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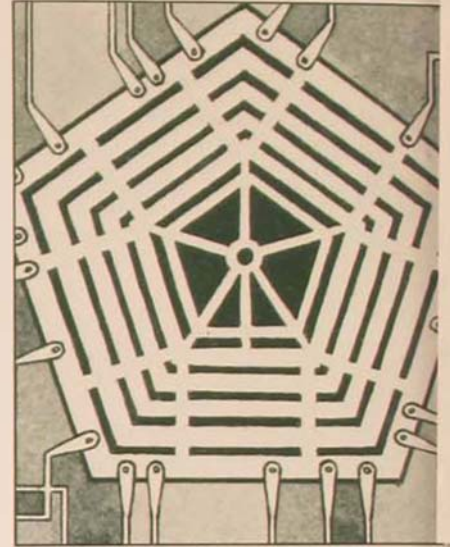MAXWELL AFB, AL 36112

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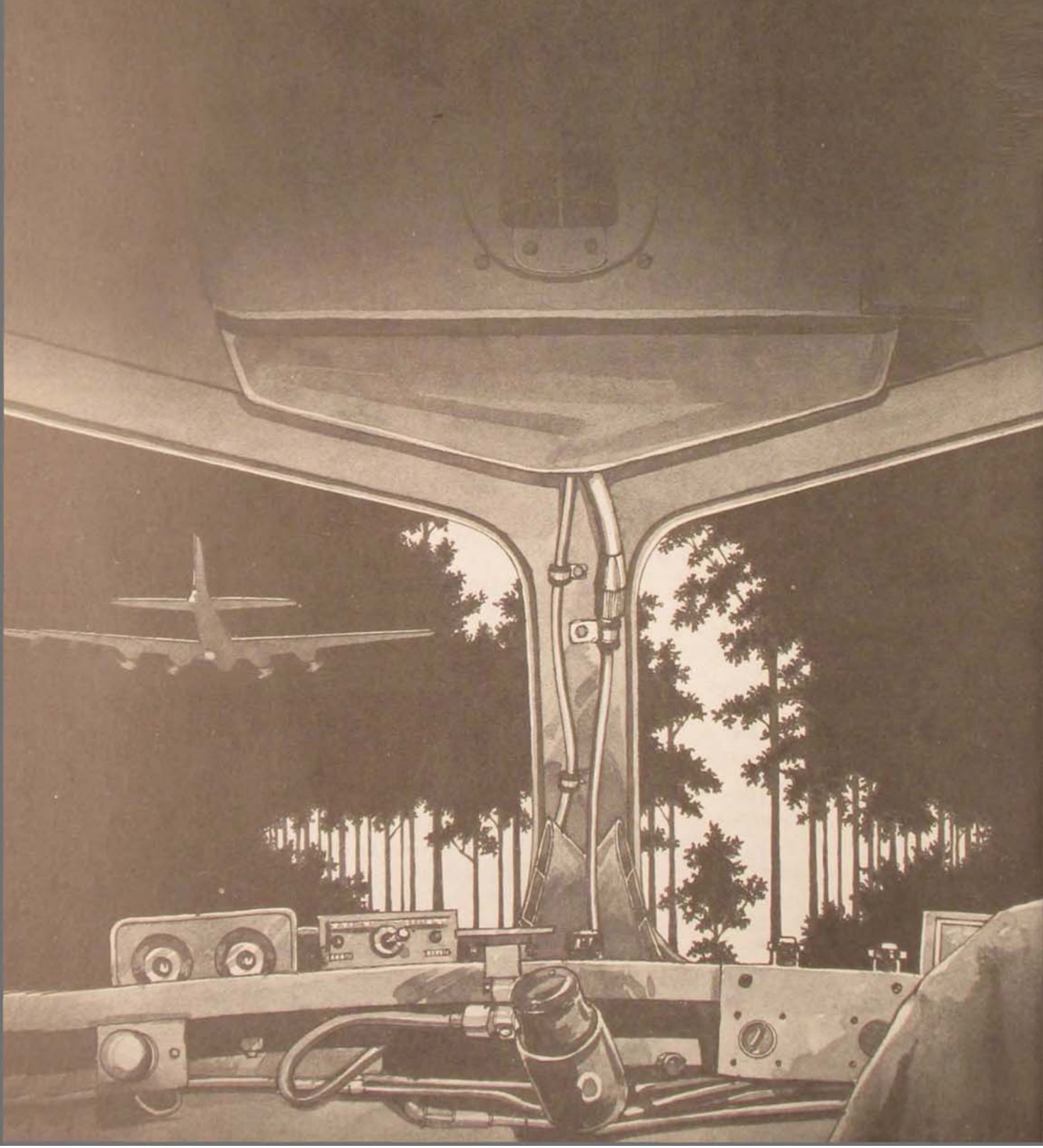
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TWO DECADES
IN THE AIR POWER WILDERNESS

Do we know where we are?

Colonel Dennis M. Drew

WHAT are the most important dates in the history of American air power? That is one of those intriguing questions for which there are no right or wrong answers, only opinions. Popular choices might include dates for the Wright brothers' first flight, General William "Billy" Mitchell's demonstration bombing of the battleship *Ostfriesland* (or his court-martial), any year in either of the world wars, or the dates for a number of significant events in space exploration. Few of us would include among our choices the year 1965, even though that fateful year marked a dramatic turning point for American air power. In 1965, American air power began the Rolling Thunder bombing campaign in North Vietnam. Before that campaign began, American airmen were convinced they understood how best to use air power to achieve decisive results in war. Since 1965 and the failure of the Rolling Thunder campaign, American airmen have been unsure of their beliefs, and the Air Force has wandered in a doctrinal wilderness.

The doctrine that the U.S. Air Force embraced so confidently as 1965 began can be traced directly to its godfather, General William "Billy" Mitchell, the firebrand prophet of air power. Although Mitchell's views changed significantly over time, the culmination of his doctrinal thinking is found in his statement before the House Committee on Military Affairs just four days after he resigned from the U.S. Army in 1926. Mitchell claimed that air power could strike directly the enemy's "vital centers" of production which were essential to the enemy's warmaking capability. In essence, Mitchell advocated the use of air power to wage economic warfare, to destroy the enemy's means of production, and thus to destroy the enemy's capability to wage modern warfare.[1]

Mitchell's court-martial just months before his resignation from the service was a crushing blow to American airmen. In spite of the obvious dangers to their own military careers, the young airmen who were Mitchell's apostles continued to preach his version of air power doctrine. During the 1930s, the Air Corps Tactical School at Maxwell Field in Montgomery, Alabama, was the center of air power doctrine development. The faculty members were the heirs of Mitchell's ideas, many having served with Mitchell during the turbulent 1920s. It is not surprising that the concepts developed by the Tactical School faculty were elaborations of Mitchell's seminal ideas. A lecture by Captain (later Lieutenant General) Harold L. George best summed up the Tactical School concepts:

> . . . nations are susceptible to defeat by the interruption of [their] economic web. It is possible that the moral collapse brought about by the break-up of this closely knit web would be sufficient; but connected therewith is the industrial fabric which is absolutely essential for modern war.[2]

The ideas promulgated by the Tactical School faculty were encouraged and then made acceptable by technological developments. While Mitchell's ideas often seemed fantastic in the 1920s, the development of high-speed, long-range, heavy bombers in the 1930s gave the pronouncements of the Tactical School considerable credibility. Moreover, these revolutionary ideas spread and took hold because they were broadcast in a school environment in which the students were the most promising officers in the Army Air Corps. Perhaps more important, members of the faculty of the Tactical School were the best of the best, many of whom went on later to important senior command and staff positions during World War II.[3]

The Army Air Corps (later the Army Air Forces) entered World War II with a doctrine that emphasized the decisive role of strategic bombardment in modern warfare. The other roles of air power were not ignored in the doctrine, as the Tactical School "readily acknowledged the usefulness of air forces in support of surface forces."[4] However, the spotlight was on strategic bombardment because the airmen be-

lieved that striking the enemy's "vital centers" could lead to quick and decisive victory. This belief, inherited by airmen and emphasized over the years, helps explain why the United States entered World War II with the two best heavy bombers in the world (the B-17 and the B-24) but could not field a first-class fighter aircraft until 1943.

Strategic bombing doctrine was put to the acid test against both Germany and Japan. The results have been a subject of considerable controversy since 1945. Skeptics pointed out that victory had been neither quick nor easy and noted that in spite of heavy bombing strikes of the Axis "vital centers," victory had still required the defeat of the deployed Axis armies and navies. Airmen, however, saw the results differently and believed themselves vindicated. They took particular pride in the results of the United States Strategic Bombing Survey, an exhaustive study conducted by a "blue-ribbon" panel that gathered much of its evidence from on-the-scene investigations. As the Summary Reports of the Bombing Survey reveal, the panel concluded that Allied air power had been decisive in Western Europe and had brought the enemy's economy to virtual collapse. In regard to Japan, the verdict was much the same; the survey panel concluded that the Japanese would have surrendered before the end of 1945 even if atomic bombs had not been used.[5]

But the atomic bombs had been used. Their destructive capacity seemed to offer airmen the ultimate tool for strategic bombardment. Mated with long-range bombers to form "atomic air power," airmen believed atomic weapons would bring the ideas of Mitchell to complete fruition.

The Korean War challenged the principle of strategic bombing, but the American military establishment considered the struggle in Korea to be an aberration, a war in which the military was hamstrung and frustrated by timid civilian leadership. The only lasting lesson gleaned from that conflict was expressed in the angry call for "No more Koreas!"

In the Korean aftermath, the newly independent Air Force produced its first doctrinal manuals amid attempts by the Eisenhower administration to reduce defense spending. Administration officials believed (encouraged by airmen) that atomic air power was a method of preventing or fighting wars on the cheap. As a result, the entire national defense structure relied more and more on nuclear weapons and air power to deter not only major wars but also more limited assaults on American vital interests. By 1956, Air Force Secretary Donald Quarles

was professing the idea that if one could deter a general war, one could also deter or win small wars. Further, Quarles made a not-too-subtle threat by declaring, "From now on, potential aggressors must reckon with the air-atomic power which can be brought to bear immediately in whatever strength, and against whatever targets. . . ."[6]

Air Force basic doctrinal manuals published during the 1950s reflected the continuing belief in strategic bombardment as the most decisive use of air power and as a tool usable across the spectrum of conflict. The refrains of Mitchell and the Air Corps Tactical School were repeated again and again in the context of a nuclear world and were encouraged by the continuing policies of the Eisenhower administration. In 1957, Secretary of Defense Charles Wilson told Congress that ". . . we are depending on atomic weapons for the defense of the nation. Our basic defense policy is based on the use of such atomic weapons as would be militarily feasible and usable in a smaller war."[7]

The Air Force was the beneficiary of such attitudes, and it received more than the lion's share of the defense budget during much of the 1950s. The Strategic Air Command became the dominant command within the Air Force. The tactical air forces reflected the trend as they became ministrategic commands equipped with fighter-bombers designed to deliver nuclear weapons. Even aircrew training missions in the tactical air forces concentrated on nuclear weapon delivery.

In spite of the interest of President John F. Kennedy in "unconventional" warfare, Air

Force doctrine remained almost unchanged between Kennedy's inauguration in 1961 and the start of Rolling Thunder in 1965. The 1961 version of basic doctrine, the doctrine with which the Air Force would enter the Vietnam War, paid only lip service to anything more than general or tactical nuclear warfare. Very little had changed since 1961, when General Curtis LeMay could say, "I think we have been consistent in our concepts since . . . 1935. Our basic doctrine has remained generally unchanged since that time."

Two fundamental, if unstated, assumptions formed the foundation for that doctrine. The most fundamental assumption was that American wars would be fought to destroy the enemy. The objective of strategic bombing was to destroy the economic and social fabric of a nation in order to destroy the enemy's ability and will to continue the fight. This most fundamental assumption fit nicely with the traditional American view of war as a crusade waged to destroy a well-defined enemy.

The second major assumption undergirding Air Force doctrine was that America's enemies would be modern industrialized nations. Strategic bombing was based on the idea of destroying the enemy's ability to produce the where-

A commitment to strategic bombing and a technology
that facilitated the construction of long-range aircraft
determined the shape of the Army Air Forces that en-
tered World War II. While B-17s (left) and B-24s (below)
were the world's finest long-range bombers, American
fighters were second-rate until the P-51s (above) were
available in 1943. Throughout the war, strategic bomb-
ing remained the focal point of the American air war.
While the Army Air Forces did not win the war single-
handedly (as air enthusiasts would have us believe), air
power did make enormous contributions to the effort.
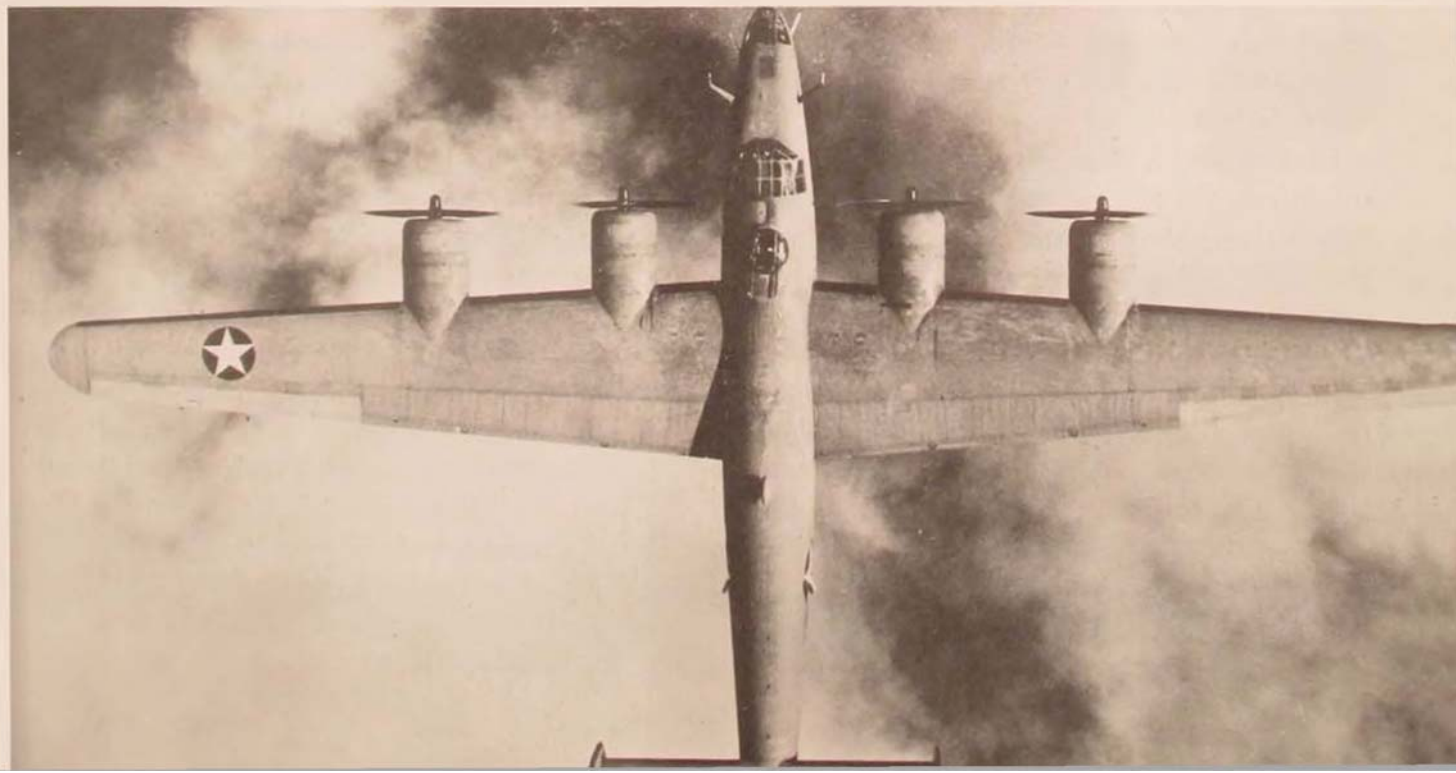
withal of modern war. It was economic warfare geared to the destruction of the vital production facilities of an industrialized state. Even the interdiction mission, regarded throughout the development of air power doctrine as the second most important air power mission (a poor second, however), assumed that the enemy would be a modern industrialized state. Traditional interdiction efforts featured attacks on rail yards, highway and rail bridges, and other presumed transportation chokepoints typical of industrially sophisticated states.

The decision in 1965 to bomb North Vietnam led directly to a clash between civilian perceptions and objectives in the war and military advice about how to best conduct the war (doctrine). Moreover, neither of the two basic assumptions of Air Force doctrine proved valid in Vietnam. The results were twofold: first, the initiation of Rolling Thunder, a bombing campaign in North Vietnam far different from that recommended by the military; second, the creation of a crisis, of sorts, for American air power doctrine.

For a variety of reasons, the American objective in Vietnam—particularly in the bombing campaign—was *not* to destroy North Vietnam. The basic American military objective was to "get Hanoi and North Vietnam (DRV) support and direction removed from South Vietnam."[9] In 1965, Secretary of Defense Robert S. McNamara defined General William Westmoreland's objective in South Vietnam by asking Westmoreland "how many additional American and Allied troops would be required to convince the enemy he would be unable to win."[10] In regard to objectives in the North, Rolling Thunder was part of an overall program to coerce and entice the North Vietnamese into abandoning their efforts. Senior government officials viewed the bombing campaign as a method to signal resolve to the North Vietnamese while slowly increasing the pressure as carefully controlled and graduated attacks increased in intensity and struck more and more important targets.

The military, meanwhile, had been planning a very different kind of bombing campaign since early 1964. Eventually codified in CINCPAC OPLAN 37-64, the plan called for a crushing attack on 94 targets, each of which was selected on the basis of three criteria: reducing DRV support for operations in South Vietnam, limiting DRV capability to intervene directly in the South, and destroying the DRV's capability to continue as an "industrially viable state."[11]

The criteria for selecting targets on the 94 Target List and the JCS plan for striking those targets indicate clearly that the Joint Chiefs desired to wage a classic strategic air campaign against North Vietnam and a complementary interdiction campaign. The proposed method of attack was to gain air superiority by attacking the principal enemy airfields; destroying the enemy's petroleum, oil, and lubricant facilities; and then destroying the enemy's industrial web. At the same time, interdiction efforts would destroy those war materials already en route to South Vietnam. In essence, the military planned to take the World War II air campaign in Europe and transplant it twenty years later into North Vietnam.

The conflict between American civilian perceptions and objectives and American military doctrine continued throughout the Rolling Thunder campaign. Air power doctrine called for the massive application of strategic bombing to destroy the enemy and its warmaking capability. The senior government leadership sought not to destroy but to persuade the enemy to cease and desist. President Lyndon Johnson characterized the dilemma as the difference between seduction and rape.[12] Throughout the Rolling Thunder campaign, the military pressed again and again for permission to increase the intensity of the bombing and to strike more important targets. Eventually this permission was granted, but slowly and gradually as Washington kept a tight grip on every facet of the campaign.

The second major assumption of American

air power, too, was called into question in the Vietnam situation. Vietnam was anything but a modern industrialized state. The North Vietnamese industrial economy was tiny even by Asian standards, producing only about 12 percent of the country's total gross national product. There were but a handful of major industrial targets. When the first targeting studies were done by the JCS, analysts found only eight industrial installations worth listing. The industry that did exist made only minor contributions to North Vietnam's military capabilities. Most of its military equipment, including all of its heavy equipment, was imported.[13]

Rolling Thunder continued through mid-1968. The President kept a tight personal control on the campaign, slowly increasing the bombing pressure and expanding the list of

targets that the airmen were allowed to strike. But those targets which the military considered most vital in Hanoi and Haiphong remained off limits, as did important interdiction targets close to the Chinese border. The campaign against approved targets was something less than overwhelming as the President imposed pauses in the campaign to allow the North Vietnamese to seek a negotiated settlement without losing "face." In the end, Rolling Thunder did not achieve its objectives. It did not "seduce" the North Vietnamese to the con-

In 1965, when Rolling Thunder strikes in Southeast Asia began, the Air Force was grounded in a doctrine that was totally inappropriate to the war at hand. One of the relatively few individualists to survive the managerial revolution of the 1950s and early sixties was Colonel Robin Olds (shown with President Lyndon B. Johnson), whose sense of innovation and imagination in tactics made up for some of the deficiencies in the fighters of the period. . . . . In only one of the numerous anomalies of the Vietnam War, B-52s were used for tactical support and interdiction missions in South Vietnam while fighter-bombers were used against North Vietnam's "strategic" target network.

When Army Air Forces bombers pulverized Schweinfurt, the objective was simple: destroy Germany's industrial warmaking capability. . . . Twenty years later, the objectives were less clear when targets included footbridges, villages (enemy structures), and stacks of rice.

ference table, and it did not convince the North Vietnamese that they could not win. One must also wonder what kind of American resolve it signaled to the North Vietnamese.

In the aftermath of Rolling Thunder and the Vietnam War, recriminations have flown from two directions. Airmen have blamed the failure of the bombing campaign on timid civilian leadership that would not "turn air power loose" in 1965 as it was turned loose during the intensive bombing of the Linebacker campaigns in 1972. On the other hand, airmen have been accused of not understanding the nature of the war, the nature of the enemy, and the restraint required to wage limited war and keep it limited.

Although airmen resist the thought, a few of them have been known to voice the suspicion

that their traditional doctrine was irrelevant in Vietnam. The two fundamental assumptions of air power doctrine were clearly incorrect in the Vietnam situation. The object of the war was not to destroy the enemy, and the enemy was not an industrialized state. There is also no empirical evidence that had Rolling Thunder been conducted differently (i.e., if air power had been "turned loose"), the outcome would have been materially different. In any case, President Johnson was not about to give in to the wishes of the airmen in 1965, despite the fact that the same proposals for a short, sharp bombing campaign of great intensity were offered to him over and over again. It seemed that airmen were so mesmerized by their doctrine that they had little else to offer even though the foundations of that doctrine were not relevant

manuals published since the end of the Vietnam War reveal that, since 1965, airmen have been unsure of themselves, to say the least.

The first thing one notices about post-Vietnam basic doctrinal manuals is that the Air Force has largely ignored the war in Vietnam. The manuals concentrate almost exclusively on theater-level "conventional" warfare and are clearly centered on the European case. The attempt to forget Vietnam is not limited to doctrine. Consider, for example, that thirteen years after World War II, the Air Force had published an exhaustive seven-volume official history of the war written and edited by respected historians. Thirteen years after the end of the American combat role in Vietnam, the official Air Force history has yet to be written, with the exception of a few isolated volumes on disparate subjects.

The second thing one notices about the basic doctrinal manuals published during the 1970s is how muddled Air Force thinking became about some of the most fundamental tenets of warfare. Even the venerable "principles of war" were not exempt from tinkering. The time-honored principle of "economy of force," for example, was interpreted in economic terms rather than stated in traditional terms of mission priorities—a particularly vexing change when one considers that the traditional interpretation of economy of force is singularly important to the effective application of air power. The unmistakable impression of such gaffes was that the Air Force was not serious about its doctrine and that those who wrote the basic doctrine manuals were ill-equipped to do so. General Mitchell and his heirs at the Air Corps Tactical School would have been appalled.

The third thing one notices about the basic doctrinal manuals written in the 1970s is that they contain very little information useful to airmen in the field. They appear to be written for use by harried Air Staffers involved in never-ending budget battles within the Pentagon. Although disappointing, this trend in doctrinal "development" was not altogether surprising.

in Vietnam and even though it quickly became obvious that they would not be allowed to execute their doctrine.

In the aftermath of the war, there is also the lingering suspicion that the war in Vietnam was not an aberration that can be passed off with a simplistic call for "No more Vietnams!" At least in some of the professional military literature, there is the growing realization that such "revolutionary" wars are not just conventional wars writ small. Rather, they are qualitatively different from conventional wars, just as conventional wars are qualitatively different from nuclear wars. Even worse, many experts believe that such "revolutionary" wars are far more likely to demand American involvement (in some capacity) than are any other kinds of conflict.

The result of the confusion and suspicions about the role of air power in the war against North Vietnam has been two decades of confusion for Air Force doctrine. Before 1965, right or wrong, airmen thought that they knew how best to use air power in war. Air Force doctrinal

The long struggle in Southeast Asia had diverted funding for new weapon systems, making budget monies for modernization programs very urgent needs for all of the armed services after the war. The culmination of the trend was the so-called comic-book basic doctrinal manual published in 1979. This manual was visually appealing but wallowed in generalities, unsubstantiated assertions, and irrelevant quotations. It was a triumph of form over substance, an air power doctrine manual that contained almost nothing about the nature of war, the art of war, or the employment of air power.

The year 1979 was the nadir of Air Force doctrine. The basic doctrine manual published in that year clearly reflected neglect, misunderstanding, and general confusion. The years since 1979 have been marked by considerable progress, spurred on by a fortunate confluence of events that were, perhaps, a reaction to the doctrinal muddle. The encouraging events may have gained impetus from the publication of the first balanced and scholarly military histories and critiques of the war in Southeast Asia as the 1970s drew to a close.[14]

A review of the professional journals beginning about 1979 reveals a spate of critical and thought-provoking articles centering on Air Force doctrine. Younger officers began challenging the current dogma, calling into question not only what the doctrine espoused but also how the doctrine was formulated. Not all of the "young Turks" agreed with one another, but they created in the professional journals, particularly the *Air University Review*, a climate of intellectual ferment.

At Air University, which had once been the center of Air Force doctrine development, both Air War College and Air Command and Staff College began implementing revolutionary changes in their curricula. The theme was to "put war back into the war college" (and the command and staff college). The study of military history, theory, and doctrine—which had virtually disappeared from both schools—suddenly reappeared as subjects of primary focus.

In addition, Air University formed a new organization, the Center for Aerospace Doctrine, Research, and Education, which has as its primary mission the development of original thought about the use of air power and is charged to assist the Air Staff in the development of doctrine.

Meanwhile, the Air Staff began assembling a team of more qualified personnel (comprising at least in part, graduates of the revamped Air University schools) to direct doctrine development efforts and produce the doctrine manuals. The quality of these personnel has continued to rise to this date. One of the direct results of this effort was the publication of the 1984 version of Air Force basic doctrine. Although this latest version of the manual has many serious flaws, it is a quantum improvement over the 1979 version.

The improvement is noticeable and admirable, but the Air Force remains in the doctrinal wilderness. Strangely, however, our experience in the wilderness, particularly since 1979, has had a beneficial side. Amid the confusion, accusations, and suspicions that surrounded air power doctrine since 1965, perceptive airmen have begun to realize that war is not the simplistic affair visualized by the pioneers of air power doctrine. Wars are not homogenized happenings fought against one kind of enemy with the same kinds of vulnerabilities. We have begun to realize that there are no magic answers which air power can deliver and that, in fact, war is a multifaceted phenomenon fought in three dimensions.

The years in the wilderness have led to intellectual ferment and turmoil. We are asking questions about the very nature of warfare rather than limiting our investigations to air power alone. We are now arguing about how our doctrine should be written, about whether we should have different doctrines for different kinds of wars, and about how to integrate Air Force doctrine with the doctrines of other services. In short, we are beginning to seek answers to the truly difficult questions, questions rarely

asked twenty years ago. Today, the most pressing need is to continue the ferment and encourage the debate. There are those who would stifle the debate to protect their own bureaucratic positions and political interests. However, those seeking a more effective force realize that the intellectual ferment must be encouraged and the dialectic process must continue. The agenda for the debate remains crowded, and the subject matter continues to be difficult and contentious.

AFTER two decades in the wilderness, do we know where we are? Yes, we do—we are still in the wilderness. But we are beginning to get our bearings so that we can find our way out. Perhaps in the foreseeable future, we will again be as confident as we were before 1965 but without the naiveté of that earlier era.

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

Notes

1. Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964* (Maxwell AFB, Alabama: Air University Press, 1971), p. 28.

2. Major General Haywood S. Hansell, Jr., *The Air Plan that Defeated Hitler* (Atlanta: Higgins-McArthur Longino and Porter, 1973), pp. 32-33.

3. Hansell, in *The Air Plan*, lists several such faculty members, including the later Lieutenant General Harold Lee George, Major General Robert Olds, Brigadier General Kenneth L. Walker, Major General Claire L. Chennault, General Muir S. Fairchild, and, of course, Hansell himself.

4. Hansell, p. 6.

5. *The United States Strategic Bombing Survey, Summary Report (European War) and (Pacific War)* (Washington: Government Printing Office, 30 September 1945 and July 1946), pp. 22 and 26 respectively.

6. Futrell, p. 227.

7. Ibid., p. 232.

8. Ibid., p. 405.

9. William Bundy, "Draft Position Paper on Southeast Asia" (29 November 1964), *The Pentagon Papers (New York Times Edition)*, edited by Gerald Gold, Allan M. Siegal, and Samuel Abt (New York: Bantam Books, 1971), pp. 373-78.

10. General William C. Westmoreland, *A Soldier Reports* (New York: Dell, 1980), p. 183.

11. *United States-Vietnam Relations 1945-1967* (Washington: Government Printing Office, 1971), vol. IV, chap. 3, p. 3.

12. Doris Kearns, *Lyndon Johnson and the American Dream* (New York: Harper and Row, 1976), pp. 264-65.

13. Raphael Littauer and Norman Uphoff, editors, *The Air War in Indochina* (Boston: Beacon Press, 1972), p. 37.

14. Two of the best books to appear at this time were Guenter Lewy's *America in Vietnam* (Oxford University Press) and Dave Richard Palmer's *Summons of the Trumpet* (Presidio Press), both published in 1978.

THE REAL STUFF

THIS issue focuses on the institutional Air Force, addressing the topics of who we are and what we are. When independence came in 1947, it was based on our ability to deliver the decisive weapon—the atomic bomb. Because air power can be decisive in war, the Air Force retains its independence.

There are many themes we could use to trace the development of the Air Force. The struggle between the bomber mafia and the fighter mafia for control of the service is one enduring theme. Our preoccupation with technology is another. Without technology, there would be no bombers and no fighters to provide the substance of the first theme. Our preoccupation with technology, then, is perhaps the more enduring of these themes and is one that is full of both promises and pitfalls.

For all that technology can do, it cannot in and of itself win wars. The side that "holds the technological high ground," does not always prevail. In fact, history teaches that quite the opposite is true.

During the Second World War, the Germans produced the greatest technological breakthroughs. German tanks were superior to most Allied tanks. The Allies had nothing that matched the technological excellence of the Me-262 jet fighters. If used properly, V-2 rockets might well have delayed the Allied advance in the west. Despite holding the technological high ground, Germany lost the war. What beat the Germans was not technologically superior weaponry; rather, it was 300 Soviet divisions grinding down their forces from the east while British and American forces, including their air forces, kept up the pressure in the west. The aircraft that made the difference over Germany were not those that were technologically superior. Numbers prevailed over quality. Leaders in the Royal Air Force and in the Army Air Forces were wise enough to insist that produc-

tion of bombers not be slowed to accommodate new technology. In the end, it was the B-17, a plane that was born of mid-thirties technology, that prevailed, and the side that held the technological high ground was ground down by superior numbers of comparatively inferior weapons wielded under the aegis of an appropriately devised strategy.
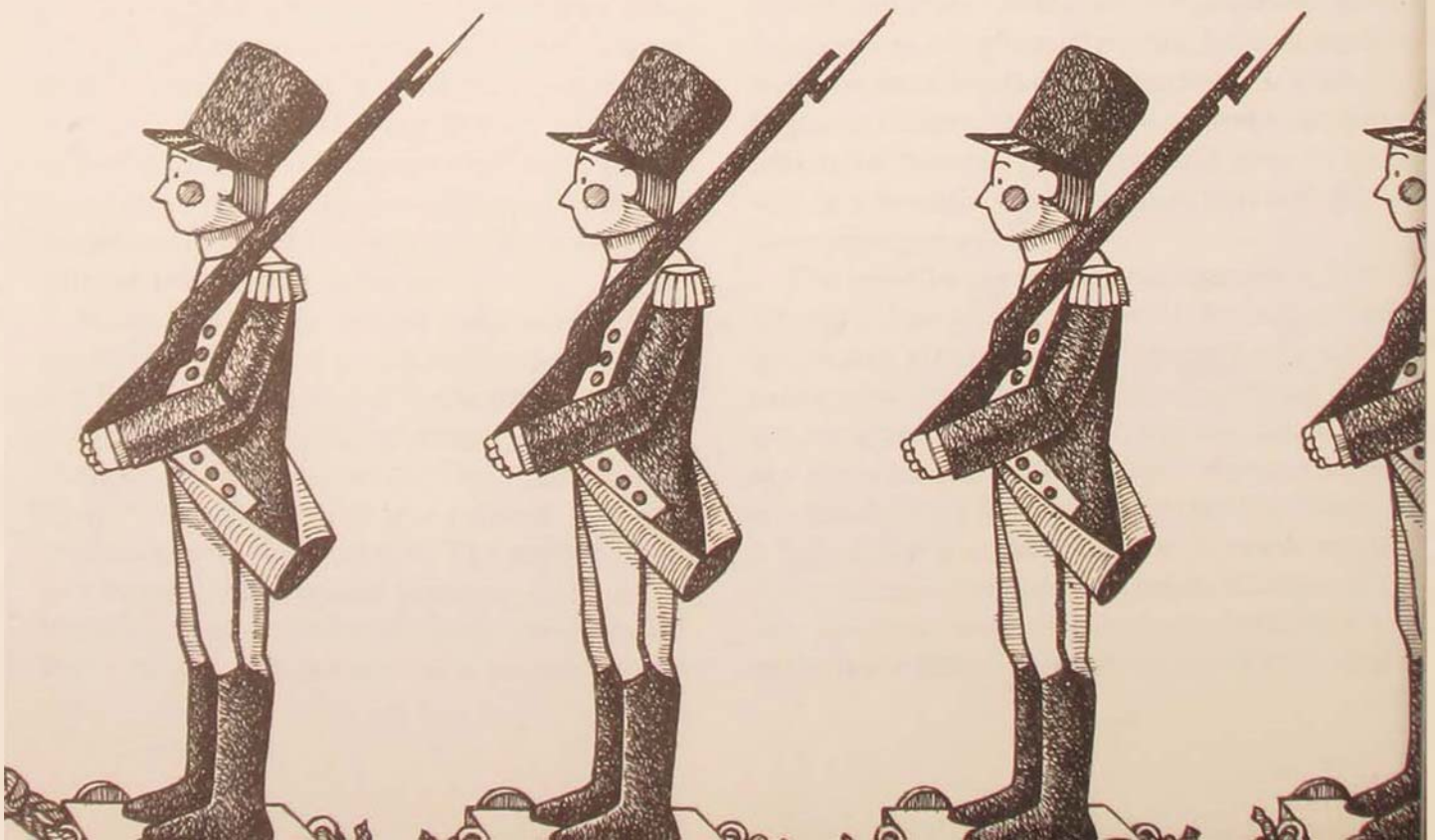
In the years since the Second World War, technology has caused a revolution, the scope of which exceeds those of the first and second industrial revolutions. Our military experiences since 1945, however, do not confirm that high technology has been the decisive factor in war. Did the side with the most technologically advanced weapons prevail in Korea or in the French Indochina War? Korea was a stalemate prompted by the introduction of massive numbers of Chinese troops. The Vietminh defeated the French because they devised a superior strategy, not because they used better weapons.

Technology served us well in Vietnam. We were innovative in its use, and, undoubtedly because of our superior firepower, many Americans are alive today than otherwise might have survived. We used air power to kill people and to destroy things, and we did so on a far greater scale than our enemy. But was technology decisive? We point, for instance, to the use of laser-guided bombs to drop the infamous Thanh Hoa Bridge. But, we need to ask, did dropping the Thanh Hoa Bridge make any difference in the outcome of the 1972 enemy offensive? The fact is that while air power played a key role in preventing the North Vietnamese from achieving total victory in 1972, NVA troops stood in greater numbers on more South Vietnamese territory at the end of the offensive than they had at the beginning.

In the years since the end of the Vietnam War, our affair with high-tech weaponry has intensified. We can point with pride at our ability to fly from England to Libya and achieve significant results in night bombing. Nevertheless, we should note, American policy in Lebanon was left in a shambles when a truck loaded with explosives blew up the Marine barracks in Beirut. A truck full of dynamite is not high-tech stuff, but in Beirut it succeeded both tactically and strategically.

The bottom line in war is victory. Wars are won or lost in the minds and hearts of men, especially in the leadership. While technologically sophisticated weaponry can be used to good effect, the advantages provided by technology have not always been enough to win. Mastery of the art of war is far more important than the stuff that is used in combat. To prepare our minds and hearts for war, we must master the study of military history because it provides the foundation on which strategy and doctrine are based. That is a tall order for a service that worships at the throne of technology, but it is one we cannot fail to fill.

The Editor

15

CREATING A STRATEGIC VISION

the value of long-range planning

MAJOR GENERAL PERRY M. SMITH, USAF (Ret)

ONE of the most exciting aspects of planning is strategic planning, i.e., helping your institution—in our case, the U.S. Air Force—create, maintain, and implement a long-term or strategic vision. Long-range planning can and should be done at many levels within the Air Force, and ideas, innovations, and new approaches should constantly bubble up to our senior leadership and to the long-range planners at major air command and Air Staff levels. Long-range planning will never solve all problems, but it does create a mindset in top leaders that causes them to ask the right questions when they make their tough day-to-day decisions. The most important thing for a decisionmaker to ask in respect to long-range planning and thinking is the following: How does the decision I am about to make fit into my vision of the future, my long-range plan, and my long-range priorities?
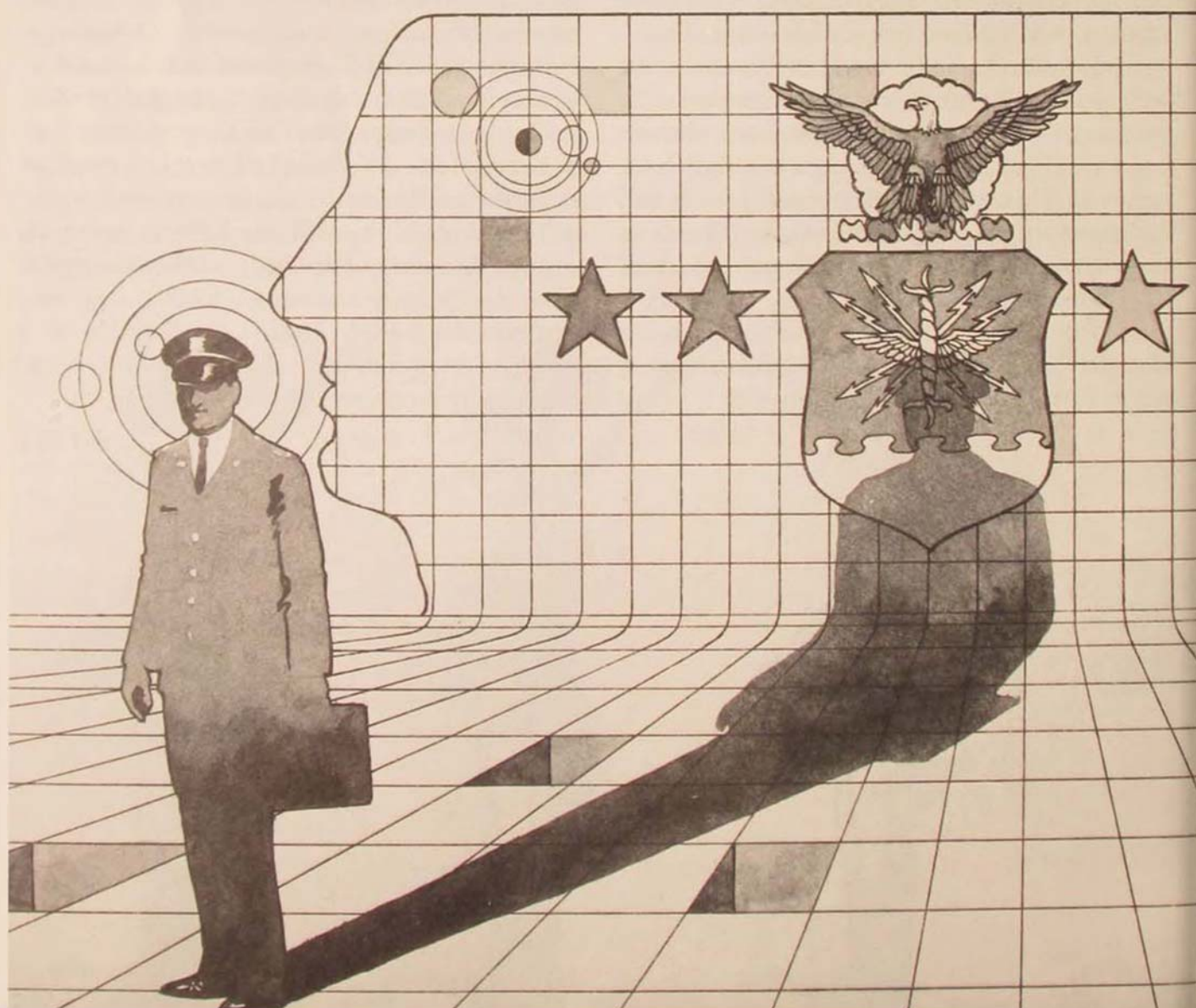
Fortunately, the U.S. Air Force has an institutionalized long-range planning process that helps the Chief of Staff, the Secretary of the Air Force, and the other key Air Force leaders make decisions from a long-term perspective. In my judgment, all professionals should understand the value of long-range planning and should be willing to surface their ideas that could lead the Air Force in important new directions. In this article, I shall outline four aspects of long-range planning: how to think about the future; why some leaders avoid long-range planning; long-range planning currently used by the Air Force; and, finally, the fifteen "laws" of long-range planning that I have developed during the past three years.

How to Think about the Long-Term Future

There are many useful techniques to force your mind and your institution to reach out beyond today's issues, problems, policies, and mindsets and to think seriously about the long-term future. By long term, I mean ten years or more into the future. The most productive timeframe for serious consideration by long-range planners is the ten- to twenty-five-year period. Any time short of ten years is so near-term that it is hard to conceive of really radical changes of approaches, and most short-term to midterm planning of an innovative nature tends to be threatening to many who are committed to present policies. More than twenty-five years is so difficult to deal with intellectually that it is probably not worth much time and effort. Exceptions to this twenty-five-year rule would be appropriate in certain technical and research and development areas where it is clear that something revolutionary and important can be accomplished but not within the next twenty-five years. Examples might be in space exploration, in medicine, in certain defense technologies, etc. Other less technical areas worthy of consideration beyond the twenty-five-year point would be long-term trends

and opportunities in demography, mineral exploration, use of seabeds, etc.

some useful approaches in long-term planning

The use of an alternative futures approach has been helpful to many long-term planners, for it forces the mind out of the "let's plan for the most likely future" approach. By considering a world beyond the year 2000 when the Soviet Union might no longer be a superpower, or other countries may have become significant military threats to the Western alliance, or the international economic system had collapsed, or a significant number of terrorist groups possessed suitcase-size nuclear weapons, the planner might find avenues of creative inquiry. The use of the alternative futures approach is a sobering but also a mind-stretching exercise that is highly recommended for both long-range planners and decisionmakers.

