AIRPOWER

JOURNAL

Winter 1987-88

COMING ...
in our winter edition

- Counterrevolution in Namibia
- Air Battle 2000
- SDI—A Historical Perspective

AU▮PRESS

EDITORIAL

Position Update

WITH THIS, the final issue of volume I, it seems appropriate to look at what the Air Force's professional journal should be and at what it offers its readership. Three aspects of the *Journal* warrant consideration, each important in its own way and each of which, we hope, will be of interest to you.

Every periodical must have some focus to guide its editors in selecting material, its contributors in adopting a creative approach, and its readers in deciding whether to spend valuable time reading. The *Airpower Journal*'s focus, in simplest terms, is the effective application of combat power. Combat power can be defined as a military force's ability to develop, field, generate, and maintain appropriate combat pressure in given situations. This is not an additive process but an interactive, synergistic one. The failure to "field" appropriate power does not simply decrease the available combat power, it may well negate it altogether.

This suggests that any journal concerned with effective combat power must entertain the myriad activities that result in the end product. To· some, that will mean operations; to others, effective logistic support; and to still others, research and development or perhaps manpower/personnel concerns. Each of these areas is appropriate for the *Airpower Journal*, and yet, each can also be inappropriate. The key is whether or not the lens through which each of these areas is viewed is concerned with improving the end product—the effective application of appropriate combat power. An issue focused on something else has little value in a professional military journal.

This still leaves too diffuse a focus for a single professional journal. Sharpening the focus is an action with which not all agree, but sharpened it must be for the reasons identified above. If we concern ourselves with the application of military power, then we may leave aside questions of whether or not military power should be applied and concentrate on how best to apply it. This means the bulk of the geopolitico-military questions can be relinquished to other journals with reputations for credible and balanced treatment. Another area of inquiry must also be forgone if the *Airpower Journal* is to hold the interest of the entire target audience. Issues of expert functional concern are also left to the excellent functional journals available. Remaining to the *Airpower Journal* is the middle ground, the concern with integrating multiple functions into cohesive military operations. In short, we are about the "operational art" in its broadest sense.

Another aspect of the *Airpower Journal* deserves mention. You will note in this issue a volume index, something our ancestor, the *Air University Quarterly Review*, printed on occasion. We will publish, both in the *Journal* and separately, volume indices by author and subject matter with each winter issue. Every five years, we plan to publish separate, cumulative indices of all *Airpower Journals* to that point. We hope they are useful to you.

Finally, the many inquiries about the Ira C. Eaker Essay Competition deserve an answer. We are pleased to announce, as noted elsewhere in this issue, the reemergence of the competition, effective with the Spring 1988 issue of the *Airpower Journal*. You will note some changes to the competition, but its original purposes remain: to honor General Eaker and to encourage you to contribute to the professional dialogue in these pages. One $500 award will be made for a feature in each issue. Only US military

members or US Government civilians below the rank of colonel or the grade of GS-15 are eligible to compete. We hope to see your feature article soon.

All in all, it was not a bad year, but we certainly expect the coming one to be even better in terms of presenting your professional military concerns for consideration and providing a useful service to you.   KWG

The Ira C. Eaker Award

Airpower Journal proudly announces that the Ira C. Eaker Award will reappear as a part of the Air Force's professional journal beginning in the Spring 1988 issue.

The purpose of the award remains as before: to honor General Ira C. Eaker by promoting professional military writing in the pages of the *Airpower Journal*. Its format has changed. Instead of a separate competition, there will be an award given for the best feature article in each issue. The winning author will receive $500 in recognition of his or her contribution to the advancement of professional military thought.

All US military personnel below the rank of colonel or equivalent and US Government civilian employees below the grade of GS–15 or equivalent are eligible to participate. This includes active duty, reserve, and national guard forces as well as precommissioning programs. Only feature-length articles will be considered.

Anyone desiring further information on the Ira C. Eaker Award or on how to submit an article may write to the Editor, *Airpower Journal*, Walker Hall, Maxwell AFB AL 36112-5532.
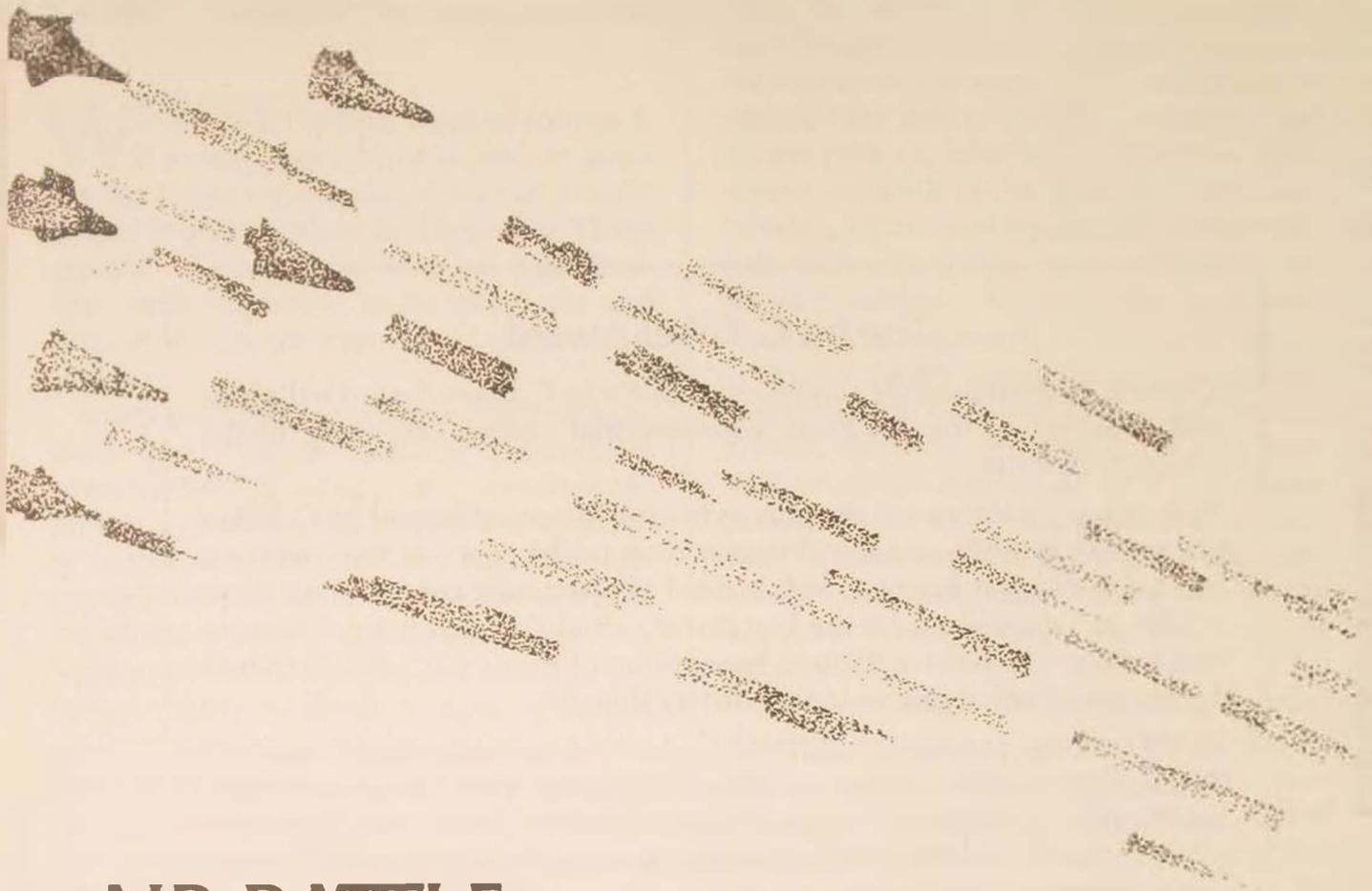
AIR BATTLE

