond the control of individual leaders and there is no emergency procedure that will always solve the problem. Studying and prac-

ticing crisis management will only make individual leaders more aware of how limited their options really are. It would be like giving a pilot an emergency for which there was no solution. Crisis management practice and study might only serve to point out that such emergencies exist. That would only undermine the ability of political leaders to deal with crisis and make them more subject to stress.

I do recommend the book. The problems Lebow describes are real and should be a prime focus of the national security debate. As an introduction to the problems of crisis management, it is excellent. As an attempt to solve those problems—well, let us say that it leaves us with a lot to think about.

Lt Col Fred J. Reule
Maxwell AFB, Alabama

The Challenge of Command by Roger H. Nye. Wayne, New Jersey: Avery, 1986, 187 pages, \$9.95.

This is not the classical textbook for which commanders and potential commanders have been searching for years. It will not teach you how to be a commander in eight easy lessons and an epilogue. It will, however, provide a solid structure for officers to prepare themselves for command at any level—5, 10, or 20 years into the future.

Roger H. Nye has taken his 40 years of experience and study, first as an armor and infantry officer and later as professor of history at the US Military Academy, and has developed a very usable bibliography of works relating to command of troops.

His book lists 250 references, biographies, autobiographies, history, command perspectives, organizational skills, leadership, decision making, training, and many other military-related subjects. One might say, "Okay, you can obtain such a bibliography at the end of any military book. But what the professional officer, who has limited reading time available, really needs is a road map to provide a focus for his or her reading."

Nye gives us just that. He structures his book around eight primary areas relating to command: military self-image; a commander's challenges; the company commander; concepts of duty; and the commander as tactician, warrior, moral arbiter, and strategist. His epilogue,

"The Commander as Mentor," sums it all up nicely.

The theme of each chapter is more than adequately supported by specific references to books listed in the bibliography, replete with asterisks to indicate the books that are recommended for priority in personal study or for use in officer professional development seminars.

In discussing mentors' responsibilities to expose subordinates to a career reading program, Nye observes that "the core of the mentor's curriculum lies in these 250 books. . . ." Here again, the realization that a junior officer's time is limited comes forth; and Nye solves this for us by providing a listing of "first books for officers who are to become readers," relating to the general outline of his book.

We should issue this book to our Officer Training School, Reserve Officers Training Corps, and Air Force Academy cadets as they begin their individual, professional reading programs. It will last them a career and, if used properly, will enhance not only their potential for command positions but their leadership, officership, and professional skills as well.

Nye provides a great deal of cognitive material here. There is something for everyone, from the newly commissioned officer who is just beginning to develop a reading program to the senior officer looking for supplementary reading. It should be the first book on a professional's shelf—and the most dog-eared.

Maj Gary C. Lagassey
Ramstein AB, Germany

Soviet Armed Forces Review Annual, Volume 9 edited by David R. Jones. Gulf Breeze, Florida: Academic International Press, 1986, 313 pages, \$47.00.

Even the casual observer will appreciate that the last three years, the present, and the near future are extraordinarily important times in the Soviet Union. In a comparatively brief period, we have witnessed an almost complete change in the national political leadership, numerous personnel shifts in the government bureaucracy, sweeping new economic policies (especially calls for technological advances), and a relaxation of controls over the media, arts, and literature. The implications of such changes for the USSR in coming years are potentially profound, depending mainly on the extent to

which Mikhail S. Gorbachev and his allies can sustain the pace of reform.