Another useful approach is a writing of prospective history. Herman Kahn was an advocate of this approach. The idea is to pick a year, such as the year 2010, and then attempt to write a history from 1985 to 2010. In a more narrow context, I like to ask the question: "What will the United States Department of Defense (or the U.S. Air Force) look like in the year 2010?" From it, a subset of questions immediately follow: "What weapon systems will be deployed; what will be the base structure, both overseas and stateside; how will we be organized; what missions will we have retained, what new ones will have been incorporated, what ones must we give up, and why?" Once these questions are answered, an examination of the timing of both divestiture and research and development activities can lead to decisions in the near term that would release money, manpower, etc., for use in more innovative areas.

how to choose long-term planners

In my judgment, only a small percentage of

any professional group makes good long-range planners. Identifying this group and carefully selecting the best are very important responsibilities of the decisionmaker and his chief planner. There are some useful methods to identify, select, motivate, and reward long-range planners. The Kirtin psychological test measures a continuum of psychological preferences from highly adaptive to highly innovative. Those who are more than one standard deviation above the norm as innovators can be considered as potentially effective long-range planners because they tend to be very creative and they like to deal with new ideas and new approaches to issues. The Myers-Briggs Psychological Type Indicator is also useful in identifying individuals who are comfortable with long-range planning. Individuals who score high in the "judging" category tend to make good planners. At the National Defense University in Washington, D.C., a great deal of research has been done with the psychological testing of executive-level people. (Anyone interested in pursuing this general subject should feel free to contact the Executive Development Department at the National Defense University.)

Interviews can be very helpful to see how widely read the potential long-range planner is. Those individuals with a deep understanding of history tend to make good planners because they can identify trends that may continue into the future. They also tend to be skillful in identifying those new developments which may have lasting impact of some importance on the future. Interviews can also identify those individuals who are uncomfortable with present policies and programs and who are willing to take risks to chart new courses for the future.

long-range planning across the government

It is my hope that one day each of the major departments in our government, each of the military services, and each of our government agencies will have a small long-range plan-ning division manned with carefully chosen creative and energetic individuals with solid operational backgrounds. The President should take two hours each month to address a long-range issue, and he should provide comments to his long-range planners in reaction to their ideas and recommendations. I hope that the Secretary of Defense, Secretary of State, our top military officers, the chiefs and secretaries of military services, the directors of the CIA and DIA, and the national security advisor to the President will also meet with their long-range planners on a monthly basis and provide feedback to them. Once every six months, the long-range planners from these agencies should meet to present papers, give briefings on their most recent studies, and trade ideas. Once a year, the top planners from each of the alliance nations should meet to share ideas and insights.

Finally, it is my hope that a long-range national security plan will be prepared and signed out by each new President, preferably within nine months of taking office, which would create a strategic vision for the nation and a strategic challenge to the national security communities. This short, eight- to ten-page plan would establish goals and priorities, would be updated annually, and would be presented to the President each year for discussion, modification, and approval. The annual presentation could be held each July, timed to have the maximum impact on the planning of the departments, agencies, and military services involved in the development of national security plans, programs, and budgets. This approach would create the proper framework for decisionmaking.

When decisions are made within the context of a strategic vision and with a full consideration of the long-term consequences of each decision, greater coherency in planning and policymaking results. However, most leaders of governmental organizations are caught up in daily responsibilities and spend little time in creating a strategic plan for their agency or service. In addition, they often fail to encour-

age the establishment of a long-range planning process that would allow them to deal with various long-range issues on a systematic and a regular basis. Leaders who are captives of an overly full daily schedule fail to plan systematically; they tend to rely on ad hoc long-range studies. While these studies can be quite useful, I very strongly believe that an occasional ad hoc long-range study is not enough to ensure that opportunities are seized to take advantage of changes in technology, the international environment, economic factors, threat realities and perceptions, demographic factors, and other areas. A systematic long-range planning process is essential for creating and maintaining a strategic vision and for building a strategic program.

Why Managers and Leaders Avoid Systematic Long-Range Planning

From my experience as a leader, a planner, an operator, a reseacher, and a teacher, I have come to a number of conclusions that may help explain why there is so much resistance to an institutionalized long-range planning process.

determinism

A number of senior leaders in our government have a basically deterministic view of the future, which is manifested in various ways. Some believe that the course of the future is already largely predetermined by forces outside their control. In their judgment, the best they can do as leaders is to adjust to an already predetermined future and make the best of what is bound to happen anyway. In fairness to these determinists, it is clear that certain things that will happen in the future are not controllable by men or women at any level or in any place. Brazil will remain, for many years, a large country with enormous natural resources, vast areas of jungle, and population largely concentrated along its coastline; Sweden will not count as much in world politics, economics, or military capability as will the United States, France, Germany, or the Soviet Union; nations will be largely stuck with their present climate, population, natural resources, topographical features, periodic natural disasters, etc., for the foreseeable future.

What planners maintain, and determinists deny, is that man can make a difference; that strong aggressive and decisive leadership by leaders of major governmental and business organizations can, in fact, change the course of the future. Planners argue that the Roosevelts, Churchills, Ho Chi Minhs, de Gaulles, Nakasones, Reagans, Gorbachevs, etc. (and the planners who support them) can and do make a difference in the course of human history. Dedicated long-range planners also maintain that these leaders can make much more of a difference in shaping the future if they create a strategic vision and combine this vision with a systematic planning process that includes an element of long-range planning.

the "don't lock me in" syndrome

A significant impediment to the establishment of a regularized long-range planning process is the fear by leaders that they will be "locked in" by any long-range plan. A long-range plan that is not reviewed and updated (at least every two years) can very easily get out of date, evolve into rigid dogma for the institution itself, and be misused by external forces; as a result, it can become dysfunctional. It is essential that all long-range plans be written in such a way that they remain useful guides for present and future decisions. "Sunset" clauses (that at a specified date in the future a plan would be phased out or canceled), scheduled reviews and updates, and flexible language in the plans are all useful techniques to avoid the rigidification of long-range plans.

long-range plans as a threat to the authority of certain leaders

Long-range plans, by their very nature, tend to

be viewed as threats to some leaders and staff directors. To not plan at all is often a safer and more comfortable approach for leaders than actions that lead to plans that appear to reduce the authority of various leaders within an organization. This is especially true when one organization is trying to develop long-range plans for other organizations. For instance, there is sometimes a reluctance by the major commanders in the field to allow a military service staff at the highest level to develop force-structure master plans. The commanders in the field sometimes fear that the development of these plans in Washington, as well as their modification over time, will wrest a certain amount of power and prestige from these field commanders.

the short tenure of leaders

Most governmental officials hold their positions for relatively short periods of time and tend to have "planning horizons" that generally correspond to the amount of time they expect to hold their present jobs. Heads of departments and agencies and chiefs of staff of the military services commonly can look forward to four years or less in office before they retire, resign, or are ousted due to a change in administration. Helmut Schmidt, Margaret Thatcher, Charles de Gaulle, George Marshall, and Dean Rusk, with their long tenure in top positions, are very much the exceptions to the rule as far as leaders of large organizations are concerned. Many business leaders also face relatively short tenures as well as the requirement to produce progress annually. People who need to look effective in the short term seldom develop the mentality or the apparatus for strategic planning.

the ideological bias against planning

Planning has a bad reputation in much of the Western world, particularly in capitalist societies. To many citizens, planning sounds like government direction or control, as well as governmental inefficiency and waste. Much of this skepticism about planning in government is well founded, but this antiplanning bias tends to spill over, unfortunately, into the national security environment. Leaders must strongly resist the temptation to avoid the responsibility to accomplish long-range planning for national security.

Long-Range Planning in the Air Force

Having had the marvelous opportunity of spending two years as the Director of Plans for the United States Air Force, I have observed at close hand a working long-range planning process as it works in the top echelons of the Air Force. This planning process is mature as a result of nearly a decade of evolution in the crucible of the Air Staff in the Pentagon. Secretary of the Air Force John Stetson helped institutionalize the long-range planning process by asking in 1977: "Where is the Air Force long-range plan?" This is a key question that all leaders should ask as they take over large organizations.

Since there was no institutionalized long-range planning process in the Air Force in 1977, Secretary Stetson took the next important step. He asked that a study group be formed to research both government and business organizations and to develop a means by which long-range planning could become a part of the Air Force planning system. The study group examined industry (General Electric, New York Telephone, and Michigan Power were particularly helpful) and government, and it devised a long-range planning system along the following lines.

A long-range planning division consisting of ten officers and headed by an Air Force colonel was formed. This division was designed to have regular and direct access to the Secretary of the Air Force and the Chief of Staff of the Air Force (the top civilian and military officials in the Department of the Air Force). A short (ten-

to twelve-page) long-range planning guidance memorandum was written; this memorandum is updated yearly and is approved each year by the Chief of Staff and the Secretary. The Long-Range Planning Division, along with the Director of Plans, meets privately with the Secretary and the Chief of Staff each month or two and addresses a specific long-range planning issue. These interchanges are not coordinated with the Air Staff agencies or with major commanders and often suggest radical solutions to long-range problems or issues. After a twenty-to-thirty-minute briefing, a number of "alternative strategies" are suggested. The Chief and the Secretary are asked to select the strategy with which they are most comfortable. The long-range planners take this guidance and enter the input of the Chief and the Secretary into the regular planning process.

In a few cases, the Secretary and the Chief will take a recommendation for implementation during the next ten to twenty-five years and decide to examine the possibility of implementation in the near term. For instance, in the early 1980s, the Air Force Chief of Staff and Secretary decided to bring together organizationally (both in the field and in the Air Staff) command, control, and communications with computers. The long-range planners had recognized that during the next fifteen years, computers and command, control, and communications would become more integrated and more interdependent; in fact, keeping computers separate would make no sense by the year 2000. The Chief and the Secretary saw the wisdom of the planners' case and decided to push up the date of consolidation by about fifteen years.

They did a similar thing with the special operations mission. The long-range planners had recommended consolidation of Rescue and Special Forces under the Military Airlift Command in the 1990s rather than keeping the special operations mission in the Tactical Air Command. The Chief and Secretary, attracted to the idea, asked that a much earlier imple-

mentation date of consolidation be studied. A few months later, after the study was completed, they decided to implement the consolidation over the next year so that the implementtion would be completed by 1983.

The Air Force Long-Range Plans Division has also become a clearing house for new ideas, for innovation, and for creativity. The Chief of Staff and Secretary look forward to their monthly sessions with the long-range planners. It allows them to escape their in-boxes, to think conceptually, to deal with new approaches to problems, and to freewheel intellectually with a group of bright, uninhibited officers. These sessions are also exciting for the officers of the Long-Range Planning Division, who have the rare opportunity to share their ideas with the top two leaders of the Air Force without having to coordinate these ideas and recommendations with any major command or Air Staff agency.

In some cases, the Chief or Secretary strongly disagrees with the planners and cancels the entire effort after hearing their briefing. For instance, General Lew Allen, Chief of Staff of the Air Force in the early 1980s, disapproved recommendations that would have radically changed the Air Force logistics system over the next thirty years. He also rejected a long-term investment strategy that was based on a long-term economic model with which he was quite uncomfortable.

Some examples of the many issues that have been addressed through this regularized long-range planning system are Latin America, technology, investment strategy, logistics, NATO, the Pacific Basin, and space. All these issues were addressed from the perspective of the early part of the twenty-first century.

The Fifteen Laws of Long-Range Planning

As a result of my experiences with plans in the Air Staff, the Secretary of Defense's Office, and a major NATO headquarters, as well as my research in long-range planning at the National War College, I have developed fifteen

laws of long-range planning that should be helpful to anyone seriously considering the implementation of the long-range planning process. Although it is rather presumptuous of me to label these points "laws," it is my firm view that if long-range planning is going to be effective in affecting the decision calculus of leaders in government, most, if not all, of these laws must be followed. So many long-range planning efforts fail because one (and, in some cases, many) of these laws is violated or ignored. I recommend that these laws be used not only as a basic guide when an individual or organization is establishing a long-range planning process but also as a checklist for long-range planners at all levels to ensure that planners do not drift away from important fundamentals.

Before I outline my fifteen laws, let me discuss in greater detail the monthly interactive sessions that should be held between the long-range planners and the top leaders of the organization. The chief planner of the organization (in the military, normally a two-star general or admiral) should introduce each of these monthly briefings and should remind the top leader or leaders that they are about to hear an uncoordinated briefing that addresses the long-range future. The briefings by the long-range planners should be short (twenty to thirty minutes), should use a small number of visual aids, and should address one specific subject.

At the end of the briefing, alternative strategies or options should be outlined and the top leaders should be asked to react to these objectives and alternative strategies. The approach should be, "Which approach, strategy, or option do you *like*" (rather than, "Which approach, strategy, or option do you choose?"). The long-range planners should not seek *decisions;* they should seek reactions and general guidance for the Chief Executive Officer. It is also important that the top leaders understand these ground rules. Since these are uncoordinated briefings that the rest of the leaders, staff, and field agencies have not seen, it is not fair to

press for a decision at these long-range interactive sessions.

After the briefing has been completed and the alternative strategies covered, the rest of the two-hour period should be spent in a "no holds barred" discussion. The leaders and the long-range planners must be willing to challenge policy, procedures, systems, organizations, doctrine, etc., as they would or would not apply in a world ten to twenty-five years hence. The chief planner must be willing to take the heat from his superiors if they react very negatively to "radical" briefings or recommendations.

Whether the leaders like or do not like any of the options outlined, the long-range planners must press them for their preferences. Sometimes, the leaders prefer a combination of two options or a less radical variant of one of the options. As the interactive session draws to an end, the chief planner should orally review the discussion to ensure that he and his long-range planners understand fully the comments and feedback they have received and to remind everyone in attendance that no initiative will be taken without full coordination with the staff and field agencies.

If the chief planner abuses his access and his mandate, using the long-range planning process to "run around the system," top staff officers and field agency leaders will join together and try to shut down the access of the long-range planning division to the top leaders. Therefore, the chief planner has an important but delicate responsibility. He must encourage his long-range planners to be innovative and creative, to challenge present policy, and to develop issues, briefings, and options that stretch the minds of the top leaders. In addition, he must be willing to take radical ideas, strategies, and doctrines to the decisionmaker. On the other hand, he must be fair to his colleagues in operations, finance, logistics, personnel, and research and development, etc. He must convince them that he will not abuse his access by pushing for decisions on uncoordinated issues. He must also be fair to subordi-

nate decisionmakers. Thus, the chief planner must be somewhat schizophrenic. He must support present policy while at the same time challenging that policy as it might apply in the long-term. A planner who merely extrapolates policy into the future is not a planner but is simply a caretaker or gatekeeper. On the other hand, a planner who undermines present policy undermines the coherence and legitimacy of the organization that he serves. Here lies the great challenge and the great opportunity—it is what makes long-range planning so rewarding.

Having described the essential features of the monthly planning session, I shall now outline the fifteen laws of long-range planning that must be adhered to if the process is to be successful.

1. The planners must answer the "what's in it for me?" question. It is important that long-range planners be able to convince their bosses, themselves, and other planners throughout the entire organization that long-range planning, in fact, accomplishes something that is worthwhile not only to the institution but also to all the individuals in the process. The most important person to convince, of course, is the top decisionmaker himself. Unlike Secretary Stetson, who asked the incisive planning questions noted earlier, many decisionmakers may not seriously consider long-range planning requirements until it is too late to reverse the serious day-to-day decisions they have already taken. Therefore, the challenge is to convince the leader very early in his tenure, when his mind is open and his energies at their peak, that it is worthwhile not only to spend two hours every month dealing with a long-range planning issue but also to reserve his valuable time for this endeavor. It is also important for the major staff chiefs and the major field agency leaders to understand and support the value of long-range planning, both at their level and at the very top of the organization. Their support, either active or tacit, for an institutionalized long-range planning system, whereby the deci-

sionmaker gets to deal with radical ideas on a regular basis, is important. By bringing up really interesting ideas, insights, and alternative strategies to help solve some of the difficult long-range problems, the planners can help the decisionmaker immeasurably. Over time, he will look forward to these sessions, for they can be marvelous opportunities for him, in a freewheeling environment, to be challenged by new ideas, new approaches, and new insights, and, most important, to articulate his objectives. He can also use the long-range planners as a sounding board for his ideas. If the decisionmaker sees no direct benefit to himself, then the long-range planning effort is doomed to fail.

2. The planners must get and maintain the support of the decisionmaker. This point is an adjunct to the first law, but it needs further development and clarification. The decisionmaker must be willing to tell his executive officer or his scheduling secretary that he wants to see the long-range planners on a regular basis. There must be enough priority in his interest in these sessions that pressing issues of the moment do not cause the meetings to be postponed again and again. The long-range planners must make a contribution in this regard in that they must work out a schedule for each year. The subjects chosen for each session must be of high interest to the decisionmaker so that he will agree to these sessions on a monthly basis and stick with this schedule throughout the year. It is also important that the decisionmaker be willing to allow approximately two hours for each of these sessions. Normally, anything less than two hours does not give justice to the issue, nor does it give the decisionmaker the opportunity to really get away from his "in box" and think about the long-term issue. Short sessions do not leave enough time for good discussion, dialogue, and feedback after the briefing is given. The decisionmaker must occasionally discuss the value of the long-range planning in his staff meetings, in his decision meetings, and in his normal day-to-day activities with his staff and

with the major commanders and leaders of the various field agencies. The decisionmaker must encourage long-range planning and ask the occasional question, "How does this decision, which I am about to take, fit into our long-range plan?" If he does not do so, the long-range planners will have a great deal of trouble getting support as they try to fold long-range planning options and approaches into the normal planning, programming, and budgeting process. One useful technique is to schedule a long-range planning interactive session shortly before the leader is to travel overseas (for instance, a "Latin America in the twenty-first century" session just before his Latin American trip), to make an important speech, or to testify on a specific topic before the national legislature (for instance, "space beyond the year 2000"), etc.

3. The planners must have direct access to the decisionmakers. After one examines long-range planning efforts in business and government, it seems to be quite clear that unless the long-range planners work directly for the decisionmaker, or, at a minimum, have direct access to him, the long-range planning effort will not be successful. Most of the best-run business companies or agencies in the United States have long-range planners working directly for their chief executive officers; the United States Navy has that system within the Defense Department. This is the ideal arrangement. The planners are protected by the boss and remain close to him by being a part of his immediate staff. Another option is to have the long-range planners work for the chief planner but have direct access to the top decisionmaker on a regular basis. In this arrangement, the role of the chief planner becomes very important because he must be committed to allowing his long-range planners to develop radical ideas. He must not remove some of the best ideas on the way up to the decisionmaker. If he filters the information and recommendations, the impact of the long-range planners on the thinking of the decisionmaker is reduced.

4. Briefings by planners must not go through the normal coordination process. This is a delicate but very important point. If the long-range planners must coordinate their briefings with all the agencies within the staff and with all the field agencies, many of their best ideas will be filtered out and much of the impact of their briefing on the decisionmaker will be lost. The general tendency in this regard is that anything that seems to question present policy or present organization will be objected to by one or more staff agencies. The planners will then have to compromise their briefing and their recommendations to accommodate these concerns. This tendency is quite dysfunctional to an innovative and creative long-range planning system. Full coordination generally leads to a very bland briefing and some very predictable recommendations that probably will not interest the decisionmaker. Over time, he will lose interest in seeing the long-range planners.

5. The process must lead to some decisions in the present. The long-range planning process can be useful even if it does not lead to many decisions in the present. However, to establish and maintain legitimacy and support for a continuous long-range planning effort, it is essential that an occasional decision be made for early implementation of an idea relating to a long-range issue or a long-range plan. So often the question is asked by critics of long-range planning, "But what does this all lead to?" These critics argue that unless the long-range planning process leads to some decisions in the present, it is just an intellectual exercise of little value. In order to gain legitimacy for the long-range planning process, it is very helpful for the decisionmaker to take a look occasionally at a long-range issue with the idea of early implementation. Making decisions in the present on long-range issues is a wonderful way to legitimize the long-range planning process.

6. The process must be institutionalized. Having an institutionalized long-range planning process is very important. Ad hoc studies

may be useful and may play an important role in bringing a large number of people into the long-range planning process for a period of time and focusing attention on an issue or issues relating to the longer term. But ad hoc studies are not enough. If there is no institutionalized process to encourage the leaders at the top of the organization to consider long-range issues on a regular basis, many opportunities will be lost. Employing a combination of both ad hoc studies and an institutionalized, regularized, month-by-month long-range planning process is the best way to ensure that the advantages of long-range planning are maximized in an organization.

7. Within the framework of the institutionalized process, long-range planning must remain flexible. The institutionalized planning process can become rigid and can lead to plans that are so inflexible that they become dysfunctional. In order to ensure that long-range plans remain flexible, all of the plans should be reviewed periodically so that they don't become too rigid or too out of date. There should be an established "sunset clause" of one to two years after publication of a plan, at which time the plan no longer has legitimacy and credibility as long-range policy. (Ad hoc studies should normally remain as studies and not become formal plans.) This expiration date should be stated specifically on the cover letter of each plan and should be signed by the decisionmaker to all staff and field agencies at the time of publication of this plan. (What is stated in the cover letter about how the plan is to be used is very important. The decisionmaker *should not* sign most long-range *studies.* He *should* sign most, if not all, long-range *plans.*)

8. In addition to the institutionalized process, periodic ad hoc studies are needed. Ad hoc studies are the norm in most organizations and often lead to decisions that are very innovative and useful. The ad hoc studies often get the visibility and support that the institutionalized process does not get. Some examples of excellent ad hoc studies accomplished in recent years by the military services of the United States are Seapower 2000, AirLand Battle 2000, Army 21, Air Force 2000, and the Air Force Project Forecast II. One of the auxiliary benefits of ad hoc studies is that they often expose large numbers of bright people to long-range problems and issues. These people often become life-long advocates of long-range planning, and, for the rest of their professional lives, they ask the big, long-term questions as they work on issues from staff and leadership positions. However, no matter how profitable a study or group of studies may be, the ad hoc approach is no substitute for an institutionalized planning process.

9. Long-range plans must be readable and short. There have been many long-range plans and studies that are of such length (often in multiple volumes) that very few people ever read them. It is important that all long-range plans be short, very readable, and as free of jargon and acronyms as possible. These plans should be packaged well—with many diagrams, charts, and the highlighting of words—to make them interesting enough for busy people to pick up and read through. Ad hoc studies should be no longer than 300 pages. The annual long-range plan should be even shorter— no more than ten or twelve pages long, with a one- to two-page executive summary—so that it can be read quickly and have real impact.

10. Planners must develop implementation strategies. The long-range planners should develop general implementation strategies to give the planners, programmers, and budget people ideas on how to carry out and implement the policies established in these plans. Decisionmaking is only one part of the overall planning process. Implementation strategies are as important as the decision itself. The long-range planning divisions, which should always remain small, can help the rest of the staff by providing some implementation ideas and avenues of approach. They should not be the implementers themselves, but they should assist the implementers as they move from

plans to programs to budget to reality.

11. Planners must avoid constraining the innovation and divestiture process. There is a general tendency in developing long-range plans to put constraints on these plans: budgetary, technological, time, etc. Although these constraints can help make the plan look more realistic, they also tend to restrict the vision of the planners and, in turn, the vision of the decisionmaker. One of my big mistakes, for instance, in the development of the Air Force 2000 Plan, was the rather severe fiscal constraints (1 percent real growth each year in the Air Force budget from 1987 to 2000) that I established before the planning began. As a result of these fiscal constraints, some interesting opportunities were rejected out of hand because they could not be funded within these fiscal constraints. Long-range planners should avoid this kind of constraining activity, both from the point of view of innovation and creativity and also from the point of view of divestiture. There should be no sacred cows: planners should be willing to recommend the divestiture of organizations, major weapon systems, major R&D programs, etc. If planners constrain themselves by not allowing the full consideration of divestiture opportunities, they are doing a disservice to the institutionalized long-range planning process and to their boss.

12. Planners must avoid single-factor causality. There are many people in institutions in this country who believe in single-factor causality. Basically they think that only one thing really counts, whether it be economics, technology, political factors, or another factor. However, single-factor causality is usually erroneous and is too simplistic. Those who accept it readily in their thinking develop a mindset that does not take into account other factors. Long-range planners must be broad-scoped people; they must take into account many factors in doing their planning. When a leader tends to focus on a single factor, it is the responsibility of the long-range planners to try to break him out of that mindset. They must try

to convince the leader that, in fact, there are multiple factors that play roles in the development of future courses of action.

13. Planners must avoid determinism—economic, political, technological, etc. Anybody in the long-range planning business who thinks that the future of the world is determined largely by events outside the control of the institution in which he works should not be a long-range planner. Long-range planners must assume that their plans, ideas, innovations, creativity, and issues really count. They must feel confident that if the decisionmaker makes a decision based on their ideas, that decision can have an impact on the future course of events. Planners must assume that people in key positions can and do make a difference. Those involved in developing long-range plans should be careful that no determinism creeps into the calculus of decision, the briefing, or the plan itself.

14. Planners must stay in close contact with the operational, doctrinal, policy, R&D, communications, and manpower communities. One of the lessons from the corporate world is that the long-range planners working directly for the chief executive officer sometimes get isolated over time from the issues, problems, concerns, and pragmatic considerations that really exist. This is one of the key reasons that the new chief executive officer of General Electric decided in 1984 to restructure and reduce the planning staff drastically at the corporate headquarters of General Electric. Long-range planners at the highest level must get out to the field and talk to the scientists in the laboratories, to field commanders and leaders, to the operators and maintainers, and to other staff agencies at all levels. Only by staying in close contact with these disparate groups can the long-range planners ensure that what they recommend to the decisionmaker is relevant, is useful, and is helpful in the pursuit of the goals of the institution. By getting out into the field and talking to people at all levels, the planners can try out their ideas informally to see how practical these

innovative alternatives are. Moving about the organization also enables them to collect some of the better ideas, innovations, and creative thoughts of people at all levels that will help them develop better long-range issues, options, and plans.

15. Incentives must be provided if innovation is to be maximized. It is rare when governmental organizations provide good incentives and rewards for the people who can think conceptually, broadly, and in the long term. Incentives must be established and publicized to encourage the person with ideas to come forward and present them. There should be awards to laboratories for creating new ideas in technology; awards to long-range planners for developing new concepts; awards to manpower experts for developing better organizations, etc. When it is time to hand out awards, the decisionmaker should be involved and the ceremony should be widely publicized. Alternatively, if a large ceremony would create undue friction, personal notes or brief meetings can be substituted.

THOSE people who go into long-range planning should fully understand that they are tak-ing risks; if they are going to do the job well, they are going to have to question present policy, procedures, organizations, doctrines, weapon systems, resources, and so forth. Creative and innovative planners are going to make people angry on occasion. If they are not self-confident people or if they are ambitious, risk-avoidance careerists, they will have little to contribute to the process of long-range planning.

Long-range planning will never anticipate and solve all of the problems and dilemmas that we will confront in the future, but it can certainly help us to be prepared for some of them. Perhaps, even more important, a long-range planning process can keep us alert to new possibilities, new insights that will help us in decisionmaking, and new ways of meeting the future's challenges.

National War College

Author's note: We all should be concerned about the future, for that is where all of us will be spending the rest of our lives. For those readers who may be interested in stretching their minds in this regard, I suggest the following books: *Coming Boom: Economic, Political, and Social* (1983) by Herman Kahn, *Encounters with the Future: A Forecast of Life in the 21st Century* (1983) by Marvin Cetron and Thomas O'Toole, *Megatrends: Ten New Directions Transforming Our Lives* (1984) by John Naisbitt, *The Third Wave* (1981) by Alvin Toffler, *Air Force 2000*, and *Air Reserve Forces 2000*.

IN SEARCH OF THE UNICORN: MILITARY INNOVATION AND THE AMERICAN TEMPERAMENT

DR. DONALD J. MROZEK

*My impression of Washington is a rush of clerks, in and out of doors, swing doors always swinging, people with papers rushing after other people with papers, groups in corners whispering in huddles, everyone jumping up just as you start to talk, buzzers ringing, telephones ringing, rooms crowded with clerks all banging away at typewriters. "Give me ten copies of this **at once.**" "Get that secret file out of the safe." "Where the hell is that Yellow Plan (Blue Plan, Green Plan, Orange Plan, etc.)?" Everybody furiously smoking cigarettes, everybody passing you on to someone else, etc., etc. Someone with a loud voice and a mean look and a big stick ought to appear and yell "Halt. You crazy bastards. **Silence.** You imitation ants. Now half of you get the hell out of town and the other half sit down and don't move for one hour." Then they could burn up all the papers and start fresh.*

Joseph W. Stilwell
The Stilwell Papers (1948)
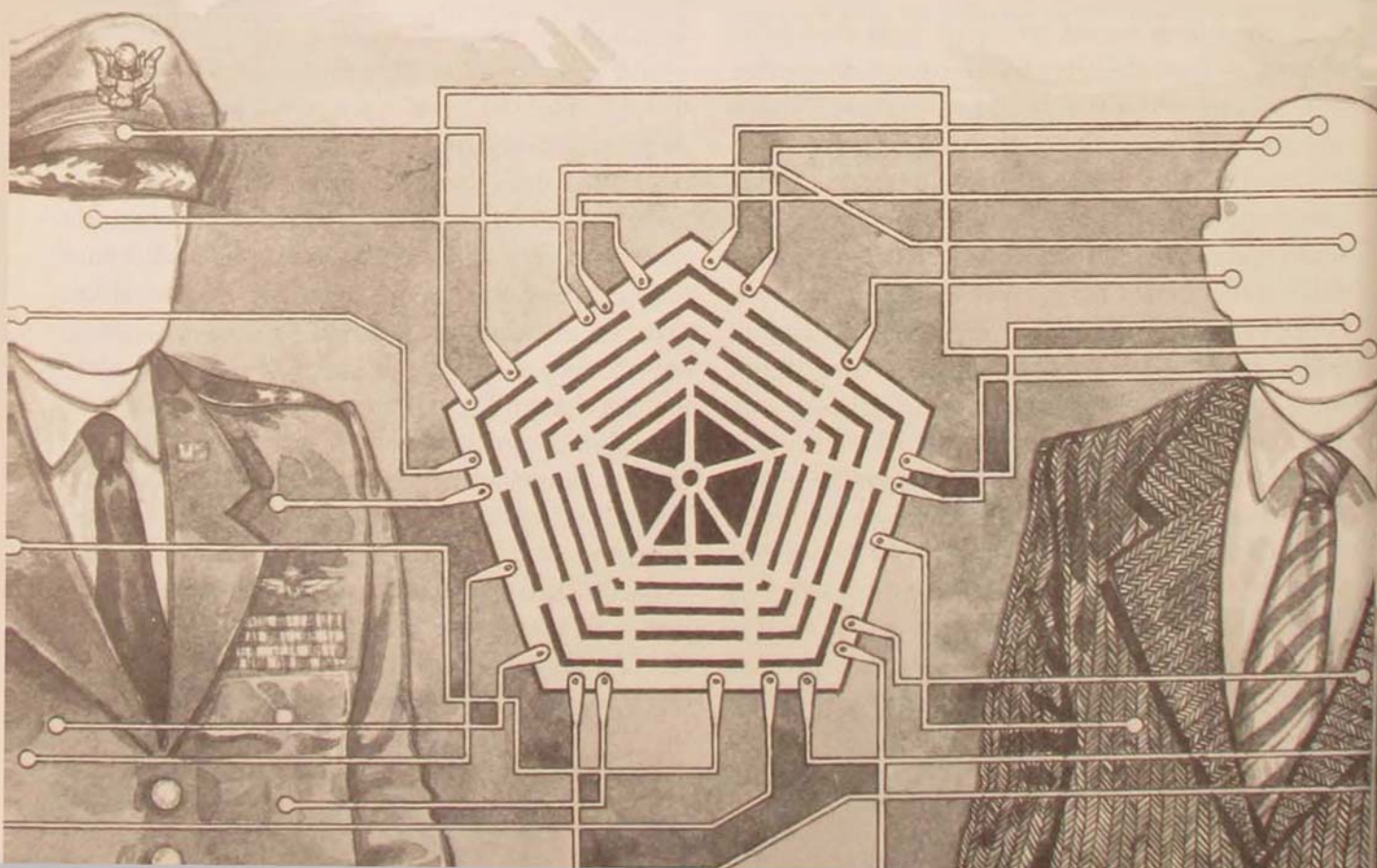
GENERAL Joseph W. Stilwell wrote his description of our nation's capital soon after his arrival in Washington in December 1941. But Stilwell might just as well have sought the mythical unicorn in some fabled mist or magical wood as seek silence, clarity, and order in American institutions. Simple lines of authority have always had attraction for those Americans most likely to control them; however, in other quarters, the virtues of a "checks and balances" system have usually held sway. Thus, even allowing for the special confusion after Pearl Harbor and for "Vinegar Joe's" acid tongue, his portrayal of wartime Washington was sadly true.

Even more troubling, some would say that the confusion which Stilwell observed was inevitable and that nothing has changed since he pronounced his judgment on the War Department's "ants"—at least nothing sufficient to remedy the underlying problems. The gist of Stilwell's view would have applied to three centuries of experience before World War II as well as to the four decades after it.

The hyperactive disarray that troubled Stilwell was not new. The American military has typically had trouble focusing on action and operational goals early in wartime, largely because these concerns are merely theoretical in peacetime. When a war is not under way, military officers and civilian defense officials have traditionally been absorbed in arguing over assets and command responsibilities. The motivation for these debates has been more than greed or pursuit of power but, more important, an effort to find order and coherence. But, perhaps inevitably, the results favored institutional stability (or, pejoratively, inertia) and sharpened skepticism about prospects for organizational innovation. Although sometimes reformers could overhaul institutions meaningfully, any new arrangements exerted dogmatic force once they were in place, and military and civilian constituencies benefiting from them rallied to ensure their permanence.

At the same time, the military's special place in American society and culture has constrained its capacity to innovate, whether in technology, strategy and tactics, or organization. The military's instinct for order and its bias toward scientific predictability have reflected the traditions and concerns generic among military professionals irrespective of national origin. But in the American context these inclinations have often been frustrated—victims of the society's complexity, of a seeming incoherence born of pragmatism, and of experimentalist opportunism. In this sense, the American military's experience with technological, doctrinal, and organizational innovation has inevitably been a story of tension and conflict, pitting the supposedly "absolute" concerns of the military professional against the clearly "relative" and specific characteristics of American society and culture.

Special Demands on a Special Institution

The special need for the armed forces to remain as innovative as possible—and at least to be receptive to relevant innovations fathered elsewhere—follows from the special duties of the military establishment. The devastating consequences of a major military failure either in deterrence or in combat have sharpened contemporary awareness of the military's role. Yet this imperative has always existed. Its importance simply has become easier for laymen and professionals to see during the past half-century of rapid technological change. In an exact sense, then, the dilemmas of adaptation and innovation do not originate in technology. Rather, they come from organizational ethos.

Although the military's need for innovation has special features, the circumstances needed to encourage an innovative disposition are generic, applying to civilian as well as to military institutions and their personnel. Venture capitalist Don Valentine bluntly named the key ingredient in operating anything big, whether a company or a church or an army. "The key

ingredient is obedience," he told an interviewer for *Inc.* magazine in 1985. "Anything big requires people performing and acting in conventional, predictable ways—within the rules."[1] Yet a key to the innovative and venturesome spirit is the willingness to rewrite the rules. But the "nonconventional person who's going to do it differently" becomes "a flatout pain in the ass" for the guardians of institutional order, hierarchy and deference, and the status quo.[2]

One feature of large institutions, which has special force within the military, is the pressure for close accounting. This, too, stems from the particular evolution of the American military, the distinctive importance of civilian and congressional oversight over military policy and spending, and the Madisonian view that tension among large institutions is a key to individual freedom. Despite skepticism about defense spending and the many episodes that foster it, the desire for standardized management and detailed accounting threatens innovation more than would an absence of controls. But given the constitutional provision for congressional oversight of military spending, the armed services inevitably live a life of endless institutional accountability. One can hardly imagine a senior officer testifying before a congressional committee without a legislative aide armed with an explanatory justification for every program under his or her authority: a lack of such information might well be taken as proof of incompetence or as dereliction of duty. Yet the hypothetical case of a senior officer who was frankly unaware of certain programs ostensibly under his authority—and proud of his lack of detailed knowledge—might better exemplify the kind of tolerance in which innovation can thrive. As investor Valentine put it, the accounting mentality "is to control things, to homogenize things. That's what control is: sameness, predictability."[3] But even if uniformity, compliance, accountability, and predictability are the essence of control, they are nearly the antithesis of innovation. Now, as in the past, the dilemma is to reconcile the prerequi-
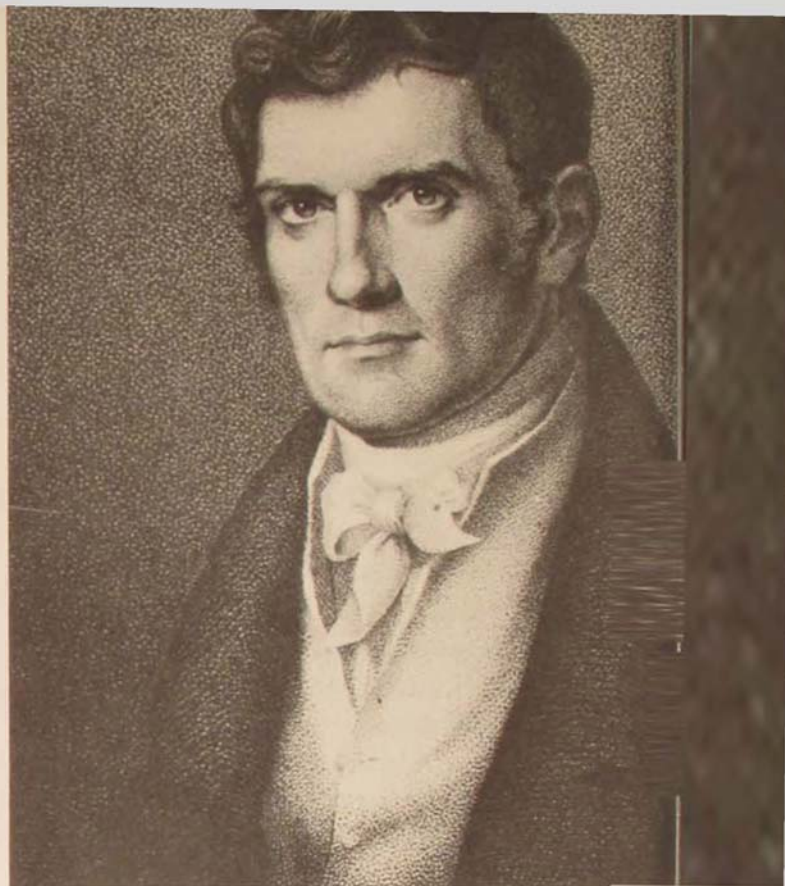
John C. Calhoun's "expansible army plan" would have provided a trained cadre of active-duty personnel that would be available in time of war to train and lead an expanded force. While the plan was not accepted, Calhoun focused attention on the need for professionalism in the nineteenth-century Army.

sites of military order with the demands of military progress.

Institutional Reform as a Problem of Innovation

Innovation in institutional structure—as in doctrine, with which structure is in constant interplay—has drawn on two quite distinct sources. One is the nature of the American political system and of the society as a whole; the other is the course of military thought and technology. From the outset of the American experience, these two sources have typically been tied to different aspects of civil-military affairs. Some military theorists have empha-

Obsessed with the carnage of the Civil War, Emory Upton inspired a generation of Army officers through his writings. Upton (shown on facing page) believed that education and training in peacetime provided the keys to victory in war.
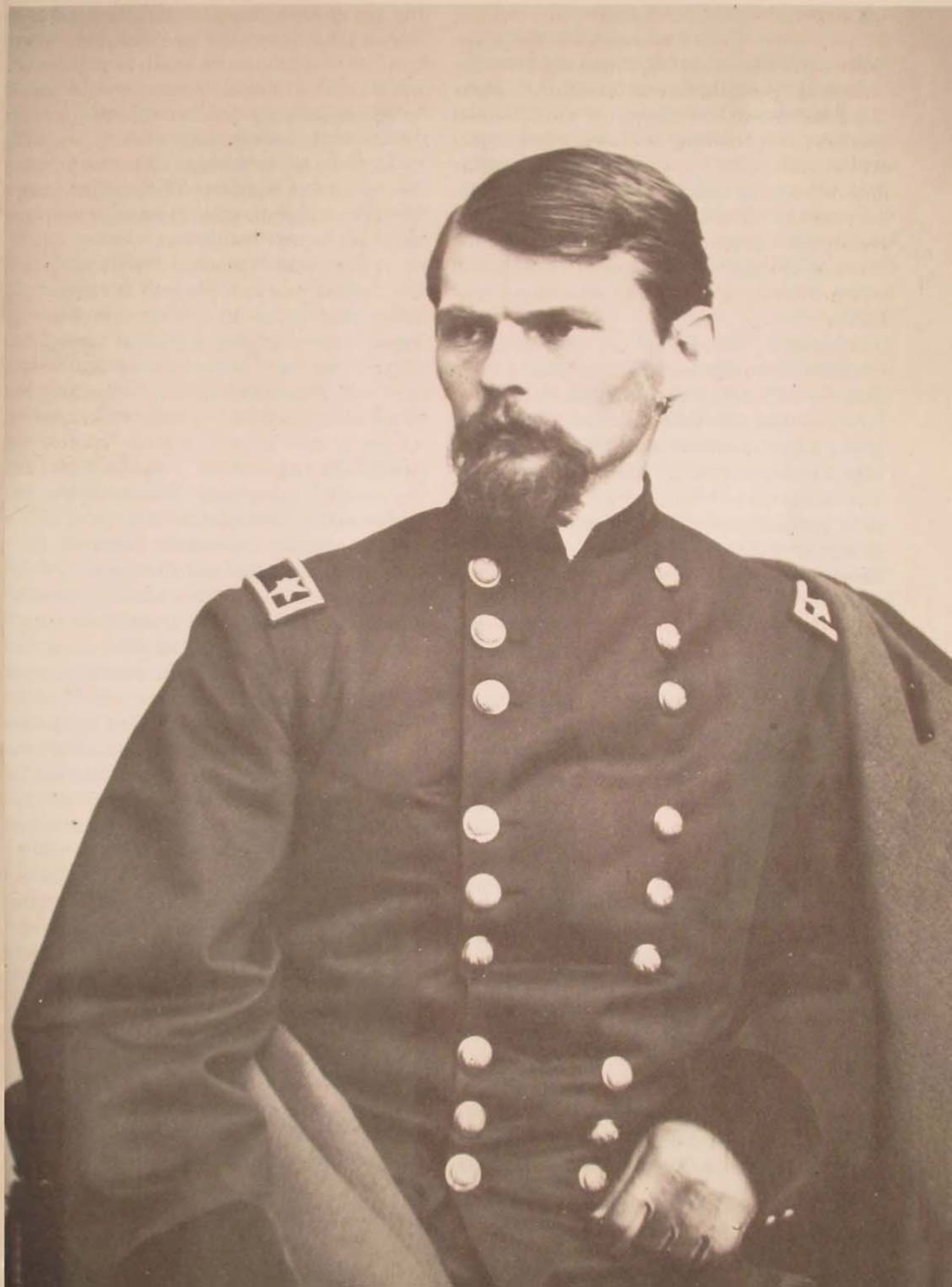
sized special features of American life, which, in their view, should substantially shape the American military system. Departing from this theme of "American exceptionalism," others have underscored the "objective" conditions of warfare, emphasizing military science over military art. The former long supported the militia concept and the principle of military service as a universal civic duty, while the latter consistently proposed military specialization and professionalism, advocating a smaller but more efficient and capable standing armed force.