2000

IN THE NATO ALLIANCE

Exploiting Conceptual and Technological Advances

Maj Gen Perry M. Smith, USAF, *Retired*

THE PURPOSE of this essay is to stretch the mind of the reader in two important related areas. First, I wish to contemplate future air technology and the impact of this new technology on potential conventional battle in Europe. Second, I would like to address other more general aspects of both technology and planning in hopes of encouraging the reader to think more deeply about the long-range future of the NATO alliance. I have purposely kept this article short in hopes that it will be read and discussed. It is a small part of my efforts, which include two new books that deal with the important issues of leadership and planning in the national security arena, as well as a series of books on warfare (2010 and beyond) which will be written by individual authors under my general editorship.*

The potential for major improvements in NATO's conventional capability over the next few years is quite high, particularly in the air environment. Much of that improvement relates directly to technological advances, but advances in doctrine, tactics, and training can and should also play an important role. It is most important that military leaders of all NATO nations keep

*Taking Charge: A Practical Guide for Leaders (1986) and Towards a National Security and Long-Range Planning (1987), both published by the National Defense University Press.
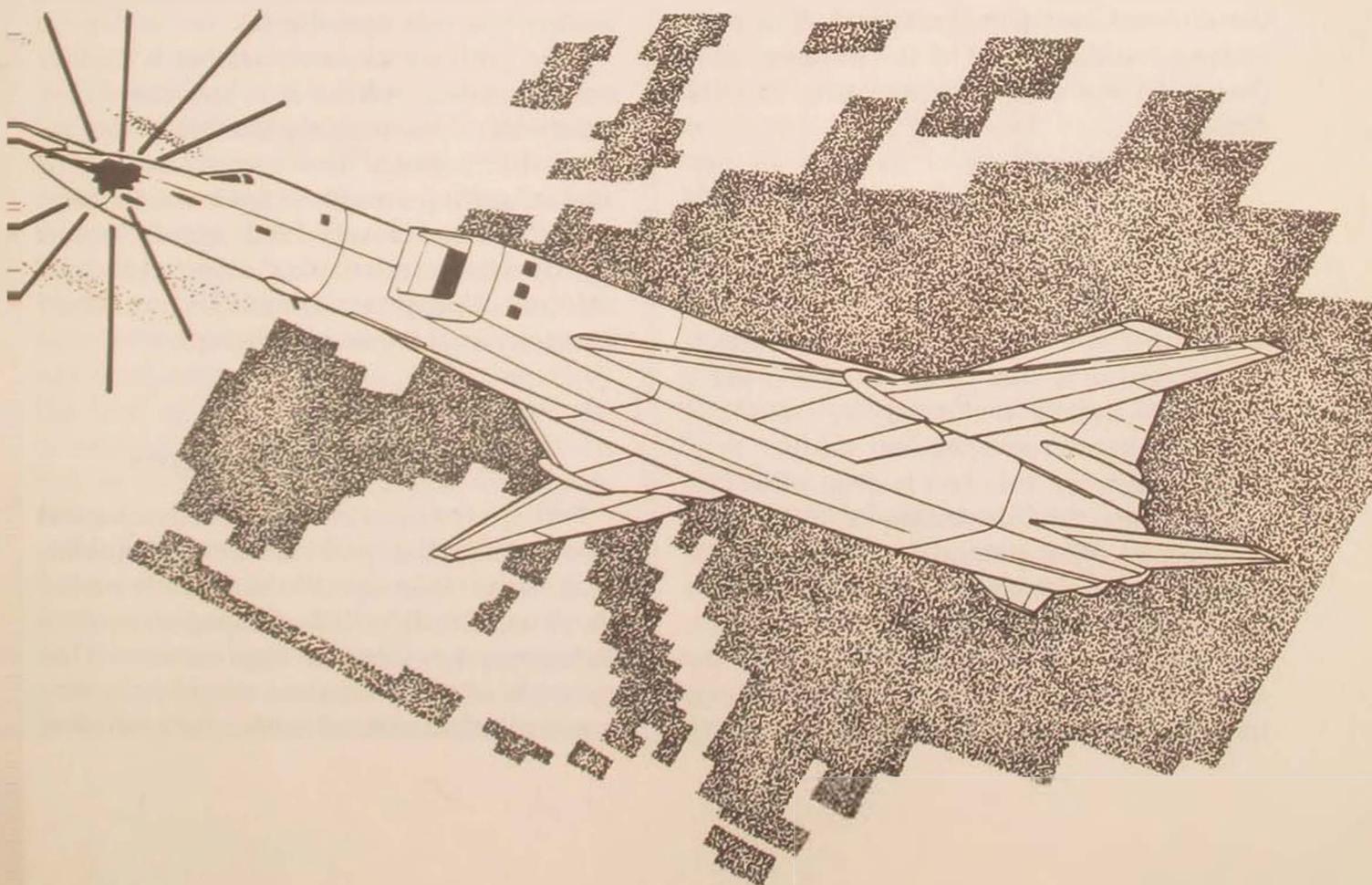
abreast of the changing battlefield environments and that they actively pursue improvements in technology, doctrine, and tactics.

The close coordination of land and air will be even more important in the years ahead than it has been in the past because technology is moving so fast and barriers to good coordination are actually becoming greater. In the past eight or nine years, compartmentalization of classified programs has become an important phenomenon in the research and development world. If present trends continue, the operational world could also be significantly affected by compartmentalization. Although there are many advantages to controlling access to very sensitive programs, there are some major disadvantages. Leaders from each of the NATO countries with major research and development programs must carefully weigh these factors when developing and implementing weapon systems, programs, and policy. These issues relating to compartmentalization are so important, both to the air-land battle in the twenty-first century and to the future of the alliance, that they deserve a few paragraphs in this discussion.

Innovation Through Compartmentalization

One of the evolving truths of compartmentalization is that innovation is considerably easier in a closed, or "black," program than in an open, or "white," one. In my judgment, this fact is even more important than the advantages of hiding the technology from potential enemies, since doctrinal and conceptual innovation is so difficult in the white world. Another advantage of compartmentalization is the rapidity with which a radical technological idea can turn into an operational system. So many

bureaucratic barriers are removed in compartmentalized programs that a weapon system that normally would take a decade or more to develop can be fielded in five or six years.