Not so well known is the fact that most of these trends have counterparts in the Soviet military sector. Thus, replacements in the top echelons of the defense establishment have been occurring at a rate unprecedented since the Second World War. They include the ouster of Marshal Nikolai V. Ogarkov as chief of the General Staff in 1984; the naming of a new defense minister, Marshal Sergei Sokolov, to succeed Dmitrii F. Ustinov (who died in 1984); and the death (also in 1984) of Chief Marshal of Aviation Pavel S. Kutakhov, commander in chief of the USSR Air Forces (VVS) since 1969. At the same time, the Soviet armed forces have been placing greater emphasis on technological improvements and have developed and fielded new weapon systems; many of these incorporate advances that reduce the qualitative edge that NATO has enjoyed and that has to some degree offset Soviet numerical advantages. The new generation of fighter aircraft and their associated air-to-air missiles are examples of these innovations that present serious challenges to the West. The question of further technological progress in Soviet weaponry is tied closely to the need to spur growth and efficiency in the civilian economy and to keep the burden of defense expenditures under control. The higher cost of producing and maintaining more sophisticated equipment forces the Soviets now to make tough guns-versus-butter decisions. Finally, the important restructuring of Soviet military commands continues, as the theaters of military operations (TVDs) are aligned into new theaters of war (TVs).

The rapidity and scope of events in the Soviet military in recent years have been so dramatic as to make it difficult to keep abreast of developments. This reason makes a book such as the *Soviet Armed Forces Review Annual* valuable. Like earlier editions in the series, this latest volume includes review articles covering the organization, equipment, and disposition of all branches of the Soviet military. An overview chapter by the editor, a bibliography of articles and books on the Soviet military published in 1984-85, a chronology of military activities, and a compendium of statistical data on Soviet military strength are very helpful. Additionally, the 1984-85 bibliography contains articles on Soviet naval theater forces, the naval officer corps, the economy, Soviet foreign policy in the Far East, and the space program.

The articles in this volume are generally well written, thoroughly researched, and backed up by numerous statistics and other facts; extensive use is also made of Russian language sources. The book is to be recommended as a reference work for the specialist and layman alike.

Dr Ralph S. Clem
Miami, Florida

"Air Force Spoken Here": General Ira Eaker and the Command of the Air by James Parton. Bethesda, Maryland: Adler & Adler, 1986, 557 pages, \$24.95 cloth.

Not only was Gen Ira Eaker one of World War II's finer commanders and a major figure in the technological development of aviation in the twenties and thirties, but he is one of the handful of policymakers who merit description as a major architect of the US Air Force. He has often been a central figure in the better histories and biographies of the development of American air power. When one examines the development of aerial refueling, long-range military aviation, or precision-bombing doctrine, one stumbles into Ira Eaker. It is hard to find an innovation of importance to the birth of the US Air Force that is not somehow connected with his career. Yet until now there has been no adequate biography of Eaker available. He merits a lot more than passing mention in the biographies of Arnold, Marshall, or Eisenhower.

Furthermore, after Eaker's retirement from active duty, he served as the conscience of military aviation, often writing and speaking with an impact that few other retired generals have had. For this reason, an understanding of General Eaker's career is of interest not just as a "period piece" from World War II, but as a way of understanding the origins and rationale of many of today's defense precedents and policies.

It is a tribute to the character of General Eaker that his biography was finally written with deep respect and admiration by his former aide and long-time staff officer, Col James Parton. Parton is much better remembered for his later career as founder and publisher of *American Heritage*. In keeping with the tradition of *American Heritage* for historic accuracy and balance, Parton included not only the profes-

sional controversies but also the flying and service anecdotes. When the occasional hint of personal friendship and bias pokes through, it only humanizes both biographer and subject.

This volume is well written, abundantly illustrated, and carefully crafted into an excellent and enjoyable book. It is well worth reading. It reminds one of DeWitt Copp's two books of this period (*Forged in Fire* and *A Few Great Captains*), and like them, this volume will repose on the reference shelves of Air Force people as a primary source on the origins of that service. It is highly recommended not only as professional reading but also for sheer enjoyment.

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Ernie's War: The Best of Ernie Pyle's World War II Dispatches edited with a biographical essay by David Nichols. New York: Random House, Inc., 1986, 432 pages, \$19.95.