Sometimes reduced to the simplicism of "militia versus regular," these opposing forces actually reflected a most basic tension in American political life—its tenuousness, its contingency, its open-endedness. The impassioned arguments over military policy in the Federalist period embodied this tension. For the most part, political leaders recognized a long list of objective military "facts"—affiliation with Federalist or Republican faction made little difference on this score. But what they did not agree on was the nature of the American experiment itself and the proper dimensions of its results. As Richard Kohn has demonstrated in his study of the debate over military policy in the Federalist era, the problem was not ignorance in technical military matters but a difference of vision over the future of America in general and of the nation's civil-military relations in particular.[1] Determining an "effective" structure hinged on agreement as to the structure's purposes. Failing such agreement, compromise and half-measures were inevitable. Once set in motion, such compromises could themselves be "innovatively" modified only to the extent that some new consensus was generated. To be sure, the forces sufficient to create such a consensus rarely developed and rarely converged.

Still, change was possible, driven by the policies of a new presidential administration or by periodic bipartisan action. Jeffersonian military policy, often vilified by those misinterpret-ing his gunboat force, clearly diverged from that of John Adams and entailed technical and institutional innovation (such as the idea of a naval militia). But such changes often proved to be scandalously deficient. In other matters, Jeffersonian undertakings were, if anything, "conservative" in the sense that they imitated European developments. The establishment of West Point and the enshrinement of the expert engineer exemplify this bias.[5]

As historical experience has demonstrated, even military catastrophe may fail to bring institutional change. In the aftermath of conflict, Americans adopting a critical stance have argued that the existing structure and doctrine had failed catastrophically. Yet others have looked at the same evidence and come to a different conclusion, basically because they used different standards. After the War of 1812, for example, the Army and its civilian leaders—notably Secretary of War John C. Calhoun—sought to reorganize the armed forces, hoping to capitalize on memories of battlefield defeat and on the humiliation of the burning of Washington.[6] Calhoun wanted to maintain the skeleton of a large army, retaining a large cadre of officers and a small force of enlisted personnel. Thus, the full skeleton of a wartime army would exist in peacetime, to be "fleshed out" when needed. Meanwhile, it would have ready the expertise that could not be raised overnight, embodied in the officers and in the "leaven" of trained enlisted men. Calhoun regarded such an "expansible army" as a bridge between military professionalism and expert authority on the one hand and democratic equalitarianism and military voluntarism on the other.

How was it possible for Congress to reject the "expansible army"—much to Calhoun's distress—especially so soon after the many failures of the War of 1812? For all the moments of heroism in the conflict, there had been years of confusion spiked with reports of fresh disasters. Clearly, Calhoun had hoped that something like "threat analysis" would fuel the engines of institutional change. Just as clearly, he

was wrong. Calhoun's own passion for military reform grew partly from his a priori idea of what an army should look like.[7] At least some congressmen wanted an armed force that (supposedly) better suited the American democratic character. But there was more. Congress understood America's vital interests as posing fewer objective demands on military forces than if the nation were more deeply committed to involvements overseas: a threat was real only if hostility of some foreign powers toward the United States existed. Yet a simplistic isolationism was not anyone's rationale, as Jefferson's wars against the Barbary pirates were not disputed. But Congress was not about to pay good money to meet threats of low likelihood. Thus, the miseries of the War of 1812 gave no blueprint for military reform because they created no consensus on American interests (and therefore no consensus on how to protect them).

The proponents of a "strong" or "standing" army during the nineteenth century hoped to follow European models—either German or French—to create a disciplined and responsive American military. Approaching the problem of form in this fashion revealed the military theorists' supposition that military knowledge, as a kind of science, was an absolute—pertinent and suitable to all societies. Yet the U.S. political system and American culture more broadly were far more eclectic—shaped by the "checks and balances" of the constitutional system. Calhoun's problems have often been blamed on false popular confidence and the absence of a sense of threat among civilian elected officials. Although true in detail, the assertion is misleading and perhaps irrelevant. The proponents of a "strong" army implicitly meant one along European lines, but they ran headlong against the widespread desire of Americans to create a special and separate way of life.[8]

The costs sustained by the United States during the War of 1812 were great enough to give pause to many thoughtful observers and sufficed to persuade Calhoun. But the events of the war bore another lesson as well—one more sub-tle but no less influential than the delusion that mere amateurs had won the Battle of New Orleans and redeemed the militia concept. A more basic political relationship had been sustained during the war, even though it had contributed to military failures: in some cases, state governments had reserved control of their militias in order to defy the will of President Madison. In the *Federalist* papers, Alexander Hamilton had suggested that maintaining state militias and restricting the size of federal forces would permit the state governments to be a "check and balance" on federal power. Tested by Hamilton's defense of the rights of states, the military system had actually performed brilliantly during the War of 1812—precisely *because* the federal government could not launch expeditions effectively and *because* President Madison never won control over the militia units near the war zones. The militia was, in a way, the states' army against the federal government.

That this balance among the states and between the states and the federal government survived the War of 1812 is further supported by the novelties to which President James K. Polk resorted in the Mexican War, such as the fiction of "group volunteering" under which state militia units actually mobilized under presidential authority without forcing Polk to invoke constitutional provisions that would have fueled fierce political battles with dissident governors.[9] Suffice it to say that the United States in the first half of the nineteenth century was neither France nor Prussia. Objectively, this was simply a fact. Subjectively, it was a "problem" if one wished matters were otherwise—as Calhoun did while Secretary of War. The reforms that Calhoun sought, as well as the ambitious goals of Dennis Hart Mahan or Emory Upton, presupposed something more like a unitary state than the United States would be for some time to come. Ironically, by the time that nationalist transformation occurred and brought a strong impulse toward institutional reform, the Army itself had become rather set in its ways, reluctant to change,

and alienated from civilian institutional inno- vators. Having fought hard to build something of an Army during the nineteenth century, the service's leaders turned reluctant to risk it by seeking something more.

By the end of the nineteenth century, the Army consisted of a set of "component com- mands" operating parallel to one another and

The seated gentleman wearing the checked vest is Secretary of War Elihu Root. When he told President McKinley that his military knowledge and experience were nil, McKinley knew he was the right man to effect reform. Root administered the War Department during its period of greatest internal reform, bringing the Army from a parochial nineteenth-century organ- ization to a force that would compete successfully with most of its contemporaries in the twentieth century.

owing only limited obedience to the Com- manding General. As senior officer of the serv- ice, the Commanding General had an ac- knowledged right to "preside" and to inspect. (The latter function made the Inspector Gen- eral one of the few high-ranking officers who were clearly his inferiors.) All other functions of the Army were conducted with what now seems a remarkable degree of autonomy. The various "bureaus," such as Ordnance or Quar- termaster, typically ran well. But there was question about how well the bureaus meshed. A Quartermaster officer stationed at a frontier post in the trans-Mississippi West was respon- sible, above all, to the chief of the Quartermaster Corps back in Washington, not to the com-

mander of the post where he was stationed. In addition, bureau chiefs developed their own political allies in Congress, aided by long tenure and by promotion within the lines of their own bureaus and not across the entire service. Therefore, the coordination that the Army might achieve depended on the sufferance and cooperation of the bureau chiefs. Clearly, this arrangement fell far short of deserving such adjectives as "integrated," "cohesive," "responsive," or "centralized." In fact, given the sharp limits on what he controlled directly and the jealousy with which Secretaries of War guarded access to the President, the Commanding General was perhaps "the least among equals." In one sense, then, the system

worked—but not if one expected the Army to respond unquestioningly to orders from on high. Thus, the reforms engineered by Elihu Root actually dealt with issues of authority to control staff and line operations more than with the alleged practical shortcomings so much overstated during the Spanish-American War.[10]

The lessons of Army reform during the era of Elihu Root are many, but what one learns depends on what one seeks. Oddly, though, the experiences of the Root years did not quite prove that the Army was incapable of changing itself. Instead, they suggested that the Army was unlikely to perceive the need for change. The Army had settled into institutional forms and traditional ways of behaving that clearly had drawbacks, but at least they existed, were in place, and functioned. For the sake of an uncertain measure of progress, it seemed to some officers that a flawed but operable system was being put needlessly at risk. A brief review of a key scandal that hastened the reform process in the Root era offers illustration.

In general, the alleged inefficiencies and scandals of the Spanish-American War served as a rallying point for those seeking structural reform of the Army; but the specific claims that the Army had sent rotten and "embalmed beef" proved particularly heated. Critics asserted that either certain Army officers had conspired in buying rotten meat chemically adulterated to make its taste and smell less offensive or they had been guilty of dereliction of duty in failing to oversee the purchases with sufficient diligence. In fact, allegations of "sweetheart deals" between Army officers and packing houses were unfair and inaccurate. They also ignored the fact that chemical adulteration of canned meat products was commonplace and that formaldehyde was a preservative of choice. In

Eli Whitney was a contractor for the U.S. forces in the War of 1812. Although he did not provide the quantities of firearms agreed on, he did much to advance the principle of interchangeable parts in the U.S. arsenal—a major reform.

the era before the Pure Food and Drug Act, the Army might very well buy "embalmed beef," but it was only about as likely to do so as any other volume buyer. Nevertheless, the charges tended to stick even when the evidence fell far short of the mark. High-ranking Army officers, including Generals Stephen Young and Nelson Miles (who were to be early "beneficiaries" of the Root reforms as Chiefs of Staff), defended their service's operations, felt maligned, and thought the idea of fundamental transformation of the Army debased by the false charges that they had suffered.[11]

What the Army missed, after all, was the underlying real reason why some civilians agitated so persistently for reform. It was not really the "embalmed beef" as much as it was the changing role and responsibility of the United States in the world. The United States was increasingly likely to be involved in overseas activity and in occasional expeditions in foreign lands.[12] As Graham Cosmas has noted, Root (and Theodore Roosevelt) wanted not only a functioning army but an "army for empire." To overstate slightly for the sake of contrast, the uniformed leaders of the Army were interested in what the Army *was* and how it was managed; Root and Roosevelt were far more interested in what the Army could *do*. Put in later terms, it was a conflict between traditional management and aggressive leadership.

In a legal sense, whether the Army could be changed was settled with the passage of the Root reforms in 1903. But the notorious resistance of Adjutant General Fred Ainsworth to the implementation of the law showed that bureaucratic stonewalling could not be prevented by law alone. The case is an ambivalent one. Ainsworth cared deeply about the future of the Army and its ability to serve the nation. But he cared so much that he could not compromise with a system that he considered suspect. Nor were the Chief of Staff and Secretary of War seeking compromise. Simplicity, clear control, centralization of authority—these were the objectives. Not the first time that the quest

for decisiveness and direction ran counter to vested interest and the tradition of dissent, the Ainsworth affair would have many successors as well.[13]

Tellingly, innovation came most promptly when it took an entirely new institutional form instead of seeking to recompose and redirect old ones. Even as the Chief of Staff and the Adjutant General fell into a long war, the Army and the Navy entered into close cooperation in the Joint Board with stunning speed. Under its secretary, Admiral George Dewey, the board sought a single vision of national strategy in which the services maintained separate but consistent roles. The essence of this accommodation was developed in little more than a year. Swiftly as this arrangement was made, however, it left little room for an air service; and a herald of innovation soon became a bastion of the status quo. To seek reform exclusively through existing institutional arms was to court intense resistance. Meanwhile, seeking reform by developing new institutional units increased chances for prompt change, but it also created new layers of vested interest and new sources of inertia.

The difficulties that proponents of air power encountered in seeking institutional change and coequal status for an air service illustrate the point. The Army and Navy had finally concluded tortuous processes of change and had even established a working interservice relationship. To upset these arrangements so soon after their creation was to ask too much of mere human beings. Faced by military theorists whose claims depended largely on technologies not yet developed, the Army and Navy tended to explain away the occasional challenges of the airmen, seeking to control circumstances rather than change in accordance with them.

What the Root reforms did was to establish a structure, a model, a paradigm of "proper" and "efficient" military organization. But a paradigm is both a tool and a barrier. As Thomas Kuhn has suggested, a paradigm provides a

framework of understanding the overwhelming bulk of what is known when the paradigm itself is articulated; at the same time, it allows for new developments and discoveries. Among the new findings and behaviors, however, are anomalies that cannot be explained by the paradigm which facilitated their discovery. Only when the psychic and practical burden of explaining away all the anomalies exceeds the psychic and practical challenge of dismissing the entire paradigm does a new conceptual breakthrough become possible; and only then does a new paradigm emerge.[14]

In a similar fashion, the most up-to-date scheme of military organization begins its rapid slide into obsolescence as soon as it is accepted. The culprit is not bad faith but the resilience of the paradigm already in place. Thus, after World War I, the priority of ensuring cooperation between the Army and the Navy led to a conservative view that military air forces required gradual, cautious development. In part, this conclusion would prevent unproven technological claims for exerting undue control on present strategy. But it also meant that the demands of the airmen would not outstrip the institutional needs of the ground and sea officers. The Army and Navy set limits on who could develop torpedo bombs and to what level, lest the flyers from the ground service have a "naval" weapon. So, too, limits on aircraft range appeared, lest the ground service's air arm have too much influence in the air space over water. These decisions were not mere acts of foolishness, although they have been often dismissed as such; nor were they mere acts of petulance. Rather, they were efforts to preserve the old paradigm.[15]

The reorganization after World War II richly illustrates the difficulty in making fundamental changes within the existing bureaucracy and in radically cutting the roles and missions of institutions already in existence. As a corollary, it shows the strength of the American tendency to reform by adding rather than dismantling institutional components. Stripped of its nuances, the Truman administration's plan for defense reorganization aimed at a single military service, unified and simplified, in which strategic priority was given to a strategic nuclear force administered principally by air officers. Duplication and redundancy were the avowed enemy of proper military organization. The centralizing clarity that Truman sought is made all the more evident by the counterclaims of the Navy, which opposed the President and called instead for "coordination" among quasi-autonomous services. Even so, no service could admit that it rejected the principle of simplicity, nor could any espouse duplication as a desirable course for the nation and its military. But reality plays tricks with rhetoric. The Navy developed nuclear-capable aircraft for its flush-deck carriers, defending them as "long-range artillery" rather than a nuclear strategic force. Its quest for missile-carrying submarines began in earnest. Soon, the Army experimented with field use of tactical nuclear weapons; and, soon after that, it was well along in an impressive program of missile development. The guardians of these programs later admitted their pride in defending technologically innovative programs against their superiors, and they won much applause for building weapons that became important elements in the U.S. force structure. On the other hand, seen structurally, they were being praised for subverting central authority. They had taken a lesson from Fred Ainsworth and gone him one better; they survived and prevailed.[16]

Curiously, the external Soviet threat that was expected to justify a large standing military proved insufficient to make the military services defer to a centralized organizational scheme when their own vested interests and strategic visions were put at risk. The threat from one's own sister services was a clear and most "present" danger in another ring of the Pentagon. The solution to the reorganizational dilemma, then, arose in response to U.S. bureaucratic needs rather than global operational demands. So, too, the "unification" desired by Truman

took the two services of the pre-World War II era and made them three—or even four, if one allowed for legislative riders ensuring the Marines.

The Soviet threat did serve as a useful means for explaining away the failure to develop a unified military system in the United States. Each service had its own reason for seeking autonomy—often through the development of a distinct nuclear capability. But the final excuse for keeping all these "in-house" forces was the growth of Soviet military power. Thus, the world situation and growing Soviet ability to hit selected U.S. targets took redundancy and

High-ranking civilian and military leaders met in the "secretaries'" conference at Quantico, Virginia, in July 1953.

blessed it as the strategic triad. Indeed, the triad is a splendid example of the traditional American love of "checks and balances," lest any one force or faction gain too much power. But it would have been politically inept to admit wanting a nuclear force because another service had one, especially while the Soviet Union provided such a ready justification to keep one's eggs in more than one basket. Thus, redundancy became a virtue, even though it has been vigorously opposed by both Democratic and Republican presidents for years. What ought to have been an embarrassing demonstration of failure became sudden brilliance, albeit by sleight of hand, when retroactive approval descended on precisely the sort of scheme that had long been seen as the path to military inefficiency and strategic bankruptcy.

Things Versus Ideas: Management Versus Operations

Americans often seem to have had greater success in making new military hardware than

in organizing military manpower or developing coherent command arrangements and strategy. This characteristic appears to run parallel to the American predisposition for "trial and error" and pragmatic action over conscious ideology. (It recalls Alexis de Tocqueville's attribution of Americans' rush to law courts at virtually the slightest provocation to the absence of a deep and preexisting traditional culture.) Specific decisions and concrete things thus become experimental steps into one's own future. In the military realm, this propensity toward specifics and tangibles showed itself in the endless debates as to who won or lost key battles in past American wars. Clearly, choosing between the militia and the regulars as the backbone of the American military was an ideological matter, even if unconsciously so. Nevertheless, it was a choice and a debate pursued in tortured argument over Lundy's Lane, New Orleans, Monterrey, Vera Cruz, Bull Run, and the western wilderness.[17] In the end, Americans could do specific things, but they had grave difficulty agreeing on how they had achieved their successes.

As a result of such proclivities, an American military could say that "clear and present danger" required making a great many guns; and, in this way, immediate problems justified a contract to Eli Whitney to mass-produce weapons for the War of 1812. (The theoretical implications of mass production and "interchangeable parts" have clearly proved to be the more intriguing long-term questions; but such grandiose matters are for the most part retrospective.)[18] In the Spanish-American War, too, U.S. authorities authorized lightweight uniforms and issuance of 45-caliber handguns without pursuing the more theoretical questions of "counterinsurgency" forces—and, tellingly, forgot with equal promptness what little had been learned.[19] In World War II, the advocates of the atomic bomb project did not begin by predicting a revolution in military theory and strategy. They simply argued that they might be able to produce a very big blast. When

general issues became too complicated, Americans took to the specific. When strategic debate seemed abstract, they clutched at the specific.

The common element in such successful instances appears to be clarity of purpose and simplicity of execution. The dedication of a team to a transcendent goal—some single weapon that this committed group perceives as central to the national interest—provides some criterion against which the value of personal sacrifice and institutional deference can be judged. Yet, unless it is inescapably clear that one bureaucratic unit must defer to another, it will not do so. Unless the individual knows why he ought to submit himself to an administrative abstraction, he might well refrain. But clear purpose provides some basis for buffing off the "frictions" so prevalent in military matters, especially in peacetime.

Examples of purposefulness are numerous, and successes have been impressive. The development of the atomic bomb exemplified the rapidity with which scientific search could be undertaken when the weapon sought might be the "ultimate" one, the enemy being fought the most villainous, and the stakes of defeat unconditional. The concern to avoid suffering a technological "Pearl Harbor" that would jeopardize national security by making defenses obsolete has been especially strong for many Americans, hinting at the priority accorded the tangible (hardware) and the secondary place of the intangible (operational organization and strategic thought). The fear that an enemy might gain first access to an "ultimate weapon"—a fear which itself reveals the predisposition to expect such "ultimate weapons" to appear—encourages the quest for hardware over strategy, partly because it presupposes that the latter is driven by technology. A strong example of this assumption was the development of weapons and strategic thought after the invention of the atomic bomb. That a single bomb could devastate an entire city was misinterpreted to mean that the principles of war had also been obliterated.[20] Moreover, the driving

force for the shaping of military strategy in the nuclear age was not the community of military professionals, whose thrust was more operational, but the coterie of physical and political scientists, whose penchant for models and theoretical structures was far stronger. The development of the specific weapon was, in a sense, easier than the creation of justifications for its use.

Even more, the pursuit of the hydrogen bomb reveals the critical role of "monomaniacal" focus, such as that attributed to Dr. Edward Teller.[21] Seen negatively, it was the unquestioning clarity of the zealot and the "true believer." Seen positively, it was the diamond-like hardness capable of overcoming bureaucratic inertia. Similarly, when programs were entrusted to single-purpose agencies, they were often headed for a more certain development than when enmeshed in larger institutional bodies where they were only one of many mouths chirping to be fed. The successes of the Jet Propulsion Laboratory and the swift development of intercontinental ballistic missiles (ICBMs) demonstrated that great strides could be made, even in time of relative peace, despite bureaucratic drags, and in the face of stunning technological demands.[22] The "black budget" advanced aircraft, such as the U-2 and the SR-71, similarly showed that superbly capable weapons and systems could be developed rapidly and efficiently, provided an overriding singleness of purpose prevailed.[23]

At the same time, however, the primacy of the specific new things over the operational system in which such things are employed had its own implications: first, that creating new military hardware would prove less difficult than carrying out innovative schemes for military reorganization; second, that the things themselves would be easier to produce than a system for using them. Thus, this fundamental question remains unaddressed: Although organizations might build weapons, how could one guarantee that these weapons would be used coherently and purposefully? The focus

on things—to the extent that it becomes a matter of creating a product and developing inventories in the form of force structure—can become an obsession with management, at the expense of leadership and operational art. As has very often been illustrated, the variables are many.

The relationship of institutional organization, technological innovation, and human adaptability in the twentieth-century American military resembles the "uncertainty principle" in physics.[24] Although the reality in physics is that the weight, speed, mass, and size of subatomic particles are varying continuously in reference to one another, the scientist, in order to measure any one feature, must imagine that it is actually constant. Although technically false, this premise is a convenient and useful compromise. Similarly, in the American military experience, the priority that one gives to any one objective—institutional order or predictability, for example—necessitates that other considerations, such as innovation and flexibility, fall to secondary status.[25]

Certain changes in the structure of scientific research and development in the twentieth century contributed to this subordination of other objectives to the quest for order and stability. As experimental projects consumed more and more resources, they came to require ever greater corporate or public investment. This increasing investment, in turn, invited the creation of greater oversight and bureaucratic mechanisms through which accountability to stockholders or citizenry might be ensured.[26]

In some cases, great achievements still proved possible; but other cases indicate that many sources of friction remained. Experimentation with unusual aircraft design suggested that the desire for major breakthroughs still lived and that some "end runs" around the developing bureaucracy remained possible. But the historian of the radical B-49 "Flying Wing," Edward T. Maloney, has claimed that the difficulty in getting sufficient support for the aircraft lay not in the B-49's performance but in its

being "before its time." Even more, he alleges that cancellation of the B-49 and commitment to the B-36 came about because of Secretary of Defense Louis Johnson's ties with Convair, the B-36's builder and a key competitor of Northrop, builder of the B-49. According to Maloney, Johnson would have accepted the B-49 on condition that Convair build it, but John Northrop refused.[27] To be sure, the details of the B-36 decision have been much debated. But the entanglement of political and corporate intrigue with technological breakthrough was not a new phenomenon at the time of the B-36 decision and continues today. (Moreover, those knowledgeable about organizational systems and processes recognize that covert experimentation has the virtue of cutting down the number of forces competing for control of research and development funds, while open programs invite endless scrutiny and a functionally infinite number of hungry mouths waiting to be fed.)

Despite the many frustrations, serious efforts to capitalize on scientific breakthroughs still abound. Typical is anticipation of the impact of artificial intelligence, clearly a potential "force multiplier" in defense- and combat-related electronics.[28] How such research is handled, however, appears to depend on the clarity with which it can be ordered. Generalized research is appealing to the scientists' disposition of earnest inquiry, but to the budget planner, it sounds suspiciously like the fictional horse that "rode off in all directions."

D URING the Vietnam War, the United States took great pains to make its technological prowess produce a victory. Manifestly, the purpose was frustrated, even though innovations were generated. Among the most widely mentioned were defoliation campaigns, the "McNamara Wall" of electronic sensors across the demilitarized zone (DMZ), fixed-wing gunships, and "smart bombs."[29] Innovations were tried, and new weapons were used.

Still, they gave only limited benefit. Obviously, if winning the war is the test, the efforts were a failure.

If one wanted to find the most prompt innovation during the Vietnam War, one would do better to look north of the DMZ or even out into the jungles where the Vietcong proved indomitable. Americans thought, debated, experimented, tested, and deployed—often with ambiguous purpose. To a remarkable degree, the Americans made use of the full apparatus for overseeing new developments. Their opponents were comparatively more direct: they saw a means of killing or disabling the enemy, and they used it. Their clarity may have been their most awesome power; and its effects remain etched in the political map of the post-Vietnam War era.

To be sure, the Hanoi regime had its problems—"drags" on how it did business. One was ideological debate and conflict.[30] Yet there was an intrinsic benefit in this sort of debate, which made clear that one's own thinking was the key to one's actions and that, even when you could not control your enemy, you could still control yourself. This kind of focus among North Vietnamese leaders—and its absence among American officials—helps to account for the war's outcome. The strategic battle in Hanoi was admitted, fought, and determined. The strategic battle in Washington was concealed, muddled, and ultimately lost in a wash of Orwellian "newspeak" in which giving up was called "Vietnamization" and the recovery of a large percentage of American POWs was treated as if it had been victory.[31]

The success of Hanoi, despite the U.S. government's enormous efforts to frustrate it, helps also to explain why threat assessment is not nearly enough to support military reform in general, let alone outline it in specifics. "Scare hell out of the country" was Senator Arthur Vandenberg's advice in touting the Truman Doctrine, military containment, NATO and "entangling alliance" (a massive innovation, in one sense)—but generating fears about threats

is not a reliable tool.[32] It gives too much control to the "other side" and too much force to their actions and opinions. Meanwhile, it yields too little attention to the warps and pressures from within the military institutions that have nothing whatever to do with a threat posed by an external power.

Like many another product, military reform in the United States is "made the American way," inspired by peculiarly American con-

The founding of the Air Force Academy on 1 April 1954 exemplified the separatist tendency within the U.S. military. Here President Eisenhower talks with distinguished guests at the signing of the act establishing the academy.

cerns and seeking objectives that have had traditional appeal here. Distressingly, one main feature in the American temperament has been the desire for "checks and balances"—a desire that runs directly counter to the demands of clarity which would make technological innovation, strategic inventiveness, and structural reform much more acceptable. In the end, resistance to innovation does not stem from some technical shortcoming but from long-standing traditions and from a questioning strain bred into the American temperament.

Perhaps military institutions (and the civilian view of them) need something like the "uncertainty principle" in modern physics.

We need to pretend that the many variables in the real world can be reduced to only a few and thus can be managed. Whatever the mechanism, the challenge is to establish a sense of clear priority. Such a talent for setting priorities may have been the only way in which America's adversaries in Vietnam enjoyed superiority. But given the outcome, other forms of superiority may have been futile when shorn of a rock-steady purpose and a crystalline focus.

Recognizing the volume of clarity and focus, along with the memory that Americans truly were their own worst enemy, may have been the only military "lessons of Vietnam" that really matter. The ultimate enemy in the Vietnam War was the American disposition on how to fight it, especially since this disposition, inspired with the spirit of "checks and balances," usually lay unattended. Even when Americans observed the special confusions of their war, they failed to see these as the natural outcroppings of bedrock traditions. Thus, in the prosecution of war, the great barrier may be the American instinct toward organizing for a war rather than waging it. So, too, the ultimate barrier to military innovation may be the American inclination on how to manage it and, indeed, the belief that it can be managed to suit the needs of cost accountancy.

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Notes

1. "Peaks and Valleys" (Interview with Don Valentine). *Inc.*, May 1985, p. 32.

2. Ibid.

3. Ibid., p. 34.

4. Richard Kohn, *Eagle and Sword: The Federalists and the Creation of the Military Establishment in America, 1783-1802* (New York: Free Press, 1975).

5. See Sidney Forman, "Why the United States Military Academy Was Established in 1802," *Military Affairs*, Spring 1965, pp. 16-29.

6. See, for example, Russell F. Weigley, *Towards an American Army: Military Thought from Washington to Marshall* (New York: Columbia University Press, 1962). Calhoun was appointed Secretary of War by James Monroe, who had served as President Madison's Secretary of War during the conflict with Britain and who had firsthand experience with the failings of the American military system. Also see Harry L. Coles, *The War of 1812* (Chicago: University of Chicago Press, 1965); John K. Mahon, *The War of 1812* (Gainesville: University of Florida Press, 1972). For information about the military policies of the Monroe administration, see Carlton B. Smith, "Congressional Attitudes toward Military Preparedness during the Monroe Administration," *Military Affairs*, February 1976, pp. 22-25.

7. This sort of thinking was usual for Calhoun—starting with a principle and deductively determining how people should behave and how institutions should be organized. At times, it threw him into rigid, mechanistic thinking that made him seem great as a logician but deficient as a human being. Richard Hofstadter called Calhoun's mind "an intellectual black mass" for this reason. See Richard Hofstadter, *The American Political Tradition and the Men Who Made It* (New York: A. A. Knopf, 1948).

8. See Weigley, particularly concerning the observations made of the armies of Europe and Asia.

9. See K. Jack Bauer, *The Mexican War, 1846-1848* (New York: Macmillan, 1974).

10. See Robert F. Stohlman, Jr., "The Powerless Position: The Commanding General of the Army of the United States, 1864-1903," Master's thesis, Kansas State University, 1975.

11. See Graham A. Cosmas, *An Army for Empire* (Columbia: University of Missouri Press, 1971); also see Cosmas, "From Order to Chaos: The War Department, the National Guard and Military Policy, 1898," *Military Affairs*, Fall 1965, pp. 105-21. Overall, Cosmas denies allegations that War Department personnel were either derelict or incompetent.

12. In his Master's thesis, Marc B. Powe has observed that Army intelligence personnel had to use the *Encyclopedia Britannica* to provide information on the Philippines to plan the campaigns in 1898. The "failure," if one would call it such, resulted from the seeming improbability that the United States would actually send units of its own Army to such a remote place. See Marc B. Powe, "The Emergence of the War Department Intelligence Agency: 1885-1918," Master's thesis, Kansas State University, 1974, p. 32.

13. For additional information on the resistance of Fred Ainsworth, see Elting E. Morison, *Men, Machines, and Modern Times* (Cambridge, Massachusetts: MIT Press, 1966), especially "Data Processing in a Bureau Drawer."

14. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962).

15. For additional information on the difficulties in determining military aviation policy in the interwar years, see Paul Y. Hammond, *Organizing for Defense* (Princeton, New Jersey: Princeton University Press, 1961).

16. See Donald J. Mrozek, "Peace through Strength," Ph.D. dissertation, Rutgers University, 1972.

17. Russell Weigley traces this tension between militia and regular factions in *Towards an American Army*. Also see Marcus Cunliffe, *Soldiers and Civilians: The Martial Spirit in America* (Boston: Little, Brown, 1968).

18. Otto Mayr and Robert C. Post, editors, *Yankee Enterprise: The Rise of the American System of Manufacturers* (Washington: Smithsonian Institution Press, 1981).

19. An excellent study of the war, which gives a positive judgment of U.S. efforts in the Philippines, is David F. Trask, *The War with Spain in 1898* (New York: Macmillan, 1981).

20. Harry G. Summers, in *On Strategy: A Critical Analysis of the Vietnam War* (Novato, California: Presidio Press, 1982), argues that the excessive deference to civilian strategists resulted largely from

the mythology of the uniqueness of war in the era of nuclear weapons. The consequences of this error abounded in the confusions of Vietnam. Among the works useful in approaching the issue of civilian engagement in developing strategy are Gene M. Lyons and Louis Morton, *Schools for Strategy: Education and Research in National Security Affairs* (New York: Praeger, 1965); and Roy E. Licklider, *The Private Nuclear Strategists* (Columbus: Ohio State University Press, 1971).

21. For additional information on the development of the hydrogen bomb, see Norman Moss, *Men Who Play God* (New York: Harper and Row, 1969); and George Fielding Eliot, editor, *The H-Bomb* (New York: Didier, 1950).

22. To be sure, there was argument over how to proceed with the ICBM. The point here, however, is that progress was largely a function of decision. In the end, choice is essential. See Edmund Beard, *Developing the ICBM: A Study in Bureaucratic Politics* (New York: Columbia University Press, 1976); and Frederick J. Ordway and Mitchell R. Sharpe, *The Rocket Team* (New York: Thomas Y. Crowell, 1979). Also see Clayton R. Koppes, *JPL and the American Space Program, A History of the Jet Propulsion Laboratory* (New Haven, Connecticut: Yale University Press, 1982).

23. See, for example, Thomas J. Peters, "The Mythology of Innovation, or a Skunkworks Tale, Part I," *Stanford Magazine*, Summer 1983, pp. 12-21; and "The Mythology of Innovation . . ., Part II," *Stanford Magazine*, Fall 1983, pp. 11-19.

24. See Werner Heisenberg, *Across the Frontiers*, translated by Peter Heath (New York: Harper and Row, 1974); and Gary Zukav, *The Dancing Wu Li Masters: An Overview of the New Physics* (New York: Morrow, 1979).

25. The search for institutional stability and predictability was not confined to the military. Indeed, it permeated American life in the late nineteenth century and after. See, for example, Robert H. Wiebe, *The Search for Order, 1877-1920* (New York: Hill and Wang, 1967). Compatible with this objective, the appointment of Elihu Root as Secretary of War was justified by Root's organizational skills and his experience in corporate law and business structure. Root was expected to apply this experience and the principles on which it was based to the Army and the War Department's administration.

26. Elting E. Morison has observed that U.S. companies that produced important scientific breakthroughs did so by allowing some fraction of research time to proceed virtually without company control. Such "unaccountability" may produce genuine innovation, but it does not necessarily produce near-term or midterm contributions to corporate profit. See Elting E. Morison, *From Know-How to Nowhere* (New York: Basic Books, 1974). Similarly, such scientific research in the military sector would not show immediate results. However, it is intriguing to see that the equivalent of corporate "free" or "unaccounted" research does exist in the

military sector through research sponsored in universities and elsewhere. Given this fact, the confusion too often seen in developing new weapons—that is, in applying the basic research to practical uses—is even more striking.

27. Edward T. Maloney, *Northrop Flying Wings* (Buena Park, California: World War II Publications, 1975), especially pp. 1, 31. An important essay concerning Johnson's approach to the issue is Paul Hammond, "Super Carriers and B-36 Bombers" in *American Civil-Military Decisions: A Book of Case Studies*, edited by Harold Stein (University: University of Alabama Press, 1963).

28. See, for example, Rear Admiral Albert J. Baciocco, Jr., "Artificial Intelligence and C³I," *Signal*, September 1981, pp. 23, 25-28. Also see *Defense Science 2000*, August 1983, especially Richard G. Naedel, "Intelligent Associative Memory (IAM): An Overview," pp. 61-68.

29. See Jack S. Ballard, *Development and Employment of Fixed-Wing Gunships* (Washington: Government Printing Office, 1982); William A. Buckingham, *Operation Ranch Hand: The Air Force and Herbicides in Southeast Asia, 1961-1971* (Washington: Government Printing Office, 1982); Earl H. Tilford, Jr., *Search and Rescue in Southeast Asia, 1961-1975* (Washington: Office of Air Force History, 1980); and Paul Dickson, *The Electronic Battlefield* (Bloomington: Indiana University Press, 1976).

30. See Vo Nguyen Giap, *Great Victory, Great Task* (New York: Praeger, 1968) and *People's War, People's Army* (New York: Praeger, 1962); Jay Mallin, editor, *Strategy for Conquest, Communist Documents on Guerrilla Warfare* (Coral Gables, Florida: University of Miami Press, 1970); Douglas Pike, *Viet Cong: The Organization and Techniques of the National Liberation Front of South Vietnam* (Cambridge, Massachusetts: MIT Press, 1966).

31. The literature concerning U.S. policy in the Vietnam War is already plentiful. Indicative of the wide-ranging opinions of the war and suggesting the ambivalence of U.S. policy are: Larry Berman, *Planning a Tragedy: The Americanization of the War in Vietnam* (New York: W. W. Norton, 1982); Leslie Gelb and Richard K. Betts, *The Irony of Vietnam: The System Worked* (Washington: Brookings Institution, 1979); George Herring, *America's Longest War: The United States and Washington, 1950-1975* (New York: Oxford University Press, 1978); and Daniel S. Papp, *Vietnam: The View from Moscow, Peking, Washington* (Jefferson, North Carolina: McFarland, 1981).

32. The incident involving Vandenberg and others at a White House meeting on 27 February 1947 is recounted in Lloyd C. Gardner, *Architects of Illusion* (Chicago: Quadrangle Books, 1970), p. 218. For accounts concerning NATO, see Lawrence S. Kaplan, *A Community of Interests: NATO and the Military Assistance Program, 1948-1951* (Washington: Office of Secretary of Defense, 1980); and Kaplan and Robert W. Clawson, editors, *NATO after Thirty Years* (Wilmington, Delaware: Scholarly Resources, 1980).

GIRDING FOR WAR: PERSPECTIVES ON RESEARCH, DEVELOPMENT, ACQUISITION, AND THE DECISIONMAKING ENVIRONMENT OF THE 1980s

Dr. Richard P. Hallion

T ODAY'S U.S. defense decisionmakers face serious challenges as they pursue efficient management of the research, development, and acquisition process. These challenges involve political, economic, time, technological, and managerial constraints that serve to create a specialized research, development, and acquisition environment. An understanding of the dynamics of this environment (together with an appreciation of the kinds of difficulties that decisionmakers face) is critically important for successfully matching anticipated defense needs beyond the 1990s with effective planning to meet them.

Problems of integrating defense planning and systems acquisition were evident in the earliest days of organized conflict. For example, during the Peloponnesian War (431-404 B.C.), the Peloponnesian states aligned against Athens found to their dismay that they could not effectively confront Athens' powerful fleet. Eventually, because the pace of technological growth was slower at that time and thus the penalty for technological backwardness was still tolerable (a situation that does not exist

Soviet surface-to-air missiles, coupled with the world's largest interceptor force, pose a difficult challenge for Air Force planners. The advanced technology bomber (ATB), which may look like the artist's depiction below, could provide a way to meet that challenge.

USAF

The airplane is a total system requiring the integration of diverse and separate technologies into a fully successful package. Samuel P. Langley's aircraft, which crashed into the Potomac on its maiden flight on 8 December 1903, was not built with controllability and structure adequately factored into the design.
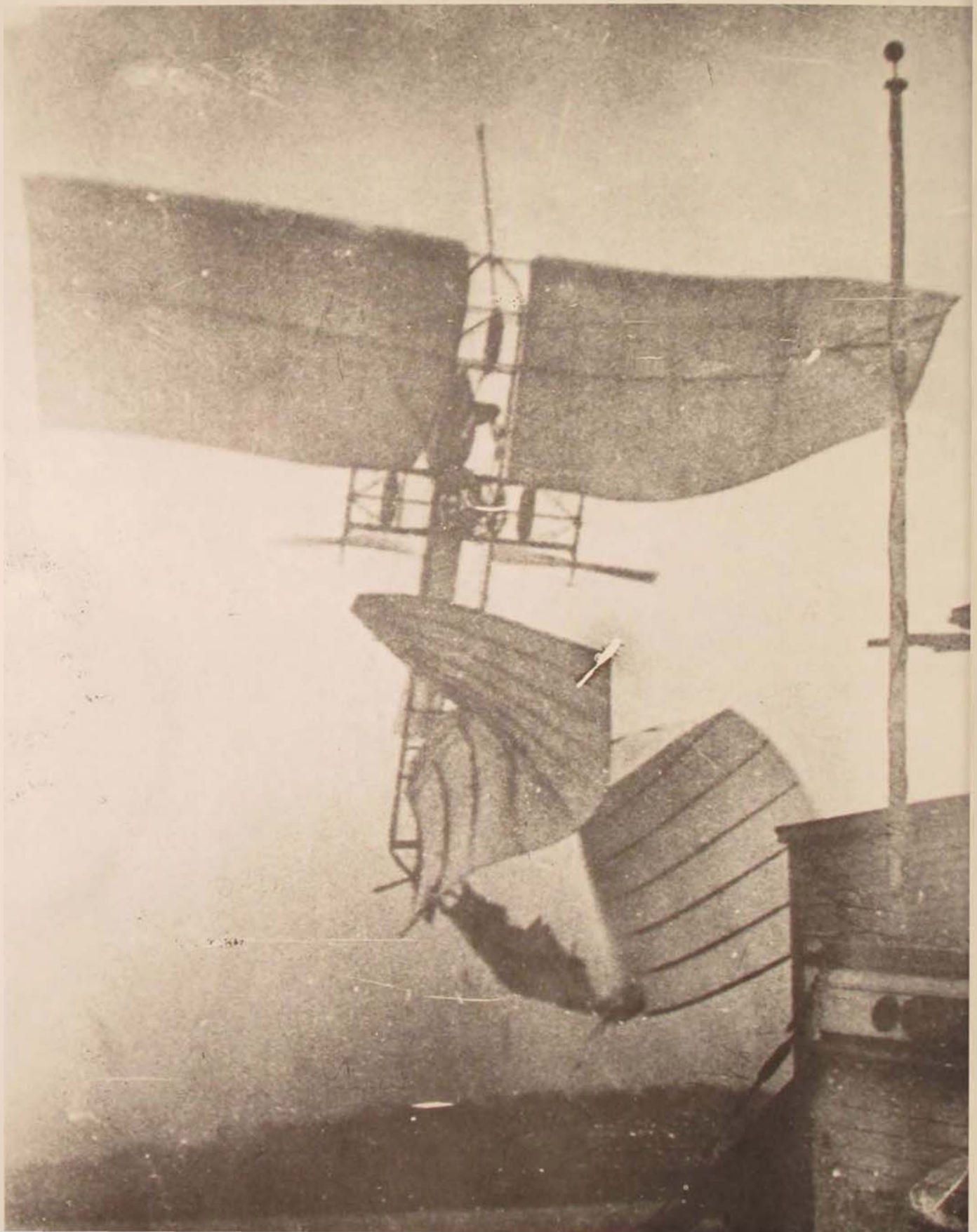
today), these states overcame their deficiencies, as Athens learned to its sorrow when attempting to seize Sicily.[1] A similar situation plagued Rome during the Punic Wars with Carthage. In this instance, Roman naval architects copied a captured Carthaginian vessel, and this derivative technology, coupled with aggressive naval training, finally spelled the end to Carthage's fine fleet.[2]

Unlike Greece, whose various states had little appreciation of military technology other than naval architecture, Rome was a nation-state with a strong sense of military technology, falling only after internal corruption and accumulated failures of civil and military leadership had taken their toll. Development of certain kinds of catapults had been standardized to the point where specific directives existed as to their manufacture and employment. The Roman army's heavy investment in military technology clearly paid off, such equipment acting as a "force-multiplier" for an overly large but undermanned empire at war with more numerous (but technologically inferior) enemies.[3]

Inspired in part by the Roman experience, the exploitation of military technology became an integral part of military and defense affairs in the post-Roman world. For example, the city-states of Renaissance Italy encouraged development of complex war machinery for their military forces. Indeed, to Renaissance man, the very word *engineer* implicitly meant "military engineer."[4] As weaponry became more sophisticated, arguments typical of later times were first heard; for example, many leaders considered early firearms a morally unacceptable weapon. Such arguments, which may smack of sophistry when one thinks of the carnage commonly wrought with conventional swords and pikes, tended to diminish as the general usage of firearms became commonplace. Attempts to ban firearms or at least restrict their use met with a notable lack of success—a demonstration that, no matter how much one might want to, it is impossible to "disinvent" a

technology once the circumstances favorable for the emergence of that technology have arrived.[5] That lesson, evident in our reading of the past, is clearly applicable to the present world as well.