These advantages must be weighed against a number of significant disadvantages. The air force of an individual nation in NATO may be developing a radically new system that may help solve a major problem its army or navy is facing. If, however, the leaders from the other services and from the other nations are not informed of this program, they may waste money and effort on an inferior system to address the same problem. In addition, there is often a "doctrinal lag" in incorporating into the mainstream of the operational world the new operational systems that were developed very rapidly through compartmentalization. This doctrinal lag can become particularly acute when the officials responsible for developing doctrine are not cleared for the program either during the research and development phase or after the system becomes operational.

This problem of doctrinal lag is further compounded when service lines are crossed, and the problem becomes more severe when national lines are crossed. For instance, getting an officer from the German navy to share closely held secrets from a tightly compartmentalized research and development program with a US Army officer (or vice versa) is just plain tough.

Autonomous Systems

Perhaps the most important technological development that will have a significant impact on the air-land battle in the early part of the next century will be the deployment of autonomous systems in large numbers. One example of such a system would be a very small pilotless aircraft with a very efficient

small engine, an airframe made of plastic or composite material, a supersensor in the nose, and a very small warhead. The supersensor, using one or more of a number of techniques, could be programmed to target a very specific type of enemy vehicle, aircraft, radar, or other system. This airborne vehicle would have a very long loiter time (many hours to a few days) and could provide a considerable capability in both the deterrence and warfighting realms.

The deterrence value of this vehicle could be its most important quality. The Soviets have historically had great respect for, and fear of, Western systems based on high technology. At times, they have overestimated the capability of these systems. This fear, admiration, and overestimation could be very helpful in causing Soviet decisionmakers to forgo contemplated offensive operations if they thought the alliance had large numbers of these autonomous vehicles deployed and on alert status in Europe. Sometime in the future it may be helpful to lift, ever so slightly, the dark veil of compartmentalization to enhance the deterrence value of some of these systems.

Autonomous systems that depend heavily on high-technology sensors, engines, and airframes are likely to be better than similar Soviet systems because the Soviets will probably continue to lag behind in these important technical areas. Hence, if Western civilian and military leaders are particularly prudent about how they manage compartmentalization, they can have the best of both worlds. In other words, technological leakage to the Soviet Union can be restricted, while defense and deterrence can be enhanced.

To further develop the point about autonomous systems, let me speculate about how they may change the face of the air-land battle. An enemy land force, facing a myriad of autonomous systems, will have to deal with real doctrinal, operational, morale, and tactical problems, particularly when it tries to concentrate the elements of the force. Movements of ground vehicles, for instance, will create noise, heat, and other observable phenomena that can be picked up by tiny but very discriminating sensors in airborne vehicles loitering over the battlefield and over other areas of high interest such as airfields and logistics areas. The enemy ground force commander will face a number of bad choices. One choice would be to destroy the vast majority of these autonomous vehicles in order to avoid suffering massive losses in the first few hours of major ground force movements. But the destruction of these systems will be difficult because they should be very small, very stealthy, and very agile. In addition, those that will be destroyed could be easily and rather cheaply replaced by others.

Another choice for the ground force commander would be to deceive these systems—that is, to spoof them in some way. This could have some very positive results, but it could also be very expensive. For instance, to produce the exact sound, heat, and shape of a Soviet truck may be almost as expensive as creating the truck itself and bringing it to the battlefield. In short, decoys only make sense when they are considerably cheaper than the real thing.

A third choice for the ground commander would be to concentrate the ground forces in such a way as to overwhelm these autonomous systems with too much data. This approach could fail, and fail massively, if the commander underestimated the capability and the number of these autonomous vehicles.

A fourth choice for the ground commander would be to accept the losses that these systems will cause and hope that the opponent will run out of such systems. This can work against an adversary who has not procured large numbers of these systems or developed the logistical, transportation,
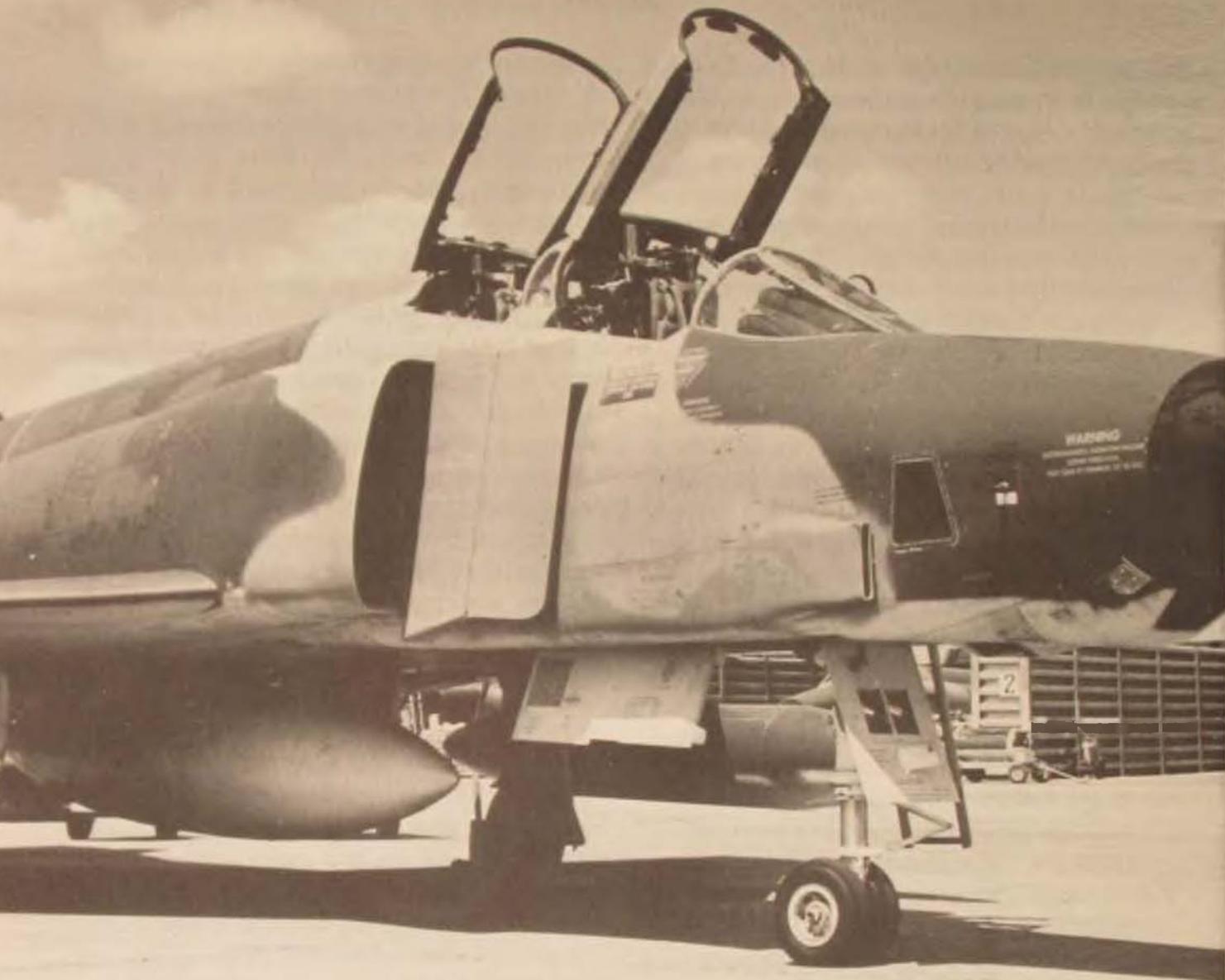
and deployment systems to ensure that enough of these vehicles are available to launch and relaunch into the battlefield area where the enemy is contemplating an attack.