"Ernie Pyle covered World War II," writes David Nichols, "the way the infantry soldier fought it: on the ground and on the move, subject to fear, filth and the capricious fates that dealt death to one man, life to another." He tells us that "Pyle was a novelty as a war correspondent. Only rarely did he write about the so-called 'big picture.' Rather, Pyle focused on the individual combatant—how he lived, endured by turns battle and boredom, and sometimes how he died, far from home in a war whose origins he only vaguely understood." (p. xiii)

Ernie Pyle was at once the most popular and widely read of the correspondents covering the Second World War. His columns, appearing in hundreds of newspapers coast-to-coast, brought the events of the world's most awesome conflict to the hometowns and doorsteps of America. Many of his columns were given prominent play in major metropolitan dailies; some were given front-page treatment.

His writing was as popular in the trenches as it was at home, where Pyle was considered something of a hero himself. His heroes, though, were not the men planning and running the war; they were not generals or statesmen. In fact, Pyle rarely wrote about anyone above the rank of captain. His heroes were in-

fantrymen who suffered the adversity and horror of war in an extraordinary way, and he spent the vast majority of his time living and working among them.

According to Nichols, Pyle "admitted that his admiration for the infantry was obsessive and that to him 'all the war of the world has seemed to be borne by the few thousand front-line soldiers here, destined merely by chance to suffer and die for the rest of us.'" (p. 22) Pyle's writing was not elegant or pretentious, just poignant and well informed. No man who had not lived among the revetments of Normandy, the beachheads at Anzio, or in the searing heat and constant danger of North Africa could write so knowingly about those young boys recently become men. It was admiration for their sacrifice that made his homespun style of journalism so appealing to so many readers.

This collection of Pyle's writing, complete with his Pulitzer Prize-winning column about the death of Capt Henry Waskow, who had been killed in the mountain fighting near San Pietro, is as fascinating as it is moving. It is certainly a different view from the one presented in the books, movies, magazines, and televised accounts we have grown up with.

"His unobtrusive style of reporting," says Nichols, "mingling, listening, rarely taking notes—ingratiated him with nearly everyone he encountered. He shared in the soldiers' tight-knit company, endured the same privations, subjected himself to the same dangers, and thus began his most significant body of work—describing for those at home the daily lives of the infantrymen who fought the war at its dirtiest level." (p. 16)

Nichols, himself a journalist from Indiana, seems fascinated with Ernie Pyle, both as a writer and as a spokesman for a bygone era of patriotism, self-sacrifice, and total involvement in the national defense. Pyle had no intention of becoming a spokesman for the combat infantryman—yet it is clear that Nichols sees him as such. Pyle viewed himself as a newspaperman, a Scripps-Howard feature writer who happened to be covering a mighty big story, nothing more. But Nichols and millions of Americans who read and were moved by Pyle's writings from 1940 until his death by a sniper's bullet in 1945 have accorded him a special place in American history.

Never before, and perhaps never again, has a journalist been as widely admired for his relationship with the men of this nation's military

establishment—especially the men at the lower rungs of the ladder. In an era of suspicion, distrust, and often outright hostility between the military and the news media, Nichols's book serves as a tribute to men whose vision was unclouded by self-interest and personal gain. A periodic trip through Pyle's writings should be a required exercise for budding journalists and incipient military leaders alike. They could glean much from the words of a man whose priorities were so uncomplicated.

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Nuclear Arms: Two Views on World Peace by Myron S. Augsburger and Dean C. Curry. Waco, Texas: Word Books, 1987. 186 pages, \$14.95 cloth.

Two ethical positions on the acquisition and possible use of nuclear weapons are forcefully presented in a debate format by the authors. Anyone who wishes to discuss the ethics of nuclear weapons should read this book. It is superbly written and is an excellent inaugural volume for a new series from Word Books called "Issues of Christian Conscience."