American military history in general and Air Force history in particular is replete with examples of how the military dealt with newly emergent technologies. During the revolution, the rifle's superiority over the smoothbore musket helped decide such critical battles as King's Mountain and Saratoga. Nearly three decades later, inventor Eli Whitney furnished a notable example of acquisition ineptness. Receiving a government contract to mass-produce 100,000 rifles, Whitney promised delivery in two years but actually took ten.[6] No example could more clearly emphasize the importance of adequately predicting problems, which translates directly into the ability to generate a meaningful schedule running from the requirement one frames to the capability one desires. Another challenge inherent in the research, development, and acquisition process is, of course, understanding the technical challenges involved and then confronting them in meaningful fashion.

When the U.S. Army contracted with Smithsonian Institution Secretary Samuel P. Langley to develop a man-carrying aircraft (the so-called Great Aerodrome), Langley rashly presumed that he could simply scale-up a larger craft from the small models he had successfully flown in the early 1890s. He built a meticulously finished but fatally flawed aircraft having an inadequate control system and a structure incapable of withstanding the loads it would experience in flight. The result was a well-publicized failure that reaffirmed a popular public image that the airplane was, per se, a questionable endeavor.[7] Langley simply misunderstood the basic principles of flight. Like many other ill-fated pioneers, he emphasized lift and propulsion, not recognizing the need for good controllability and an adequate structure. In short, he did not appreciate that an

airplane represents a *total system* requiring the *integration* of diverse and separate technologies into a fully successful package.

Even sadder was the reaction of the scientific and military community to the Langley accident. As early as 1896, Lord Kelvin, one of the major scientists of the day, rashly stated "I have not the smallest molecule of faith in aerial navigation other than ballooning," an indication (then as well as now) of how an acknowledged expert in one field can be so wrong in predicting the pace of technological progress in another with which he is less familiar.[8] After Langley's two 1903 takeoff crashes, official interest in flight waned, the rationale being that if someone of Langley's stature—a recognized authority in science—could not solve the problems of flight, then it was likely they were unsolvable at the time, probably far into the future, and possibly for all time.[9] Ironically, even before the harsh editorial judgments about Langley's "folly" had died away, the Wright brothers were readying their epochal 1903 Flyer, the first aircraft capable of making a powered, sustained, and controlled flight. Unlike Langley, the Wrights had undertaken a cautious, careful, and incremental ground and flight test program that (in its proceeding from theoretical conception through component design and testing and on to flight validation) is a model for such endeavors, even by today's rigorous standards. Their chief reason for success was, however, their perceptive understanding of the problem.[10]

Sometimes it pays to be a fast second. When the European pioneers were introduced to—and humiliated by—the Wright technology in 1908-09, they quickly moved to develop advanced aircraft, building on the same basic design principles. American aviation, on the other hand, stagnated—in part because of the enervating effects of the Wright-Curtiss patent infringement controversy but in the main because of complacency. As a result, when military and industrial planners confronted America's wartime needs during the Great War, they

rashly expected to deliver thousands of aircraft in short order. In fact, not a single American-designed aircraft reached the Western Front, thanks to multiple failures in the acquisition process, starting with inadequate forecasting and continuing through a naive belief that the automobile industry could construct airplanes as rapidly as it produced cars, plus a questionable decision to copy European designs but with an American powerplant.[11] As an official summary of America's wartime aircraft production morass stated:

> The Army had practically no material, personnel, or experience in the designing, producing, or using of aeronautical equipment. . . . The country had no accurate knowledge of the aeronautical requirements of modern war. . . . Adequate manufacturing facilities for the production of aeronautical equipment of a war type did not exist in this country. . . . There was no definite understanding as to how much aircraft equipment would be required for the use of the Army or Navy, and therefore no program to work to.[12]

Stung by criticism, defense planners vowed never again to have such a debacle on their hands. When President Franklin Roosevelt issued his famous call in May 1940 for an annual production rate of 50,000 airplanes, a suitable industrial base and military organization existed.[13] Ironically, the memory of America's lack of preparedness in World War I convinced many Axis planners that the United States could not adequately mobilize for war, and they subsequently learned to their sorrow that what had held true in the past was not gospel in the present. And with even greater irony, it was the Axis powers that proved incapable of sustaining the appropriate combination of production, technological innovation, and creative decisionmaking necessary to overcome the war-winning impetus of the Allied nations. In part, this inability stemmed from complacency, but, in the case of Nazi Germany, also from ideological misconceptions and the politicization of science and technology (such as the quest for "Aryan"—i.e., "non-Jewish"—physics), coupled with

poor management of research, development, and acquisition programs.[14]

The lessons of the Second World War were regarded as profoundly significant by postwar defense planners, yet the generally successful Allied—and especially American—efforts in the field of research, development, and acquisition were marred nevertheless by specific problems, surprises, and disappointments, particularly in the field of gas turbine (jet) propulsion. The discovery that the United States ran third behind Nazi Germany and Great Britain shocked Army Air Forces (AAF) Chief Henry H. "Hap" Arnold, who determined that never again should the AAF find itself in a position of technological inferiority in the field of aeronautical development.[15] He arranged for the immediate importation of Whittle engine technology from Great Britain and, more significantly, introduced a tradition of seeking outside and independent advice from prominent scientists and engineers such as Theodore von Kármán, which eventually led to both the USAF Scientific Advisory Board and civilian "think tanks" such as the Rand and Aerospace corporations.[16]

But if the American shock at discovering the superiority of new German jet aircraft over conventional piston-engine fighters warned against the dangers of technological complacency, the German experience with the V-2 missile warned against nations becoming obsessed with the technologically fanciful at the expense of developing truly meaningful and effective war-winning weapons. In the absence of an atomic warhead—which, because of Germany's ideologicalization of science, was an impossible attainment for the Third Reich—the V-2 simply constituted an enormous R&D drain having negligible military impact.[17]

There were more general lessons, including the differences in the approach to research, development, and acquisition within totalitarian and democratic societies. Generally speaking, an examination of the wartime situation indicates that democratic societies have greater difficulty reaching decisions in these areas than do totalitarian societies, primarily because a totalitarian state tends to have a more streamlined decisionmaking process wherein opposition is less vocal and persistent. However, it is more likely that the democratic society will make a wise decision, and it is certainly easier for a democratic society to reverse a bad course of direction or remedy a bad decision than it is for a totalitarian state. In part, this difference is due to the character of leadership and the leadership style of a totalitarian society. Generally speaking, in both right-wing and left-wing totalitarian governments, the process of decisionmaking is caught up in the cult of the individual (the cult of the leader). Reversing a bad decision (or even making less drastic changes to a development process or research program) first involves convincing the leader that he is wrong, and then requires finding some means whereby a reversal of direction can be achieved with minimal loss of prestige—a considerable task.[18] (Certainly the cult of the leader afflicts nontotalitarian societies as well, usually in more extreme "Theory X management"-style corporations, but its negative potential is much less than in a society where respect for the leader's decisionmaking is caught up with how loyal one is considered to the state.)

The extraordinarily rapid development that took place in aviation between 1939 (when the turbojet first flew) and the early 1950s (when the supersonic breakthrough was in full flower) gave rise to a number of interesting attempts to take this new technology and apply it to a new generation of combat aircraft. Generally speaking, trends ranged from too conservative to too radical. For example, many designers retained the basic aerodynamic configuration of propeller-driven aircraft (i.e., straight wing and tail, relatively low fineness ratios, and relatively thick wing sections), producing such aircraft as the B-45 Tornado and B-57 Canberra—conservative designs that offered a few advantages over the generation of piston-engine aircraft

that preceded them. On the other hand, in such ambitious projects as the proposed (but never built) cart-launched rocket-ramjet XP-92 interceptor, designers let their imaginations run riot, producing impractical aircraft having dubious value.

As in many other human activities, a more reasoned "middle path" approach worked best in designing aircraft—a fact illustrated by the first generation of sweptwing fighters and bombers, typified by the F-86 Sabre. What is disturbing, however, is the number of aircraft that were designed without adequate thought being given to the mission that they should fulfill. Within the so-called Century series, for example, only the F-102 and its derivative, the F-106, served in the role (interception) for

The B-45 (below) was a conservative design that utilized the straight wing and tail, similar to the piston-engine aircraft that preceded it. . . . Unlike the ATB, the XB-70 (facing page, top) did not anticipate Soviet defenses adequately. Had it gone into production, the XB-70 would have posed little threat to the Soviets. . . . When the XF-92A (facing page, below) first flew in 1948, it was considered an extremely advanced aircraft. The great worth of the plane turned out to be in the field of high-speed research.
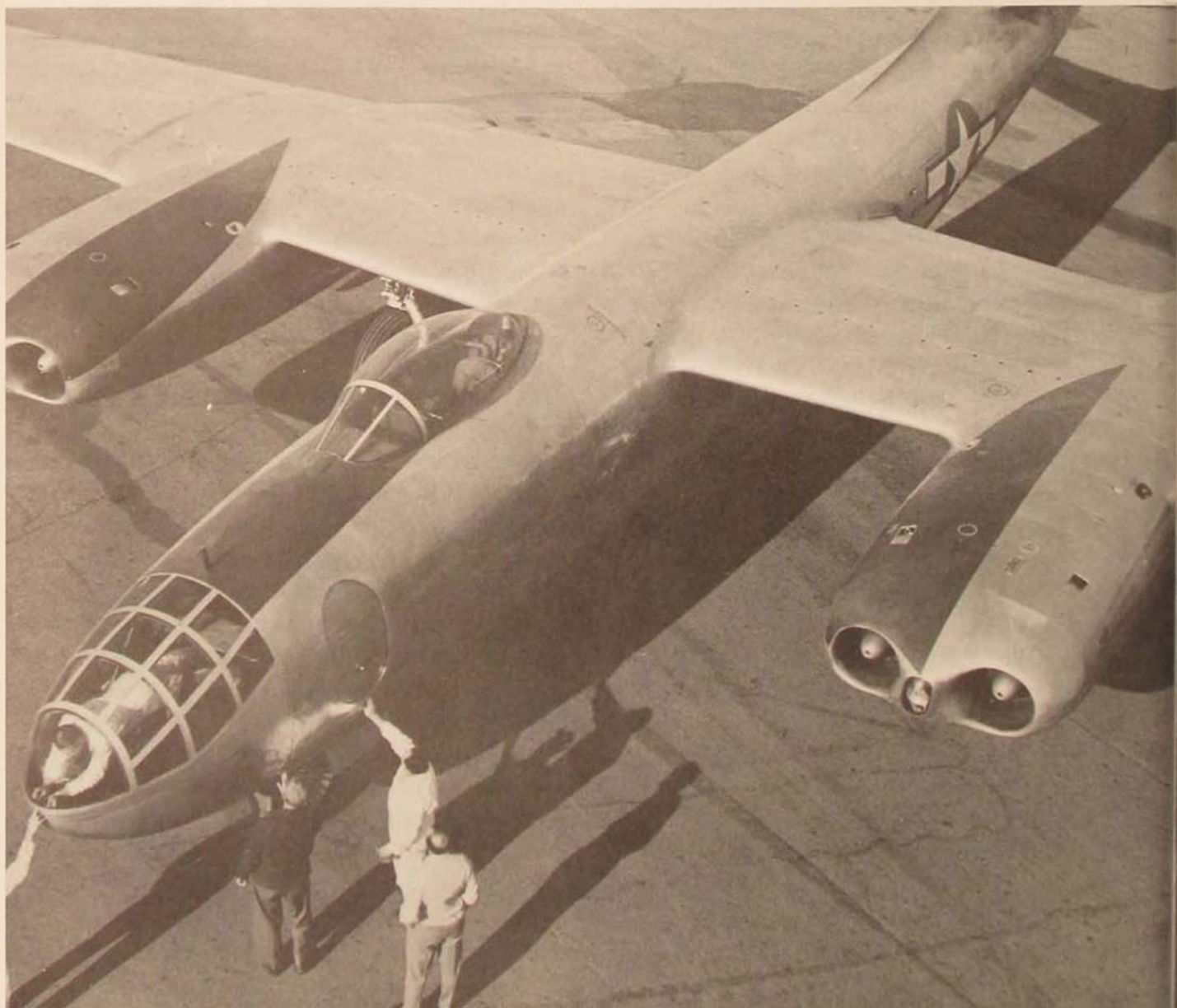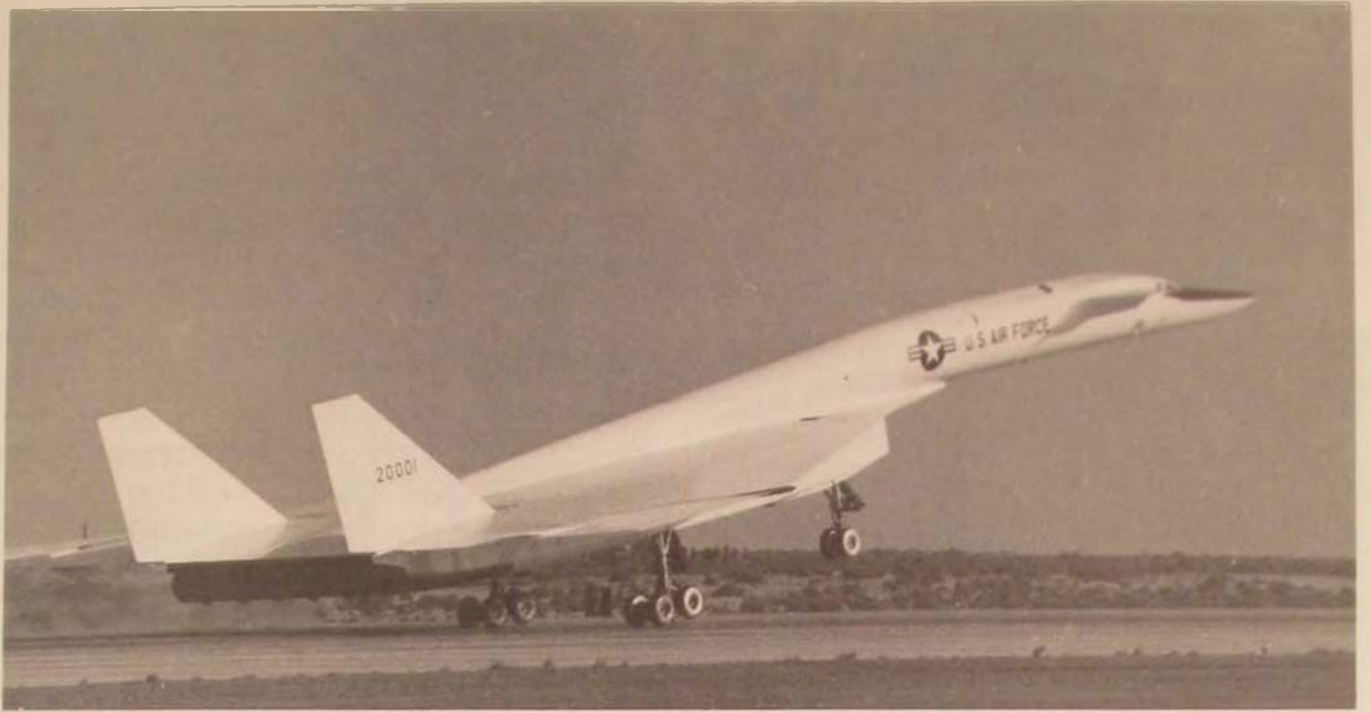
which they were originally intended. The F-100, F-101, F-104, and F-105 all underwent drastic changes in mission, some successfully (such as the F-105) and others less so (such as the F-104).[19]

A not-so-nostalgic look at the 1945-65 time period indicates some of the characteristic problems in acquisition of selected Air Force aircraft:

Unrealistic Proposals

Northrop XP-79	North American F-108
McDonnell XF-85	North American XB-70A
Convair XP-92	General Dynamics F-111
Republic F-103	Rockwell OV-10

Disappointments

North American B-45	Republic F-84
Martin B-57	(straight wing)
Douglas B-66	Lockheed F-94C
Lockheed F-104	Convair B-58

Aircraft that the USAF Learned to Live With

Convair B-36	McDonnell F-101
Boeing B-47	Convair F-102/F-106
Republic F-84F	Republic F-105
Northrop F-89	General Dynamics F-111
Lockheed F-94A/B	Rockwell OV-10
North American F-86D/L	

Genuine Successes

North American F-86	Northrop T-38/F-5
Boeing B-52	McDonnell F-4
Boeing KC-135	Lockheed U-2
Lockheed C-130	Lockheed SR-71

Of the unrealistic proposals listed, three were actually built: the XB-70A, F-111, and OV-10. Simply stated, the XB-70A could not have undertaken successfully the long-range strategic bomber mission envisioned for it by the time of the late 1960s; failure to predict adequately the capabilities of Soviet defenses encouraged development of this system, which was canceled before being placed in service. Ironically, the cancellation decision, while good, was made for the wrong reason—namely, the then-popular assumption that missiles would inevitably replace manned aircraft (the

same thinking that nearly emasculated the Royal Air Force through the infamous 1957 White Paper of British Defence Minister Duncan Sandys).[20]

The story of the F-111 is so well known as to hardly bear reexamination; two widely differing requirements were optimistically meshed into a single-development program. The result was a costly, protracted program that cost the U.S. Navy more than ten years of fighter development time (from the 1958 F-4 to the 1971 F-14) and produced a seriously compromised design that gave the Air Force innumerable difficulties during its transformation into an acceptable weapon system. A congressional investigation concluded that the original development decision in 1961 had been a mistake, "one of a series of management blunders . . . which compounded error upon error as the TFX [F-111] program stumbled along year after year."[21]

The OV-10 story was far less calamitous but indicative of similar misconceptions. Designed as a counterinsurgency aircraft primarily for armed observation and forward air controlling duties, the OV-10 was underpowered and equipped with questionable provisions to carry a small squad of troops in its aft fuselage cargo bay. It lacked the speed, firepower, endurance, agility, and survivability required for the kinds of missions it was flown on in Southeast Asia.

In all of these cases, developers were entranced with a *concept* (high-altitude mach 3+ strike, commonality in developing new weapon systems, light semi-STOL multimission counterinsurgency aircraft) without giving adequate thought to either the *practicality* or the *war-fighting environment* that each would be expected to meet.

The disappointments listed may be summarized as follows: the straight-wing B-45 proved incapable of surviving in the Korean air war environment of 1950-53 when confronted by early MiG-15 sweptwing interceptors. The mistake here, aside from obviously underestimating potential enemy capabilities, was over-

The OV-10 was designed as a counterinsurgency and forward air control aircraft. It turned out to be underpowered, lacking in endurance, and hampered by a design mishmash that provided questionable space for a small squad of troops in the aft fuselage. In short, the OV-10 was a plane seemingly designed by committee.

looking once again the old truth that an airplane is a totally integrated system; merely adding turbojets to an outmoded aerodynamic configuration did not make an acceptable jet bomber/reconnaissance aircraft. One had to take advantage of the inherent capabilities of the turbojet by joining it to an equally sophisticated airframe.

The disappointing Martin B-57 and the Douglas B-66 suffered from serious limitations that compromised their usefulness. In the former case, planners selected a British aircraft for "off-the-shelf" production (canceling a truly advanced indigenous airplane, the XB-51, to do so), discovering later that American needs dictated total structural redesign. In the latter case, an excellent Navy aircraft (the A3D) was modified to meet an Air Force mission but

was so altered by weight and powerplant changes as to be of but questionable value as a bomber; it served primarily in electronic countermeasure/electronic counter-countermeasure (ECM/ECCM) roles until retirement.

Among other disappointments, the F-104 seems to be a case of an aircraft in pursuit of a mission (as does the B-58); it served but briefly as an interceptor and as a tactical fighter with the Air Force. The F-84s, while workhorses, were underpowered and ground-loving. The F-94C suffered from serious engine flameout problems caused when its salvo-launched unguided rocket armament generated inlet airflow distortion (a result of poor design). Unreliable avionics further effectively limited its potential as an all-weather interceptor.[22]

The Air Force managed to live with a number of aircraft that had limitations, undesirable characteristics, marginal performance, or handling quirks. For example, the early-generation turbojet interceptors—the F-86D/L, F-89, and F-94 series—all suffered from a variety of nagging problems (such as, in the case of the "Sabre Dog," high pilot workload) that limited

their effectiveness. (So, too, did the F-102 and F-106, which underwent prolonged gestation but which, once flaws were corrected, became very useful aircraft.) The thin-winged B-47 suffered from severe aeroelastic manifestations that limited its performance and served as a warning to Boeing for future bomber designs. Pitch-up—a problem that plagued many early sweptwing aircraft—imposed constraints on the F-101. Initial structural problems and a serious problem with hydraulic leaks following battle damage plagued the F-105. And, finally, the aforementioned F-111 and OV-10 all took getting used to—and sometimes at the cost of aircrew and aircraft lost.

There were a number of success stories, however, such as the elegant F-86 series of day fighters, the B-52 (profiting from the B-47), the KC-135 (incorporating lessons from both B-47 and B-52), the C-130 (a brilliant concept, coupled with excellent design), the T-38 and F-5 family (an example of creative, evolutionary engineering, coupled with rigorous designing for well-defined missions), the F-4 (based on McDonnell's previous jet fighters and the Navy's Korean experience), and the U-2/SR-71 (both special-purpose aircraft that reflected thorough understanding of the mission requirements for specialized high-altitude reconnaissance aircraft, coupled with a solid grasp of what technologies needed to be incorporated in such vehicles). A surprising aspect of most of these is the degree to which they were *privately initiated* projects—outright in the cases of the KC-135, T-38, and F-5; near-private in terms of the F-86, U-2, SR-71, and C-130; and akin to private in the cases of the F-4 and B-52, which benefited directly from a long company tradition of designing naval fighters or long-range bombers and transports. There was little guidance or direction offered from the federal government—a positive comment on the prescience of the companies involved, but a disturbing one on the ability of government planners to forecast their needs adequately and then seek suitable solutions from industry.

In the cases of the KC-135 and T-38/F-5, the companies involved had already designed the aircraft before they approached the government; they tried long and hard to generate interest before finally being successful. (In Boeing's case, the company next had to sell the jet transport concept to the airlines, meeting with fierce resistance along the way from airline executives firmly wedded to the propeller-driven airliner.)

The absence of government guidance was especially the case in developing the U-2 and SR-71, where Lockheed was out on its own on the frontiers of flight. It is often held that so-called black programs can accomplish twice as much as more open programs and for half the cost and development time; in the absence of conclusive evidence, such statements must remain intriguing speculation, but the cases of the U-2 and the SR-71 seem to bear out that at least in one company's experience such claims appear to be true. Presumably, these advantageous results are possible because of more streamlined management, smaller development teams, stringent review of mission requirements, and rigorous adherence to cost and time schedules.

IN the late 1960s and early 1970s, the Air Force embarked on a new wave of acquisition, both to offset the growing obsolescence of a fleet dating largely to the 1950s and to redress some of the more serious flaws of defense direction and management that had occurred in the 1960s. The subsequent history of the programs spawned from that restructuring effort, such as the F-15, F-16, and A-10, has been one of general success. However, in looking beyond the 1990s, it is clear that a number of attributes of the present decisionmaking environment that affect the research, development, and acquisition process must be understood by today's decisionmakers. Many of these are beyond the control of managers—but this does not mean that the process is out of control or

closed to the influence of shrewd decisionmakers acquainted with its intricacies and topology. The following thoughts, then, are offered in the spirit of stimulating discussion and comment and not with the intention of being proffered as great revealed truths.

Today, even more than in the past, technological decisions are not reached on the basis of technological merit alone but on the basis of a host of other factors—social, political, and economic. A perusal of recent decisionmaking reflects this fact: the SST cancellation, ABM Treaty, fast-breeder reactor development, genetic engineering, B-1A/B development, MX Peacekeeper production and basing, the Strategic Defense Initiative, to name a few. Technologists and military planners no longer have—if indeed they ever did have—the sole option in deciding to develop a system. In part, this complexity in decisionmaking occurs because . . .

Technology has become so complex and expensive that it has become increasingly time- and cost-intensive to pursue and increasingly requires approval by the political process. It is so expensive that it requires the outlay of public funding, necessitating informed political decisionmaking by representatives of the citizenry (whether one is building a highway, a supercarrier, or an aircraft system). Because of cost factors, the number of private ventures undertaken (such as the T-38/F-5 series of the past or the P-51 of World War II) is quite small and usually insignificant. Hence supporters of new acquisition programs must realize that . . .

Understanding the political process is critical. The base of program support in Congress changes every two years with elections, requiring constant and repetitive rejustification of programs. Because elected representatives tend to seek a "spreading of the wealth" through their districts and states, program advocates must consider this aspect in their presentation. Further—and this is not a criticism—it is unrealistic to expect that political decisionmakers will be able to or will wish to understand the intricacies of technology and military requirements (this fact is evident in the reading of congressional appropriations testimony and, for example, the TFX debates of the 1960s). Normally schooled in legislative and economic affairs, they have other agendas and many other issues to grapple with. Program advocates must learn to present their positions in a manner and style that is comprehensible to those who determine the direction and govern the finances. Every four years, there are major changes in the executive branch leadership induced by the electoral process; even if the same administration remains in power, senior-level management usually changes. This shakeup forces program redirection from the very top of government. Simultaneously, at roughly three-to-four-year cyclces, other high-, mid-, and low-level managers in the civilian government, military, and industrial communities tend to change, reflecting their own promotions (career progression) through their organizations. This phenomenon reveals another characteristic about corporate and governmental leadership: . . .

We no longer have czars. The days of a Wernher von Braun or a Hyman Rickover having decades of control over a major program have passed. In some respects, this departure from czarist control is good: the abuse of such long-term power by a poor manager can be disastrous. What is lost, however, is the notion of *continuity* and *lessons learned*—in short, *corporate history.* No longer do we have people in charge of a major program who have a stake in it from beginning to end. In fact, the rapid turnover in administrators leads to what might be termed a "Smith years-Jones years" problem. An incoming administrator is under a great amount of pressure to make his or her own mark on a program. Industrial-organizational psychologists have long recognized that this circumstance often manifests itself in a compulsion for change as an affirmation of managerial prowess and authority (what is sometimes referred to as the "history-book syn-

drome"): the new manager often feels unable to prove competency and his or her "right" to manage the predecessor's project except by imparting changes to it. This tendency is a serious problem since it is subtle, is caught up in the personality of the individual decisionmaker, may send a signal to subordinates that triggers a "group-think" response, and functions at all levels—high, middle, and low—in the managerial process.[23] Awareness is one method of avoiding it. Another method involves the recognition that . . .

Planners must always keep in mind the appropriate level of technology required for a particular program. Technological progression tends to follow so-called biological or S-shaped growth curves—slow infantile growth as a technology appears, rapid maturation to adulthood, and then a leveling-off as natural limits are approached.[24] Today, many technologies are in an almost explosive growth cycle, particularly in the field of avionics. Since development times routinely approach (and sometimes surpass) the twelve-year mark, managers, who are naturally desirous of incorporating the latest state-of-the-art achievements in their programs, feel strongly compelled to add on new technology to programs already in development. What program managers must keep in mind, however, is whether an addition will meaningfully enhance the capabilities and usefulness of a system or whether it will simply build in greater costs, lengthen development time, complicate system operation, and increase maintenance requirements. Before producing the successful aircraft of the 1940s-60s and such aircraft as the F-15 today, their developers thoroughly understood the mission that had to be met, the level of technology that had to be incorporated, and the amount of potential needed for future development and progressive improvement. They assessed what was actually needed, determined the appropriate level of technology, and had the discipline to live with the decision. Their success reemphasizes that . . .

Intelligent, reasonable futures forecasting is of vital importance to systems acquisition. No one ever developed an airplane with the intention that it would disappoint or fail—and yet such has often been the case. Today, with time- and cost-constraints facing defense administrators, such failures can no longer be tolerated. Planners must approach the future with responsible assumptions, using cautious futures forecasting techniques, to avoid the Scylla of ignorance on one hand and the Charybdis of false expectation on the other. As one team of futures forecasters has warned, "Forecasting . . . is an uncertain exercise, plagued with fallacies, uncertainties, and ignorance. It cannot aspire to be called a science, and it must avoid the dangers of pseudo-science."[25] Practitioners of forecasting methodologies—cross-impact matrices, Delphi interrogations, and the like— pretend to be able to offer accurate estimates of what future conditions will be. However, these methodologies are heavily influenced by the constraints of the forecasting process itself— such as Delphi's questionnaires—as well as by

Transports, particularly tactical transports, suffer in a design-procurement environment traditionally entranced with mach-3-capable aircraft. Procurement of a transport to replace the C-123s and C-7s, which are now long gone from the inventory, may take the brunt of budget cuts. Whether a plane like the YC-14 will ever be a part of the Air Force is an open question.

qualitative nonobjectivist factors. Additionally, there is a perspective problem that parallels the narrow field of view of a telescope. At the time that a requirement is formulated, the desirable attributes which a system should possess at the time it enters service are typically not readily apparent. These are perceived most accurately only as one approaches the stage of initial operational capability—usually resulting in a frantic, costly, and time-consuming last-minute adding-on of technology in an attempt to offset obvious deficiencies. Futures forecasting can be strengthened by the recognition of a basic historical law: future expectations depend on how well the present world is understood, and that understanding, in turn, depends on the degree to which we comprehend our history. (Moreover, our expectations of the threats we face and the posture and capabilities of potential adversaries are, of course, equally dependent on how well we understand *our potential adversaries'* history, comprehend *their* present, and forecast *their* future.) Finally, . . .

We must be aware of all the factors and pit- *falls confronting the defense and acquisition decisionmaker.* A host of constraints, difficulties, and problems can confront a decisionmaker attempting to undertake the development and management of a major system. One is the temptation (usually afflicting the uninformed policymaker) to cancel a system that performs reasonably well (or a system that has experienced developmental problems but is now finally on track) in favor of some advanced new technology "just around the corner." This has resulted in the cynical (but appropriate) maxim "best is the enemy of better." Managers confronting this temptation should realize that if it is carried to its logical extreme, nothing will ever be built; something will always hold greater promise. If our planners fall victim to this temptation, we face the danger of becoming followers rather than leaders in technology, as other nations adapt concepts and ideas (which we may have originated) into workable production systems while we continue to search for Holy Grail solutions. Examples of two areas in which we frittered away meaningful

lead-times in favor of further refinement (thereby causing delay and increasing costs) are those of attack helicopter development and the abandonment of the AMST STOL transport program of the 1970s. This practice is intolerable in an age where we increasingly lack the grace and time to play catch up.

An even graver danger is technological smugness, which not uncommonly is linked to typecasting of one's adversaries. In the United States during the 1950s, for example, there was a generalized unquestioning acceptance of the backwardness of Soviet technology vis-à-vis the West. A cursory look at history and ongoing realities should have dispelled such smugness. Russian technologists developed the world's first multiengine transport (the Sikorsky *Bolshoi*); introduced the first modern monoplane fighter (the Polikarpov I-16); first applied ramjet propulsion to aircraft; fielded excellent tactical aircraft (such as the Ilyushin Il-2), armored fighting vehicles (such as the T-34), and battlefield rocket artillery (the infamous *Katyusha*); flew a turbojet sweptwing fighter (MiG-15) two months after the F-86; detonated an atomic bomb four years after Trinity; and developed their first supersonic day fighters (the MiG-19) and hydrogen bomb simultaneously with America's F-100 and H-bomb programs. Given this track record, it is dismaying that the West was so surprised by Sputnik in 1957—especially since the Soviets had been openly announcing their intentions to launch an earth satellite for several years previously.[26]

Nevertheless, technological smugness in the United States continues. Recently, increased media attention has been focused on a generalized Soviet trend whereby the planforms of existing Western aircraft appear to be copied with distressing frequency. One commonly voiced assertion is that this occurrence indicates the backwardness or bankruptcy of Soviet aircraft design practice. Nothing could be further from the truth: it simply represents a traditionally pragmatic Soviet recognition that one method of reducing the long development times of air-

craft projects—which afflicts the Soviets as well as ourselves—is simply to adopt a proven or well-thought-out design planform. (This Soviet tradition dates to copying the B-29 as the Tupolev Tu-4 back in 1947). Thus this practice is a measure not of Soviet lack of technical imagination but, rather, of managerial craftiness. It is aided and abetted by the unfortunate free flow of information and even hardware from the West to the East—products of contradictory governmental impulses regarding technological transfer, the natural results of an inquisitive press in an open society, irresponsible release of information, and, certainly, active espionage aided by our weaknesses in protecting access to sensitive materials. In one notable case, the British government sold the newly designed Rolls-Royce Nene turbojet to the Soviet Union (at a time when the Nene was not yet in use on Britain's own aircraft). This decision freed the designers of the MiG-15 from having to compromise their design with inferior engine technology. Thus, when the MiG met our Sabre over the Yalu, it did so with a Soviet-built copy of the Nene.[27]

One glaring difference affecting the research, development, and acquisition process is the disproportionate investment in military R&D by the United States and the Soviet Union. A recent survey of military R&D spending revealed that the Soviet Union invested better than $120 billion more than the United States during a ten-year period. Nevertheless, our nation's R&D funding level has remained stagnated since 1965; indeed, the United States today spends only 75 percent (in constant dollars) of what it spent in 1965 on building the national technological base.[28]

Another inherent problem within the acquisition process is thinking in terms of going from some initial operational requirement toward some initial operational capability (IOC). But is the IOC the critical issue that defense planners should be addressing? Rather, isn't it the time the *last* unit to reequip or acquire a new system becomes operational? The French

Air Force experience in 1940 offers an example of an air force that had large numbers of mediocre aircraft and small numbers of truly excellent aircraft entering service: the force was overwhelmed by larger numbers of good aircraft fielded by the Germans. A good defense planner recognizes that managerial responsibilities do not end with a new system entering service and the initial deliveries to the first users. Rather, the acquisition process must emphasize fleet-wide introduction of equipment.

THROUGHOUT the development of aerospace technology, the general trend has been toward *evolutionary* rather than *revolutionary* progression. We must change this pattern to meet the defense needs of the post-1990s successfully. Doing so might involve a number of activities: one worthwhile action could be to reestablish the joint USAF-NASA-industry research airplane committees that functioned so well in the 1950s and 1960s; another might be to fund the construction of new "X-series" aircraft to acquire basic knowledge, validate new technologies and design concepts, and act as technology demonstrators for new generations of military aircraft. Systems Command's initiative in launching Forecast II, seeking to emulate the success of the earlier Project Forecast of the 1960s, should be applauded as one responsible step toward comprehending the Air Force's future.[29] In any case, it is easy to ascertain the kinds of "solutions" that will *not* work: increased micromanagement, centralized organizations for acquisition, and all the other hoped-for solutions that generally promise greater "oversight" and which, ironically, generate oversight of a different and far more intolerable kind: the oversight of missed opportunities and enforced decisionmaking paralysis. Breaking the traditional pattern requires that decisionmakers possess insight unfettered by the constraints of a technological mindset emphasizing the incremental nature of development. It is not with this traditional mindset that we will achieve the breakthroughs of tomorrow that rank with such past and present developments as the turbojet engine, supersonic design technology, or stealth technology. Instead, we must remember the prophetic aphorism of Francis Bacon, one of the great apostles of modern technology, who wrote early in the seventeenth century that "by far the greatest obstacle to the progress of science and to the undertaking of new tasks and provinces therein, is found in this—that men despair and think things impossible."[30]

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Notes

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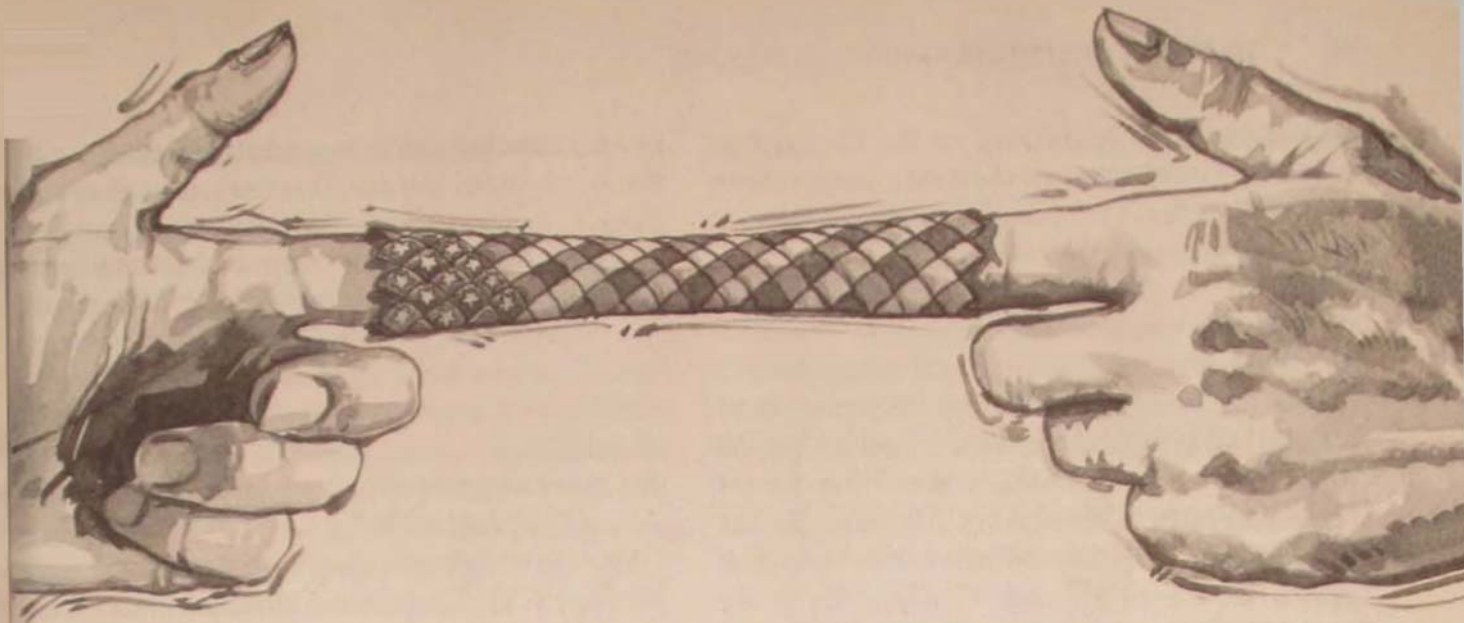
THE LEGACY OF HALFWAY UNIFICATION

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ANYONE who is familiar with U.S. Air Force history knows that roles and missions duplication has become as much a part of our military heritage as the wars we have fought. A primary reason for this has been our inability to overcome the biases blocking true unification of the armed forces. Merely scratching the surface of the nation's air power for the past forty years will show that the Air Force has just as much to be concerned about in settling the who, what, when, and wherefores of unity today as when it became an equal partner under the National Security Act of 1947.

Since the National Security Act and Executive Order 9877 neglected to fix the division of service responsibilities, the sensitive area of air power roles and missions was left open to broad interpretation. This circumstance occurred because, as written, the act was a compromise on the key issues of unification, which the U.S. Navy had opposed during months of divisive postwar dialogue. Ancestral voices from this period remind us that today's concerns for military reform are not much different from that earlier struggle.

The U.S. Army led the drive for unification, for its top leaders were convinced that an autonomous air force and unified direction of the armed forces were imperative lessons to be drawn from their experience in World War II. Generals George C. Marshall and Dwight D. Eisenhower were two of unification's strongest advocates. They both believed in a single defense establishment with three coequal branches—land, sea, and air.

Determined Navy opposition was keyed more to the relatively new dimension of air power than it was to the Army's traditional domain of ground warfare. Prior to the rise of the air weapon as a major force in war, the Army and the Navy had drawn generally accepted boundaries between land and sea warfare, but these had become clouded in the tridimensional operations of World War II. The Navy harbored some concern for the integrity of the Marine

Corps, since its operations in the Pacific had overlapped with those of the Army, but its greatest fear was that of losing its naval and marine aviation to an autonomous air force.

Adding to the Navy's misgivings was the precedent set by our wartime ally, Great Britain, whose naval aviation was controlled by the Royal Air Force. Although this was not an officially stated position by unification proponents in the United States,[1] it is evident that the founding fathers of the U.S. Air Force did believe that all military aviation should be integrated into a single organization. Their unshakable faith in the indivisibility of air power would have demanded this, for it was seen as the ideal alternative to the duplication and fragmentation of effort inherent in the existing structure. In his memoirs, Admiral Arthur W. Radford recalls that General Carl "Tooey" Spaatz, who became the Air Force's first Chief of Staff, spoke frankly to him about wanting all naval aviation integrated into the autonomous air force.[2]

Any form of unification that would break up the Navy's own integrated team of air, sea, and land components was anathema to Admiral Radford and his fellow flag officers. The war in the Pacific had brought the aircraft carrier to the fore of fleet operations, and the Navy was not about to relinquish control to another service. On the other hand, the admirals' plans to build a 65,000-ton carrier capable of launching atomic strikes smacked of encroachment on the strategic air mission.[3]

Both sides of the unification issue had strong political support. No one seemed more dedicated to unifying the armed forces than did President Harry S. Truman, but even he wearied of the bickering and supported compromise legislation that would be acceptable to both sides. Thus, the resultant National Security Act established the U.S. Air Force as a separate service from the U.S. Army but gave the country only the semblance of defense unification.[4]

Although the National Security Act ended their long struggle for independence, the Air Force founding fathers generally deplored the compromise of key unification issues that led to its enactment. Some believed that it might still be possible to gain control of all strategic air elements which were not tied directly to fleet operations, but even this idea proved wishful. Years later, Lieutenant General Ira C. Eaker would note wryly that by failing to unify all military aviation, the act had accomplished the exact opposite. It had "legitimized four military air forces."[5]

Perhaps dissatisfaction with the act was best expressed by Lieutenant General James H. Doolittle, whose thoughts on unification appeared in the December 1948 issue of *Air Force* magazine. He labeled it "an unfortunate compromise" that had made the new Air Force primarily responsible for national air power but had left the Navy free to pursue its policy of self-sufficiency. This contradiction resulted in "two self-sufficient, competing air forces, each planning to win the air war in its own way." The general's article underscored the failure of the act to establish a strong, coordinating head of the Joint Chiefs of Staff or to clearly designate roles and missions by Executive Order. Only unification of a sort had been achieved.[6]

The Air Force Association, at its annual convention, had endorsed the principle of a single integrated Air Force. Fully supporting this principle, Jimmy Doolittle saw no reason why naval aviation could not be integrated into the Air Force as a special branch, just as had been done with tactical aviation for the Army. He was concerned that the compromises had already "intensified rather than reduced the undesirable effects" of interservice competition. Quarreling had already broken out over funding priorities for the Air Force's B-36 intercontinental bomber program and the Navy's supercarrier, *United States*, even after roles and missions differences presumably had been put to rest at the Key West and Newport conferences.[7]

The first Secretary of Defense, James V. Forrestal, had convened the Joint Chiefs at Key

West, Florida, in March 1948 to resolve differences that had already arisen over roles and missions. Forrestal (who as former Navy Secretary had led the fight against unification) seemed intent on achieving jointness in defense planning and direction but also sought to preserve the tridimensional self-sufficiency of the Navy. That the primary air power role, including strategic operations, belonged to the Air Force was reaffirmed at Key West, but this did not exclude the Navy from "acquiring and maintaining an air component consistent with its primary mission of controlling the seas." Some limits were placed on the growth of the U.S. Marine Corps, but the Marines, too, were free to develop their own air component.[8]

The Key West conferees produced a functions paper that replaced Executive Order 9877, but the Air Force's first Chief of Staff was unhappy with the results. Before stepping down as chief in April 1948, "Tooey" Spaatz expressed his concern to Forrestal that the Key West discussions had failed to answer the prevailing question of "whether there were to be two air forces or one air force."[9] This concern proved well founded in the days ahead.