Enemy airfields will also face the devastation that these autonomous systems can cause. Turning on external power units, towing airplanes, and taxiing aircraft may all become very risky operations if autonomous airborne systems are loitering over key enemy airfields. In the past, airfields have been vulnerable to attack, but the launching of aircraft could still take place at night, in marginal weather, and in between enemy air or missile attacks. In the future, however, a commander of an air base will have to deal with air attack by aircraft, glide bombs, missiles, and autonomous systems. In the past, attacks on air bases were of short duration, and airfield repair and the recommencement of launch and recovery of aircraft could take place after each attack. But by the year 2000, even the rapid runway repair vehicles may be programmed as targets of these overhead autonomous systems,
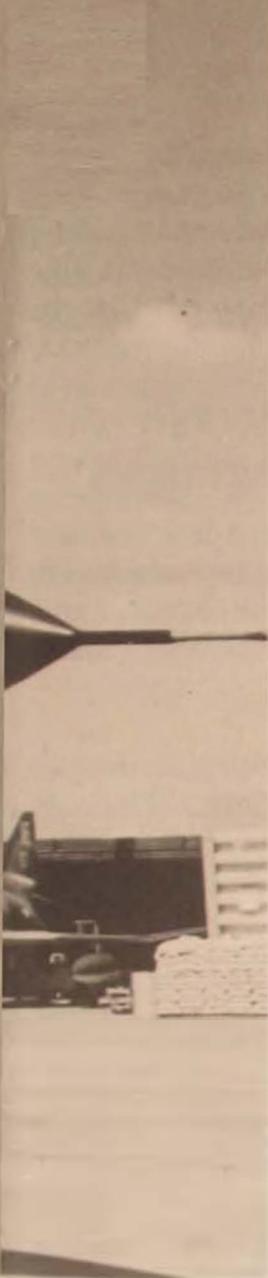
The RF–4C (left) has served the needs of the Air Force for over two decades. The Air Force and Navy are working on unmanned aircraft as a possible follow-on reconnaissance vehicle to meet the needs of the next century. The manned aircraft, like this A–10 close-air-support aircraft (above) will always be needed. But just as its performance is enhanced by its ability to carry these Maverick missiles, the overall performance of air power may be enhanced by better technology and the inclusion of remotely piloted vehicles (RPV) used in concert with manned aircraft

and the repair of runways and taxiways may become much more hazardous than in the past.

The Twenty-first Century Air Base in Europe

Autonomous systems will not require air bases of the traditional size and scope, but planners must be creative in the deployment, launching, and recovery of autonomous systems in order to take full advantage of their size and stealthy characteristics. Of course, there will still be many aircraft that must operate off hard surfaces. Dispersal will become increasingly important, and technology, if properly exploited, can help a great deal in this area. Expert systems that provide help to maintenance technicians have excellent potential here. If each aircraft mechanic and each avionics technician has a small computer containing the knowledge of some of the very best and most experienced maintenance supervisors, the overall manpower needs could be

reduced and the ability to disperse aircraft in small numbers to diverse locations would be enhanced.

The great emphasis on the very high realiability of aircraft systems will begin to pay off by the early part of the next century, and there will also be a modest decrease in the need for spare parts and for supply people to provide and manage the spare parts. These factors will help in enhancing the ability of an aircraft squadron to disperse quickly and to operate out of austere locations. Tactical deception must become a high priority for commanders of fixed air

bases. There are many things that an air base commander will be able to do to make the air base very difficult for the enemy to find and, once found, difficult for him to identify the "real" targets.

Exploiting NATO's Technological Advantages

Over the course of the next few decades there will be a technological race of extraordinary proportions. The United States and its NATO partners should be able to win

This YQM–94A prototype strategic reconnaissance vehicle flew as early as 1973, demonstrating the validity of remotely piloted systems to loiter for up to 24 hours, considerably longer than the manned RC–135 aircraft it was designed to replace.

this race. The Soviet Union and Eastern European nations have deep, abiding problems with the relationship between widespread public access to high technology and the need to maintain control over their populations. These problems will inhibit exploitation of high technology sufficiently to give the West an advantage that prudent public policy can exploit. Microcomputers, software engineering (the "hacker" role here can be most important if the defense communities of the West can attract some of the best of the hackers), miniaturization, expert systems, and intelligent computer-aided design can all make important contributions to air warfare. In short, the societies that have the most computer-literate populations and the populations with the most highly developed innovative and entrepreneurial skills should be the winners of this important technological race.

The real challenge for the alliance, however, is not the development of these new systems. The challenge is how to share this technology between and among NATO nations and how to develop the doctrine and tactics for the optimal use of these systems.

These US Navy Pioneer RPVs are deployed on board the battleship USS Iowa, providing over-the-horizon targeting and reconnaissance, up to 110 miles away. The Pioneer uses a rocket-assisted takeoff technique and is recovered using a net recovery system aboard the battleship.

This coordination of technology, doctrine, and tactics should be accomplished prior to the operational deployment of these new systems. Since changes in doctrine and tactics come quite slowly in the NATO environment, it is encumbent upon the leaders in the United States, Great Britain, West Germany, and other nations who are developing exotic new systems to share the basic technology and the operational capability with the leaders of the NATO operational commands. This sharing of information should take place at least a year before each new black program becomes operational. Individual nations must take the initiative to disclose this sensitive information because the NATO operational commanders will, in many cases, have insufficient background or insight to ask for it. It is clearly not enough that the research and development chiefs of each service and each nation share this information; the NATO operational commanders must be briefed in some detail.

The Changing Operational Environment

The battlefield of the twenty-first century will be dramatically changed by the ground and air systems that are being developed now and that should be deployed over the course of the next 10 years. Periods of budgetary austerity may even accelerate this trend toward exotic new systems because many of these systems are considerably less expensive than traditional systems such as manned aircraft, helicopters, tanks, and artillery pieces. As service programs in each of the nations of the alliance are developed during upcoming austere budgetary years, decision analysis, mission area analysis, and systems analysis should highlight the value of these new systems. In addition, these analytical techniques, which have

matured materially in recent years, should help in the difficult but important divestiture process. For instance, it is likely that both the A–10 aircraft (the primary American close-air-support aircraft) and the RF–4 (the primary tactical reconnaissance aircraft of a number of NATO nations) will not be replaced by manned systems when they become obsolete in the early part of the next century. These aircraft will probably be replaced in large part by autonomous systems that have a low unit cost and a very considerable mission capability. A great advantage of these autonomous systems that was not discussed earlier in this article is their potential to accomplish a multiplicity of missions with only modest changes to the sensor software. In other words, a lethal autonomous system could be designed to do all of the following missions: close air support, battlefield air interdiction, interdiction, counter-SAM attack, and airfield attack. A single weapon system should be capable of being changed from mission to mission by changing a small software package in the vehicle itself.