Both authors are well qualified. While teaching at Eastern Mennonite College and pastoring, Myron Augsburger, ThD, has written widely on war and the Christian's responsibility. Dean Curry is a director of the National Association of Evangelicals' Peace, Freedom, and Security Studies Program. A prolific author on Christians and politics, he chairs the history department at Messiah College and holds a PhD in international politics.

Augsburger relies on the traditional Christian pacifist position, which opposes all use of force by Christians, to argue that nuclear weapons are immoral. He adds to that critique by advocating the use of government monies for humanitarian purposes rather than for military ones. Curry, on the other hand, comes from the Just War tradition and contends that nuclear weapons can have moral uses, particularly as deterrents to worse evils. That Just War position says that since God has established governments for the maintenance of peace and welfare of the governed, those governments can legitimately use necessary, proportional force in self-defense. The point-counterpoint of Augs-

burger and Curry presents all of the important theological arguments on war and nuclear weapons. As a result, this book is a fine primer for a class on the Christian ethics of war.

Unfortunately, the debate is not a balanced one. Augsburg's logic is often confused. His church advocates Christian separation from any governmental force, be it police or military, and sees the primary duty for Christians as being in the area of evangelism and relief of human suffering. Augsburg presents these traditional pacifist arguments superbly but unfortunately identifies the possession of nuclear or other weapons with the desire to attack and dominate others who are weaker. That has not been the practice of the United States or its Western allies. His arguments are further eroded by his attempts to blend his pacifist position with a Just War position that has presuppositions that undercut a pacifist position. For instance, he advocates conventional arms buildups, and possibly wars, to replace nuclear weapons because nuclear weapons are, by definition, disproportional to any threat and are incapable of limiting collateral damage or non-combatant casualties. But the use of conventional weapons may result in very similar cost, inhumanity, and suffering. He thus appears to approve of one kind of suffering while being against another. In his favor, he never calls for unilateral disarmament. He advocates arbitration, forward conventional defense, and an "International Peace Institute." He also argues powerfully for social justice but never indicates how a society can achieve it or preserve it in the face of a totalitarian threat.

Curry argues with clarity and a wealth of support. His presentation of the Just War position is classic. The book is worth the price for this understanding alone. While presenting his arguments more clearly than Augsburg, Curry superbly responds to pacifist objections to the maintenance and possible use of nuclear weapons. For instance, he notes that God's *shalom*, or peace, is not just the absence of war but includes justice and righteousness. He believes that such a standard cannot be expected of human society before God's resolution of history. His central argument is that Western society faces an unrelenting threat from the humanistic, totalitarian, Communist regimes. Freedom, democracy, and faith are such important elements of American (Western) life that they are worth defending to the end. He points out that Christians have never been reluctant to give

their lives for a great end. The choice should not be between being "Red and dead"; both should be opposed. Therefore, Western governments must oppose totalitarianism, hopefully without provoking a nuclear conflict. He does state that a nuclear conflict will probably not result in the end of civilization. Nuclear weapons have become more accurate and smaller, they are under close control, and there is no particular reason to suspect that a nuclear exchange would become total.

Put this book on your "must-read" list if you are concerned about the possession or use of nuclear weapons. To understand how a Christian can participate in the military, read Curry's article.

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National Security: Enduring Problems of U.S. Defense Policy by Donald M. Snow. New York: St. Martin's Press, 1987, 272 pages, \$35.00.

If "we achieve in proportion to what we attempt," Donald M. Snow has accomplished much with *National Security*, the latest work from this productive political scholar. Snow offers a concise overview of major defense issues, setting them into historic context and outlining their transformation over time. Among the main subjects are the potential for nuclear war, whether global or theater; the emergence of nuclear arms and the effort to eliminate or to manage them; the intertwining concerns about conventional forces and concepts for their employment; the diversity of problems in "peripheral" areas of the world and their ties to the superpowers; the debate over defense spending; and the impact of the American military ethos and the nation's special "way of war." This is a very tall order, indeed, but Snow fills it remarkably well.