In 1946, Spaatz had testified before the Senate Committee on Military Affairs that he considered unity of direction for the nation's air potential "an absolute imperative" stemming from the lessons of the past war.[10] He remained true to this belief during his years as chief and afterward as a senior spokesman for air power. In a *Life* magazine article appearing a few days before the Joint Chiefs were to convene a meeting at Newport, Rhode Island, in August 1948, Spaatz expressed his opinion that the Navy's planning for atomic-capable aircraft carriers was an unnecessary and costly duplication of land-based strategic strike forces. His words fell on deaf ears at Newport, however, for the Navy gained reassurance of at least a collateral role in strategic air operations that included planning for the use of atomic weapons.[11]

Beginning in August 1948, the retired Air Force general was on the staff of *Newsweek* magazine for more than a dozen years as air and military consultant and as contributing editor. During bitter public airing of the B-36 controversy in 1949, which intensified after Forrestal's successor, Louis Johnson, canceled the Navy's supercarrier, Spaatz's periodic *Newsweek* column was an articulate and informed voice speaking for stronger unification and for the new role of air power—that of having displaced the Navy as the nation's first line of defense. If the Navy gained from the controversy, it was the reassurance from Spaatz's successor, General Hoyt S. Vandenberg, and Air Force Secretary Stuart Symington that the Air Force did not officially covet control of carrier aviation.[12] It first appeared that proponents of stronger unification might have gained more from congressional hearings on the controversy, but their hopes waned with the outbreak of war in Korea in June 1950.

When the services reached their "unfortunate compromise" in 1946, the Joint Chiefs had agreed to formalize the unified theater concept they had adopted during World War II. Unified commands were established with single commanders in chief charged with directing all assigned air, sea, and land forces through service component commanders. When the Korean War started a few years later, however, the Far East Command under General Douglas MacArthur had taken no formal steps to organize a truly unified command headquarters.[13]

Under unified theater planning, the air component commander was responsible to the theater commander for the centralized direction of his total available air assets. Prosecution of the war in Korea by the United Nations Command did not alter this basic conceptual arrangement, since it applied equally to either joint or combined operations. The Far East Air Forces commander, Lieutenant General George Stratemeyer, obtained MacArthur's personal assurance that he would centrally control all theater air power in his air component role, but this proved difficult in actual practice.[14]

General Vandenberg readily placed under

Stratemeyer's control all Air Force combat units in the war zone, including those of the Strategic Air Command. This decision was in keeping with Air Force doctrine, for the principle of centralized control (with decentralized execution) had been accepted practice since the North African campaign in World War II. Centralized control provided the most efficient and economical use of available resources. More important, it took maximum advantage of air power's inherent flexibility by assuring the theater commander of air support when and where he most needed it. However, it was not compatible with naval doctrine, which employed its air power as an integral part of fleet operations.[15]

The Navy hedged on placing its carriers under the air component commander's control, even though there was no naval campaign, as such, in the Korean War and the carriers were used mainly for strikes against land targets in North Korea. There was no active requirement to defend the fleet from enemy air attack, for U.S. planes readily achieved total air superiority over the battlefield. Incompatible communications equipment was a major obstacle to centralized control of the Navy's aircraft, but the primary reason given for the Navy's refusal to place its carriers under the Air Force was the flexibility required to shift its forces whenever and wherever they were needed across the expanse of Asian waters. The Navy routinely coordinated its air operations with the Air Force but would not participate actively in the joint operations center activities until the very end of the fighting.[16]

The Marine air units presented a different problem. Since the Marine Corps equipped and trained its air and ground units to conduct self-contained combat, it was reluctant to pool its aircraft under the centralized control of another service commander. Marine forces were traditionally wed to amphibious operations, which made them more dependent on their own air support, with Navy ships providing most of the heavy artillery. In Korea, however, the Marines fought beside Army units in a sustained land campaign. The landing at Inchon was the only amphibious operation of any real military significance in Korea, and it was a joint undertaking between crack Army and Marine units.[17]

The Marine air units were put under the air component commander's centralized control in Korea eventually, but they did not go quietly. Their displeasure was aired in the news media, making the issue a controversy of intense national interest. There was accompanying criticism of the Air Force for its alleged neglect of tactical aviation. Thus, joining the Marines in their hour of discontent were some Army infantrymen who doubted the wisdom of having given up their own dedicated air support.[18]

One of the more enlightened responses to these critics was an article by General Vandenberg that appeared in the 17 February 1951 issue of the *Saturday Evening Post*. This analysis of the Air Force's role in Korea was a thoughtful reminder of air power's indivisibility. "We don't speak of a 'strategic' or a 'tactical' Army or Navy," Vandenberg wrote, "yet those terms constantly are applied to the Air Force."[19]

General Vandenberg reminded readers that the first and overriding demand on the air forces was "to win the air battle on which final victory on land or sea is predicated." Achieving this objective required the concentrated effort of both fighters and bombers, as did the role of interdicting enemy lines of communication. Similarly with total victory in mind, the Air Force often diverted its bombers from their primary missions to support troops in contact. This flexibility of directing air power where it was most needed served the principle of economy of force by ensuring that air resources were not harnessed solely to missions or segments of the front where they were not always in use.[20]

Conversely, the Marines shared in the benefits of air superiority and interdiction operations and had added USAF fighters and bombers available for close support in emergencies, yet

sought to isolate their own air resources. True, their specialized doctrine, training, and ordnance limited the usefulness of Marine air units for roles and missions other than close support, but their integration under centralized control did substantially increase the air component commander's capabilities in support of the total ground battle.[21]

General Vandenberg knew that the Air Force was not blameless in the other services' arriving at misperceptions about the indivisibility of air power. Certainly, the organizational development of the Air Force into strategic air and tactical air contributed to this misunderstanding. Among others, Major General Orvil A. Anderson, who was the founding commandant of Air War College, belabored this arbitrary division of functions. He warned that the compartmentalized entities that comprised the new autonomous organization were "shibboleths" which would "hang as lodestones around our necks . . . long beyond our time."[22]

The armed force's first combat experience with halfway unification was not an entirely satisfactory one. A war of sanctuaries and constraints fought under the umbrella of nuclear deterrence, the Korean conflict was fought with deliberate limits that were no boon to unification. The Army's flirtation with helicopters there started the Army on the road back to rebuilding its own air force. The Navy and the Marine Corps hardened their resistance to unification, both pursuing an active course of roles and missions duplication in the years ahead.[23]

Achieving the presidency on a platform that promised no more Koreas, Dwight Eisenhower was dedicated to a national policy of nuclear deterrence. He also sought closer unification of the armed forces, for intense rivalry had developed over the need for conventional forces and the question of who would control new atomic weapons such as missiles. Eisenhower began his second term in 1957 with the admonition that the country wanted interservice rivalry to stop.[24]

By June 1956, retired Air Force leaders, such as Spaatz and Eaker, had begun again to speak out for more complete unification. Spaatz noted that the Joint Chiefs of Staff had "a fatal weakness in that its members are also the senior military officers of their own services." They were regarded "as service advocates instead of over-all military planners." Spaatz thought what was needed was "complete integration of the services—one uniform, a single promotion list, interchangeability of personnel, and a General Staff presided over by a Chief of Staff under a civilian Secretary of Defense." Eaker, too, said that he thought "all three services may one day be in the same uniform with one promotion list."[25]

Recognizing that the country might not be ready to accept such complete unification, Spaatz suggested in December 1957 that Congress should pass a new reorganization act which would place all three services under the control of a single Secretary of Defense served by a limited number of assistant secretaries. He thought that the civilian departments of Army, Navy, and Air Force should be abolished. A single military Chief of Staff would take charge of advising the Secretary of Defense in matters of military policy. Service commanders would be answerable directly to the Secretary of Defense.[26]

Calling "the middle way the wise way," however, Spaatz came out in support of President Eisenhower's more moderate reorganization plan in April 1957. This plan failed to create a single Chief of Staff, but Spaatz thought that it might give the Secretary of Defense enough authority "to weld the individual services into a force sufficiently unified to prepare for a modern war emergency without impoverishing the nation in the process." Eisenhower sought legislation that would organize all "deployed troops into truly unified commands" and do away with "separate ground, sea, and air warfare . . . forever."[27]

Simultaneous crises in Lebanon and Taiwan during the summer of 1958 might have spurred

legislative action on the President's proposal, for analyses of U.S. operations in these two crises showed little progress toward formulating coherent joint doctrine. Eisenhower signed the new defense reorganization act into law in October 1958. It laid the groundwork for new JCS guidance, which increased joint planning and preparation for unified operations and led to establishing the U.S. Strike Command in 1961.[28]

At the same time, however, the U.S. contingency actions in Lebanon and Taiwan had revealed flaws in a national policy of almost exclusive reliance on nuclear arms. Eisenhower's "New Look" had given the nation strong nuclear deterrence but unfortunately had neglected conventional capabilities. During the final days of the Eisenhower presidency, the Army took the lead in reorienting joint thinking toward a course of flexible response.[29]

President John F. Kennedy adopted this course as the cornerstone of national policy after he took office in 1961. In response to Nikita Khrushchev's bluster about "wars of national liberation," this policy led to an impassioned courtship with counterinsurgency warfare and eventually into the protracted conflict in Southeast Asia. By substantially increasing the range of armed commitment, Kennedy's policies unwittingly hurt the progress of unification because they fostered a greater degree of roles and missions rivalry among the services.[30] Where earlier secretaries had placed limits on the development of Army aircraft, Secretary of Defense Robert S. McNamara encouraged the growth of Army aviation. His promotion of free competition in the development of systems and tactics for low-intensity conflict turned the jungles of Vietnam into a virtual laboratory for counterinsurgency testing. Experimentation eventually ran the gamut from equipment that was a throwback to "Terry and the Pirates" combat of World War II to high-tech systems as the "McNamara fence" of electronic sensors along the infiltration routes from North Vietnam.[31]

Besides the wholesale roles and missions duplication in Southeast Asia, our sub-rosa entry into the early stages of the fighting and the Johnson administration's policy of gradualism helped write one of history's most inconclusively fragmented chapters on air warfare. By comparison, the saga of theater air operations in Korea reads like a paradigm of unity when examined against the diffused fighting of three separate air wars in the skies over North Vietnam, South Vietnam, and northern Laos.[32]

The failure to establish a single, unified theater of operations for the entirety of Southeast Asia seems to have been one of the inexcusable mistakes of the war. General William W. Momyer, who was the senior Air Force commander there during the pivotal years of 1966-68, certainly believed so. The consequence of disunity was a patchwork of command arrangements for air power that were uniquely different for each of the three major geographical divisions of conflict.[33]

Within the confines of South Vietnam and the contiguous interdiction routes in Laos, General Momyer and successive senior Air Force commanders were responsible for centrally directing the in-country air war, with exceptions. One anomaly was the Marine Corps air wing that carried out totally independent tactical operations in the northernmost corps area until the North Vietnamese siege of the Marine outpost at Khe Sanh in 1968 forced a change. The inordinate demands on air power in the defense of Khe Sanh and in the simultaneous defeat of countrywide attacks during the 1968 Tet offensive made a convincing case for integrating the Marine air operations under General Momyer's centralized control. The Marines contested this arrangement, however, and it remained a sore spot through the end of the conflict and afterward.[34]

Army aviation in South Vietnam presented another problem entirely. A joint agreement in 1967 turned over the Army's fixed-wing aircraft to the Air Force, but the Army never put its helicopter gunships in Vietnam under the sin-

gle-manager system with other tactical air re-
sources. Nor were the Air Force's B-52 bombers
that flew missions over South Vietnam placed
under theater control. The use of this leg of the
nation's nuclear deterrent force for conven-
tional bombing operations in support of in-
country ground action might have rounded out
the portrait of air power indivisibility, but re-
tention of these B-52s under Strategic Air Com-
mand control recognized the fallacy of not hav-
ing a unified theater structure for directing the
war.[35]

Air power was even more rigidly compart-
mentalized in the on-again, off-again Rolling
Thunder campaign against North Vietnam.
With unprecedented oversight from Washing-
ton, air operations against the North were os-
tensibly under the Pacific theater commander, a
Navy admiral whose headquarters was in Ha-
waii. One consequence of this peculiar arrange-
ment was the division of North Korea into
route packages, with the Navy targeted for iso-
lated strikes in the region nearest their carriers
and the Air Force given responsibility for the
rest. Thus, the United States, for a second time,
fought a major air war involving political con-
straints and sanctuaries in Asia by having the
Navy and the Air Force perform coordinated
but totally independent operations.[36]

Although air strikes in the North were car-
ried out against a defense environment far su-
perior to that of the Korean War, there were
similarities, including that of overall U.S. air
superiority. Because of the protraction of the
war and self-imposed constraints, there were
tactical and technological shifts in the advan-
tage afforded strike operations against the
North, but U.S. forces on land and sea were
completely free from the threat of enemy air
attack. There was even more than the usual
rivalry between the Navy and the Air Force,
with the news media at one point accusing
them of resorting to a sortie race in their zeal to
outdo each other.[37]

Momyer and his successors had responsibil-
ity for all Air Force operations over the North,

except for the B-52s when they were finally
unleashed against North Vietnam in the Line-
backer campaigns of 1972. The B-52s remained
under the Strategic Air Command, which an-
swered directly to the Joint Chiefs in its role as
a specified command. Another anomalous com-
mand arrangement concerned the Thailand-
based tactical units that bore the brunt of oper-
ations over North Vietnam and Laos. These
units came under the operational control of the
senior Air Force commander in Vietnam but
were actually assigned to the Thirteenth Air
Force commander in the Philippines. These
units were prohibited from performing strikes
in South Vietnam until the Khe Sanh and Tet
emergencies of 1968 demanded the support of
all available air power.[38]

Air operations over northern Laos were even
more unique. There was a blend of Air Force
and covert Central Intelligence Agency opera-
tions there, carried out in support of govern-
ment forces and those of the Meo leader, Gen-
eral Vang Pao. The U.S. ambassador held tight
rein on these air activities, becoming, in effect,
another separate air commander in a "theater"
of war already hopelessly compartmentalized.[39]

Although unprovable, logic suggests that
the artificial constraints placed on air power,
including the compartmentalization of forces,
were as much a factor in the unhappy conclu-
sion to the war as the lack of clear-cut military
objectives, the gradualistic use of military
force, and the war's growing unpopularity at
home. There is also popular conjecture that the
great concentration in Washington on details
for running the war—amid the plethora of
technocratic but inexperienced voices accom-
panying the systems analysis invasion of the
Pentagon in the early 1960s—might have been
counterproductive to efficient prosecution of
the war. The contribution of these leaders and
their analysts to the professorial complexity of
what might have been a relatively uncompli-
cated low-intensity conflict may never be
known.

It was almost a contradiction that the Kennedy

administration chose to retailor national policy into a military "coat of many colors" but embraced the staid Eisenhower pattern for strengthening the powers of the Secretary of Defense. One military observer to the changing scene wrote in 1963 that the new defense secretary, Robert S. McNamara, had "centralized authority in his office as never before." This observer was General Thomas D. White, the Air Force's fourth Chief of Staff, who had followed "Tooey" Spaatz on the editorial board of *Newsweek* after his retirement in 1961.[40]

General White found it ironical, though, that the Air Force, which had been the only service to back greater centralized authority in the defense department, appeared to have suffered most under McNamara's tight controls. "Such cherished AF programs as the RS-70 are meeting slow death, the Skybolt has been canceled, and progress in military space power is not apparent," he wrote. Reasoning that "what is good for the nation is good for the Air Force" and the Chief Executive, his Secretary of Defense, and Congress determine what is good for the nation, General White saluted his service colleagues for their sound attitude in accepting the new roles thrust upon them by recent changes in national policy.[41]

The former Chief of Staff challenged the administration, however, for what he perceived to be derogation of the military role at top levels of government. One of his *Newsweek* pieces was at once a testimonial for the cherished American system of supreme civil authority over the armed forces and a remonstrance against unseasoned influence from "the vast array of professors, scientists, [and] financial and computer experts, together with hundreds of civil-service employees scattered throughout all echelons of the Pentagon and elsewhere." He warned of a burgeoning belief "that dependence on temporary civilian experts and even computer tapes has overshadowed military advice." Had voices like his been heeded, might the nation have been spared the anguish of vacillation, stratification, and protraction in Vietnam?[42]

General White's words also have meaning for today. He chided those who taught "that there is no experience of modern war and that military art has now become mathematical science," just as he bristled at their references to "battleship admirals," "bomber [barons]," and "cavalry generals."[43] As evidenced by today's ongoing dialogue on military reform, there remains substantial room for disagreement among the military services, but our senior officers must be heard, for only they have the "experience of modern war."

That we continue to make mistakes is almost axiomatic. Costly blunders in the war against terrorism, such as the abortive Iranian rescue attempt in 1980 and the Marine headquarters bombing in Beirut three years later, are made no less tragic by shining successes such as last year's precision interception of the *Achille Lauro* hijackers aboard an Egyptian airliner and this year's retaliatory raid against Libya. But mistakes are not unique to the Department of Defense: as General White cautioned in his reminder that professional military men must be heard on military matters, "at least as great errors have been made in diplomacy, in economic forecasts, and in business decisions."[44]

Much of today's criticism about interservice rivalry, wasteful procurement practices, and questionable weapon systems programs sounds like yesterday's war of words about military reform. Recently, *Time* magazine reported charges made by a blue-ribbon government panel that "all too many of our weapon systems cost too much, take too long to develop, and, by the time they are fielded, incorporate obsolete technology."[45] This appraisal comes as no surprise to those who are treating an old problem, but again relevant are General White's words to the critics of twenty years ago whose cure might have been worse than the disease: "The payoff has come in the cold clear fact that this nation has been militarily safe throughout some of the most critical years in history."[46]

Military professionals have been at the fore-

front of the present movement toward reform. Among those who led the early charge is David C. Jones, the Air Force's most recent general officer to have served as Chairman of the Joint Chiefs. While still chairman in 1982, the general spoke out for legislation that would strengthen the powers of the Chairman of the Joint Chiefs and those of theater commanders. His recommendations were strikingly similar to the position taken by General Spaatz and others before the Eisenhower reorganization nearly thirty years ago.[47]

These reformist views have been supported by a wide variety of former senior officers and defense officials, as well as by at least two studies, one assembled at the Georgetown University Center for Strategic and International Studies in 1984 and another released by the Senate Armed Services Committee in October 1985. Late last year, the House approved legislation to overhaul the joint military structure—to include increasing the chairman's term from two years to four; making him the principal military adviser to the President, the National Security Council, and the Secretary of Defense; and offering theater commanders more power over deciding personnel, budgeting, and command issues. These fundamental changes remained in the Senate version of the bill that passed unanimously in May of this year.[48]

Proponents believe that this bill may be crucial to achieving true unity of effort in preparing for and conducting joint military operations. They hope that it will resolve the problems with unity of command which the military faced in Korea, in Vietnam, and in more recent actions such as Grenada. Others are not so sure. Our experience since the 1958 reorganization indicates that mere overhauling of the system will not in itself give us unity of effort. What may be needed is legislation that will draw clear and final lines of distinction between roles and missions for land, sea, and air warfare—legislation that will provide the framework for unifying the application of these distinctly separate dimensions of warfare.

For the efficacy of air power, more of the same may not be enough if real war comes. Only if defense reorganizes in a manner that recognizes air power's indivisibility are we likely to see any marked improvement in the American way of air warfare. General Henry H. Arnold's definition of air power as the nation's "total aviation activity . . . potential as well as existing," later paraphrased by the Congressional Aviation Policy Board as "an entity not fundamentally divisible as a weapon, or as a carrier," has yet to be improved on.[49] Today, the Air Force has lived with halfway unification for as long as it took to gain autonomy, but it has come no closer to fulfillment of this basic element of its doctrine.

Military air power, perhaps irrevocably, has been severed four ways. This fragmenting has led to overlap in all roles and missions areas, even to the conceptual extreme of extending rotary-wing operations into the realm of interdiction. Each service has developed its own air doctrine, oftentimes with disregard for the total air power situation. The Air Force has stood almost alone in practicing the principle of unified direction of theater air resources. Consequent air power fragmentation holds grave implications for our readiness for world conflict today but promises to be even more precedential in charting tomorrow's military course in space—now viewed as an extension of existing doctrine but soon likely to become the fourth dimension of modern war.

SHORT of total air power integration, the Air Force's best hope for the forthcoming reorganization seems to rest on the promise that reorganizing will unify the development, preparation, and employment of air power through centralized direction by a single air component commander. If not, one may listen for the voices asking whether today's version of unification has done any better than its predecessors in dealing with the relevant question of our having two, three, or four air forces or one air force.

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Notes

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2. Stephen Jurika, Jr., editor, *The Memoirs of Admiral Arthur W. Radford* (Stanford, California: Stanford University Press, 1980), p. 82.

3. Futrell, p. 96; Wolk, p. 161; Colonel Alfred F. Hurley and Major Robert C. Ehrhart, editors, *Air Power and Warfare: Proceedings of the Eighth Military History Symposium, USAF Academy 1978* (Washington: Office of Air Force History, 1979), pp. 227, 258-59.

4. Wolk, p. 98; Alfred Goldberg, editor, *A History of the United States Air Force, 1907-1957* (Princeton, New Jersey: D. Van Nostrand Company, 1957), pp. 101-02.

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9. Futrell, p. 99.

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11. Ibid., p. 100.

12. Ibid.; Malcolm Muir, "An Announcement by the Publisher," *Newsweek*, 26 July 1948, p. 5. General Spaatz left *Newsweek* in November 1961.

13. Robert F. Futrell, *The United States Air Force in Korea, 1950-1953*, revised edition (Washington: Office of Air Force History, 1983), p. 44.

14. Ibid., pp. 47-48. Also see General George Stratemeyer's Korean War Diary, Vol. II, USAF Historical Research Center (USAFHRC) 168.7018-16.

15. Ibid.; General William W. Momyer, *Air Power in Three Wars* (Washington: Government Printing Office, 1978), pp. 52-59; Colonel Thomas A. Cardwell III, *Command Structure for Theater Warfare: The Quest for Unity of Command* (Maxwell AFB, Alabama: Air University Press, 1984), pp. 13-17. Also see "The Quest for Unity of Command" by Colonel Cardwell in the *Air University Review*, May-June 1984, pp. 25-29.

16. See note 15. Also see Wayne Thompson, draft chapter, "The Air War in Korea," Office of Air Force History, pp. 13-14; and Colonel Don Z. Zimmerman, "FEAF: Mission and Command Relationships," *Air University Quarterly Review*, Summer 1951, pp. 95-96.

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coming . . .

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STRATEGIC AIRLIFT
past, present, and future

DR. WILLIAM M. LEARY

STRATEGIC airlift, as we know it today, grew from modest beginnings. In May 1941, as the United States edged ever closer to war with Germany, the need to deliver aircraft to England brought about the organization of Air Corps Ferrying Command. Colonel Robert Olds set up shop in a small office in the basement of Washington's Munitions Building, recruited a few staff members, and began to draw long lines on navigational charts. One of those lines became reality on 1 July 1941, when Colonel Caleb V. Haynes ferried a B-24 to Prestwick, Scotland, via Montreal and Gander. This first transatlantic flight would be followed by many more. During the next four years, more than 21,000 additional aircraft would be flown to destinations around the world.[1]

In June 1942, Ferrying Command formed the nucleus for a new Air Transport Command (ATC). Intended to provide strategic airlift under priorities established by the War De-

partment, ATC quickly demonstrated that air transport had come of age. For the first time, the movement of supplies by air had ceased to be "an interesting airmen's experiment and became a solid part of the Army's logistical equipment."[2] At its peak, in July 1945, ATC's 3700 aircraft carried 275,000 passengers and 100,000 tons of cargo in a worldwide network of airways.[3]

Operation of the vital air link between India and China provided the most dramatic war-time example of air transport's new importance. With land and sea routes closed, supplies could reach China only by a treacherous air route over the Himalayas. Pilots flying "the Hump" encountered severe turbulence, icing, and generally foul weather to the north while trying to avoid the Japanese fighters that lurked to the south. Professional airlifters found their greatest challenge in the Hump, and they responded by developing methods and techniques that not only got the job done
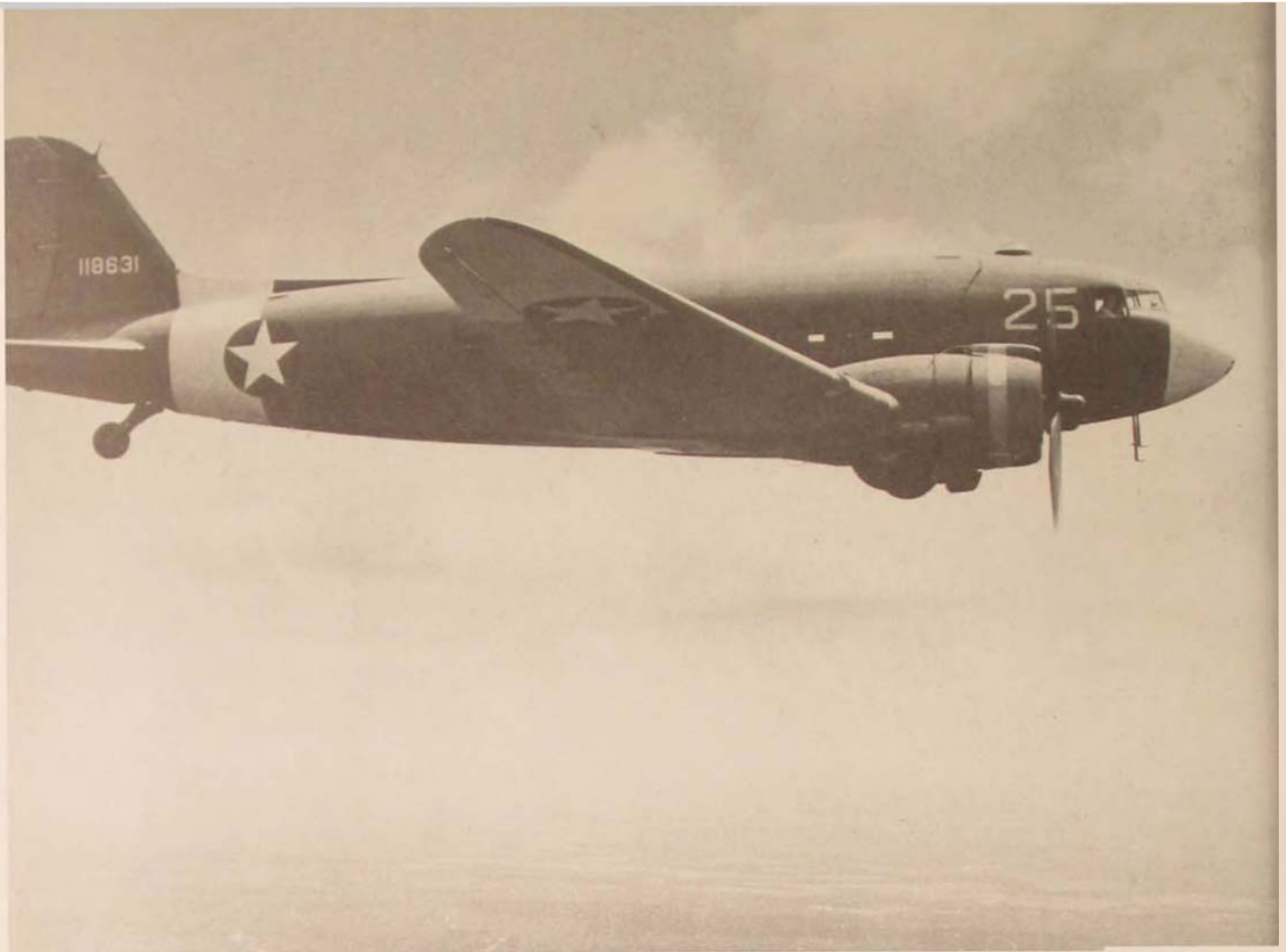
Douglas C-47s (above) and C-54s (facing page) were part of the 3700 Air Transport Command aircraft that hauled 275,000 people and 100,000 tons of cargo in July 1945, when that force was at the height of its World War II strength.

During the Korean War, the Military Air Transport Service (MATS), as the military airlift organization was renamed in 1948, flew personnel and cargo from the United States to the Far East, often returning with wounded aboard.

but also would prove useful in Berlin, Korea, and beyond. Thanks to the skill and determination of the men of ATC's India-China Division, tonnage rose from 1227 in December 1942 to 71,042 in July 1945. But the human cost was high: more than 1600 airmen lost their lives carrying supplies to China.[4]

The postwar years brought organizational change as military airlift responded to a series of international crises. Early in 1948, ATC combined with the smaller Naval Air Transport Service to become Military Air Transport Service (MATS). Scarcely had Major General Laurence S. Kuter taken command of the new organization when the Soviet Union threatened America's postwar position of leadership in Europe by blocking access routes to West Berlin. President Harry S. Truman, anxious to avoid a direct military confrontation with Russia, rejected advice to send an armed convoy through to the city; instead, he ordered an air-

lift to sustain the city's 2,200,000 inhabitants.[5]

After modest beginnings under local commanders, the Berlin Airlift escalated when Brigadier General William H. Tunner and his team of professional airlifters took over the assignment. Drawing on the experience gained in operating the Hump route, Tunner soon had planes landing at and taking off from Berlin at ninety-second intervals around the clock. Standardized operational techniques and careful planning sustained the rhythm of the airlift, bringing sharp increases in tonnage and aircraft utilization and a decrease in accidents. As the airlift's commander observed, "That's where the glamour lies in air transport."[6] In all, 276,569 flights carried 1,783,000 tons of goods into Berlin before the Russians admitted defeat by reopening the land routes to the city.[7] Airlift had enabled the United States to sustain its position in Europe—and without resorting to war.

The outbreak of fighting in Korea in 1950 placed new demands on the nation's airlift resources. MATS, together with civilian contract carriers, flew priority cargo and personnel from the United States to the Far East, often returning with wounded (more than 66,000 in three years).[8] General Tunner and his airlift team were also called on to impose order on the early chaos of air transport between Japan and Korea. After they established Combat Cargo Command in August 1950, Tunner's centralized control quickly brought about more efficient operations in what now would be considered tactical airlift.[9] Both tactical and strategic airlift played a vital role in supporting and sustaining the military efforts of the United Nations throughout the Korean conflict, although their accomplishments received scant recognition in the official histories.[10]

MATS encountered hard times after the Korean War. The Eisenhower administration's emphasis on "massive retaliation" produced a sharp decline in funding for conventional military forces, and airlift suffered more than most. As General Tunner pointed out, "So mundane an area as air transport was relegated to the bottom of the priority list on grounds of both grand strategy and economy."[11] At the same time, the civilian airline industry launched an all-out campaign to take "routine" military cargo and personnel off MATS aircraft and place them on commercial carriers. This proposal received a considerable amount of support in the media; if approved by Congress, it would have crippled MATS.

In the midst of a growing public debate about the status and role of MATS, Chairman Carl Vinson (D-Ga.) of the House Armed Services Committee appointed a Special Subcommittee on National Military Airlift. Headed by L. Mendel Rivers (D-South Carolina) and charged with conducting an inquiry "into the adequacy, or inadequacy, of the national airlift," the subcommittee took testimony in March and April 1960. Deputy Secretary of Defense James H. Douglas told the subcommittee that his department intended to work with commercial airlines to develop modern cargo aircraft: as civilian airlift capacity increased, military traffic would be diverted to the commercial carriers. Somewhat in contrast, Secretary of the Air Force Dudley C. Sharp reported that President Eisenhower had approved $50,000,000 for modernization of MATS "hard-core" airlift capacity. However, the President also had ordered a reduction in "routine" traffic by MATS, allowing commercial airlines to move into this market.[12]

The subcommittee listened to this kind of testimony for two months and then issued a report that shocked a complacent administration. Strategic airlift capability, it warned, was "seriously inadequate," and commercial airlines were not the answer. Unless immediate action was taken to improve MATS's generally obsolete equipment, the nation would find itself in a position of "unacceptable risk" within five years. The subcommittee recommended that $335,000,000 be spent to purchase "off-the-shelf" aircraft as an interim measure while development proceeded on a new jet cargo aircraft with intercontinental range. "The Military Air Transport System is a weapon system," the subcommittee emphasized, "which is required in the performance of military missions involving strategic airlift." As such, it needed a designation more consistent with its mission. The subcommittee recommended that MATS be redesignated the "Military Airlift Command."[13]

This milestone report marked the beginning of a decade of change for military airlift. Congress approved funds in 1960 to purchase fifty C-130Es and appropriated $50,000,000 to develop a jet transport to replace MATS's aging, propeller-driven C-124s. The next year, President John F. Kennedy called for enhanced airlift capacity in his first State of the Union message. The new administration increased the interim procurement program to ninety-nine C-130Es and thirty C-135s.[14] In April 1961, the Air Force signed a contract with Lockheed-Geor-

gia for five test-and-evaluation jet transports.
The prototype of the C-141 was completed in
August 1963, and the first squadron became
operational early in 1965.[15]

A growing American presence in Vietnam
gave the C-141 ample opportunity to prove its
value. The first of many C-141s touched down
at Saigon's Tan Son Nhut airport on 5 August
1965, delivering 50,000 pounds of general cargo.
Later in the year, MATS responded to an
enemy threat against the central highlands by
airlifting the 3d Brigade of the 25th Infantry
Division from Hawaii to Pleiku. Between 23
December 1965 and 23 January 1966, C-141s
flew 231 sorites to move the brigade's 3000 men
and 4700 tons of equipment across the Pacific.
Another dramatic demonstration of strategic
airlift took place between 17 November and 29
December 1967, when 413 C-141 and C-133
missions carried 10,355 men and 5100 tons of
equipment of the 101st Airborne Division from
Fort Campbell, Kentucky, to Bien Hoa.[16]

Even before the first C-141 rolled off the
Lockheed assembly line, plans were under way
for a much more impressive strategic airlifter.
In the summer of 1963, the National Military
Airlift subcommittee called for development of
"a new, very large, turbine-powered cargo air-
craft" to haul outsize cargo for the Army. It
estimated that the cost of procuring fifty of
these giant transports would be $20,000,000 per
aircraft, "a sum which staggers the normal im-
agination."[17] This airplane was the one that
the Air Force had wanted from the beginning—
and Air Force leaders believed that it would be
well worth the price.

Lockheed-Georgia won the contract for the
C-5 Galaxy, surely one of the technological
marvels of the twentieth century. In February
1968, following completion of its 285th
C-141, Lockheed closed down the assembly line

and retooled for the C-5. Military Airlift Com-
mand (MATS had become MAC in 1966) took
delivery of the first operational aircraft at
Charleston AFB, South Carolina, on 6 June
1970. It was fitting that Representative Rivers
was on hand for the occasion. More than
anyone else, he had been responsible for the
nearly 1000 percent increase in military and
civil airlift during the 1960s. His subcommittee
had been the foremost advocate for the C-141
and C-5. Military Airlift Command—and the
nation—owed him a debt of gratitude.

The National Military Airlift subcommittee
held its last meetings in 1970. Responding to a
study by the Joint Chiefs of Staff that predicted
a serious deficit in outsize cargo capability by
1974, the subcommittee recommended procure-
ment of two additional C-5 squadrons and mod-
ernization of the tactical airlift force, includ-
ing development of a replacement for the C-130

that would interface more effectively with the C-5. This report, as it turned out, set the agenda for the future—but for the 1980s, not the 1970s.[18]

The 1970s, in fact, would see little progress in enhancing the nation's strategic airlift capability, as both Congress and the administration lost interest in the problem. By the time Congressman Rivers died in December 1970, "C-5" had become a dirty word for many Americans. The government had ordered 115 airplanes for $3 billion; it received eighty-one at a cost of $5 billion. Senator William Proxmire

(R-Wis.) labeled the C-5 program "one of the greatest fiscal disasters in the history of military contracting." The project, another critic charged, had been characterized by "political pressure, gross mismanagement, enormous waste, [and] confusion."[19]

The only noteworthy improvement in MAC's fleet came late in the decade when the stretched (23.3 feet) and air-refuelable C-141B appeared. An important organizational change took place in 1974-75 when the airlift resources of Tactical Air Command were consolidated with MAC, ending a lengthy debate between advocates of

efficiency through centralization and those who favored operational autonomy.[20]

MAC continued to perform with professional excellence during the 1970s, supporting the declining war effort in Vietnam, flying relief supplies to Guatemala and Guam in the wake of natural disasters, and carrying personnel and equipment to Korea and Zaire during emergencies. An especially noteworthy operation took place during the Yom Kippur War in 1973. Between 14 October and 14 November, MAC mounted one of the largest strategic airlifts in history, delivering 22,395 tons of cargo from the United States to Israel in 567 C-5 and C-141 sorties.[21]

Despite the accomplishments of strategic airlift, expanding American global commitments, especially in the Middle East, produced an ever-widening gap between airlift capabilities and requirements. In 1980, a concerned Congress directed the Department of Defense to make a comprehensive study of strategic mobility. This report—the Congressionally Mandated Mobility Study of April 1981—set a "minimum goal" of 66,000,000 ton-miles per day (66 MTM/D) for combined intertheater

The flexibility provided by our airlift capabilities kept our forces even with the Vietcong and North Vietnamese. In Operation Pickett in December 1966 (left), 4000 men and 2400 tons of supplies were airlifted from Tuy Hoa to halt an enemy offensive against Kontum. . . . When the balloon goes up again, C-141Bs (above), along with other intercontinental aircraft in the MAC inventory, will be ready to take our forces wherever necessary.

airlift capacity. As existing capacity stood at less than thirty million ton miles per day, significant progress would have to be made to achieve "MAC's magic number" by the end of the century.[22]

The incoming Reagan administration, after reviewing the Defense Department's priorities, decided to double strategic mobility funding. In order to narrow the airlift gap as quickly as possible, the Pentagon purchased fifty C-5Bs (a C-5 with a strengthened wing and advanced structural materials and systems)[23] and forty-four KC-10s (a transport/tanker operated by the Strategic Air Command). Also, nineteen Boeing 747s in the Civil Reserve Air Fleet (CRAF) would be modified for military use by adding a cargo door and strengthening the floor.[24]

In September 1983, the Air Force issued the Airlift Master Plan, a "definitive statement" on how it planned to close the airlift gap by the end of the century. The plan envisioned a two-stage assault on the 66 MTM/D objective. By the end of fiscal year 1988, the Air Force ex-

pected to complete the first stage and reach 48.5 MTM/D with a fleet of 215 C-141s, 64 C-5As (with wing modifications to extend their service life by 30,000 hours), 44 C-5Bs, 41 KC-10s, and 86 CRAF aircraft. The second stage would take place during the 1990s as 210 new C-17s came into service, enabling the Air Force to retire or transfer to the Reserves 180 C-130s and the entire C-141B fleet.[25]

To date, the first phase has caused few funding problems with Congress; however, the second phase, especially the central role of the C-17, has run into trouble. The Air Force's case for the C-17 was put best by General Thomas H. Ryan, Jr., commander in chief of MAC, when he appeared before the Senate Armed Services Subcommittee on Sea Power and Force Projection in March 1984. The C-17, he argued, was "essential to modernize and expand both

intra- and intertheater airlift in the most effective and economical way." It would bring low operating costs, was easy to maintain, and meant sharply reduced manpower requirements. Capable of carrying outsize equipment, it could haul eighty-six tons of cargo more than 2900 miles and then deposit the load at forward airfields with runways as small as 3000 feet by 90 feet. Moreover, with redundant systems and the ability to make steep approaches and impact landings, it was "designed to survive in a semihostile environment." And the C-17 was not a

gamble. On the contrary, it came with an unprecedented manufacturer's warranty that "literally guaranteed" not only the aircraft's reliability, maintainability, and availability but also its performance. In short, General Ryan emphasized, acquisition of the C-17 was far and away the best way to meet the strategic airlift goal of 66 MTM/D by the end of the century *and* significantly enhance intratheater airlift.[26]

Although Congress has approved developmental funding for the C-17, prospects for production funding are not good. A sign of the times came in January 1986, when the conservative and influential Heritage Foundation released a "Backgrounder" paper that attacked the Airlift Master Plan for underutilizing existing aircraft and for resting on questionable operational and planning assumptions. It recommended that the Air Force cancel the C-17, build more C-5Bs and KC-10s, extend the service life of C-141Bs, and develop a new short-range tactical airlifter to replace the C-130. Under this program, the Air Force still could meet the 66 MTM/D objective—and at a saving of $20 billion. Gramm-Rudman-Hollings, the

report warned, soon would force a careful examination of all federal spending; if the U.S. Air Force could not sell its lift-enhancement program to Congress as cost-effective, the entire effort to close the strategic airlift gap would be placed in jeopardy.[27]

Two months later, General T. R. Milton, USAF (Ret) sounded a similar theme in *Air Force* magazine. Intercontinental air transports, he observed, "need not be designed to land behind the front lines on improvised runways." Furthermore, the attempt to design aircraft to carry outsize Army equipment has often been "an exercise in futility." Instead of concentrating on development of a new airplane, the Air Force should pay more attention to

higher utilization of the existing fleet. "With hard times ahead for the military budget," he stressed, "the problem now is once more one of priorities. Airlift is an absolute essential to any meaningful national strategy, but that doesn't necessarily have to mean either a new airplane or nothing."[28]

Future prospects for strategic airlift appear mixed. There is general agreement on the need for an enhanced airlift capability to support the nation's global responsibilities. Strategic mobility, as one informed student of the topic has emphasized, "is not just important—it is indispensable."[29] Furthermore, in a world of unreliable allies, requirements for strategic airlift are more likely to increase than to diminish. On the other hand, fiscal restraints are sure to become even greater in the foreseeable future. Historically, airlift has not had a high priority during financially hard times—a fact that leads to the inevitable conclusion that the C-17 pro-

gram, at a cost of $37.5 billion, will be one of the first "sacred cows" to feel the budgetary axe.[30]

But the airlift situation is not entirely bleak. The C-5B remains a viable financial and political option, and no one questions the Galaxy's superiority to the C-17 as an intercontinental transport.[31] Tactical airlift will suffer most without the C-17, but there are other possibilities. Powered-lift technology has made enormous progress in recent years, with NASA reporting "outstanding" results after extensive testing of its Quiet Short-Haul Research Aircraft.[32] It may be feasible to develop a less expensive replacement for the C-130 in the years to come or even to persuade Congress to accept a less ambitious C-17 program.