A significant impediment to rapid deployment in this area is a residual "Luddite" mentality, or opposition to technological change, that exists within the defense communities of all the NATO nations. In fairness to those who are skeptical about the magic of exotic technology, there have been many unfulfilled promises in the last few decades. In addition, the Clausewitzian concepts of the "fog of war" and "friction" must be kept in mind when planning for the use of military forces in the demanding and confusing battlefield environment. Hence, thoughtful skepticism must be the order of the day when contemplating the long-range future. The long-range planner must, however, try to avoid putting blinders on and losing the opportunity to grasp the technological, doctrinal, and tactical importance of the recent dra-

matic improvements in the reliability and capability of miniaturized systems.

The "technological slingshot," the acceleration of the exploitation of particularly promising technology, is a reality in the civilian world. It could become a reality in the military world, particularly if the advantages of development in the black world can be fully exploited. Whereas it took decades to take the concept of a telephone, a radio, and a television and turn them into fully operational and reliable systems, it has taken a much shorter time to do the same thing for the transistor, the semiconductor, and the laser compact disk. Although the military has generally not taken full advantage of this "technological slingshot," recent initiatives such as the US Air Force Project Forecast II were designed to do just that. All the nations of the alliance should consider emulating the Project Forecast II effort since only by determined, sustained, and innovative methods will the right technologies be given the proper emphasis and sustained support.

Another major aspect of high technology that will have important military applications and that should be exploited over the course of the next decade will be in mission planning and training. Mission simulation has finally become both reasonably realistic and a lot of fun. Tank crews, fighter pilots, and many others can now learn a great deal by driving or flying in simulators. Leaders must understand that simulators will not be useful until the crews actually want to use them and learn from them. As new modifications are made to individual weapon systems, the simulator should get the modification first. In that way, the crews can learn how to use the new capability of the weapon system before that capability is placed in the actual aircraft, tank, or helicopter. This procedure will also ensure an interest by the crews in climbing into the simulator on a regular basis. By the early

part of the twenty-first century, considerable training costs will be saved through realistic simulation. Hopefully, these cost savings can be translated into more and better systems.

Mission planning using small personal computers will also be much improved. Already the hackers are showing us how much can be done on a small computer. A recent example is the very realistic and sophisticated computer game licensed by the National Football League called NFL Challenge, which uses over 120,000 lines of code but can be played on a personal computer (PC). Just before a pilot walks out to his airplane to fly on a combat mission, he will be able to glance at his portable PC, update it with the very latest intelligence data, and replan his route to and from his target in an instant. By the year 2000, he will be able to do this again when he is en route to his target as he receives updated intelligence information.

As long as the alliance has to face a medium-tech enemy, its ability to offset quantity with quality will remain strong, especially if strong research and development programs are in the defense budget of each of the major NATO nations. Compressed research and development cycles, institutionalized innovation, and long-range planning in each nation and in the alliance as a whole, as well as close coordination among nations, should be the guidelines for the alliance over the next 15 years.

In the years ahead, the alliance should focus more attention on concepts and doctrine and should develop institutional arrangements whereby new conceptual ideas can be shared, debated, and, in some cases, incorporated into NATO doctrine and procedures. Let me cite an example. In 1986 Col John Warden of the US Air Force wrote a seminal paper at the National War College in Washington, D.C. It won a major

research award, and yet there was no easy way to ensure that strategists and planners in the alliance were exposed to his ideas. A clearinghouse for new conceptual ideas should be established in every major NATO headquarters and in every ministry of defense. If each major national and international headquarters had a small (five or six people should be adequate) long-range planning division with direct access to the top commander or leader, the alliance, over time, could develop a better strategic vision. In addition, these long-range planning divisions could be the place where bright young people (from throughout each of the commands) with fresh ideas could interject them at a high level.

The military chain of command, for all of its strengths, is an impediment to innovation. It is time that leaders of the alliance recognize this fact and take action to solve this problem. Conceptual thinking based on a solid understanding of operational factors has been largely lacking in recent years. Our concepts must keep up with our technology. Better still, our concepts should stay ahead of our technology if the advantages of our technology are to be fully exploited.

Radical Conceptual Approaches

Let me close this short essay with a discussion of the need for long-range planners to go beyond conventional wisdom and to think radical and heretical thoughts. So much planning done in the alliance is not much more than the extrapolation of current policy and programs into the distant future. Long-range planning must avoid fiscal, conceptual, organizational, technological, political, psychological, and economic barriers to clear thinking. For instance, there is much to be said for the use of the "alternative futures" technique in thinking through the planning process. Two or three alternative "Soviet Unions" in the year 2005 might provide the planner and the decisionmaker with a better understanding of future opportunities and possibilities. It seems quite clear that the Soviet Union is going through some important internal change right now and a straight-line extrapolation of the Brehznev period into the twenty-first century would not seem prudent. On the other hand, it is too early to make definitive judgments about the Gorbachev legacy for the next century. If the alliance is to thrive in the future, it must think clearly about its major adversary. The use of the alternative futures approach may be helpful.

As far as military planning is concerned, radically new concepts are worth examining even if the only purpose they serve is to stretch the minds of planners and decisionmakers. John Warden may be correct when he looks into the future and sees air superiority as the primary mission in the air-land battle. Others with equally innovative concepts should be encouraged to come forward and advance their ideas with little or no risk to their military careers.

If the alliance is to win the air superiority battle and be the ultimate winner of the war of the twenty-first century, therefore, major reconsideration of Army and Air Force (as well as Navy and Marine) doctrine needs to be undertaken between now and then. The further the nations of the alliance are removed from the last war, the harder they must work to ensure that their military forces and doctrine are relevant to the next war. The fact that most innovators are uncomfortable in large bureaucratic organizations means that there will always be a shortage of ideas and innovators within the military services. If the civilian and military leaders of the alliance recognize this very natural tendency, they can compensate for it in a number of ways. A senior and very experienced analyst, a trusted member of for-

mer Secretary of Defense Caspar Weinberger's staff, has pointed out that some of the very best intelligence work is being done by individuals and organizations outside of government and that one of the great advantages of contracting out more work is that fewer people remain inside government to provide bureaucratic barriers to the implementation of new ideas.

In addition, very influential individuals like Senator Sam Nunn are not only asking the tough questions but also are showing a greater discomfiture with the answers they are getting to questions relating to strategic planning and institutional innovation. The military must reach out for help to overcome the personal and institutional impediments to innovation.

Another serious problem the alliance will face in the years leading up to the twenty-first century will be the widening differential in military capability between the high-tech nations of the alliance and those nations that for economic or other reasons do not move forward rapidly as far as military technology is concerned. Military leaders in an alliance must be able to discuss issues together; and if the leader from a high-tech nation is constantly "dazzling" his counterpart with the esoteric terminology of high technology, the communication barriers will only become more troublesome. It will be the task of all leaders to nourish the alliance by understanding the barriers to good communication and coordination and breaking down these barriers on a regular basis.