This book can prove useful, even for the specialist, as a brief "refresher" course and a reminder of what specialists often take for granted in their discourse with others. Also valuable is Snow's underlying view that one's stance on defense issues necessarily draws on cultural and historical factors and does not grow in a totally "value free," "culture free," "scientifically neutral" fashion. Indeed,

Snow's discussion of the development of such weapon systems as nuclear weapons, intercontinental missiles, long-range bombers, and the elements for a strategic defense system shows that human choice is as important as technological necessity.

National Security translates "defense English" into a language that any reader can understand. Terminology about national security changes rapidly, and the same terms may reappear years after their first use. Snow helps keep track of such terms, making their meanings more readily understandable. Concerning nuclear strategy, for example, Snow enables even nonspecialists to comprehend declaratory strategy, employment strategy, fractionation, the strategic integrated operational plan (SIOP), mutual assured destruction, limited nuclear options, countervailing strategy, and many other concepts. This demystification of the vocabulary concerning national security issues strips away needless abstraction and clutter from problems that are complex enough on their own.

Snow judiciously describes the views of successive presidents and their appointees substantially in their own terms. For example, his first reference to the Strategic Defense Initiative (SDI) does not include the more colloquial term "Star Wars." (p. 69) Two more references to SDI come before Snow uses the term "Star Wars," noting that it is "a designation the president strongly dislikes as suggesting frivolity." (p. 186) Only once in eleven later references does Snow use the term "Star Wars," even there using quotation marks and pairing it with the official term. He also avoids undue political characterization of the positions espoused by the leaders of other countries. Again, Snow acts not as judge of which policy is best but as a reliable guide to what the various positions have been. Given the heated environment in which defense issues are often discussed, Snow may come in for criticism in some quarters on such matters. But it will not be deserved.

The book is not flawless, and some of Snow's observations are debatable. Of the American reluctance to keep a standing army, Snow asserts that it meant "more attention to the so-called social net of benefit programs that began to appear during the 1930s New Deal." (p. 33) The problem lies in what Snow leaves out, since the New Deal era also served as herald of a standing armed force and of an enduring involvement of the United States in world affairs on an "entan-

gling" basis. The governmental role grew in both areas. Also, may we really style the War of 1812 and the Korean War as "long"? (p. 36) Can one really say that the American War for Independence could have been sustained over many years because Americans were united for total political aims when only a distinct minority supported separation from the Crown? (p. 36) The National Security Act of 1947 created the National Military Establishment and an Office of the Secretary of Defense but not the Department of Defense, which was formally founded under the terms of the amendment to the Act of 1947, which was passed in 1949. (p. 49) Perhaps not even the Reagan administration would be comfortable with Snow's calling arms control a "staple of the liberal Democratic agenda" (p. 228), especially since Snow often distinguishes between arms control and disarmament. Overall, however, such questions are small compared to the book's many important merits.

Snow's *National Security* is a worthy addition to a valuable series of "primers" on America's place in world affairs—a series that includes such established works as John G. Stoessinger, *Why Nations Go to War*; and Charles W. Kegley, Jr., and Eugene R. Wittkopf, *American Foreign Policy*. Snow's reach is ambitious. His grasp is impressive. His book is worth reading.

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Nuclear Fallacy: Dispelling the Myth of Nuclear Strategy by Morton H. Halperin. Cambridge, Massachusetts: Ballinger Publishing Company, 1987, 173 pages, \$19.95.

Since the Soviet Union obtained the ability to strike the American homeland, there has been an ongoing debate about the military utility of nuclear weapons, particularly in Europe. In *Nuclear Fallacy*, Morton Halperin contends that the threat to use nuclear weapons has not played a central role in resolving any of the intercontinental crises since 1945, if it has played any role at all. The author proposes several changes that the United States could make unilaterally in its nuclear posture that would decrease the chance of accidental nuclear war and, at the same time, increase the security of the West.