Strategic airlift has a proud record of accomplishment. Since 1941, the men and women of Ferrying Command, ATC, MATS, and MAC have met all challenges with dedication and skill, overcoming equipment shortages and operational difficulties to deliver vital cargo to China, Berlin, Korea, Vietnam, and elsewhere, in support of America's global responsibilities. No matter what the future brings in terms of equipment, there is no reason to doubt that this situation will change—at least so long as the personnel of MAC (in General Ryan's words) "wear the uniform proudly and know the meaning of words like patriotism, duty, and honor."[33]

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"BETTER THAN" IS THE ENEMY OF "GOOD ENOUGH"

Anonymous Soviet
general officer

COLONEL RICHARD H. GRAHAM

W HEN I first heard that quotation several years ago at Air War College, it didn't mean much at the time, as I had been busy flying airplanes for the previous seventeen years. Since the phrase was catchy enough, it always stuck in the back of my mind, but it wasn't until my tour on the Air Staff that those words began to have real meaning. Here I found that it clearly portrays the dilemma facing policy-makers and decisionmakers in establishing priorities and requirements for new weapon systems. What follows is intended to amplify the wide-ranging impact of that quotation, explore briefly Soviet and U.S. approaches to

fielding new technology, and provide some diverse views and food for thought.

What the unnamed Soviet general officer was saying in effect is that holding out for something better to come along on the horizon will be in conflict with what is already on the books and sufficient to do the job. At first blush, many research and development advocates might find this quotation somewhat offensive since it appears to fly in the face of promoting technological advances. But in one simple sentence, it brings to light the perplexity of choices and alternatives confronting the entire defense community in the application of new technology.

Soviet and U.S. Systems Acquisition Philosophies

To the Soviets, this quotation has been part of their doctrine in fielding weapon systems. The Soviets see system evolution as a continuous stream in which new subsystems can be mated to proven components in an endless chain of updating and modifying. They are more likely to pursue a course of progressive modification than one of dramatic innovation. In their view, equipment that is complex in operation or fragile in design will be of little use under stressful conditions of combat. A 1985 *Washington Post* article stated that some U.S. logisticians have expressed those same concerns: "They fret that their delicate construct of computers, dust-free repair labs, and ocean-spanning supply lines will collapse in the smoke of battle."[1] The most pervasive characteristic of Soviet technology is aversion to risk when it comes to designing new weapons—they value stability, security, and conservatism.

Since World War II, the United States has believed that it could develop sufficient technological superiority to compensate for Soviet numerical superiority. Even today, the Soviets continue to stress numerical strength while striving for technological comparability;

neither requires acceptance of great risk or uncertainty. But it appears that the Soviet Union is narrowing the U.S. lead in weapons technology faster than predicted. In an interview with the *Washington Times* last year, General Lawrence A. Skantze stated: "It's not just the issue of quantity any more; it's also the issue of improved quality in the systems that they are putting out in the field."[2] In response to Soviet advances in technology, General Skantze initiated Project Forecast II—a look into the next ten to twenty years to determine what technology the U.S. Air Force must develop to stay ahead of the Soviet threat. Project Forecast II is attempting to reestablish the technological lead in what the Air Force perceives to be principal high-payoff areas.

In contrast with the Soviet approach to systems acquisition, the American approach accepts quantitative inferiority while demanding superior technical performance, together with its inherent uncertainty and risk. General Skantze has commented on the subject of technological risks and our approach.

> I'd like to add that as a result of having to develop technological leverage and maintaining it, we do push the state of the art, there's no question. But we push it in a deliberate way, though we're not trying to invent things on schedule. We push it in a way that there are risks, and there are technical problems that have to be solved. But if they become the basis on which no decisions are made, then I think we're just undercutting the very leverage that we depend on to beat a quantitatively superior threat. The public needs to understand that our counter to quantitatively superiority is technical leverage which we get from staying ahead of the Soviets. In order to do that, we've got to take some risks, but on a prudent basis, and we've got to expect some technical problems, but ones we can solve.[3]

Technology has been received by the West as its only alternative in compensating for the increased numbers of Soviet military equipment. This reliance on technology has evolved over the years into U.S. development of weapon systems that are termed "force multipliers"—to account for the Soviet quantitative superiority.

What is the Soviet view of U.S. technological leverage? In a series of statements made during a frank interview that was published in the *Red Star* on 9 May 1984, Marshal Nikolai Ogarkov ruled out the use of nuclear weapons in a major conflict (since using such weapons would be suicidal) and articulated his conclusion that conventional weapons are crucial to the future military equation.[4] The Soviet military faces a major window of vulnerability into the next century as the West continues to modernize with a new generation of conventional "smart" weapons.[5] As a result, resentment among the Soviet citizenry will grow against a military that cannot keep up with the West, while the military will become more convinced that the civilians are destroying their capacity to defend themselves.

One result of the U.S. approach is a focus on achieving extraordinary jumps in system capability. Although the United States may await realization of technical capability for such jumps, it may not really be capable of matching Soviet quantitative superiority solely through the application of advanced technology. Technical sophistication does not guarantee mission effectiveness. Sophisticated aircraft with impressive capabilities may offer significant *potential*, but the extent to which that potential can be realized will depend heavily on the way aircraft are employed in combat.

Because the U.S. military frequently develops replacement items as discrete products which are budgeted and justified with the rationale that their predecessors are on the verge of obsolescence, a vicious circle involving priorities and fiscal defense budget realities not uncommonly results. As military dependency on advanced technology increases, it drives the requirements for technical performance upward. These additional performance criteria, in turn, drive costs upward, tending to constrain the quantities that can be procured. Reduced quantities further increase dependence on high technical performance. This whole process often results in overdesign against the threat

by incorporating impressive capabilities of questionable practical value.

Requirement for "Better Than"

How many times have you seen a statement of "need" that was based more on technological feasibility than on performance spread or capability actually called for by most real mission demands? How much of an aircraft's performance range is essential for mission needs, and how much may be merely a product of routine overdesigning? In a 1985 Rand paper on fighter force planning, Benjamin S. Lambeth was convinced that "excessively technical threat portrayals can yield serious imbalances between our perceived operational 'requirements' and our actual needs for most real-world contingencies."[6] A major share of our new weapon systems comes from technological breakthrough (opportunity) rather than from a mission "need."

It is important to keep two forms of technology application in mind. One, commonly referred to as the "technological imperative," incrementally improves weapon systems as the technological opportunity presents itself. The other, more complex form is advanced technology that defines possible new military strategies, equipment, application, or institutional structure and offers revolutionary changes to our traditional way of doing business.[7] The current Strategic Defense Initiative is a classic example of the potential that advanced technology has on changing military concepts and doctrine drastically.

In his book titled *Military Reform—The High Tech Debate in Tactical Air Forces*, Colonel Walter Kross concluded that the "Reformers" deemphasize or simply discount justified combat tasks to argue their case against high-technology weapons. The Reformers believe that we should field a day/fair-weather fighter force and limit air attacks to the immediate battlefield. The Reformers in their choice of "brilliantly simple" technology for weapons

have no time for TACAIR functions aimed at preventing or altering land battles. But Kross argues, "In the process the Reformer leaves serious gaps, clearly evident gaps, for the Soviet Planner to exploit."[8] To emphasize his point further, Colonel Kross adds:

> How would NATO Planners feel if Soviet Planners were willing to forfeit what our own American Reformers would abandon in an effort to refute overly complex weapons and attendant combat tasks? I think our NATO Planners would be elated to hear that Soviet aircraft would avoid night bad weather operations, that they would abandon air intercept radars and longer-range radar missiles, that they would not attack our airbases or suppress our air defenses, that they would not conduct countercommand and control operations, and that they would not try to interdict our logistics as we attempted to reinforce front-line Army units. Instead, Soviet TACAIR would only concentrate on close support of advancing Soviet armor and maintaining air superiority over Soviet airspace and the battlefield in day visual conditions.[9]

When Is "Good Enough"

Does anyone ever practice the "good enough" principle? President Carter applied it in 1977 when he canceled the B-1 bomber program. He believed that current B-52s, modified and equipped with nuclear air-launched cruise missiles (ALCMs), were "good enough" for our nuclear deterrent posture at the time. Was he right in doing so? Only time will tell the validity of his decision. Clearly because of his cancellation decision, we are now procuring fewer (100 rather than 244), much more capable B-1Bs for approximately the same costs. To a lesser extent, the modification community practices the "good enough" principle, for it is this group that is charged with modifying our older, less capable weapon systems to the point of being "good enough" to meet the threat until new systems can be fielded.

It is obvious that, at some point in time, one must modernize his weapon systems. But when? Should we wait for high technology that is on or just beyond the horizon, or should we proceed with proven technology? The question is difficult, and the answer lies somewhere between that of a current meld and future technology applications. In an interview with the Advanced Technology Fighter (ATF) program manager, Colonel Albert Piccirillo, *Aviation Week and Space Technology* reported:

> The danger now is in not being bold enough and coming out with an aircraft that the threat will be able to overcome in four to five years. We want to come out with something that will put us 10 years ahead of the Russians.[10]

The question facing decisionmakers then becomes a matter involving unknowns: Can this technological breakthrough we've been waiting on truly compound our adversaries' defensive problems, or can it be easily defeated by enemy adaptations?

Currently we are signing up to no more than 100 B-1B bombers in the hopes that stealth technology will permit the development of the Advanced Technology Bomber (ATB). Benjamin F. Schemmer commented on the House and Senate agreement to have the Defense Department report ATB costs by February 1986: "Stealth critics suggest that that language is a foot in the door to challenge ATB's technical uncertainties and huge costs, and thus continue production of Rockwell's B-1B bomber."[11] In discussing problems in AMRAAM air-to-air missile development, Schemmer stated:

> Air Force Systems Command coerced the contractor, Hughes Aircraft, into accepting a $421-million development contract and a 50-month schedule to invent a complex missile incorporating launch-and-leave radar technology into a small, seven-inch tube weighing under 350 lbs. After investing $250-million of its own money, Hughes (and the Air Force) found that the laws of physics and fundamental economics were not compatible with artificial clocks.[12]

As a nation, we expect so much promise out of our future technology and keep telling ourselves that we can eventually realize it, resulting in large amounts of concurrency between research and development and production in

order to field a weapon system as quickly as possible. Many systems are fielded with the knowledge that they will require modification and upgrading at some later date, either because funding was insufficient or technology was unavailable to develop the full capability. Defense Secretary Caspar Weinberger's decision to cancel the Army's air defense gun, DIVAD, was prompted by the gun's incapability to meet the military threat effectively. The General Accounting Office and other critics of the DIVAD had charged that the technology behind the project was faulty, but the gun was ordered into production anyway before a complete operational test and evaluation of the system.

What if the "better than" technology never materializes or the Soviets find a simple solution to defeat something like stealth aircraft technology? Then we often find ourselves left with a new weapon system that is a series of compromises in order to field a system "better than." On the other hand, one could probably argue that everything we do in the defense business is merely a continuous series of compromises based on current fiscal realities.

It becomes obvious that "Better Than Is the Enemy of Good Enough" leads directly into the "quantity versus quality" debate that has been raging for years between the military-industrial complex and "military reformers" from all sectors of American society. In his 1985 Rand paper on fighter force planning, Lambeth discussed this debate in considerable detail and concluded that, with all things considered, the issue is not really about quantity versus quality at all:

> The real issue is *how much* 'quality'; across what performance spectrum, in what force mix, numerical strength, and sustainability, do we need to give us our desired mission-effectiveness for most plausible scenarios at a cost we can afford?[13]

On the other hand, lack of confidence that U.S. technical sophistication can offset Soviet numerical superiority places excessive emphasis on the well-known tendency to stress "rubber on the ramp," while deferring future investments to some later date.

As much as our technology application in the defense business is open to debate by critics and reformers alike, we fully recognize that it is not a perfect system. Without some acceptance of risk in our weapons development program, we could find ourselves facing similar problems reported of the Soviets. Harley D. Balzer, a historian and close observer of Soviet science and technology applications, stated that their system is not as well off as it may appear to the West. According to Balzar, recent Jewish émigrés from Russia have reported a scientific community characterized by growing corruption, declining quality, and personal rivalries; they further portray the Soviet system as extremely resistant to reform, providing little encouragement for innovation, and characterized by shortsighted goals that discourage adoption of new processes.[14] While many of these reports are probably not totally unbiased views, they provide us with insight about an otherwise closed Soviet system. Because the Soviets place a high priority on secrecy, the exchange of ideas and presence of competition that enable science and technology to thrive are often absent. As a result, Soviets lose the technological opportunity that flourishes in our society under a free enterprise system.

GIVEN all the complex issues related to them, resource allocation decisions involve hard choices. These choices all revolve around program funding and budgeting. The budget process is an organized decisionmaking process that involves complex considerations, multiple and diverse views, and timely consensus to achieve Air Force objectives. No one functional element, expert, or specialist can claim adequate competency to make all these decisions; resource allocation is everyone's business. Throughout this trying process, whether he realizes it consciously or not, the Soviet general's quotation will remain in the back of the

decisionmaker's mind as he weighs the evidence and casts his vote.

Hq USAF

Notes

1. *Washington Post,* 18 August 1985.
2. *Washington Times,* 27 August 1985.
3. Deborah G. Meyer and Benjamin F. Schemmer, "Interview with General Lawrence A. Skantze, USAF, Commander, Air Force Systems Command," *Armed Forces Journal International,* September 1985, p. 64.
4. *Red Star,* "The Defense of Socialism: Experience of History and the Present Day," Interview with Marshal Ogarkov, 9 May 1985, First Edition, pp. 2-3.
5. Jerry F. Hough, "Soviet Decision-Making on Defense," *Bulletin of the Atomic Scientists,* August 1985, p. 87.

6. Benjamin S. Lambeth, "Pitfalls in Fighter Force Planning," P-7064 (Santa Monica, California: Rand, February 1985), p. 7.
7. Jacques Gansler, "The US Technology Base: Problems and Prospects," in *Technology, Strategy and National Security,* edited by Franklin D. Margiotta and Ralph Sanders (Washington: National Defense University Press, 1985), pp. 109-11.
8. Walter Kross, *Military Reform—The High Tech Debate in Tactical Air Forces* (Washington: National Defense University Press, 1985), p. 188.
9. Ibid., p. 189.
10. "USAF to Request Demonstration Validation Proposals on Advanced Tactical Fighter," *Aviation Week and Space Technology,* 26 August 1985, p. 24.
11. Benjamin F. Schemmer, "Dark Horizons for the U.S. Air Force?" *Armed Forces Journal International,* September 1985, p. 86.
12. Ibid., p. 88.
13. Lambeth, p. 5.
14. Harley D. Balzer, "Is Less More? Soviet Science in the Gorbachev Era," *Issues in Science and Technology,* Summer 1985, p. 39.

AEROSPACE DOCTRINE: WE'RE NOT THERE YET

MAJOR GROVER E. MYERS

THERE has been much written within the pages of the *Review* lately on the subject of space doctrine. Some of it, like Lieutenant Colonel Charles D. Friedenstein's article (November-December 1985), insists that space is unique and totally different from the air environment and, therefore, the U.S. Air Force should develop a unique and separate space doctrine. Colonel Friedenstein states—I believe in a general sense correctly—that "the environmental principles of aerospace war do not uniformly apply to space because the air and space environments are different." (p. 21) While I disagree with some of his arguments on the nonapplicability of some of the principles of war to the space environment, I would not take issue with the idea that the air and space environments are basically different.

In another article by Major L. Parker Temple III (March-April 1986), the image of General William "Billy" Mitchell is once again revived to support an argument for separate space doctrine (it seems that a good many "space power" advocates associate themselves with this early crusader for the separateness of air power). Major Temple states, correctly in my view, that our current doctrine pays very little attention to the space environment other than to say that air and space are one—the aerospace. He then makes what I consider to be the critical and unfortunately all too common error of our current space doctrinal thinking—namely, assuming that since the environment is different, then what space forces do in that environment must also be different. He points out that *"Basic Aerospace Doctrine* is wrong . . ." when it "fails to list the space missions or specified tasks for which the Air Force is the DOD executive agent" (p. 27) and instead discusses our traditional missions such as interdiction and strategic offense from an aerospace perspective.

What AFM 1-1 is attempting to do, albeit poorly, is to point out that regardless of factors such as orbital mechanics, differences in vehicle design, or relative vehicle speed and maneuverability that space force advocates use to imply separateness, air *and* space forces perform the same fundamental functions. In a very basic sense, what all military forces (tanks, planes, missiles, ships, and satellites) do is provide the capability for strategic and tactical offensive and defensive actions. More specifically, the U.S. Air Force has developed its particular missions and tasks as subsets of this larger strategic and tactical whole. What the manual is attempting to make clear is that strategic offense, counterair, and interdiction are really strategic aerospace offense, counteraerospace operations, and aerospace interdiction and that air and space forces are complementary in aerospace operations. The basic missions are the same in both the air and space, irrespective of the claims of space doctrine pundits that what space forces really do is "force application, space control, space support, and force enhancement"—the missions that Major Temple referred to in his article. I must agree with our doctrine in this instance: we are an *aerospace* force and, as AFM 1-1 states, "Air Force missions describe broad military objectives attained by employing aerospace forces." These do change fundamentally when we go into orbit.

I would agree, however, with critics such as Colonel Friedenstein and Major Temple when they point out that there is a paucity of discussion of the space environment and its effect on warfare in Air Force doctrine. They are correct when they say that our doctrine assumes that what is true for air operations is also true for space operations. With current technology (and very possibly with any technology), orbital mechanics do impose certain constraints not present with traditional air forces. For example, altitude provides a satellite a greater field of view than an aircraft, and space provides a far greater "loiter" capability (years or even centuries in orbit); on the other hand, their predictable orbits and lack of cover make satellites vulnerable, and their very high speed severely restricts classic maneuverability. One could list a similar comparative balance sheet for air forces; the point is that our "aerospace" doctrine does not do so. AFM 1-1 assumes away strengths, weaknesses, and synergisms with the statement that "the use of 'air' should not be construed as a more limited treatment of the aerospace medium."

What is needed is a sort of compromise. The Air Force "establishment" needs to recognize officially the differences of the space environment and the advantages that space forces provide in accomplishing traditional Air Force missions. At the same time, space force advocates must recognize the disadvantages of space forces and realize that the missions of air forces also apply to space systems—that we are an aerospace force and that system characteristics do not imply separateness. There is no better place for this compromise than AFM 1-1, and the sooner we get on with it, the better off the Air Force will be. Our doctrine must do a much better job of describing and integrating the aerospace environment.

I would not end my critique with AFM 1-1, however. The discussion of the synergism of air and space forces must filter down to our operational and tactical doctrine (our 2- and 3-series manuals) to include consideration of how space elements enhance our capability to accomplish our strategic and tactical missions. AFM 1-1 and its Air Staff authors must take the lead here, however, or a truly unified aerospace doctrinal regime will be slow, maybe dangerously slow, to emerge (the Soviets do not seem to have as much trouble integrating as we).

One further point with respect to the presumed separateness of the air and space environment begs discussion. Until now, access to and operation in space have required "different" equipment—rockets rather than jets or props, launch pads instead of runways (only half true for the shuttle), and space suits rather than

g-suits. Astronauts have been seen as "different," space capsules do not look or "fly" like airplanes, satellites do not need pilots, and, of course, space is more "hostile" to humans than air. These perceptions have developed almost a cultural heritage of their own but are slowly changing and will, I think, almost completely break down in the future. Today, the SR-71 crews wear space suits and fly at the edge of space, according to some definitions; the shuttle uses a crew to carry cargo to space and then "flies" to a runway landing. For the future (the fairly near future, according to some prognosticators), the United States will have an aerospace plane (or TAV—transatmospheric vehicle) that most official predictions state will be able to operate in space and in the air, will be able to accomplish strategic and tactical offensive and defensive missions, and will, as the space shuttle does today, deliver payloads to and from orbit—all totally from a runway rather than a launch pad. Introduction of the TAV will not mean that air and space differences will disappear, but it will surely make them less meaningful than they are today.

During the late 1920s and the 1930s, the U.S.

Navy—at the "urging" of one General Mitchell and despite the reluctance of many of its senior "battleship" officers—laid the doctrinal and technological groundwork for what is now a powerful naval air arm. The Navy accepted and incorporated the "unique and different" air environment into its operations; it ventured into an essentially alien environment in order to strengthen U.S. naval power. Today, the Navy seems to have few problems venturing into space to do the same thing—control the seas. The air is not alien to the Air Force, and neither should space be. The Air Force exists today largely because of the reluctance of the Army of the 1940s to accept the need for the long-range projection of air power beyond the immediate battle area. In the future, a separate U.S. Space Force (with all the associated "empires" and bureaucratic competition) could exist simply because the U.S. Air Force refused to integrate space forces and doctrine fully into its operations and the all-important budget process—because it failed to make the logical and natural step to a truly aerospace force.

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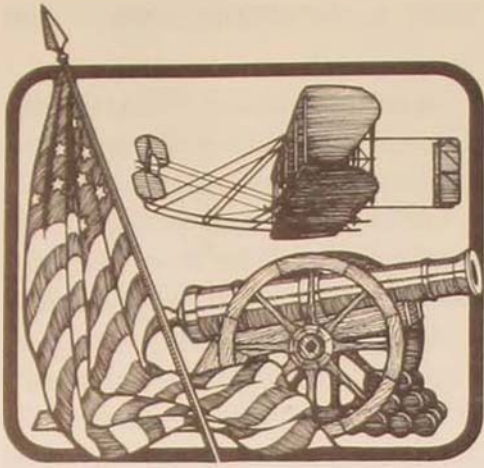
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GIULIO DOUHET AND STRATEGIC AIR FORCE OPERATIONS
a study in the limitations of theoretical warfare

Michael J. Eula

THE Italian General Giulio Douhet reigns as one of the twentieth century's foremost strategic air power theorists. Along with William "Billy" Mitchell, Douhet understood that the technological advances in weaponry made during World War I were not fully utilized by Allied commanders. Douhet thus spent the decade after the war constructing a theory that would facilitate the strategic use of what he conceived to be the biggest technological breakthrough of all, the airplane. As such scholars as Raymond Flugel have pointed out, Douhet's theories were crucial at a pivotal pre-World War II Army Air Force institution, the Air Corps Tactical School.[1] Over time, these theories became institutionalized to the point that they were rarely questioned. Their influence was subsequently evident in strategic Air Force operations.

From the perspective of past missions, we can now assess the applicability of Douhetism to actual operations. If his theories have been generally invalidated, then how much importance can we attach to Douhet's writings? All too often, strategists tend to skirt the evidence in favor of the model.[2] But as eminent social theorists outside of history per se will be the first to say, models are, at least ideally, heuristic devices.[3] They provide ports of entry, but they do not replace vigorous empirical analysis. Even such eminent measurement-error sociologists as R. W. Hodge and P. M. Siegel have been moved to write:

> Any measure is subject to both errors incurred through definition of a less than completely valid measure [of] a theoretical construct and error incurred through an operational measure which is not perfectly reliable.[4]

Scholars have the privilege of living with "operational measures" not "perfectly reliable." Military strategists, however, do not.

BEFORE testing the central concepts of Douhet's arguments against actual developments under combat conditions, it is first imperative to reconstruct Douhet's model. Probably its most striking feature is its essential simplicity. Accordingly, some of its most renowned phrases are also its most enticing—"the new form of war" and "the aerial field as the decisive field" are crucial here.[5] The effect of such slogans is almost magical. Douhet manages to reduce complex entities, i.e., "war,"

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into easily mastered concepts. While doing so might serve the purpose of inducing militaristic zeal, it does little to address the serious, rational concerns of planning military objectives.

Thus war itself—with its enormously complicated industrial, political, and logistical problems—is reduced to the relatively clear issues emanating from Douhet's consideration of the offensive use of aircraft.[6] In this regard, the offensive capabilities of aircraft seem to erase completely the analogous reality of defensive measures.[7] Douhet thus argued that "such offensive actions cannot only cut off an opponent's army and navy from their bases of operations, but can also bomb the interior of the enemy's country so devastatingly that the physical and moral resistance of the people would also collapse."[8]

What did Douhet propose to do with this offensive power? Quite clearly, his most pressing goal was twofold. On the one hand, he argued that air power should be directed toward the utter obliteration of the enemy's industrial base. Typically, Douhet minced no words when he argued that a strike force *"should always operate in mass"* to *"crush the material . . . resistance of the enemy."*[9] Second, Douhet was convinced that the effect of this was to, without doubt, demoralize the enemy population. He thus wrote:

> In terms of military results, it is much more important to destroy a railroad station, a bakery, a war plant, or to machine-gun a supply column, moving trains, or any other behind-the-lines objective, than to strafe or bomb a trench. The results are immeasurably greater in breaking morale . . . in spreading terror and panic. . . .[10]

Such offensive striking power precluded the need for a large number of fighter aircraft. What would be the use of tactical weaponry in an era of massive strategic bombing? Douhet's war was swift and sure, decisive beyond question. He did not call for the abolition of tactical aircraft in the way that such scholars as Edward Warner have implied.[11] In light of twentieth-

century developments, however, it might be said that Douhet put it in its proper perspective. It is crucial to remember, nevertheless, that this balance was not conceived of in an overly theoretical way. Accordingly, Douhet pointed out:

> There must be both combat planes and bombers in an Independent Air Force. . . . As for bombers, it is obviously desirable to have the greatest possible number, because, whatever the circumstances, it is always opportune to launch major offensives. Therefore, there can be no set proportion of combat planes and bombers since both depend upon diverse independent circumstances.[12]

The phrase "independent circumstances" is crucial, for it suggests Douhet's almost intuitive grasp of the very essence of war. I refer here to the quality of instability and vagueness inherent in the process of fighting—at least at certain historical moments.[13] The problem with Douhet's position, though, is that it was formulated during the prenuclear age in general and the ICBM era in particular. The ICBM is not the long-range bomber or even the V-1 rocket, as Bernard Brodie made clear in a passage noteworthy for its brilliant simplicity:

> Nuclear weapons also made defense against strategic bombing enormously more difficult and disheartening to the defender. The defense of London against the V-1 was considered effective, and yet in eight days, 2,300 hit the city. The record bag was that of August 28, 1944, when out of 101 bombs aproaching London 97 were shot down and only four got through. But if those four had been atomic bombs the record of defense would not have been considered good.[14]

Another surface appeal of Douhet's argument lies in its mathematical "certainty." In a discussion of bombing patterns, Douhet conveys the impression that such tactics could be worked out in advance—to the letter.[15] This sort of thinking, in certain quarters, has worked to the disadvantage of strategic operations.[16] Indeed, such a posture assumes that air strikes can be directed at the industrial base of the enemy.

Combat experiences during the Korean con-

flict are a stark example of Douhet's utter inability to grasp the intricacies of international relations. I am not suggesting that he should have foreseen the quagmire of mainland Asia. My point, rather, is that the Fifteenth Air Force, in spite of overwhelming superiority, was unable to strike a final blow at the material base of the communist war effort because that base was located in Mainland China and the Soviet Union.[17] Strategic bombing thus came to a screeching halt on 26 September 1950.[18] International political concerns, in this instance, overrode purely strategic necessities. It was not simply a matter, as Douhet put it, of maintaining "violent, uninterrupted action against surface objectives to the end that it may crush the material and moral resistance of the enemy."[19]

"Uninterrupted" operations suggests a vital element in Douhet's scheme. This perspective held grave implications for army and naval strategists, as it implied the obsolescence of their forces. Certainly, Douhet discussed the role of fixed fortifications on land.[20] He also paid attention to the defensive functions of naval forces.[21] But clearly, sea and land power would, inevitably, be rendered pointless in a massive attack swiftly carried out.[22] The demoralization of the enemy population would be crucial at this point, as would a suitable lack of enemy defenses.

For Douhet, one fundamental way of sustaining the potential for massive, uninterrupted strikes was to employ all of a society's available aircraft. This could best be accomplished, he argued, through a reliance on civil aviation. The state thus maintains civil aircraft "in active service . . .[so] that the planes [can] be easily and rapidly converted into warplanes."[23] Douhet thus assumed that the typical civil airplane could be easily converted into a heavy bomber, a premise that was highly questionable even in his own day.[24] This is a point which such scholars as Warner have failed to fully grasp. Just because Douhet later modified his position, relegating civil aircraft to "secondary functions," does not mean that he regarded those subsidiary capacities as inconsequential.[25]

More on that subject later. At this juncture, let me complete the outline of Douhet's main points. Two aspects stand paramount here. The first of these was his apathetic attitude toward defensive strategy. The second was his notion of total war.

I have already implied that Douhet largely ignored the possibilities inherent in defensive measures. His assumptions concerning, say, bombing patterns, certainly illustrate this. So does his embryonic conception of the blitzkrieg. Throughout, the potential for resistance is overlooked. Accordingly, he asserted that "the decision will be quick in this kind of war. . . ."[26] Bombing patterns, however, do not mean as much when the enemy knows that you are coming. He thus manifested an acutely ahistorical frame of mind—one that was unable to transcend the experiences of the First World War. In short, he failed to understand that technology tends to develop in a multilinear way that is very seldom predictable. An even cursory examination of the medieval longbow and its relationship to the armored, mounted knight, for instance, would have raised doubts about the assumption that defensive strategies remain dormant in the face of offensive threats.

Douhet's view of total war also presumes too much. For one thing, the centralization of command has seldom proved to be an easily attainable goal. Indeed, given such realities as interservice rivalries (as well as intraservice ones) and vague, contradictory national political goals, one might conclude that such command efficiency is a hopelessly utopian ideal.[27] Further, to assert the idea of a national "will"— indeed, to assume the existence of a civic spirit with theoretical roots in continental liberalism—is to thoughtlessly project European models onto fundamentally different societies—such as the United States. Strategists in America cannot assume the viability of this approach, particularly within the seamless web of American culture.

This, then, is the basic outline of Douhet's argument as it appears in *The Command of the Air*. The task now is to illustrate its basic theoretical weaknesses in light of actual Air Force operations. Only then can its use as a heuristic guide be questioned.

I HAVE already pointed, in an admittedly cursory way, to the inappropriateness of some of Douhet's arguments, given actual Air Force sorties. Korea and the assumptions surrounding bombing offensives is one stark case in point. There are four issues that need to be discussed within the context of the Air Force's institutionalization of Douhetism. These are Douhet's deemphasis of defensive measures, the assumed demoralization of the enemy population, the alleged mathematical certainty of uninterrupted bombing, and the reliance on civil aviation.

In the matter of defensive measures versus offensive potential, it is indeed surprising that Douhet failed to grasp the historical reality of defensive technological development and its necessary correlation with offensive innovations. Early on in his career, Douhet built a reputation as an electronic technician at Turin Polytechnic.[28] As early as 1904, he was studying the "Calculations of Rotating Field Engines."[29] His "Outlines of Electrotechnics" was later published as a pamphlet while, simultaneously, he delivered a lecture at the Sorbonne on the separation of hydrogen and oxygen from air.[30]

Despite such impressive credentials, Douhet's argument concerning the inevitability of offensive superiority points to a profoundly distorted view of air warfare. Given the technical aspects of actual operations, it does not have much credibility. Look, for example, at a relatively effective attack on 2 November 1943. Three hundred twelve tons of bombs were dropped on the Wiener Neustadt Messerschmitt Me-109 airframe works in Austria.[31] Despite Douhet's claims that the "only really effective

aerial defense cannot but be indirect . . . ," the Fifteenth lost ten B-17s on that one day alone.[32] But this was only the beginning. During the February bombing runs on aircraft plants in Austria and Germany, approximately eighty-nine Fifteenth bombers were lost.[33] As one analyst put it, bomber "losses per sortie were nearly five times as great as those of the escorts."[34] Axis defensive measures, such as radar, flak, and large numbers of tactical aircraft, were thus far more effective than Douhet had anticipated. For the 340th, this fact was painfully learned. As James Cate and Wesley Craven tell us, there were about "ten of twelve planes holed by AA fire on a mission against Venafro." During the October runs over Leghorn-Pontedera, the loss of Liberators on loan from the Eighth Air Force was also heavy. Cate and Craven tell us that the Liberator force

> . . . met heavy flak and around sixty fighters, some with a 37-mm cannon in their wings and others which lobbed rocket-type shells into the bomber formation with considerably accuracy. Fourteen of the bombers were shot down and fifty-two damaged. Enemy losses were undetermined, but apparently did not equal the Liberator losses.[35]

This was also, in the same sort of scenario, apparent in Vietnam. During the Linebacker II missions of December 1972, B-52s carried on an offensive against Haiphong and Hanoi that made runs on Fortress Europe look paltry indeed. The losses suffered due to SAMs, MiGs, and antiaircraft batteries were very heavy. SAMs in particular were quite effective, as the Fifteenth lost five bombers during this period.[36] Fifteen bombers were lost in all.[37] Richard Nixon was forced to admit that his "major concern during the first week of bombing was not the sharp wave of domestic and international criticism, which I had expected, but the high losses of B-52s."[38]

Linebacker II is a particularly good example of Douhet's underestimation of the enemy's morale. Despite intensive bombing at unprecedented rates, the will of the North Vietnamese was not broken. Here, the key to under-

standing lies in the realm of culture. Douhet and his Air Force adherents operated from a certain level of rationality concerning "acceptable" levels of death. What is acceptable to one people, particularly from the West, is not, however, necessarily applicable somewhere else. Technology does not necessarily overcome anger and a sense of nationalist zeal. Conversely, technocrats are not necessarily fighters.

Vietnam is also a useful laboratory to consider Douhet's belief in the mathematical certainty of uninterrupted bombing operations. Of course, "uninterrupted" is itself quite an assumption. Most attempts to predict accurately the probable effect of precise bombing patterns failed in Southeast Asia. I have already pointed to the inability of B-52s to undercut North Vietnamese morale. But I have in mind even more than that. Douhet, in chapter 3 of *The Command of the Air*, offers very precise equations, i.e., 50 bombing units = the destruction of 500 surface meters.[39] The luxury of such sureness has not been proved in reality. Consistent pounding of North Vietnamese targets, all based on often intricate quantitative models, failed to yield the desired result—the complete and utter halting of the enemy's logistical efforts. Ironically, the efforts involved in planning pinpoint bombings were themselves perceived by some as signs of weakness, not power. High-ranking officials, such as George Ball, were thus moved to argue that dropping "bombs was a pain-killing exercise that saved my colleagues from having to face the hard decision to withdraw."[40] This was not the sort of decisiveness that Douhet had argued would result from awesome offensive striking power.

There is, finally, Douhet's point concerning the use of civil aviation. Nowhere in Air Force strategic history has this measure been even remotely relevant. Complex bombing operations, even as early as 1943, have precluded the possibility of using aircraft designed for civilian use. To go into the technical reasons for my position is redundant, given the general knowledge of rigorous strategic requirements.

Within the context of this knowledge, it is silly to take seriously Douhet's assertion that as

> . . . for the planes themselves, even in military aviation circles, the misconception is held that civilian planes cannot be used for war purposes because the two types of planes must have different characteristics. I call this opinion a misconception. . . . Such compromise would be of advantage to military aviation for this reason: by basing itself upon civil aviation, which is constantly active, it would always have at its disposal the latest types of plane; whereas, if it relied upon its own means, it would often find itself armed with antiquated models.[41]

Douhet then went on to make the incredible argument:

> This misconception also results from the fact that military aviation today uses almost entirely planes of extreme characteristics; whereas civil aviation uses planes of moderate characteristics. And, I repeat, aerial war is not fought with planes of extreme characteristics, in spite of occasional air battles.[42]

MORE than anything else, the theoretical irrelevance of *The Command of the Air* is rooted in Douhet's insensitivity to historical development and cultural diversity. Even a nodding acquaintance with the history of warfare would have alerted him to the correlation between offensive capabilities and developments in defensive technology.[43] His failure to grasp the complex cultural history of peoples, regarding death, for instance, translated into false assumptions concerning the enemy population's tolerance of intensive bombing. Such oversights proved disastrous by the time of Vietnam. For social scientists, our Vietnam experience has added credibility to Max Weber's warnings concerning bureaucratic inertia. For Air Force commanders, it illustrated the clear weaknesses of Douhet's model.

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Notes

1. See Giulio Douhet, *The Command of the Air*, Joseph P. Harahan and Richard H. Kohn, editors (Washington, D.C., 1983), and Raymond Flugel, "The Air Service Tactical School and Its Doctrine, 1921-22," in "United States Air Power Doctrine: A Study of the Influence of William Mitchell and Giulio Douhet at the Air Corps Tactical School" (Ph.D. dissertation, University of Oklahoma, 1965), p. 96.

2. This is the whole point of a movement such as the Annales School in France. In Fernand Braudel's *Structures of Everyday Life*, for instance, the immersion in "mundane" daily activities is in direct opposition to the often lofty models brought to bear in historical analysis. It is, more than anything else, a reaction against the abuses of a philosophical idealism dating back to the nineteenth century.

3. I have in mind here the analysis of Sarajevo offered by Georg Henrick von Wright, the so-called quasicasual approach that combines intentionalist and casual explanations. See von Wright's *Explanation and Understanding* (Ithaca, New York, 1971).

4. R. W. Hodge and P. M. Siegel, "A Casual Approach to the Study of Measurement Error," in *Methodology in Social Research*, edited by A. Blalock and H. M. Blalock, Jr. (New York, 1968), p. 55.

5. In "Contents," *The Command of the Air*, p. xiii.

6. An often overlooked aspect of waging war is in the area of national culture. On this level alone, the complexity inherent in even small-scale skirmishes (i.e., Vietnam as opposed to World War II) is staggering. See Loran Baritz's *Backfire: A History of How American Culture Led Us into Vietnam and Made Us Fight the Way We Did* (New York, 1985).

7. A somewhat dated but certainly useful overview of defensive measures in a major war is found in Gordon Wright, "The Broadening Scope of War: The Scientific Dimension," in *The Ordeal of Total War: 1939-1945* (New York, 1968), pp. 79-106. Also refer to Bernard and Fawn M. Brodie, "Radar" and "Operations and Systems Analysis: The Science of Strategic Choice," in *From Crossbow to H-Bomb* (London, 1973), pp. 207-13, 268-78.

8. Douhet, p. 25.

9. Douhet, pp. 49 and 103.

10. Douhet, p. 126.

11. Edward Warner, "Douhet, Mitchell, Seversky: Theories of Air Warfare," in *Makers of Modern Strategy: Military Thought from Machiavelli to Hitler* (Princeton, 1973), p. 490.

12. Douhet, pp. 106-07.

13. R. J. Rummel has provided a graphic representation of the process of conflict, which is, at least on some levels, applicable to strategic nuclear concerns. See R. J. Rummel, "Levels of Conflict," in *Understanding Conflict and War: The Conflict Helix*, volume 2 (London, 1976), p. 240.

14. Brodie and Brodie, p. 263.

15. See, for example, his discussion of an attack force of fifty bombers in Douhet, p. 50.

16. Even something as simple as weather was often overlooked by Douhet when he discussed bombing patterns. His discussions more often resembled Weberian ideal types than heuristic devices designed to meet real strategic requirements. Such theoretical flaws soon become evident in real operations. Look, for instance, at the inability of the Fifteenth Air Force to select a target in central Italy due to the bad weather during autumn in 1943. Consult James L. Cate and Wesley F. Craven, editors, "The Fifteenth Air Force," in *The Army Air Forces in World War II* (Washington, D.C., 1983), p. 557.

17. U.S., Directorate of Public Affairs, Hq Fifteenth Air Force, March AFB, California, "The Korean War Years, 1950-1953," in *Fifteenth Air Force: The First 40 Years, 1943-1983* (n.p., n.d.), p. 12.

18. Ibid.

19. Douhet, p. 129.

20. Indeed, he spoke of the "co-ordination of army, navy, and air force under a unified command." Refer to the Preface in Douhet, p. xi; also see pp. 8-9.

21. For example, see Douhet, p. 53.

22. See the comments of Richard A. Preston and Sydney F. Wise, "The Modern War Lords," in *A History of Warfare and Its Interrelationships with Western Society* (New York, 1970), especially p. 285. Also refer to the analysis of Warner, op. cit. For a discussion of the early institutionalization of Douhet's thoughts on strategic planning in the U.S. Air Force at large, see Flugel, pp. 235-58.

23. Douhet, p. 83.

24. Look at the plight of Bréguet bombers during the First World War. There were numerous maintenance problems attendant to these specialized aircraft. Spare part availability plagued the model 14 B-2, and it could not be assumed that mechanics were able to use parts from other airplanes—or indeed, that those other craft could be fitted with such Bréguet devices as its bomb-dropping gear.

25. This is one of my major points of departure from Warner. On page 495 of his article, he argues that Douhet "displayed [a] caution in technical prophecy." Warner thus goes astray because he assumes that Douhet's linguistic usage is a clear indication of analytical emphasis. Douhet's language is, of course, decidedly nontechnical. But a closer reading of *The Command of the Air* reveals Douhet's strongly technocratic flavor. All the characteristics are there. In sum, attempts to systematize war from a theoretically rigid perspective—i.e., the attempt to bring a disinterested rigor into the management of operational elements such as bombing patterns—were all futile efforts to impose order on an area of human life that does not lend itself easily to rationalism. A failure to use the language of Taylorite technocracy does not mean that it is not there.

26. Douhet, p. 61.

27. Consider the recent debate about the Joint Chiefs of Staff. See U.S., Committee on Armed Services, United States Senate, *Defense Organization: The Need for Change* (Washington, D.C., 1985); and "Thinking Things Over," *Wall Street Journal*, 6 November 1985, p. 34.

28. Flugel, p. 74.

29. Ibid.

30. Ibid.

31. *Fifteenth Air Force: The First Forty Years, 1943-1983*, p. 2. For a broader discussion, see Cate and Craven, "The Fifteenth Air Force," pp. 546-84.

32. Ibid.

33. Ibid.

34. *Fifteenth Air Force: The First Forty Years, 1943-1983*, p. 4.

35. Cate and Craven, pp. 550-51.

36. Ibid., p. 28. On the effectiveness of SAMs during this period, see Baritz, pp. 223-24. The North Vietnamese claimed to have shot down a total of thirty-four B-52s, but that claim seems to be too high.

37. *Fifteenth Air Force: The First Forty Years, 1943-1983*, p. 28. Also see the discussion of "Air Defense" in James F. Dunnigan, *How to Make War: All the World's Weapons, Armed Forces and Tactics* (New York, 1983), p. 405.

38. In Baritz, p. 224.

39. Douhet, p. 50.

40. In Baritz, p. 155.

41. Douhet, pp. 83-84.

42. Ibid., p. 84.

43. An obvious example here is the crumbling of the medieval castle under the onslaught of bombards. There are many other cases that I could cite.