The air battle in the early part of the twenty-first century may well be the decisive battle and, as a result, demands our attention, our time, and our best intellectual efforts. Too much time is being spent by leaders on current problems and too little time is being reserved for long-range thinking and planning. If this paper can, in a small way, be a catalyst for better planning and better thinking, it will have served its purpose.   □

Hogs in the Rear

A-10s in Rear Operations

Maj Darrel D. Whitcomb, USAFR

SOMEBODY ONCE said that an army travels on its stomach. This was not a reference to a mode of transportation but recognition of the important role that logistics play in military operations. The US Army is keenly aware of this fact. Additionally, it realizes that its logistical tail is vulnerable to enemy action and that combat operations may be necessary in rear areas. These rear operations will be joint affairs requiring close integration of ground and air action.[1] The purpose of this article is to examine the concept of rear operations and to propose the use of the A–10 in this area. Rear operations will be defined as one part of the overall air-land battle, and possible threats will be examined. This will be followed by a discussion of the capabilities of the A–10 and some considerations for its use as a close-air-support asset in the rear area.

The US Army's current basic fighting doctrine is called AirLand Battle. As laid out in Field Manual (FM) 100–5, *Operations*, it reflects the structure of modern warfare and the application of the classical principles of war to contemporary battlefield requirements. It is inherently three-dimensional in nature and requires close coordination and synchronized operations with other services. Additionally, the doctrine recognizes that commanders from theater through division level must actually conduct three types of operations in support of overall campaign plans: close, deep, and rear operations.[2]

Close operations comprise the current activities of major committed combat elements. They are sometimes referred to as the main battle, where steel meets steel. They are sometimes violent and can be highly dynamic, and they are marked by high consumption of materiel and heavy casualties. Close combat is frequent and includes Air Force close air support (CAS).[3]

Deep operations comprise operations against enemy forces not yet in contact and are designed to influence the conditions in which future close operations will be conducted. Included are such things as attrition of enemy follow-on units or the deep maneuver of friendly units to shape future battles. Their purpose is to deny freedom of action to opposing commanders and to disrupt their tempo of operations. They would include Air Force interdiction, reconnaissance, and jamming operations.[4]

Rear operations comprise those activities rearward of our own units in contact that are designed to assure our freedom of maneuver and continuity of operations. They include such things as command and control and all of the logistical assets and actions necessary to sustain combat. To a division commander, they could include such things as fuel sites, transportation, and medical units. To a theater commander, they could mean securing support airfields, nuclear sites, major lines of communication, and so on. Needless to say, to an adversary our rear areas represent target-rich environments.[5]

The Army, in its FM 90–14, *Rear Battle*, recognizes three levels of threat to the rear area.[6] Level I threats are generally seen as small teams of enemy-controlled agents, terrorists, or enemy sympathizers. Their objectives could be political disruption, assassination, or sabotage of key sites and lines of communication.

Level II threats have two forms. One consists of unconventional forces skilled in infiltration. The other is conventional company-size airborne or heliborne assaults. Their objectives would be to destroy key installations such as airfields and nuclear sites, logistic sites, and reserve forces. They would also collect intelligence and create disruption and confusion in support of a front/army main attack.

Level III threats are considered to be assaults by units of battalion or larger size.
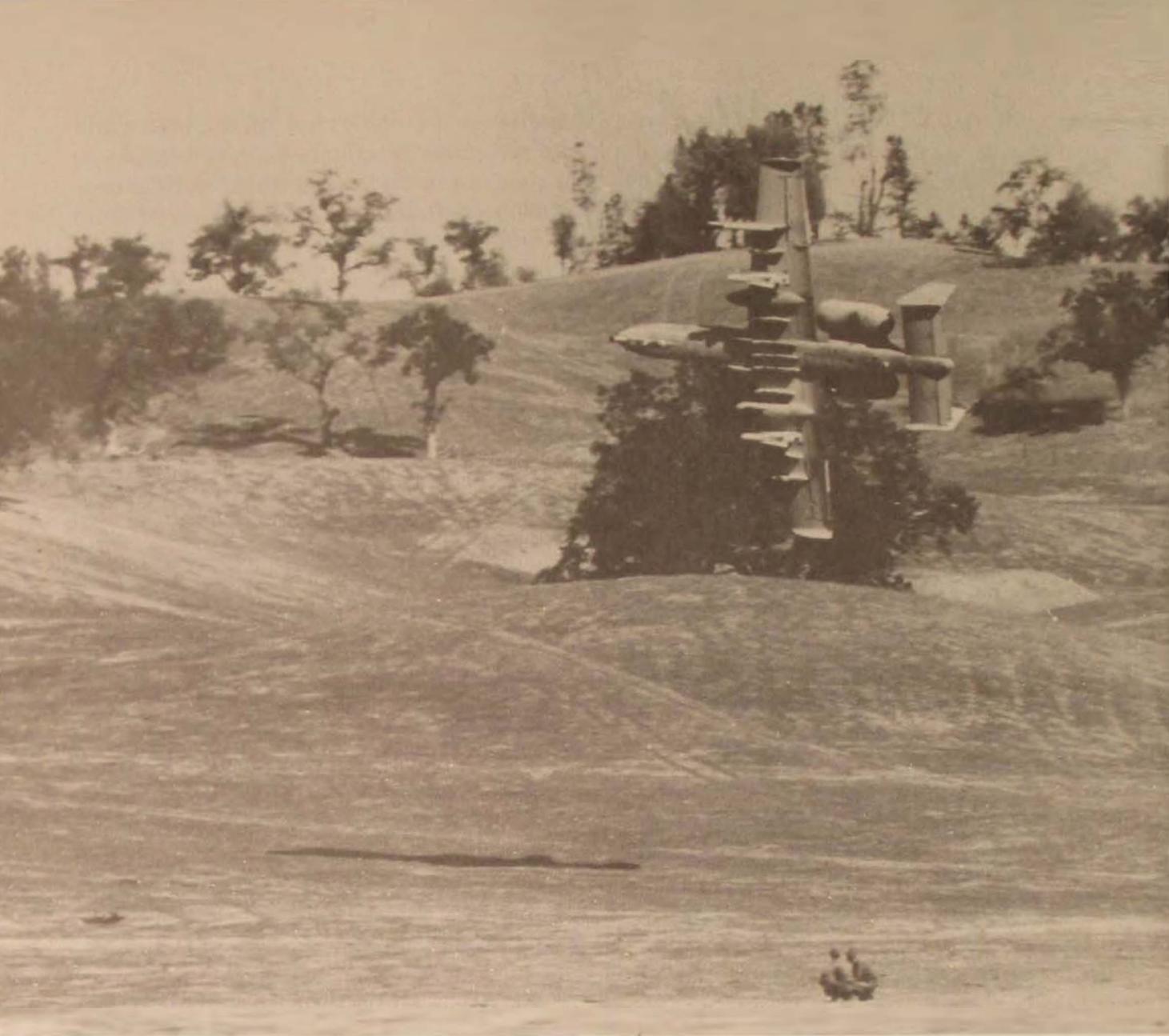
A-10 aircraft (above) regularly train with US Army
units. Integration of A-10s into rear area defenses
would not be a difficult task.

The firepower of the A-10's 30mm gun (above right)
would provide significant airborne firepower for ac-
tion over the wide areas of rear operations.

The A-10's (lower right) ability to carry a wide variety
of ordinance on multiple weapons stations means it
can attack different types of targets with the right
kind of munitions.