According to Halperin, US nuclear strategy has changed very little in the past 40 years. At first, nuclear weapons were treated as "regular weapons" and integrated into all military planning. Under this strategy, nuclear devices were "simply better weapons that may be used as a matter of course in any military conflict." When the Kennedy administration took office, it rejected the "regular weapons" model as espoused by the doctrine of massive retaliation. Thus, the "special weapons" model (the first use of nuclear weapons should be carefully considered) was formulated and remains the centerpiece of American nuclear strategy today.

Briefly critiquing nearly 20 international crises from Iran in 1946 to the Persian Gulf at the end of the Carter administration, Halperin concludes that resolutions were possible because of "the nature of the security interests at stake, the balance of conventional military weapons, and skillful diplomacy accompanied by a willingness to compromise—not the nuclear threat." Several of these international crises are too complex—Vietnam, for example—for Halperin's broad generalizations. The inclusion of the *Pueblo* incident even as a fleet-ing nuclear crisis is dubious at best. The ultimate reason for the steady erosion of the nuclear threat is the great reluctance by presidents to use nuclear weapons, which suggests that the "special weapons" model has always operated throughout the nuclear age.

If the nuclear threat has played only a peripheral role in conflict resolution, Halperin suggests the adoption of a third model in order to prevent accidental nuclear war and uncontrollable escalation. Nuclear weapons should be treated as "explosive devices," which would call for "the weapons to be used in very extreme circumstances in order to demonstrate national resolve, but never as weapons to fight wars." The military would plan its warfighting strategy as if nuclear weapons did not exist; nuclear weapons would be "stigmatized." To reinforce this new attitude, there would be a strict separation between conventional and nuclear strategies. If the individual military branches cannot perform this task on their own, Halperin suggests creating a new nuclear

command solely dedicated to nuclear strategy, with its own staff and answerable only to the president.

Halperin believes that there are two main dangers in the present nuclear situation. First, both sides fear a surprise attack, but each side is acquiring first-strike weapons. Second, under present NATO nuclear strategy, presidential control of nuclear weapons during a European crisis would be strained.

To reduce the threat of a first strike, Halperin reiterates several old arms control proposals: a nuclear freeze, a comprehensive test ban, and reduced reliance on missiles with multiple warheads. Halperin's own proposals—intrusive on-site inspections, stationing submarines far away from the other side's homeland, and agreements not to target command and control capabilities—are problematical, and even Halperin himself is skeptical of the Soviet response.

The adoption of the "explosive devices" model has several advantages as far as presidential control is concerned. First, if this new attitude is adopted, very few nuclear weapons would be stored in Europe and in less-vulnerable positions, restoring a measure of control to the president during a crisis. Second, a changed nuclear policy frees forces from protecting nuclear storage sites, and dual-capable aircraft would not be withheld during the initial attack; NATO could use all the resources available to fight the Soviet offensive instead of hedging in order to protect nuclear weapons. Third, NATO commanders would be released "to do what they know how to do: equip, train, and deploy their forces for sustained conventional operations." With this reduced reliance on nuclear weapons and increased emphasis on conventional strengths, "it would be easier for the Alliance to make the decision to use force" and "it could effectively deter acts other than large-scale overt Soviet military aggression."

Halperin realizes that his proposals might increase the possibility of a conventional war, but in his eyes the alternative is the status quo of basing the security of Western Europe on "a doomsday machine linked to a roulette wheel."

Stephen M. Sobieck
Keck Center
Claremont, California

notams

Military History Symposium

The Department of History of the US Air Force Academy has announced that its Thirteenth Military History Symposium will be held 12-14 October 1988. The topic will focus on the role of intelligence in military operations. For further information, write to: Executive Director, Thirteenth Military History Symposium, HQ USAFA/DFH, USAF Academy CO 80840-5701.