You've got the sti

ON NONCONFORMITY

COLONEL ALAN L. GROPMAN, USAF (RET)

THERE is a specter haunting the U.S. Air Force—it is the ghost of nonconformity. The evidence for my assertion is the lively debate within the pages of the *Air University Review* since William S. "Bill" Lind's disquieting article in the November-December 1984 issue, titled "Reading, Writing, and Policy Review: The Air Force's Unilateral Disarmament in the War of Ideas." Lind's essay directly criticized Air Force censorship, and it spoke indirectly of a deeper problem in the Air Force at large— hostility to ideas that do not conform to current, "official" Air Force positions.

Each issue of the *Review* subsequent to Lind's article has contained letters to the editor or short essays supporting Lind's position. The most depressing of these comments were those from former *Review* editors expressing frustration with the policy review process. Almost all authors and editors writing on this topic who had direct experience with the Policy Review apparatus in the Air Force concurred with Lind. I have never agreed with Bill Lind before, but the concern he expressed about censorship and the larger issue—introducing novel ideas to the Air Force—is correct. The Air Force, apparently, does not approve of its officers' airing views that differ from established positions.

From my experience of twenty-six years in the Air Force, I sincerely doubt that Lind's article would have been cleared by Policy Review if it had been written by an active-duty officer. The Air Force attitude on nonconformity can be capsuled in a statement protesting Lind's remarks made by Brigadier General Richard "Dick" Abel when he was Director of Public Affairs. General Abel complained that the *Review*, by publishing Lind's remarks, did not understand "the need for the Air Force to speak with one voice." ("Whose voice?" potential authors might ask.)

Abel's point of view was supported about a year later by Colonel Ronald B. Johnston, who was responsible for Security and Policy Review under General Abel and for some time after the general retired. Johnston wrote in the *Review* that each of us must see ourselves and act as a "DOD spokesperson." Both Abel and Johnston agreed that active-duty officers must conform to "official" Air Force positions or not break into print.

Censorship is real, but the Policy Review apparatus is not the only censor. In fact, it rarely, if ever, initiates the censorship process. Who are the censors in the Air Force?

Unfortunately, almost every staff officer in the Pentagon is, or can become, a censor. One

need not be a general to bar publication of disagreeable ideas, and, in fact, almost never does the issue of censorship reach flag-rank officers (although generals, too, can become censors). The censors are most likely to be Pentagon field-grade action officers who have been given the task of "recommending" (really, almost deciding) whether a proposed article for the *Review* or any other journal should be published. The Policy Review process seeks an expert on the subject under question, but almost always the "expert" is also an "advocate" whose life could be complicated by an article in the *Review* that does not conform with current policy.

Censorship comes about from the mistaken idea that Policy Review binds military authors to agreeing with current policy. That is not so. The purpose of policy review is to ensure that a writer articulating Air Force policy on a subject does so correctly. However, if an author disagrees with the policy and so states that his or her essay calls for a change in policy, then there should be no censorship. One recognizes that special rules apply to policymakers, that is, to four-star generals whose articulation of a different policy may be taken to be the enunciation of a new policy; but for individuals below the level of general, especially with disclaimers, this approach should not apply—but apply it does. We are not questioning obedience here. Military people carry out orders, whether or not they agree with them. We are questioning the idea that honest dissent is damaging.

The consequence of always staying in lock step in whatever battles the Air Force has with other services, with other executive departments, or with the legislature is intellectual sterility, which in the long run will deplete the thinking foundation of this or any other service.

When one looks into our past, one sees hostility to airmen whose opinions differed from accepted policy even at the time when the Air Force was in its heroic period of doctrine development, supposedly alive to new ideas. For example, while the Air Corps strategic bombing advocates formulated a doctrine new to American warfighting, they banned those around them who disagreed with the efficacy of that doctrine. In so doing, they guaranteed conformity but cost the lives of thousands of bomber crewmembers during 1942 and 1943. We cannot afford to make that type of mistake again. Let us all pledge to open our journals (and our brains) to new ideas, even nonconformist ones.

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Letters

some thoughts from an Air Corps Tactical School graduate

Major James B. Smith's "Some Thoughts on Clausewitz and Airplanes," which appeared in your May-June 1986 issue, prompts comment from a student who sat through the lectures of Larry Kuter and Possum Hansell in the Class of 1936. They were my introduction to Strategic Bombardment, my specialty being Observation. I listened with interest, knowing that Kuter and Hansell were bright young

protégés of General Hap Arnold then at March Field. I surmised that he was the source.

At that time, I traced some ideas to a source different from that cited in the article, to Admiral Mahan's work *The Influence of Sea Power upon History.* I knew that General Arnold had studied that work at Army War College through Major Horace M. Hickam. (A discussion of Mahan's idea was in your March-April issue, pp. 104-10.) Mahan's theme was that British sea power, protecting trade routes essential to Britain's welfare, was an instrument of foreign policy. It does not take much of an extension to conclude that air power could be an instrument of foreign policy. In fact, Major Hickam suggested that to me in 1932. But the use of air power beyond the battlefield calls for a more sophisticated reason for strategic bombardment than "trade." Hence, Clausewitz was brought into the picture, being an authority. As he had died in 1831, his theories *must* have related to the conventional thinking of that time— i.e., that wars are fought to acquire or to protect territory, the will to resist notwithstanding.

I do not recall any discussion of the limitations of strategic bombardment, and there are two: the first is that it is intermittent; the second, that air power cannot hold territory (possession, that is). Bombardment is a flexible extension of artillery, and its purpose is destruction; but to what end? In 1936, the end was to support the ground forces within the battle zone. I read the talks as a matter of control, whether air power should be limited to the battlefield (tactical) or used outside the battlefield (strategic).

The *Principles of War* by Clausewitz was required reading during the twenties. It was in paperback, as I recall, published by a military publishing house in Harrisburg, Pennsylvania, in 1925. It was my understanding that this was the English text used at Army War College.

The last battle that I can think of that meets the Army Field Service criteria for destruction was Waterloo, both sides practically destroyed, but Wellington less so. The Franco-Prussian War was settled when the Prussians got to Paris. The Civil War ended when Lee's territory had been reduced to the State of Virginia.
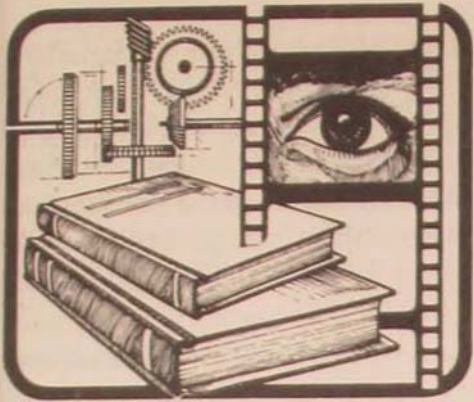
Interestingly, we were defeated in a battle of wills by the Vietnamese, and they had no air power. The will to resist is quite nebulous, human nature being what it is. Guerrilla action should teach us something, and the Soviets are learning in Afghanistan.

The Battle of the Falklands is a kindergarten sample of my view on territory. The Argentines seized British territory, and England reacted. The Argentine Air Force was unable to influence the outcome, despite their Exocet missiles. The British traded several ships damaged or sunk to place 5000 foot soldiers on the island and regained their territory.

The nuclear bomb clouds the picture to the extent that the acquired territory may be useless for either or both sides. That is where we stand today. It does not make sense to defend one's territory in such a way as to destroy it.

For the record, Muir Fairchild's nickname (mentioned on p. 54) should be "Sandy," I believe.

Major General Edmund C. Lynch, USAF (Ret)
Austin, Texas

IDEAS AND THE WARRIOR

LIEUTENANT COLONEL ROBERT C. EHRHART

War is a matter of vital importance to the state; the province of life or death; the road to survival or ruin. It is mandatory that it be thoroughly studied.

Sun Tzu, *The Art of War*

PROJECT Warrior was initiated in 1982 with two objectives: "to improve the warfighting spirit and perspective of our Air Force people" and to enhance our "understanding of the theory and practice of war with particular emphasis on the contribution of air power."[1] From the beginning, the program has aimed at both the heart and the brain of the warrior.

Project Warrior was not to be a quick fix, but an ongoing process. "This project," said its founders, "is for now and for the future." Nor was it intended just for those who would wield the "cutting edge." The senior Air Force leaders who laid the framework for Project Warrior made no bones about this:

A total team effort is envisioned, including officer, enlisted, guard, reserve, and civilian. All contribute to the accomplishment of the mission, and it is essential that all be included in the program.[2]

With this broad approach in mind, the program stresses maximum flexibility for commands, agencies, bases, and units as they work to achieve Project Warrior's dual objectives.

HOW are we doing? At some bases, Warrior has made little headway. At others, units or individuals have developed dynamic programs that are affecting the attitudes of unit members. These programs remind people why the U.S. Air Force exists, why they serve, and why the Air Force cannot be simply a "nine-to-five" job. Meanwhile, our senior leaders continue to support Project Warrior. In a letter dated 30 September 1985 to all major command and separate operating agency commanders, General Charles Gabriel, then-Air Force Chief of Staff, observed, "With our continued support and participation, it [Project Warrior] will have a lasting effect on the United States Air Force."[3]

To date, most of the elements of the various Warrior programs throughout the Air Force have tended to stress the "heart" side of Warrior, focusing on the warfighting spirit and military perspective. This emphasis is as it should be because motivation and commitment touch all Air Force people and are particularly essential to any successful military force.

Nevertheless, we must not forget that the other side of Warrior—the brain side—is also important. In situations where we will not have overwhelming material superiority or

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when material resources are not sufficient in themselves, victory can come only through wise use of available assets. This necessitates disciplined study as well as the creative use of our intellects. Project Warrior helps achieve this goal through the study of military history. In the letter that initiated Warrior in 1982, then-Chief of Staff General Lew Allen stated this explicitly:

> I believe that a continuing study of military history, combat leadership, the principles of war, and particularly the application of air power, is necessary for us to meet the challenges that lie ahead.[1]

A basic understanding of the development of military forces—especially air forces—and of the way in which they have been employed enables us to build on past successes and to avoid previous mistakes. This guidance pertains not only to operations and tactics but also to the development of doctrine, command organizations, and preparation for employment.

While history does not repeat itself, even a cursory study of the past spotlights recurring military issues with which we still grapple. The effort to understand these recurring issues by analyzing how they are addressed in a variety of circumstances and why these efforts succeeded or failed can help us deal with them more effectively. The answers may not always be the same, but the effort will increase the possibility of finding the appropriate answers for *our* time.

The comment that the world now moves too quickly for history to be of value is, in reality, an argument *for* using what past experience offers. Ours *is* an age of rapid change; it is also an age in which victory—and defeat—can come at a pace far quicker than our predecessors had to face. We may no longer have the luxury they had—to learn (or relearn) by trial and error. In future conflicts, there may be no second half in which to regroup. Improper tactics or inappropriate strategies may result not just in setbacks but in outright defeat.

misuses of history

Unfortunately, using the past is fraught with pitfalls. It is easier to misuse history than to use it correctly. For this reason, it may be helpful to dissect the potential for misapplication before considering how military professionals should approach the past.[5]

Misuse #1: Extracting "lessons" indiscriminately from the past without taking into account technological, political, economic, or social differences. Bernard Brodie, one of the early Rand thinkers, stated it well when he wrote, "The phrase 'history teaches,' when encountered in argument, usually pretends bad history and worse logic."[6] In the classroom of combat, it often results in defeat.

After their thumping by the Germans in 1870-71, French military leaders looked back to ancient Rome and saw élan and the offensive spirit as keys to the Legions' victories. From this evaluation, they evolved the dubious doctrine of the *offensive à outrance* (the unlimited offensive) and the idea, embodied in Plan XVII, that "what the enemy intends to do is of no consequence."[7] Unfortunately, the French ignored or misread the importance of such technological developments as the machine gun and barbed wire. Thus, in the fall of 1914, the gallant *poilu* (infantryman) in his red kepi and trousers learned that courage is often wasted against uninspired bullets.

In the Six-Day War in 1967, audacious Israeli armor thrusts, combined with air superiority, routed Arab forces. After this victory, the Israeli Defense Forces (IDF) reorganized with a preponderance of armor and a reduction in infantry. The "lessons" of 1967 proved costly just six years later when both armor and air forces were confronted by greatly improved technology in the form of surface-to-air missiles and antitank rockets. The IDF was able to reverse the tide in the 1973 War, but this victory should not obscure the penalty they paid, in casualties and materiel, for neglecting to update their "lessons."

Misuse #2: Focusing too narrowly on what happened, to the neglect of why things happened and why people acted as they did. Too often, history is studied with an overemphasis on dates and isolated facts. Such an approach, while helpful for Trivial Pursuit, can obscure the meaning of events or result in misinterpretations that become potentially disastrous "lessons." Dates are only pegs on which to hang the narrative of history; they provide a framework for relating—and understanding—events. In themselves, they are not history, but merely chronology.

Castigating European military leaders for their failures in the Great War of 1914-18—and even knowing what they did wrong—is not so important as understanding why they did what they did, why they were wrong, and why they failed to do other things. Specific situations will not recur exactly, but attitudes of mind and habits of thought may very well do so. Again, Bernard Brodie was on the mark when he noted that it was the horizons of the World War I commanders rather than their skills which were so limited; and, he warned, "there is nothing in the stars that guarantees our own generation against comparable errors."[8]

Misuse #3: Focusing too narrowly on "our" past and ignoring the experiences and perceptions of others. This myopic approach often translates into a concentration on the victors while ignoring the defeated. The relationship between victory and capability is far more complex than a simple A = B equation, however. The final outcome of a conflict does not mean that the victors were superior in everything from organization to training to specific weapons to employment. They may only have been relatively better in one or two respects in that specific situation. They may have been worse in many areas, but their weaknesses were compensated by certain strengths that might not be present in a future conflict. Nor is defeat synonymous with ineffectiveness. The Wehrmacht ultimately lost World War II, but few would say it was ineffective.

Focusing on only one side of a struggle provides only one-half the perspective. It is impossible to understand the astounding success of the German blitzkrieg in 1940 and again in 1941 by concentrating only on the attackers. If we are to understand blitzkrieg operations fully, we must know what the Western Allies and the Russians did wrong as well as what the Wehrmacht did right. And we must understand *why* each nation's decisionmakers and forces did what they did. Similarly, given the defensive strategy of NATO, it would seem logical to study more closely how the German Army and Air Force conducted the war on the Eastern Front from 1943 to 1945 rather than focus on the Allied campaigns—land and air—in Western Europe during the same period.

the uses of history

In light of the possible errors we might derive from history, why should we make the effort? Why not just ignore the past and concentrate on the present and the future? To stand the question on end: How can history be useful? What does it provide? What are its proper roles?

The study of military history makes us think about our profession. It is impossible for the conscientious warrior to study the past without becoming more aware of the problems and demands of his own time. He cannot help being more attuned to current developments and asking, "How do these factors affect our warfighting capabilities?" History is replete with military leaders who failed to ask this question or who answered it incorrectly because their vision was too narrow.

The study of military history enlarges our perspective. When we study events, we need to do so with a curious and questioning mind: Why did the participants act as they did? How could they have changed the outcome of events? What would I have done?

Indeed, one could argue that the most important thing to learn from history is what made people think and act as they did.[9] By consider-

ing the circumstances under which others made decisions, we may gain helpful insights, avoid similar mistakes, and better adapt our decisions and actions to our circumstances. We can, in short, heed the guidance of Otto von Bismarck, the Iron Chancellor of Germany: "Fools say that they learn by experience. I prefer to profit by others' experiences."[10]

By broadening our horizons, the study of military history reduces the ethnocentrism that has a way of sneaking into the military planning of all nations. Embedded within the French Army's Plan XVII, for example, was the widely shared belief that "we [the French] possess . . . a soldier, undeniably superior to the one beyond the Vosges in his racial qualities, activity, intelligence, spirit, . . . [and] patriotism."[11] Unfortunately, "this was neither the first nor the last time that bad anthropology contributed to bad strategy."[12]

Moreover, the study of military history reminds us that war is more than battles and campaigns and that warfighting capability refers not simply to "force structure." The battles and operations of the past are important, but our analysis of them must consider not only tactics and weapons but also such critical aspects as logistics, command and control, training, organization, and the evolution of doctrine. As we better understand the logistical difficulties that Rommel faced, the importance of esprit de corps to the Marines at the Chosin reservoir, or the contrast between the caution of Union General Joseph Hooker and the audacity of Generals Robert E. Lee and "Stonewall" Jackson at Chancellorsville, we improve our grasp of the nature of war and the complexity of the factors involved in victories and defeats. The value of past experience can be illustrated by a quick look at a few of the issues with which the Air Force is grappling at this moment.

Air power's role in maritime operations. The fact that land-based aircraft in World War II sank more enemy shipping than did Allied surface forces or sea-based air should suggest some value in considering how this achievement was accomplished. Also, since long-range aircraft were an important factor in the Allied victory over the North Atlantic U-boats, might not that experience be worth another look?

The development and effective integration of new technology into aerospace operations. This is an area where specifics change, but basic issues remain. Military professionals have always wrestled with the effective integration of new technology into their systems of warfare. Sometimes they were successful (e.g., the German employment of armor in World War II); sometimes they failed (as the French did with their misapplication of the *mitrailleuse,* an early version of the machine gun, in 1870). How military forces viewed new technology and the success with which they applied it offer insight not only into the technology but even more into the psychological and bureaucratic aspects of this issue. Richard Hallion's *Rise of the Fighter Aircraft,* for example, not only explains the intimate relationship among technological change, doctrinal evolution, and air superiority in the First World War but suggests what this relationship means for air forces of today and tomorrow.[13]

The importance of inspirational and innovative leaders. For air leadership, look at George Kenney, arguably the most innovative American airman in the Second World War. No one was more effective when it came to inspiring troops, getting the most from truly shoestring support, and operating in a joint environment. Does Rommel have anything to offer by way of dynamic leadership? What about Napoleon's ability to inspire and motivate men in combat? What about Mao Tse-tung's capacity for adapting strategy and tactics to resources?

HAVING argued against the fallacy of clear and simple lessons from history, let me conclude this brief overview of historical study in Project Warrior by suggesting not lessons but two observations.

First, war has always involved a moral as

well as a material facet. The collapse of Plan XVII demonstrated that spirit alone cannot ensure success in combat. On the other hand, history offers numerous examples, from the Spartans at Thermopylae to the imprisoned flyers in Hanoi, that the heart of the warrior is an essential ingredient in combat. General William Tecumseh Sherman noted: "There is a soul to an army . . ., and no general can accomplish the full work of his army unless he commands the soul of his men as well as their bodies and legs."[14]

Whether we call it "esprit," "cohesion," or simply "pride," the importance of this ingredient has not been lessened by modern weapons or sophisticated command and control systems. If anything, the competing demands of our age make moral forces even more important both in training and in fighting. As America's most successful blitzkrieg warrior, General Patton, observed, "Wars are fought with weapons, but they are won by men."[15] By stimulating a greater awareness of the military tradition and heritage of the Air Force, Project Warrior strengthens both our spirit and our perspective.

At the same time, war continues to be an intellectual endeavor as well. Even after the industrial, technological, and scientific revolutions, it is not sophisticated weaponry that ultimately matters but the ability to employ it properly. The "great captains"—men such as Marlborough, Napoleon, Sherman, and Manstein—have been those who could outthink rather than simply outnumber their opponents. Overwhelmingly, the evidence indicates that fortune favors those military forces whose members repeatedly ask, "Is there a better way?"

The intellectual mastery of war becomes acutely important when we realize that in war things rarely happen as the combatants wish. Given war's inevitable fog and friction, the side that understands the nature of war as well as the technology of the age—the force that masters the art as well as the science of war—stands the better chance. Through its emphasis on the study of military history, Project Warrior seeks to contribute to this intellectual mastery. A continuing study of military history—and integration of its fruits with the realities of today and the future—is indeed necessary to meet the challenges that lie ahead.

Hq USAF

Notes

1. "Project Warrior" pamphlet, March 1982, p. 4.

2. Ibid., p. 3.

3. CSAF letter to ALMAJCOM SOA CC, "Project Warrior," 30 September 1985.

4. CSAF letter to ALMAJCOM SOA CC, "Project Warrior," 5 February 1982.

5. Michael Howard's "The Use and Abuse of Military History" is an excellent analysis by a premier military historian.

6. Bernard Brodie, *Strategy in the Missile Age* (Princeton, New Jersey: Princeton University Press, 1959), p. 50.

7. Colonel Grandmaison in *The Great War*, edited by Cyril Falls (New York: Capricorn Press, 1959), p. 35.

8. Brodie, p. 59.

9. "[The] study of military history can be of great assistance in developing this ability [to think rapidly and accurately]; but . . . its focus must not be on the action, but the thought processes of successful commanders," Bill Lind, "The Case for Maneuver Doctrine," in *The Defense Reform Debate: Issues and Analysis*, edited by Asa Clark et al. (Baltimore: Johns Hopkins Press, 1984), p. 93.

10. Cited in B. H. Liddell Hart, *Strategy*, second edition, revised edition (Washington: Praeger, 1967), p. 23.

11. Ferdinand Foch, cited in Brodie, p. 52.

12. Ibid.

13. Richard P. Hallion, *Rise of the Fighter Aircraft, 1914-1918* (Annapolis, Maryland: Nautical and Aviation Publishing Company of America, 1984).

14. Cited in Robert C. Ehrhart, editor, *Modern Warfare and Society*, vol. I (Colorado Springs, Colorado: USAF Academy, 1979), pp. 8-20.

15. Quoted in Martin Blumenson, *The Patton Papers*, vol. I (Boston: Houghton Mifflin, 1972), p. 16.

# AIR FORCE NONSPEAK

Colonel Richard S. Cammarota

Reading maketh a full man; conference, a ready man; and writing, an exact man.

Francis Bacon

THE craft of writing has been variously referred to as an "art," a "science," and a "curse"! As it thrives in today's Air Force—and other major bureaucracies—it is all of these and more. Writing, a means to communicate thoughts with "understandable" visual symbols, is nowhere more distant from its purest form than in a bureaucracy—ironically, a word whose history carries suggestions of both "writing" and "concealment."[1] Although you may find exceptions (bureaucrats who write clearly and nonbureaucrats who write like bureaucrats), something about the inherent quest for survival in a bureaucracy makes writing not so much an *offensive* device to communicate thoughts and ideas as a *defensive* tool to conceal imprecise thinking or a lack of thought. The objective of bureaucratic writing, in fact, is too often to obscure rather than to illuminate, to preserve rather than change, or to state rather than explain. Reversing those tendencies, if you are frank enough to admit you're a bureaucratic "nonspeaker," is not difficult but demands that you be willing to expose more of your thinking processes in your writing.

Writing is, after all, a visual symbol of thought. We write what we think. As a friend of mine said about military writing, "modern linguists believe that man does not just express his thoughts in words; he actually *thinks in words.*"[2] Although we can, of course, think nonverbally, most of our thinking uses words. George Orwell believed that
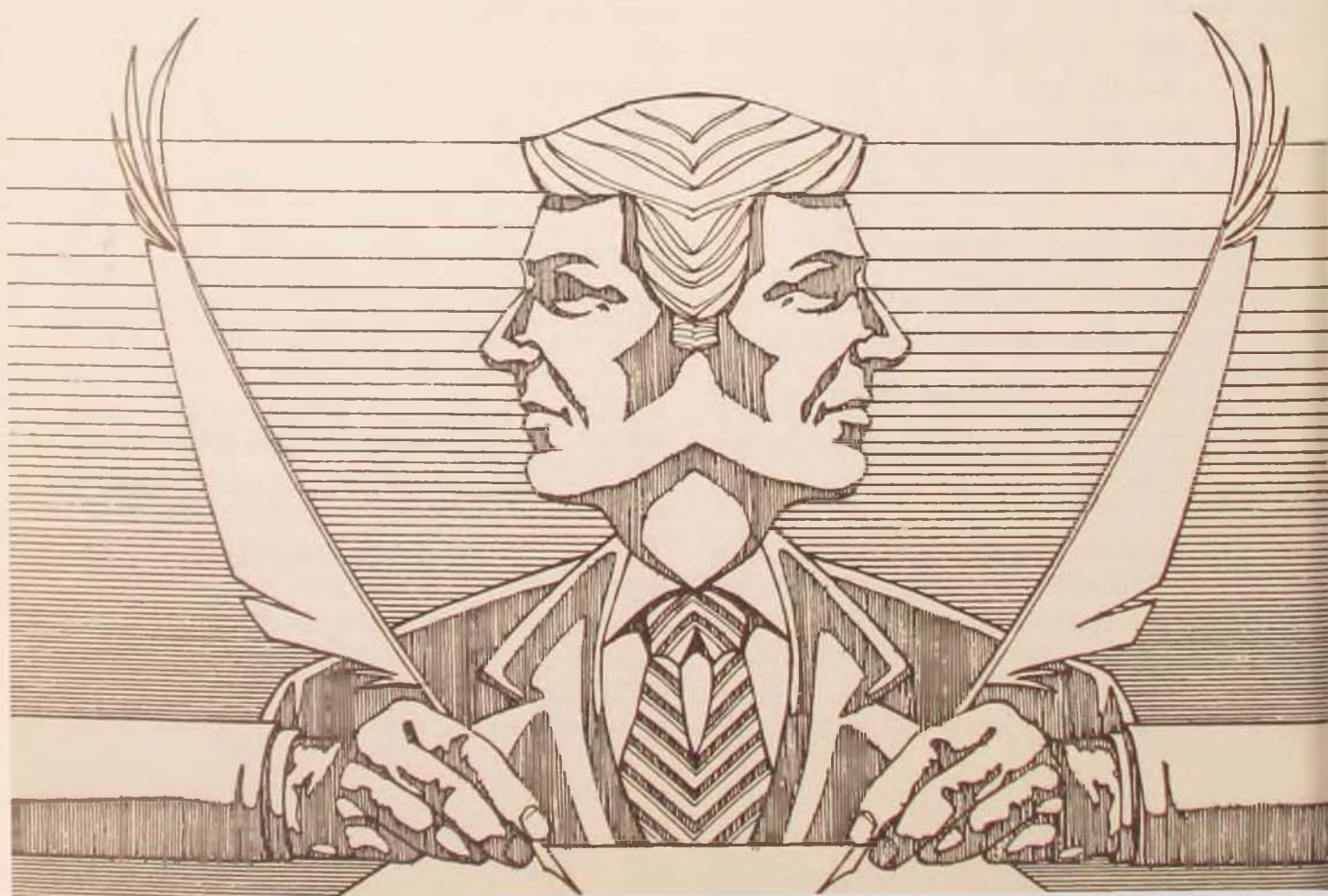
when you think of a concrete object, you think wordlessly, and then, if you want to describe the thinking you have been visualizing, you probably hunt about till you find the exact words that seem to fit it. When you think of something abstract, you are more inclined to use words from the start.[3]

Many fine "thinkers" I've known and worked with actually use a pencil or pen to think out problems. I have seen them jot down the major concepts or premises of a problem and "watch" as the words pointed the directions. Also, more than a few language specialists insist that one has learned another language only when he starts to think with it. Orwell had essentially the same idea, though stated it inversely: "If one gets rid of [bad writing] habits, one can think more clearly."[4]

Why Not Write Clearly?

Obscurity is perhaps the primary reason a bureaucracy, with its territorial imperatives, formidable coordination requirements, and labyrinthine status measurements, generates less-than-concise writing techniques. The U.S. Air Force, although having made substantial progress in recent years to encourage its bureaucrats to write clearly, is no exception. Instead of moving right to that visual expression of thought, why does the bureaucrat typically try to obscure it? One reason is that he may lack confidence in his ability to express those ideas on paper, away from the help of facial expressions and vocal tone (incidentally, the "he" is merely generic—my criticisms apply equally, I fear, to bureaucratic women). Consequently, the bureaucrat often assumes that "if I write more, people will understand better" or "if I repeat it enough, I'll be sure that my reader will know what I mean." As a result, we who must decipher his cryptological messages are treated to such challenges as:

> Since these monies were not included in the most recent budgetary plans, departments must meet these requirements within their own resources. Budget requests outside approved parameters

will not be forwarded for consideration, and functions involved will have to be accommodated by already approved funds.

Too often, the bureaucrat's reason is simple: to keep relatively arcane what really needs to be said. Perhaps the purpose is to conceal the logic or the rationale of the writing—or the lack of it—perhaps to distract the reader from the essential logic and thus require a follow-up discussion. Historically, I have found the motivation for such obscureness to be merely protective and defensive concerns, but Louis B. Lundborg believes it can be more malicious:

> The bureaucrat struts his power by pontificating—and pontificating is virtually synonymous for polysyllabic language. Bad as this is, his language is the lesser of evils: the power to obstruct, exercised by self-important people, is the real bureaucratic evil.[5]

Another reason for this obscurity is that the bureaucratic writer wants to make the subject impersonal, to reduce the topic to a mechanical description. In doing so, he effectively eliminates any human involvement, any personal persuasion. As noted bureaucratic analyst Max Weber puts it, this motivation is in bureaucratic behavior itself: "The ideal official conducts his office . . . [in] a spirit of formalistic impersonality, *sine ira et studio*, without hatred or passion and hence without affection or enthusiasm."[6] The problem, of course, is that while you might call the functions of the bureaucracy impersonal, writing is still between humans: "Machines stamp letters, measure oil, and convert acids, but only human beings talk and write *about* these procedures so that other human beings may better understand them."[7]

An important reason the bureaucrat wants his writing impersonal is to avoid personal responsibility and thus accountability. As a result, we see a good many plural first-person and singular third-person pronouns, as well as the "anonymous" passive voice.

While he is obscuring and dehumanizing his writing, the bureaucrat, often submerged in his tightly structured world, writes to impress his

readers with his command, his authority. To salvage from his small corner of the bureaucracy some semblance of power or significance that will produce some effect, the bureaucrat tries to sound impressive, official, and authoritative. For example, he cannot say that science has made the world smaller and the world economy larger. He must say with much more embellishment:

> Maybe the gradual actualization of this solidarity was the result of scientific and hence technological progress which minimized distances and maximized the requirement for ever-expanding markets.

The motivating force behind this behavior is linked to the nature of a bureaucracy. Max Weber again:

> The type of organization designed to accomplish large-scale administrative tasks by systematically coordinating the work of many individuals is called a bureaucracy.[8]

The compromises of language negotiated while pursuing that coordination are often debilitating to writing's clarity, directness, and brevity.

Bureaucratic Writing Techniques

How does the bureaucrat achieve all this obscurity, this imprecision? He relies on several staple techniques that characterize those same two motivators: those that make his language abstract and those that try to impress his reader.

the "art" of abstract writing

The bureaucrat loves to "nominalize" verbs or action words into nouns. Where someone might say, "I investigated the incident," the career bureaucrat will say, "I conducted an investigation of the incident." Besides almost doubling the necessary words, "smothering" the verb in a noun (usually by adding *-ion, -ance, -ence, -ant, -ent,* or *-ity*) "inactivates" the power of the verb. Instead of doing something, the writer is now "having something done!"

Bureaucrats perform similar magic with other parts of speech. Instead of "being capable," something "has the capability." Perhaps the most famous recent example of smothering is a word whose etymology is dizzying: from the simple, dependable noun *priority* came the verb *prioritize* and ultimately the "new" noun *prioritization!* More damaging than inactivating the drive of the verb, smothering removes the verb's important contribution to the trail of reason, of logic, and "elevates" it to a level of abstraction and imprecision. *Investigation* is a lot more vague than *investigate.*

Also effective in making the bureaucrat's writing abstract and less traceable are "indefinites." Beginning a sentence with "It is important that . . ." or "This is a vital part of . . ." delays the essence of the sentence to its weakest part—the middle. Also, as a good pronoun, "it" should refer back to an antecedent. As an indefinite delayer, "it" refers ahead to whatever follows "that." "This," technically a demonstrative adjective, should point to an immediate following noun. Using it without such a following noun is ambiguous and misleading.

Other effective delayers are "there is" and "there are." Using these expletives forces the subject after the verb:

> There are five uses for those files.

Better written:

> Five uses exist for those files.

Best written:

> Those files have five uses.

Like indefinites, these delayers force the key elements of the sentence to the weak middle. Also like the indefinites, they are imprecise and vague in meaning and direction.

In a larger sense, bureaucrats often also start paragraphs with delayers. Such phrases as "As we all know" and "As you are aware" not only delay the action but are patronizing—if your readers are already aware, why are you telling them? In the broadest sense, the biggest delayer

is a whole paragraph that doesn't get to the point. We have all read lead paragraphs we kindly refer to as "history-of-the-world" introductions!

Perhaps the most popular way to make bureaucratic writing abstract is to overwrite. Instead of simply writing "this practice wastes time and money—have a secretary do it," the career bureaucrat chooses to write:

> This administrative function tends to overutilize valuable manhours and budgetary resources. Having an administrative support specialist perform this function would conserve important occupational and financial assets and result in enhanced organizational efficiency. Consequently, this department should consider removal of this function from its manning requirements and transferral of the responsibility to an employee specializing in administrative support.

Another way in which the bureaucrat makes his writing abstract is by using abstract words instead of active ones. *Interface* is so much less "nail-downable" than *relationship* or *association* or *rapport*. *Implement* is so much less specific than *execute* or *activate*. *Methodology* is easier to hide behind than *plan* or *method*. *Promulgate* is so vague that I'm still not sure what it really means. Most frightening is one government agency's recent decision not to use the word *killing* anymore; that agency now refers to the "unlawful or arbitrary deprivation of life." This kind of manipulation is motivated by the same impetus that moves a bureaucracy to "encapsulate controversial policies and programs into slogans such as 'Vietnamization' and to recruit support for the slogan without indicating what if any substance lies behind it."[9]

An increasing number of abstract words are terms that bureaucrats have invented themselves! *Prioritize* I have already mentioned. Others include *nonconcur*, *impact* (as a verb), and *utilize*. (What on earth is the difference between *utilize* and *use*?) The latest "school solution" catchword whose appearance guarantees an Air Force document's acceptance is *enhance*. Don't say *increase*, or *improve*, or *enlarge*—say *enhance*. It is already so overused it is truly bureaucratic nonspeak.

Easily the most overused way to inactivate writing is to overconstruct. We are much more likely to read about "the briefing, presented by Major Smith" in a bureaucrat's paper than about "Major Smith's briefing"; similarly, "the policy of Colonel Harrison" is much more bureaucratic than "Colonel Harrison's policy." In fact, "of" and "of the" constructions are almost always talismen of bureaucratic writing ("removal of the . . ." instead of "removing the . . ."; "design of the . . ." instead of "designing the . . ."). Such constructions use a noun instead of a gerund and add an unnecessary word ("deferral of the action" instead of "deferring the action").

Part of the bureaucrat's repertoire is "doubling" to reinforce his point. Why say "forceful" when you can say "forceful, emphatic"? Why only say "careful" when you can say "careful, deliberate"?

Finally, the bureaucrat's lack of trust that prompts his use of excessive words and repetitious language also causes him to doubt the meaning of words themselves. Using a noun such as *emergency* is not enough. The bureaucrat must say "a *serious* emergency." Instead of relying on a word to convey meaning or "qualifying" a noun or verb downward and limiting its meaning (a "partial engagement," the "incomplete plan"), the bureaucrat modifies "upward" or tries to reinforce a thought already complete: the "full program," "an erroneous miscalculation."

writing to "impress" others

The other category of bureaucratic imprecision in writing is using language to impress. The leading device—without contest—is jargon. While most bureaucrats will excuse their jargon because it conveys precise meaning no other words can, the ultimate reason they use it is because it sounds impressive! Anyone can say

that "this budget account holds money for another agency until they need it," but any financial bureaucrat worth his service seniority will say that "this budgetary category is a fiduciary account pending fiscal exigencies."

Jargon does much more than convey specialized meanings; it makes its user look "savvied," experienced, all-knowing in that field. The attitude of the jargonist is something like "If they don't understand it, they probably shouldn't be reading it!"

One will uncover as many specialized forms of Air Force jargon as one can find fields of knowledge. Computer technicians cannot understand physicians' jargon, and logisticians' argot is undecipherable to personnel specialists. Perhaps the most frustrating are writings of behavioral scientists and systems analysts, whose argot sounds like the language you and I use every day but has meanings we have never used.

Finally, the device most often used by bureaucratic writers to impress and extend logic is the passive voice. Unfortunately, since the passive voice puts the subject last, that subject can be (and often is) omitted. Consequently, while most ordinary people might say, "I erased the computer disk," the bureaucrat will first try "The computer disk was erased by me." Then, realizing he can "hide" the responsibility for that act, he will write, "The computer disk was erased." (In this particular case, that version would probably suggest revoicing the sentence again to eliminate any human involvement: "The computer disk erased"!)

To those government bureaucrats who have decided to make their writing active, let me warn you: active voice demands a subject. During my years in DOD bureaucracies, I have learned that subjects ("doers" or "actors") are frequently hard to find. Often, when I have challenged passive construction, I have found that no actor exists—or no one is willing to acknowledge one. Because recasting a thought in the active voice *demands* a subject, it often puts a cautious bureaucrat in the uncomforta-

ble position of actually admitting *who* is doing the action! The passive voice is as close as the bureaucrat comes to a chameleon's protective coloration.

How to Change

Since writing is the visual expression of your thinking, the purpose of writing should be to give your reader a graphic trail of your reasoning, your logic, your argument. Whatever the purpose of your letter, paper, or report, you will better convince the reader of that purpose if he or she can see your logic pattern and can follow you to your conclusion.

How can even a bureaucrat do that?

The first step, before you even write a word, is to understand for whom you are writing. Ben Franklin once observed that if you want to convince someone, "speak not to their reason, but to their interests." That advice has never been more true. If that audience shares your knowledge of the subject, perhaps jargon is indeed advisable, but be personal and direct: talk to that audience.

The second step is to reduce your paper to its essential purpose.

Please review this draft policy and give me your comments by Wednesday, 12 August.

Challenge every element of your message. If a portion will in any way distract from your essential purpose, either modify it or drop it!

Sketch the basic pattern of your logic; indicate your line of reasoning. For anything greater than a short letter, you should sketch an outline. If your logic is faulty, you will find out there.

Emphasize relationships. From the parts of sentences to the order of paragraphs to the pattern of ideas, how they all relate to one another is crucial. Here you are marking that logical path with clear directional signs. You are not patronizing your reader. Instead, you are making sure he or she travels the same path you have traveled to get to your conclusion. For

example, you have drafted these three sentences:

> This department has an interest in long-range planning.
> Our charter includes development of future programs.
> We should be represented on the corporate Long-Range Planning Board.

Ask yourself whether they relate. If they do, how? You should not only tell your reader these three important thoughts but also reveal their relationships:

> Since our charter includes developing future programs, this department is interested in long-range planning. Consequently, we should be represented on the corporate Long-Range Planning Board.

Of course, to be able to mark clearly the relationships of your words, *you* first will have to see those relationships! The more you write, the more you will find that this single aspect will help refine your thinking.

Use analogies, similes, and other comparisons. These devices help your reader put the concept you are discussing in the context of something he or she better understands. For example, discussing how a portion of the federal budget works might seem clearer to someone who does not work with it daily if you compare it to a household budget—but make sure your analogy survives close comparison.

> Just as you manage your household budget, the federal government decides what it needs to buy and how much it needs to spend, matching that outlay against what it has in the bank (U.S. Treasury receipts from taxes). If it does not have enough funds, like you, it must borrow. Also, like you, it must then pay interest on that debt (the national debt). However, unlike you, if it finds that debt rising above its ceiling, it simply raises that ceiling.

Simplify your verbal symbols. The simpler the words (with fewer connotations and overtones), the leaner the logic train.
Avoid:

> Disseminate changes to all personnel, ensuring

appropriate methodology is discussed to facilitate comprehension.

Try:

> Pass these changes to all your people, and make sure they understand why we have made them.

If you think that *utilize* better characterizes what you mean than *use*, then you're using the wrong words altogether! "Utilize" and "use" mean the same thing—one just says it more pretentiously than the other.

Use the best places for emphasis in your sentences and paragraphs and paper—the ends and the beginnings. The end is the strongest because it is the last thought in the reader's mind as he moves to the next part:

> If it applies to your employees, subscribe to the magazine.

The beginning is next best because it is the first thought on a "blank" mental "page":

> Subscribe to the magazine if it applies to your employees.

The middle is the weakest because it is easy to "gloss over":

> If it applies, subscribe to the magazine for your employees.

ALTHOUGH you may see exceptions, much Air Force writing is of this bureaucratic ilk. Given the fundamental territorial imperative of the bureaucratic animal, Orwell's basic judgment of political writing applies here as well: "The great enemy of clear language is insincerity."[10] The only way to clear writing is to go directly to the concrete thought and express it accurately. That process is, I must admit, antithetical to most of the survival and protective instincts of the bureaucrat. Consequently, I close with a word of caution. Robert K. Merton, another observer of bureaucratic behavior, describes a characteristic trait of bureaucracies:

Since the group is oriented toward secondary norms of impersonality, any failure to conform to these norms will arouse antagonism from those who have identified themselves with the legitimacy of these rules.[11]

Ignoring the inviolable—but unspoken—bureaucratic writing rules I have just elaborated will probably invoke this antagonism. Be prepared for resistance and friction. Bureaucracies are not noted for accepting change willingly.

Merton points out also that successful bureaucracies have attained "a high degree of reliability of behavior, an unusual degree of conformity with prescribed patterns of action."[12] They will not change easily—even in the face of logic, reason, and clarity. But if enough people write logically, rationally, and clearly, that writing itself may become a "prescribed pattern of action."

Wright-Patterson AFB, Ohio

Notes

1. Curiously, the etymology of *bureaucracy* joins the French *bureau*—originally referring to the woolen covering for a writing desk, then to the desk itself—and the Greek suffix for "power, rule." Our modern meaning of the word is "governmental administration through bureaus."

2. John D. Bergen, "Military Language: Barometer or Booby Trap?" *Military Review,* June 1975, p. 19.

3. George Orwell, "Politics and the English Language," in *Readings for Writers,* edited by Jo Ray McCuen and Anthony C. Winkler (New York: Harcourt Brace Jovanovich, 1974), p. 284.

4. Orwell, p. 276.

5. Louis B. Lundborg, "The Voices of Business," in *The State of Language,* edited by Leonard Michaels and Christopher Ricks (Berkeley: University of California Press, 1980), p. 394.

6. Max Weber, *The Theory of Social and Economic Organization* (New York: Oxford University Press, 1947), pp. 19-20.

7. Jacqueline Berke, "The Quality of Good Writing," in *Readings for Writers,* edited by Jo Ray McCuen and Anthony C. Winkler (New York: Harcourt Brace Jovanovich, 1974), p. 38.

8. Weber, p. 4.

9. Ibid., p. 145.

10. Orwell, p. 283.

11. Robert K. Merton, "Bureaucratic Structure and Personality," in *Reader in Bureaucracy,* edited by Robert K. Merton, Ailsa P. Gray, Barbara Hockey, and Hanan C. Selvin (Glencoe, Illinois: Free Press, 1952), p. 365.