These could be airborne, air assault, amphibious, infiltration, or reconnaissance units or operational maneuver groups (OMG) up to army size. Their objectives would read as above but on a larger scale. They could include the seizure of national capitals, economic centers or ports, or the encirclement of major friendly ground units.

Our ground commanders must give due consideration to these threats when planning their operations. Operations plans and orders will direct that a specific unit headquarters be directly responsible for conducting operations in the rear.[7] This headquarters is usually the rear area operations center (RAOC). Additionally, combat and combat-support units will be identified with, at the very least, on-order missions to conduct rear area operations under RAOC control. They will probably include aviation, artillery, air defense, military police, engineer, and possibly even infantry units. The ground commander may also plan to divert some allocated CAS sorties for use in this area.

But the commander must be careful in his allocation of combat power to the rear. He cannot allow units to be siphoned away from the main battle or from reserves being marshaled for offensive operations. He must practice economy-of-force operations, initially using his combat service support elements and CAS sorties to detect, delay, and destroy intruding forces.[8]

The A–10 could be a most satisfactory asset for this operation. It possesses all of the capabilities necessary for theater air power.[9] It is highly responsive and can react theaterwide to rapidly changing situations. It is highly mobile and can quickly concentrate or disperse as necessary. Self-protection capabilities make it highly survivable in the rear area. It can establish presence by bringing force against weakness. By its very

positioning over the battlefield, it provides an ability to observe the enemy.

Additionally, the A–10 is equipped for this mission. The inertial navigation system provides a means for quick and accurate navigation. It can be programmed with the universal transverse mercator (UTM) grid map coordinates used by Army units. Communication equipment includes a UHF-AM, a VHF-AM, and a VHF-FM radio. The VHF-FM radio is common with FM radios used by Army units. This gives the A–10 pilot the ability to talk to anyone in the Air Force tactical air control system (TACS) or Army control channels.[10] Ordnance loads will always include the 30–mm GAU–8 gun, a highly lethal, accurate weapon not conducive to collateral damage. The A–10 can also carry the Maverick missile and many types of free-fall ordnance. This specifically includes the CBU–89 Gator mine, which could very effectively be used to bottle up larger type units.[11] Finally, the A–10 is equipped with the Pave Penny laser identification system, which, when used with a laser designator, facilitates accurate target visual identification.[12]

The A–10 would be optimal for such operations because its primary mission is close air support.[13] However, A–10 pilot training to date has focused primarily on the main battle at the forward line of own troops (FLOT), where large formations will be in contact. Training scenarios generally call for an alert scramble with immediate tasking to a contact point where a forward air controller (FAC) is contacted for final control for a high-threat run in. Consideration of rear operations close air support requires a broadening of horizons. Alert scrambles could obviously be used, but tasking would be less clear. Aircraft could be sent into areas far from the FLOT. Minimum-risk routes of contact points may not be available. Only target UTM coordinates might be provided, and a FAC may or may

not be on the scene. In the absence of a FAC, initial contact could possibly be with the air support operations center (ASOC), which is that element of the TACS collocated with an Army corps headquarters. The ASOC would probably pass the flights off to the RAOC, which would provide an initial briefing and then pass them off to a US Air Force Security Police air base defense team, an aviation commander, or ground commander for final control. However, non-FAC control is considered for emergencies only. The ground commander involved must accept the increased risk and decreased probability of mission success.[14]

As seen earlier, the targets themselves could vary. Level I threats may not be suitable targets warranting the expenditure of air sorties. However, Level II and definitely Level III threats would be valid A–10 targets. Additionally, since these enemy forces (be they airborne, air assault, or mechanized forward detachments) are designed for speed, they are lightly armed with air defense assets.[15] This makes them low-threat targets susceptible to air attack. The exception to this, of course, would be the larger OMG units of division-plus size that could be expected to possess normal divisional air defense capability. These would have to be handled as high-threat targets.[16]

The A–10, then, could provide the ground commander with an excellent asset to employ in rear operations. It is equipped to be optimally used in that area, and its pilots are trained for the mission. It gives the commander the ability to react to a potential threat quickly and lethally without initially drawing upon his main battle strength.

The threat to our rear is real. The Army has a saying that the priority of support should always go to the main effort. By reacting quickly with highly lethal A–10s against any incursion in a classic economy-of-force role, we can perhaps ensure that the rear operations do not have to become our main effort.   □

Notes

1. TACP/USAFEP/PACAFP/AACP 50–36. *Joint Concept Procedures for Close Air Support in the Rear Battle*, 8 July 1986, 1–1.
2. FM 100–5, *Operations*, May 1986, 19.
3. Ibid.
4. Ibid.
5. Ibid., 20.
6. FM 90–14, *Rear Battle*, June 1985, 1–2.
7. Student Text 100–9, *The Command Estimate* (Fort Leavenworth, Kans.: US Army Command and General Staff College, July 1986), 4–11.
8. FM 90–14, 2–5: TACP/USAFEP/PACAFP/AACP 50–36, 3–4.
9. AFM 1–1, *Basic Aerospace Doctrine*, 16 March 1984, 2–3.