USAF Historical Research Center Grants

The USAF Historical Research Center has announced that it will make available several grants for FY 1988 for the study of the history of air power at the Historical Research Center, Maxwell AFB, Alabama. Applicants must have a graduate degree in history or a related field and a background in aeronautics, astronautics, or other military-related subjects. A broad range of military subjects may be researched with an emphasis on performing research using primary resource material of the USAF Historical Research Center. For application and further information, write to: Director, USAF Historical Research Center, Maxwell AFB AL 36112-6678. Application deadline is 28 February 1988.

Colorado Air Guard History

The Colorado Air National Guard has announced that it will be compiling a commemorative history of the organization. The sponsor is looking for material, including photographs, articles, and other reference material. The book, entitled *Colorado Pride*, will be sold only on an order basis for \$30. For an extra \$5, the sponsor will emboss your name on the leather cover. To contribute material or to order *Colorado Pride*, contact: Maj Charles Whitley, *Colorado Pride* Coordinator, 140 TFW/PA, Bldg 27, Buckley ANG Base, Aurora CO 80011-9599.

Project Warrior Top Ten

The Air Staff has announced the Project Warrior Ten professional reading list for 1987. This list is a yearly feature of the Project Warrior program to encourage study in the military profession of arms. This year's list includes:

1. *The Men of Company K: The Autobiography of a World War II Rifle Company* by Harold P. Leinbaugh and John D. Campbell. New York: W. Morrow, 1985, 318 pages.
2. *Iron Eagle: The Turbulent Life of General Curtis LeMay* by Thomas M. Coffey. New York: Crown Publishers, 1986, 474 pages.
3. *The Challenge of Command: Reading for Military Excellence* by Roger H. Nye. Wayne, N.J.: Avery Publishing Group, 1986, 187 pages.
4. "Air Force Spoken Here": *General Ira Eaker and the Command of the Air* by James Parton. Bethesda, Md.: Adler and Adler, 1986, 557 pages.
5. *Race to the Swift: Thoughts on Twenty-First Century Warfare* by Richard Simpkin. Elmsford, N.Y.: Pergamon Press, 1985, 376 pages.
6. *Once a Warrior King: Memoirs of an Officer in Vietnam* by David Donovan. New York: McGraw-Hill, 1985, 323 pages.
7. *Crossroads of Modern Warfare* by Drew Middleton. Garden City, N.Y.: Doubleday & Co., 1983, 320 pages.
8. *A Genius for War: The German Army, 1807-1945* by Trevor N. Dupuy. Englewood Cliffs, N.J.: Prentice-Hall, 1977. Reprint. Fairfax, Va.: Hero Books, 1984, 400 pages.
9. *Soldiers: A History of Men in Battle* by John Keegan and Richard Holmes. New York: Viking, 1986, 288 pages.
10. *Fighting Back: Winning the War against Terrorism* edited by Neil C. Livingstone and Terrell E. Arnold. Lexington, Mass.: Lexington Books, 1985, 268 pages.

These books are available at all Air Force libraries and will be sent to units with an active Project Warrior program. They are also available in commercial bookstores. All are good additions to the military professional's library.

Project Recall Seeks Information

Project Recall, a Flight Safety Foundation effort to help make flying safer, is seeking experiences, anecdotes, and articles that contribute to making flying safer. If you know of such mate-

rial, contact: Project Recall, Flight Safety Foundation, 5510 Columbia Pike, Arlington VA 22204-3194.

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Air Force Chief of Staff

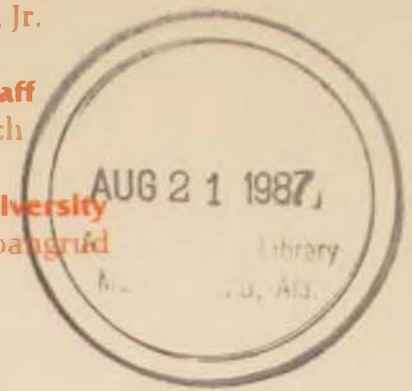
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