12. Ibid., p. 370.

SOUTH AFRICAN DEFENCE FORCE: DEFENDING WHITE AFRICA

Dr. Thomas P. Ofcansky

THE South African Defence Force (SADF)—which consists of the Permanent Force, Citizen Force, Commandos, and Auxiliary Services—is one of the strongest and most innovative military organizations in the world. Since the mid-1970s, for example, the SADF, often using locally designed and manufactured weapons such as the 155-mm G-6 self-propelled gun and 127-mm multiple rocket launcher, has struck targets throughout southern Africa with relative impunity. Despite the SADF's reputation and many achievements, however, little is known about its operations and organization. Even South Africa's latest official yearbook only contains five pages about the country's military establishment.

Four recently published books have shed some light on the inner workings of South Africa's armed forces. Helmoed-Römer Heitman, a member of the South African Army Citizen Force and a military affairs journalist, has written a profusely illustrated, semiofficial study titled *South African War Machine,* which purports to give "an authoritative and com-

prehensive description" of the SADF.† In addition to discussing the historical evolution of the Army, Navy, and Air Force, Heitman examines most of South Africa's special forces groups, including the elite 1st Reconnaissance Commando, the 44th Parachute Brigade, the largely black 32d Battalion "Buffalo Soldiers," and the South-West African Specialist Unit.

Also, the author describes the relationship between the SADF and the defense forces of the nominally independent homeland republics of Transkei, Bophuthatswana, Venda, and Ciskei. Other chapters pertain to the Armaments Corporation of South Africa (ARMSCOR), which produces all arms and equipment too sensitive to entrust to private enterprise or unavailable on the international market because of sanctions; counterinsurgency operations in South West Africa (Namibia); antiterrorist operations in Lesotho and Mozambique; and South Africa's 1975 intervention in Angola.

In view of Heitman's relationship to the SADF and the fact that he submitted the manuscript to the government in Pretoria for policy review, *South African War Machine* contains no surprises or meaningful analysis of recent operations. Moreover, at the publisher's request, the author avoided any mention of politics, particularly the subject of racial discrimination. To make matters worse, the book lacks documentation and a bibliography. What the reader is left with, therefore, is a narrative survey that serves as only a basic introduction to the SADF.

F ROM a different perspective, Robert S. Jaster analyzes South Africa's continuing diplomatic and military struggle against the South West African Peoples Organization (SWAPO).†† Contrary to the opinion of many observers, Jaster, a freelance analyst and part-time lecturer, maintains that SWAPO has failed to disrupt Namibia's economic life or to pose a serious threat to South African authority. Jaster does argue, however, that South Africa's Namibia policy lacks a coherent plan for the territory's future political development.

In terms of explaining the SADF's role in the Namibia conflict, *South Africa in Namibia* contains an interesting supposition—namely, that senior SADF officers may have acted independently from the Botha government and ordered at least some of the Namibia military operations and cross-border raids into Angola against SWAPO sanctuaries to wreck chances of a settlement. According to this interpretation, the attacks provoked SWAPO into repudiating all peace initiatives, thereby freeing South Africa to proceed with a military solution and to avoid being blamed for the collapse of negotiations. In view of the fact that General Constand Viljoen, former Chief of the South African Defence Force, recently admitted that the military had pursued similar goals in Mozambique by continuing to support anti-Marxist Mozambique National Resistance rebels without government authority and in clear violation of the nonaggression pact between the two countries, Jaster's theory may well be true.

Jaster also reveals that, apart from military considerations, SADF activities in Namibia and southern Angola have yielded valuable economic benefits. To help increase international arms sales of missiles, tanks, armored personnel carriers, and naval craft, ARMSCOR officials make arrangements for prospective buyers to visit the operational area for on-the-spot evaluation of "battle-tested" weapons. This strategy—coupled with ARMSCOR's par-

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†Helmoed-Römer Heitman, *South African War Machine* (Novato, California: Presidio Press, 1985, $20.00), 192 pages.
††Robert S. Jaster, *South Africa in Namibia: The Botha Strategy* (Lanham, Maryland: University Press of America, 1985, $7.75), 122 pages.

ticipation in such arms exhibitions as the 1982 Greek Defendory Exposition and the 1984 Fida International Air Show in Chile, plus favorable reports in many technical journals and magazines, such as the authoritative *International Defense Review*—has resulted in worldwide recognition of South Africa's ability to produce sophisticated armaments.

Because of rapidly changing events throughout southern Africa, *South Africa in Namibia: The Botha Strategy* contains at least one outdated observation. Jaster claims that although South Africa has justified its increasingly aggressive cross-border raids into Angola by alleging Soviet military involvement with SWAPO, "no Soviet combat troops have appeared in Angola." This is no longer the case. On 3 September 1985, Senior Lieutenant K. Kirov Vioroshilov became the first Soviet soldier to die in combat in Angola. His death gives credibility not only to South Africa's accusations of a Soviet-SWAPO connection but also to reports that Soviet army officers started directing offensive operations at the brigade, battalion, and possibly even company levels shortly after Mikhail Gorbachev's rise to power in March 1985.

Unlike Heitman, Jaster fails to mention the role of SADF special forces units in the Namibia conflict. The 1st Reconnaissance Commando, which is similar in composition to the British Special Air Service, has not only carried out many intelligence-gathering missions in Namibia and Angola but also participated in attacks against SWAPO guerrillas. However, in all fairness, it should be pointed out that open sources rarely include information about such units or their operations. Another minor shortcoming is the lack of any discussion about the organizational relationship between SWAPO and its military arm, the People's Liberation Army of Namibia (PLAN). Despite

these few omissions, *South Africa in Namibia: The Botha Strategy* is essential to anyone who wishes to understand South African military affairs.

J ASTER also edited *Southern Africa: Regional Security Problems and Prospects*, which is a collection of five essays that originally appeared in the International Institute for Strategic Studies *Adelphi Papers* series.† Although each selection explores a different facet of southern Africa's security predicament, three of them are particularly useful for understanding the SADF's historical evolution and future prospects. Apart from assessing the chances for peace and stability, the editor's two contributions, titled "South Africa's Narrowing Security Options" and "A Regional Security Role for Africa's Front-Line States," include information about the SADF budget, manning levels and force structure, and arms expenditure rates, in addition to describing the military's relationship to anti-Marxist rebel groups in southern Africa.

In his essay titled "South Africa: A New Military Role in Southern Africa 1969-82," Christopher Coker, a lecturer in international relations at the London School of Economics, provides the most useful analysis of the SADF. Beginning with the SADF troop buildup in Rhodesia (now Zimbabwe) during the late 1960s, Coker discusses all major ground and air strikes against Mozambique, Angola, Lesotho, Zambia, and Zimbabwe. Such raids, according to the author, will continue as long as South Africa believes that neighboring countries are supporting the outlawed African National Congress or SWAPO guerrillas.

A UTHOR Willem Steenkamp's *Borderstrike!* is a detailed account of the SADF's

incursions into Angola (Operation Reindeer, 1978; and Operation Sceptic, 1980) and Zambia (Operation Revenge, 1978) against SWAPO guerrilla groups.† According to the author, who is the *Cape Times* military correspondent and has served with the SADF in the operational area, the book "tells the story of ordinary . . . men involved in bitter fighting, of careful planning that went awry through force of circumstance, and seat-of-the-pants decisions that worked for no reason other than that some people have a good sense of intuition."

The South African government reviewed *Borderstrike!* for possible security breaches and also required Steenkamp to use pseudonyms for many SADF personnel quoted in the book. Nevertheless, the author maintains that the book is a "reasonably accurate" analysis of what day-to-day life was like for the average soldier during these cross-border operations. In addition, *Borderstrike!* affords the reader the rare opportunity to study operational maps and performance capabilities of many SADF weapon systems—something none of the other books contain. Moreover, although the photographic illustrations in *Borderstrike!* are black and white and often of poor quality, they are more realistic and valuable to a military analyst than those in *South African War Machine,* many of which undoubtedly were staged.

On the negative side, according to the author's own admission, the book lacks "true objectivity"; indeed, the reader often has the impression that some passages belong in a SADF public relations pamphlet. Steenkamp also failed to include a bibliography and index. Despite these shortcomings, *Borderstrike!* is a worthwhile report on the SADF in action and would be a welcome addition to any military library.

DESPITE the fact that these four books contain an impressive array of information, the SADF remains an enigma. None of the authors examine the nature of South Africa's military relationship with Israel. Supposedly, these two countries freely exchange intelligence, as well as scientific and military technology; and Israeli advisors are rumored to have accompanied the SADF on various operations. Even such issues as the SADF's reported use of torture, lethal gas, and low-yield nuclear weapons against SWAPO; its supposed recruitment and use of foreign citizens and mercenaries; and its intelligence and covert activities in foreign countries are not addressed. Nevertheless, the authors cannot be blamed for these flaws: information about these matters is simply unavailable. Undoubtedly, a more comprehensive study of the SADF will appear sometime in the future. Until then, interested readers can rely on the books discussed in this review to gain a fairly good appreciation of the SADF and its operations.

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†Willem Steenkamp, *Borderstrike!* (Durban and Pretoria: Butterworths Publishers, 1983, $22.50), 266 pages.

Short Bursts

The New Direction in American Politics edited by John E. Chubb and Paul E. Peterson. Washington: Brookings Institution, 1985, 409 pages, $9.95 paper, $26.95 cloth.

Assessments of the Reagan presidency have already begun, but as this volume demonstrates, one will have to wait several years before confidently issuing long-term postmortems. *The New Direction in American Politics* is a comprehensive book in which fifteen contributors span political, economic, military, and institutional issues. Its broad perspective enables analyses at both practical and philosophical levels, while differentiating between possibly transient gains and more permanent systemic alterations affected by the Reagan administration. Indeed, this collection of assessments can be used as a reference work on Reagan's performance to date.

The thesis of *The New Direction in American Politics* is that American politics has changed. The Republican party has redefined the terms of policy debates at the expense of programs and preferences of the past five decades. "The fragmented coalition once known as the Democratic party," as editors John Chubb and Paul Peterson phrase it, must work to retool its programs in order to catch up with Republican gains. However, the Democrats still retain formidable power outside the White House at all levels of government. The New Deal has not been abandoned, but the question is now one of *degree* of government activism, instead of activism per se. For instance, the "new federalism" has barely altered federal centralization. In some cases, forces for change and adroit legislative minuets have been moderated by stabilizing bureaucratic institutions.

Not only could specific Reagan policies be transient, but one policy consequence—the ballooning federal deficit—may actually be dangerous. One of the authors cautions that a future recession coupled with the deficit could prove disastrous for government activities and for the economy in general.

It is still too early to assess Reagan's tenure as President. To do so would be analogous to closing the book on FDR's presidency in 1937. We must wait. At most, Chubb and Peterson contend that a new American political landscape will emerge. At least, they remind the reader that realignments, or shadows thereof, are not merely electoral phenomena but changes that encompass attitudes, arguments, policies, and ways of doing business.

Dr. Robert A. Vitas
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Security or Armageddon: Israel's Nuclear Strategy edited by Louis René Beres. Lexington, Massachusetts: Lexington Books, 1986, 237 pages, $12.95 paper.

The subject of this book has aroused both speculation and heated debate. Defense strategies in the Middle East have been, and continue to be, forged based on two diametrically opposite possibilities: Israel may or may not have the "bomb." Through this collection of essays by well-known scholars, Louis René Beres of Purdue University presents what the world knows about Israeli nuclear capabilities, strategy, and intent. Ranging from advocacy of an active nuclear deterrent posture to a scholarly discussion of the legality of nuclear war, *Security or Armageddon* provides an in-depth and definitive look at the ramifications of nuclear proliferation in the Middle East.

The strategic possibilities raised in the book include a nonnuclear posture (conventional deterrence), a posture of "deliberate ambiguity," and open testing and deployment of nuclear weapons. Each is treated thoroughly and convincingly, providing in the process an interesting analysis of the political ambiguities and complications one encounters when trying to analyze the political environment of this region on whose peace the future peace of the world seems to increasingly depend.

The stated position of the Israeli government has been, from the outset, that Israel would remain nonnuclear, despite occasional indications to the opposite, as in the 1970s when such illuminaries as Moshe Dayan advocated an open nuclear development and deployment posture. Theories about a covert nuclear weapons program have been kept alive by politically ambiguous acts such as that of the Rabin government's Foreign Minister Yigal Allon. (Allon proposed establishment of a nuclear weapon free zone in the Middle East at the United Nations in September 1975 after voting against the same resolution when it was offered by Iran and Egypt only a year before.) While maintaining a conventional posture, Israel has provided evidence of a "no first introduction" nuclear policy. Authors in the book cite the 1981 attack on an Iraqi nuclear reactor as either proof of Israeli determination to prevent nuclearization of the Middle East conflict or proof that Israel would retain the option of being the first regional power with the capability.

The political effect of this public ambiguity appears to have benefited Israeli national security,

since potential aggressors have had to consider the possibility that Israel does have a "bomb in the basement" and, to ensure its national survival, one of its prime stated national objectives could be to use the bomb. The 1973 war and Israeli Defense Force (IDF) experiences have made it clear, however, that the IDF cannot fend off another massive attack by Arab armies supported in depth by Libyan and Soviet advisors. To Shai Feldman and others, this means that Israel must "go nuclear" to present the ultimate deterrent to potential invaders.

The ramifications of nuclear weapons—their deployment, their efficacy, and the regional effect of their presence—are discussed in depth and intelligently in *Security or Armageddon*. Regional deterrence is presented in the context of the value systems of the countries involved, with both optimistic and pessimistic outcomes. In an interesting sidelight, "microproliferation" (i.e., the spreading of nuclear arms to terrorist groups from Arab countries following Israel's lead) is presented as a prospect that could throw the worldwide nuclear balance into disarray.

My only criticism of this book is the redundancy in the articles. Feldman's ideas, the concepts of deterrence and nuclear proliferation, and international alliances, just to name a few, are discussed in virtually every article, making an otherwise interesting book rather difficult to get through at times. With a little more editing, Beres could have made this book much more readable without affecting either the quality or the relevance of its content.

Overall, *Security or Armageddon* is an excellent study of an issue that could affect us all. It is worth the time to read and should be on the reading list of everyone who follows geopolitical and nuclear issues.

Major Gary D. Loftis, USAF
Barksdale AFB, Louisiana

OPEC: The Failing Giant by Mohammed E. Ahrari. Lexington: University Press of Kentucky, 1985, 256 pages, $25.00.

This volume should be of value to anyone interested in the dealings between the oil-producing countries and those purchasing their product, particularly how those dealings have led to the oil glut that produced today's plunging oil prices.

Mohammed E. Ahrari, Professor of Political Science at East Carolina University, examines the relations between the sellers—the oil-producing countries—and the buyers—the oil companies—over the period 1901-85, a relationship that ultimately involved direct transactions with the governments of the oil-consuming nations.

The main focus is on the events leading to the genesis of OPEC and on how those events transformed the world's oil market. For many years, the international oil market had remained a buyers' market as the giant oil companies held the upper hand over the oil-producing countries. This situation persuaded the oil-producing states that only by forming a united front could they deal successfully with the oil corporations.

After the birth of OPEC, the world oil market switched to a sellers' market as the oil-producing states raised prices by limiting or reducing production. In the 1970s, OPEC achieved power and prestige far beyond the expectations of its founders. Successive price hikes swelled OPEC's total revenues to more than $278 billion by 1980.

However, a number of circumstances ultimately reduced OPEC oil power: disagreement among members relating to prices and production quotas; conservation measures and changes to other fuels by the industrial countries. Perhaps of more significance was greater production by non-OPEC nations, such as Mexico and Britain, a development that eventually cut OPEC's share of world production from 50.6 percent in 1970 to 32.1 percent in 1981. A conclusion that a reader may gain from this account of the rise and subsequent collapse of OPEC power might be that no multinational cartel can maintain, over the long run, price controls over its product.

This well-documented book contains tables, figures, and a comprehensive chronology. Although it may have little appeal for the casual reader, *OPEC: The Failing Giant* offers an excellent overview of the problems confronting the international oil system through most of this century.

George Ott
Corvallis, Oregon

Jane's Aviation Review edited by Michael J. H. Taylor. London: Jane's, 1985, 176 pages, $18.50.

Michael J. H. Taylor has produced yet another hallmark book in *Jane's Aviation Review*, the fourth and best of Jane's editorial efforts to capture in a single volume all that is worth reading about in the field of aviation. His editorial perspective includes multiple and diverse topics of interest for readers ranging from the aviation buff to the aerospace engineer. Taylor has assembled the works of eighteen credible and skillful writers and included excellent photographs to capture the reader's interest and embellish the written word.

Taylor's introductory piece presents both a preview and an overview of the volume. He begins with

an assessment of commercial aviation growth and then discusses the U.S. aviation industry's recovery in the aftermath of the Vietnam War. He concludes with the observation that the 1980s may signal the "beginning of a new East-West understanding on the basis of respect rather than fear" and proposes that space represents the new frontier with opportunities for cooperation that may soften superpower rivalry. There is quite obviously a lot between that beginning and that ending, as is made clear as the reader peruses the pages between the book's leadoff selection titled "Simplicate and Lose Your Shirt" (on fighter aircraft design) and the final selection, "Commuterliner Cornucopia," which reviews the thirty aircraft types on offer to the regional airlines of the world. Between those two pieces are twenty-five articles on different subjects that are certain to enlighten the mind and challenge the imagination. Michael J. H. Taylor has done it again.

> Colonel James L. Cole, Jr., USAF
> *Andrews AFB, D.C.*

The Patterns of War since the Eighteenth Century by Larry H. Addington. Bloomington: Indiana University Press, 1985, 318 pages, $10.95 paper, $29.50 cloth.

In providing this fine addition to available texts on military history, Larry H. Addington writes with authority on a wide range of military affairs, beginning with the transition from dynastic to national warfare that occurred between 1775 and 1815, which he considers "a revolution in Western warfare" and a logical point of departure. He carries his account through the Anglo-Argentine War of 1982 in the South Atlantic.

Although Professor Addington's "underlying assumption" is that "the history of warfare is best understood as a process of change in war's social-political, technological, and organizational aspects," his book is primarily a good campaign history emphasizing strategy, tactics, and operations. Surprisingly, after he reaches the wars of this century, he gives little attention to individual military leadership—a curious omission since surely there must be some relationship between individual initiative and subsequent patterns of warfare. Addington is at his best in discussing land warfare. In his comments about B-29 operations in World War II, in contrast, he is confused about General Curtis LeMay's initial involvement in the Pacific campaign.

Addington provides, in essence, five chapters on the development of patterns of war in various periods since the eighteenth century, plus two chapters—on World War I and World War II, respectively—that illustrate the climax and application of those patterns. Unfortunately, the periods preceding those wars (particularly World War II, as Addington notes) did not clearly indicate the direction that war would take. What Addington does make ably clear throughout the text, however, is the ever-increasing role of technology in warfare.

As a historian, Addington is properly circumspect about making predictions. Nevertheless, he concludes with some observations as to probable future patterns of war: the continuing threat of nuclear and biochemical warfare, the continuance of recurring conventional wars, and the flourishing of guerrilla warfare and terrorism (which, in turn, will lead to greater attention to counterinsurgency and antiterrorist methods).

The Patterns of War since the Eighteenth Century contains good outline maps of major wars and campaigns, which have the virtue of not being overladen with data. There are diagrams of some basic military formations and maneuvers for the period 1775-1815, but, unfortunately, that feature is not continued for later periods. The selective bibliography is more than adequate for the general reader. *The Patterns of War* is a text that should be seriously considered by anyone offering a course in the history of warfare since the eighteenth century.

> Dr. George W. Collins
> *Wichita State University, Kansas*

And Brave Men, Too: The Unforgettable Stories of Those Who Were Awarded the Medal of Honor in Vietnam by Timothy S. Lowry. New York: Crown Publishers, 1985, 246 pages, $14.95.

According to Timothy S. Lowry, there are only about 279 *living* recipients of the Medal of Honor. The Medal of Honor is our nation's highest award, usually bestowed posthumously, but sometimes awarded to service survivors who demonstrated valor and gallantry *far beyond* any normal call of duty or risk of self for their countrymen. The deeds in this book about Vietnam valor will wet your eyes and stimulate your body's fighting reflexes. To read what Americans did to earn this honor in acts illustrating loyalty and absolute determination is inspirational.

"I'd give my immortal soul for that decoration." You might guess who said that to a young soldier at Casablanca in 1943. General George S. Patton never earned the honor he so proudly presented, but he is remembered for his grit nonetheless. President Harry S. Truman said, "Awarding the Medal of Honor is

the most pleasurable of all presidential duties."

General Dwight D. Eisenhower refused the medal for recognition of his leadership in European campaigns. Many years later, he told a GI upon whom he had just bestowed the medal, "Son, I would rather have the right to wear this than be President of the United States."

Perhaps this phrase best summarizes all Medal of Honor Americans: they were recipients of the award "for conduct in which manhood rises above self."

Colonel Richard Pilmer, USAF
Scott AFB, Illinois

Women in War: First-Hand Accounts from World War II to El Salvador by Shelley Saywell. New York: Viking, 1985, 304 pages, $17.95.

Women in War tells the very intense personal experiences of twenty-two women from eight countries who have participated in wars from World War II to El Salvador. The overwhelming impact of this book is summed up by Shelley Saywell in the brief introduction. She states, "What these stories prove is that in today's world men and women share the responsibility for the fighting of wars and the fight to preserve peace. War is not, can no longer be, a male domain."

Saywell allows each woman to tell in her own words how she made her commitment to war, how she was treated by her male comrades, her ability to kill, the emotional toll, and how her war experiences changed her. The author skillfully weaves their stories together, often pairing women with similar experiences but with contrasting personalities.

In spite of the tremendous sadness and suffering that is depicted, this book is very positive. It should be required reading for every military member, from new recruit to career professional. It will make women proud of their decision to serve in the armed forces, and it will give men and women alike a great sense of humility in the face of awesome courage.

Over and over, the women echo the same refrain, "We fought because we had to, because we had no choice. It wasn't a feminist thing; it was our duty." *Women in War* puts the focus on the role of women in the military where it belongs—not on equal rights, but on equal responsibility.

Judith Galloway
Pensacola, Florida

The Last Two Years of Salvador Allende by Nathaniel Davis. Ithaca, New York: Cornell University Press, 1985, 480 pages, $24.95.

If Ambassador Nathaniel Davis is to be believed, his portrayal of the downfall of Salvador Allende in 1983 and the United States' role in that tragic event is the most revealing to date. It is, indeed, a fascinating and detailed history of the first freely elected Marxist in the Western Hemisphere, covering the period from when Allende took office as President of Chile in 1971 to the bloody military-led coup that overthrew his administration on 11 September 1973. There is no other day, no other act, that has so affected the modern history of Chile as the latter. That the leader of the junta, General Augusto Pinochet, still governs Chile today, twelve years after the coup, makes *The Last Two Years of Salvador Allende* not only fascinating in its own right but timely as well.

Davis went to Chile in 1971 as U.S. ambassador and served in that post until November 1973. He was there, and he was indisputably a principal actor in the drama that ensued as Allende strove to bring his brand of economic and social justice to Chile. To Chileans, the U.S. ambassador represented all the good or evil that could be brought to bear on their nation's destiny. In this book, Davis tells his story, stripping away the hearsay, the innuendo, and the false and faulty interpretations. In its place is a story told with candor, sympathy, and an amazing amount of detail by a former top public official. It is not an apologia, such as politicians are wont to produce to justify acts, but an explanation, a statement of record. Yet, it is more than that.

Davis not only drew from his own special, privileged knowledge of events but also made a historian's search into the vast documentation of the era. I have read no better account of the Allende years, in English or Spanish. The ambassador's writing is particularly strong in the narrative portions of the book, especially when he puts analysis aside and tells the story of the last ten days of the Allende regime. It is narrative history at its best: compelling, exciting, filled with detail of human beings in crisis.

Davis attacks the great issues head on. In 1970, the presidential election in Chile was thrown into the legislative body because none of the three presidential candidates, including Allende, received a clear majority. Did the United States promote a military coup in 1970 to forestall the election of Allende by the Chilean Congress? Yes. The operation, labeled Track II, was authorized by Richard Nixon and Henry Kissinger. It failed.

Did the United States promote the coup of 1973 that succeeded? No. The answer and the evidence that the ambassador provides are unambiguous and clear.

Did the United States bring about the fall of Al-

lende by a persistent, corrosive unfriendliness between 1970-73? No, says Davis. The Allende tragedy was born of Chile's own idiosyncracies and unwillingness to supplant an open, Western-style parliamentary democracy with a closed, Marxist model. But, Davis also claims quite convincingly, what we learned between Cuba in 1959 and Chile in 1971-73 helped produce the end of the Allende regime, for better or worse.

Did a combat military patrol murder Allende on the afternoon of the coup as it burst into the smoking and littered presidential palace, La Moneda, to rout out the last of Allende's defenders? Or did the president commit suicide with a submachine gun held between his legs and aimed into his cranium?

The application of power and the results of that application fill this book. Given today's situation in Central America, the themes and lessons are timely, immediate, and—I think the reader may sometimes discover—surprising. Ambassador Davis can be believed, and *The Last Two Years of Salvador Allende* should be read by U.S. planners and strategists taking us down to the briar patch of Central America today. What they plan and what they get, in many ways, will be a function of how well we learned the lessons of Fidel Castro and Salvador Allende.

Dr. Lawrence A. Clayton
University of Alabama, Tuscaloosa

The Air War: 1939-1945 by Janusz Piekalkiewicz, translated by Jan van Heurck. Poole Dorset, England: Blandford Press (in the United States: Harrisburg, Pennsylvania: Historical Times), 1985, 436 pages, $19.95.

Published in German in 1978, *The Air War: 1939-1945* by Janusz Piekalkiewicz was released in an English-language version in 1985. It is structured chronologically, with a chapter covering each six months of the air war from Poland in 1939 to Japan in 1945. Each chapter, in turn, is subdivided into two parts. In the first part of the chapter, Piekalkiewicz provides summary-paraphrases of press releases from various belligerents and neutral nations. Thus, private agencies (such as Reuters) and newspapers (such as Sweden's *Svenska Dagbladet*) are represented, as are government bodies, including, for example, the Wehrmacht High Command (OKW). The second, much longer part of each chapter is headed "Strategy and Tactics" and is also organized chronologically.

The student of World War II will find little that is new in this volume, but *The Air War: 1939-1945* does present a mass of information about the uses of air power and occasionally the misuses: the attack on Dresden, Germany's earlier "Baedeker raids" on such historic British cities as Bath and Canterbury, and the Allied persistence in area bombing of German targets even after evidence about the lack of effectiveness of the bombing had begun to accumulate. A consistent theme of the book is the incessant striving for technological superiority, especially in the use of radar. For example, both the British and the Germans refrained from using radar-jamming foil, for, ironically, neither thought its adversary had conceived of it and each feared that to employ foil in combat would cause the other side to immediately use it as a countermeasure. Termed "Window" by the British, foil was shelved for almost a full year in the European air war while the Japanese independently developed their own differing version of "Window"—"tricking-paper," as they referred to it—in time to virtually blind America's radar-aimed antiaircraft weaponry during the American night-bombing raids on Guadalcanal.

In a work of this scope, errors are inevitable. References to Admiral Ernest J. King as Admiral "Ring" and to Rabaul as a U.S. base are obvious examples. However, such mistakes are not sufficient to detract from this volume's appeal. Perhaps the book's most valuable feature is its lavish use of statistics (for instance, a list of the principal air attacks on German targets and the tonnage of bombs dropped in each of these attacks), its illustrations, and its charts and graphs (some, such as air distances and distribution of forces, being quite helpful). *The Air War* is not a work that one will wish to read at one sitting, but, as a work of reference, it will be a worthwhile addition to the literature of the Second World War.

Dr. Lloyd J. Graybar
Eastern Kentucky University, Richmond

A Time of War: Air Force Diaries and Pentagon Memos, 1943-45 by James Gould Cozzens, edited by Matthew J. Bruccoli. Columbia, South Carolina: Bruccoli Clark Publishers, 1984, 407 pages, $29.95.

Being present at *any* creation is an opportunity not often afforded ordinary people, whether that creation be paradise, India, or the Pentagon during World War II. James Gould Cozzens, while not really present in the sense that he manipulated events, *did* occupy a unique and privileged position during that time. He was thirty-nine years old and already an accomplished writer when he entered the Army Air Forces (AAF) in 1942. His task was to

summarize for higher officials those events from around the world which could cause unfavorable publicity for the AAF. Cozzens had access to the daily Top Secret "scandal sheet," as it was familiarly known, and he focused his energies on reports that would give the decisionmakers a heads-up on key facts and figures, on something going wrong, or on something that was potentially explosive. He also was called on to write speeches and public statements for senior AAF leaders, including the Commanding General himself, General Henry "Hap" Arnold.

A Time of War is a unique compilation of personal observations and official events during World War II. While one of Cozzens's diary entries might reflect the trials and tribulations of everyday life at the Pentagon (the place hasn't changed much, it seems) or additional research necessary to complete his memos, the final memo—the one sent to the Chief, Office of Information Services—is printed chronologically close to the diary entry to assist in continuity and context. Somehow, the method of presentation seems to work, and we are exposed to an all-too-swift tour of life and events within the wartime Pentagon. That kind of tour tends to create a range of reactions and emotions. What makes the book entertaining is its candor; what makes it valuable to students of air power is the text of the official memos that Cozzens typed for his superiors. There are detailed, occasionally numbing statistical summaries; but these are relatively rare excursions in the book. While some students and researchers might be interested to know that, as of 8 August 1944, there were fifty-eight Army Air Forces and forty-eight Royal Air Force squadrons in France, other readers are more likely to be excited, angered, fascinated, or afflicted with a sense of déjà vu when reading about the role and duties of women and blacks in the AAF. Then there are the reports of racial and religious discrimination, public outcries over cost overruns, misuse of military boats and planes by senior officers, lengthy discussions on the attitude and general morale of fighter pilots and bomber crews, and rumblings about the value of air power in winning the war. There are also references to the early bureaucratic struggles over postwar AAF strength, the need to begin a professional military education system, the problem of airlines' hiring pilots, and even a concern that too many medals were being handed out. Evaluations of the effectiveness of the main combat aircraft of World War II, as well as models for follow-on fighters and bombers, are also frequently cited.

But history is made by people, and here the reader will experience Cozzens's view of some of the legends and heroes of the Army Air Forces. These range from the real-life model for Flip Corkin in the comic strip "Terry and the Pirates," to the young (and terrifying, to Cozzens) Curtis LeMay, as well as von Kármán, Kenney, Kuter, Norstad, and—Cozzens's own choice to replace "Hap" Arnold as CG—Orvil Anderson. In fact, Cozzens's editorial remarks about personalities offer some of the more entertaining vignettes in the book. Some are humorous, such as his observation that a certain general's "ideas remain meagre, but he gets more emphatic about them." In another case, a colonel who was a Medal of Honor winner was irate over perceived inadequate civilian maintenance of his base bus fleet. The colonel canceled the contract and, when the contractors attempted to restore their access, tore up a show-cause writ in front of the local sheriff and had the sheriff ejected from the base. Someone from the Air Inspector's office described the colonel to Cozzens as a type painfully familiar to him—"no brains, no sense, not worth his weight in chicken s--t outside combat, and maybe not there."

Perhaps because familiarity does indeed breed contempt, Cozzens's treatment of one air power hero—General "Hap" Arnold—grows tiresome and becomes distracting. As a professional writer, Cozzens was often called on to draft the speeches and public statements of General Arnold. "Mr. A," as he was officially referred to for security reasons, had so many cheap shots taken at him by Cozzens that one is almost tempted to discard the book early. At one point, I counted five sour comments on five consecutive pages about "Mr. A's" editing talents, his looks, his speech making, and his "bottom-pinching beam characteristics." But these comments should be taken as the interesting observations of an outsider, not as reflections on General Arnold's leadership capabilities. "Mr. A," says Cozzens, "performed the impossible in building the Air Force."

James Gould Cozzens received the Pulitzer Prize after the war for his novel *Guard of Honor*. He found the seed for that novel while preparing his official memos on a protest by black officers at Freeman Field, Indiana, against segregated officers' clubs. This incident—and Cozzens's candid and careful reporting of it—gives *A Time of War* one of its few solid lines of continuity that the reader can follow without backtracking. The incident was a sad one but provides a different, if uncomfortable slice of AAF life which we don't often encounter in our study about air power.

Cozzens was *not* present during the great deliberative sessions on wartime strategy. The reader will not gain further insights on how the great decisionmakers of the war weighed the pros and cons of

plans against our enemies. Even the growing numbers of reports about a collapsing Germany and the use of the A-bomb against Japan are reported as rumors or as notes after the fact. Nevertheless, Cozzens has left us an important, if somewhat sordid, certainly valuable insight into a remarkable part of our history.

Colonel Evan Parrott, USAF
Offutt AFB, Nebraska

Yank: The Story of World War II as Written by the Soldiers compiled by the editors of *Yank*. New York: Greenwich House (distributed by Crown Publishers), 1984, 263 pages, price unknown.

Let's face it, with such writers and reporters as Sergeant Merle Miller, Private William Saroyan, Private Irwin Shaw, and Sergeant Andy Rooney, among others, *Yank* couldn't fail to be the popular journal it was at the time—and the enjoyable reading this compilation remains even today. There is something that still attracts us to World War II. Perhaps it was the fact that we were truly in a fight for our way of life. Perhaps it was the image of Pearl Harbor seared into our memory. Perhaps it was simply America as first the underdog and then the liberating, exhilarating hero. Perhaps it was the music, which stirred, thrilled, and supported the boys in the field. Perhaps it was simply the fact that we won.

But maybe it was also due to publications such as *Yank*, which cast the "ordinary" GI into a role as spokesman for his society at war around the world so that he might report that war to his society back home.

Yank revives some of the universal emotions that all soldiers share—the fighting, a smattering of humor amidst all the grief, the girl back home, the enemy, the officers, the importance of mail, terror in the skies, the desire just to get home safely, and, of course, the lousy food. True, Americans in Vietnam fought just as heroically, but somehow *Yank* captures the essence of what the fighting was all about much better than the *Pacific Stars and Stripes* did twenty-five years later (and infinitely better than *Grunt* and other privately printed trash that hit the streets of Saigon and elsewhere during the war). It goes without saying that *Yank* maintained much higher standards than the often hostile, commercial press during the Vietnam era, which offered endless opinions about who was winning the war—or who should be winning the war.

Yank was a weekly *for* the GIs written *by* the GIs. This compilation of some of its best short stories—

including a twenty-three-page facsimile of the 7 September 1945 edition—helps explain why those "ordinary" GI reporters communicated this monumental struggle in a truly unique style and manner. The grand sweep of high-level policymaking won't be found here. Neither will the microscopic dissection of politics and polemics. There was simply no reason to provide that; everyone knew the "why" of the war.

The reader is taken on a tour of almost all of the major battlefields and theaters of World War II and given a GI's point of view of what went on and what it was all about. It's an absorbing, entertaining, emotion-charged account of the daily life of those GI reporters who were there when it began, struggled across Europe, pushed their faces into the sand of small islands in the Pacific, interviewed Mussolini's guards, lived with Yugoslav guerrillas, flew on combat missions, sweated out preinvasion jitters with invasion forces, and reported—almost brick by brick—the collapse of Germany and Japan.

Yank is stark and shocking at times, with descriptions of GI dead and dying, the destruction, the sacrifice, the scenes of Nazi death camps, and Japanese brutality. Nevertheless, the stories never seem to tear at the fabric of the nation as did the nightly scenes of Vietnam on TV. That's because World War II was truly a people's war—a jihad of sorts—with clear political goals, the crystal-clear image of the enemy, the lines of battle cleanly drawn, and the ebb and flow of battle easily followed at home. And there were the victories—few and far between at first, but gradually more frequent, until the great Allied war machine crushed Germany and Japan into helpless remnants of once-robust societies.

Yank goes a long way toward proving what one columnist said recently about combat journalism: "War can never be described, only shared." *Yank* helped a lot of people share *their* war in a way that hasn't been seen since.

Colonel Evan Parrott, USAF
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Hitler's Legions: The German Army Order of Battle, World War II by Samuel W. Mitcham, Jr. New York: Stein and Day, 1985, 540 pages, $20.00.

This is a work that general readers are likely to overpraise and specialists are likely to find irritatingly useful. It is less a conventional order of battle than a listing, by type and in numerical order, of the Wehrmacht's ground combat divisions. Each reference includes the major subordinate formations, a brief operational history (usually mentioning some

of the more important commanders), and a list of sources. On these terms, it invites comparison with the standard German treatments—Wolf Keilig's *Das deutsche Heer 1939-1945* and Burkhart Müller-Hillebrand's *Das Heer 1933-1945*. It is easier to use than either of these works and is enhanced by Samuel Mitcham's presentation of the *Wehrkreis* system, unfamiliar to English-language readers, whch was central to the German organization and replacement structure. However, to call Mitcham's bibliography spotty is an understatement. One may empathize with the financial problems that kept Mitcham from doing research in Germany, while noting that this circumstance cannot by itself excuse an inadequate data base. Mitcham seems unaware of basic published material. He refers to neither Keilig nor Müller-Hillebrand. He ignores George Tessin's fourteen volumes on the formation of the army and the Waffen-SS, as well as Tuider's and Held's bibliographies. His source notes suffered from his nearly complete ignoring of divisional histories.

These are the kinds of omissions that make it easy to doubt an author's credibility. At best, Mitcham's heavy reliance on Western wartime intelligence sources creates unnecessary gaps in his records. It forces him to make tentative statements, often easily verifiable or correctable by referring to published German authorities. The work would have benefited also from an analysis of the nature of the divisional system, the principles underlying organizational equipment, and manpower allocations. Instead, Mitcham offers a descriptive narrative, with familiar material that is again marred by avoidable errors. He confuses, for example, the 150-mm infantry Howitzer with an antitank gun. He asserts that the mountain division had three line regiments—a mistake that he corrects in the body of the book.

Yet for all its shortcomings, *Hitler's Legions* must not be summarily dismissed. As the only modern single-volume, English-language compendium of the Wehrmacht, it will find a place, *faute de mieux*, in many institutional and personal libraries. That it could have been far better done does not deny the worth of having it executed at all.

Dr. Dennis E. Showalter
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You Only Live Once: Memories of Ian Fleming by Ivar Bryce. Frederick, Maryland: University Publications of America, 1985, 139 pages, $12.00.

For one whose first consciousness of the world of spies, saboteurs, and the like came through the hand of Ian Fleming, Ivar Bryce's *You Only Live Once:*

Memories of Ian Fleming is a delightful reminder of evenings spent fascinated by the exploits of 007 and his antagonists. The insights offered by Bryce do much to explain the richly descriptive style of Fleming and the popularity of the Bond books, not to mention the fantasy of the *Chitty Chitty Bang Bang* series.

However, this book is not, as the title suggests, solely about Ian Fleming. Rather, it is a reflection on Bryce's life, entwined as it was with Fleming's, from childhood through the two major wars of this century and the thirty years thereafter. It is, as well, a rendering, with appropriate British style and grace, of two bright, inventive, adventuresome men who played interesting roles in the intelligence activities of the United States and the United Kingdom during World War II.

Beyond satisfying the general interest in what made Fleming (and, therefore, Bond) tick, Bryce offers one chapter in particular, titled "On Active (or Inactive) Service," that is of genuine value to the student of intelligence. Therein, Bryce colorfully describes several real World War II intelligence and covert enterprises: an early experiment with a truth serum that would later become the anesthetic pentathol; wartime relationships among the FBI, the Office of Strategic Services, and British intelligence; the sabotage of a critical Nazi aviation fuel dump in Brazil; and a British covert activity to influence the United States' entry into the war by providing for the American discovery of a "manufactured" German map depicting Nazi intentions in South America.

Told with élan, these stories serve to remind us of the enduring nature and breadth of both clandestine intelligence and what we euphemistically refer to today as "special activities." Moreover, such descriptions are particularly valuable when accompanied by the perceptive evaluation of a participant, as in this work.

From the outset, the author makes no claim toward scholarship nor any attempt to produce a definitive biography. Accordingly (and appropriately, I think), this work is a very personal, though regretfully short introspective of selected events shared by Bryce and Fleming. As Bryce reports, Fleming encouraged him to write of his exploits; but one senses that Bryce had a certain reticence to do so as an exclusive subject. That reluctance is regrettable since Bryce could quite obviously fill in many of the blanks that remain in the accounts of wartime intelligence operations.

Bryce observes that, as is typical of most of us, his "memory is uncertain and grows faultier each day." One can only hope that further details are soon

forthcoming, for Bryce is now 79. In the meantime, *You Only Live Once: Memories of Ian Fleming* serves mostly to tantalize.

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Kommando: German Special Forces of World War Two by James Lucas. New York: St. Martin's, 1985, 245 pages, $16.95.

Special forces of the world's armies are commonplace now but were not so in World War II. The traditional repugnance of the orthodox military establishment to the employment of such troops was typical in the German army as well as most other armies before 1939. Conventional soldiers' aversion to using disguise and the tactics of guerrilla warfare springs from their concept of soldierly honor. Deceptive warfare was considered as reprehensible as spying—it was deceitful and unworthy of a soldier. As a result, the first German special units were formed in the *Abwehr*, or counterintelligence branch, under Admiral Wilhelm Canaris. In the first comprehensive account of the special forces, English military writer James Lucas traces the development of German special units in all three branches of the services, but his major focus is on the army's Brandenburg unit. Lucas's definition of special units is broad, including units grouped to form a unique fighting detachment (such as the Luftwaffe's ram-ming squadron), units using original tactics or weapons (such as the glider troops at fortress Eben Emael), and units formed to conduct a specific type of military operation (such as the guerrilla movement, the Werewolf).

Lucas has divided *Kommando* into four parts: one on the ground operations, one on the navy, a brief section on the air force, and a fourth section on the "political" special forces such as the Werewolf and the Freikorps. His coverage of the Luftwaffe's special forces is sketchy but interesting. Little is known about the operations of such units as the KG200, which undertook intelligence raids as well as combative operations. Like the successful achievements of all German units during the latter part of the war, KG's effectiveness was wasted on stop-gap operations on various fronts. The unit's personnel were seldom employed in operations for which they had been trained. That misapplication of talent, plus constant interference by the SS and Hitler, meant that the special units never reached their potential.

Lucas has written an exciting account. Relying heavily on personal interviews and some after-action reports, he conveys a feeling for the battles. He covers much quickly and lightly, but there remains much to be done on the special forces. This book should mark a beginning. The fifty photographs and numerous charts and diagrams that Lucas includes add to the reader's pleasure.

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AWARD

The *Air University Review* Awards Committee has selected "Sandino against the Marines: The Development of Air Power for Conducting Counterinsurgency Operations in Central America" by Captain Kenneth A. Jennings as the outstanding article in the July-August 1986 issue of the *Review*.

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contributors

several times during his career, he served in a variety of positions, ranging from branch chief to Joint Chiefs of Staff planner to Director of Plans.
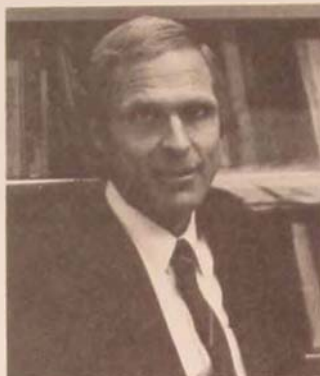

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