10. TACP/USAFEP/PACAFP/AACP 50–36, A-1.
11. TACP 50–27, *Joint Operational Concept and Procedures of Air Delivered Mines (J-Mine)*, 26 September 1984, 4–2; Capt Jack Kearney, "The Gator Mine," *USAF Fighter Weapons Review*, Fall 1986, 6–9.
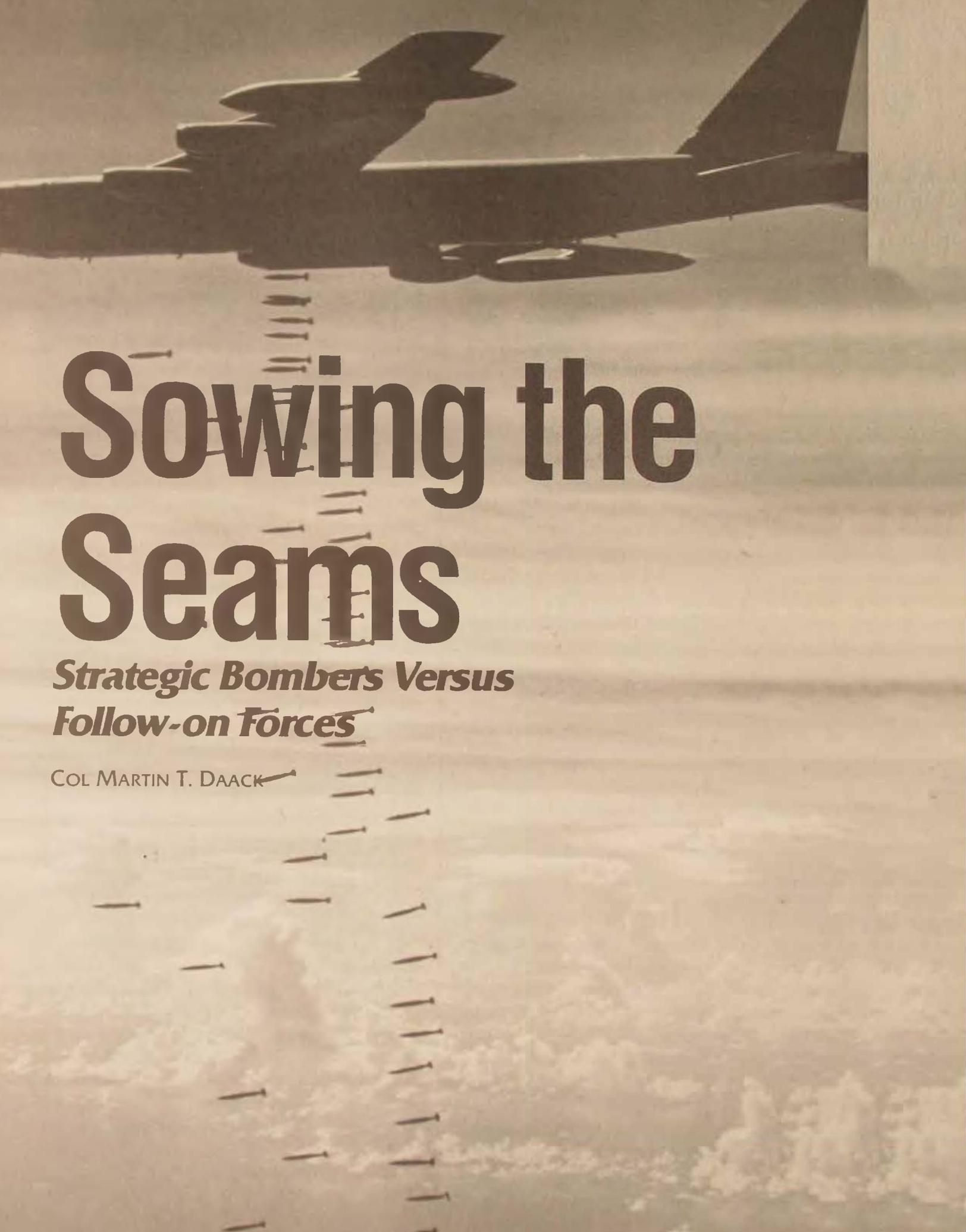12. TACP 50–25, *Joint Laser Designation Procedures*, 11 December 1985, A–68.
13. TACM 3–1, *Mission Employment Tactics: Tactical Employment A–10*, 31 January 1986, 1–1.
14. TACP/USAFEP/PACAFP/AACP 50–36, 6–2.
15. FM 100–2–3, *The Soviet Army*, 16 July 1984, 4–131, 4–132, 4–136, 4–140.
16. Ibid., 4–59.

Sowing the Seams

Strategic Bombers Versus Follow-on Forces

Col Martin T. Daack

FOR THE foreseeable future, the most dangerous adversaries facing the United States and its allies are likely to be "organized, equipped, trained, tactically schooled in Soviet military concepts."[1] A basic tenet of Soviet-style warfare is the employment of massed, mechanized, combined arms units of armor, infantry, artillery, and integral air defense. Airborne and airmobile forces, as well as offensive and defensive air forces, round out the combined arms team.

The Soviet operational model depends upon mobility, mass, maneuver, and momentum. Its theoretical tactics revolve around superior numbers and firepower, gaining and maintaining offensive momentum to advance 30 to 50 kilometers a day.[2] Momentum is sustained by multiple echelons that can "pass through or around the first echelon, join the fight with fresh forces, and press on to achieve and maintain continuous operations."[3]

The US Army doctrine for countering this Soviet-style threat is outlined in Field Manual (FM) 100–5, *Operations*. Called Air-Land Battle doctrine, the concept focuses on destroying the momentum, tempo, and coherence upon which the Soviet model relies.[4] To accomplish this, the US Army depends heavily upon air power. Air strikes help to "feed the enemy to the Army in bite-sized chunks" by delaying, disrupting, or destroying the uncommitted enemy echelons while isolating committed forces so they can be destroyed.[5] Targets range from just beyond friendly artillery range to deep interdiction.

On the other hand, Air Force doctrine states that "the first consideration in employing aerospace forces is gaining and maintaining the freedom of action to conduct operations against the enemy."[6] This priority counterair mission will leave fewer resources initially dedicated to the ground battle, placing Army and Air Force doctrine at odds.

This paper proposes a way to redress this doctrinal mismatch by employing strategic bombers in the ground-attack role to delay, disrupt, detour, and destroy follow-on echelons of enemy armor and infantry during the first few critical hours and days of a major conflict. Since tactical air forces initially will be engaged in the air superiority battle, the use of bombers in a theater role against the closest follow-on forces will afford the timely application of firepower required to dovetail interservice doctrines. This proposal capitalizes on the strengths of bombers while working within survival limitations in the lethal environment of a Soviet-style combined arms attack. This proposal is designed using only conventional munitions, with no tactical or strategic nuclear weapons employed by either side.

Why the Heavy Bomber?

The thought of enemy armored divisions crashing echelon after echelon against US and allied defenders is sobering. However, armored units are not omnipotent. According to Field Manual 100–5, "They are vulnerable in close terrain, such as forests and cities, and in limited-visibility conditions. They cannot cross most rivers and swamps without bridging, and they require substantial logistical support."[7] For instance, there is a substantial problem involved in trying to refuel and rearm tank columns, especially while fighting in urban areas. The judicious use of air power can capitalize upon these limitations to create a favorable tempo in the battle while denying engagement to the enemy by destroying bridges, fords, rail-

ways, and roadways to force him into difficult or impassable terrain; by mining advantageous avenues of approach and chokepoints; and by destroying as many enemy forces as possible before they can close with friendly ground forces.

The most judicious use of air power while tactical fighter aircraft conduct the initial airspace control battle is to use strategic bombers to "sow the seams" to isolate enemy follow-on echelons from friendly forces and from each other through the use of gravity bombs, air-scatterable mines, and standoff munitions. This concept is consistent with the first dictum of antimechanized operations: "to destroy the combined arms integrity of the enemy at all levels while keeping the combined arms integrity of your force intact."[8] The concept is also in keeping with Air Force doctrine calling for employing aerospace power as an indivisible entity.[9]

Traditionalists initially would use bombers strictly in deep-interdiction missions against strategic logistics bases, railroads, highway networks, and economic targets. However, the time-critical nature of the immediate ground threat and the potential requirement to resort to tactical nuclear weapons should a follow-on attack succeed dictate that these limited, high-leverage

Long-range bombers, like this B–52H, can provide theater support from safe areas away from the battle area or can loiter for long periods of time to be used as needed.

24

bombing platforms be used more flexibly and closer in.

Bombers envisioned in this proposal include the B–52G/H, the B–1B, and the advanced technology bomber (ATB). These aircraft have inherent advantages in area-denial missions and in attacking massed formations. In the first place, their radars and terrain-following equipment allow for ingress, strike, and egress day or night in all weather conditions at low altitude (below 300 feet), thus reducing or eliminating detection from ground-based threats. Self-contained electronic countermeasures also allow the bombers to jam enemy radars, screening the bombers' approach. In addition, the low radar cross section of the B–1B in a head-on, nonradiating mode—about the same as an F–16 (one square meter)—and the stealth characteristics of the ATB further enhance the survival of these new systems.

By carrying large amounts of standoff munitions, bombers can remain outside of lethal air defense range and still create and exploit enemy "killing zones."
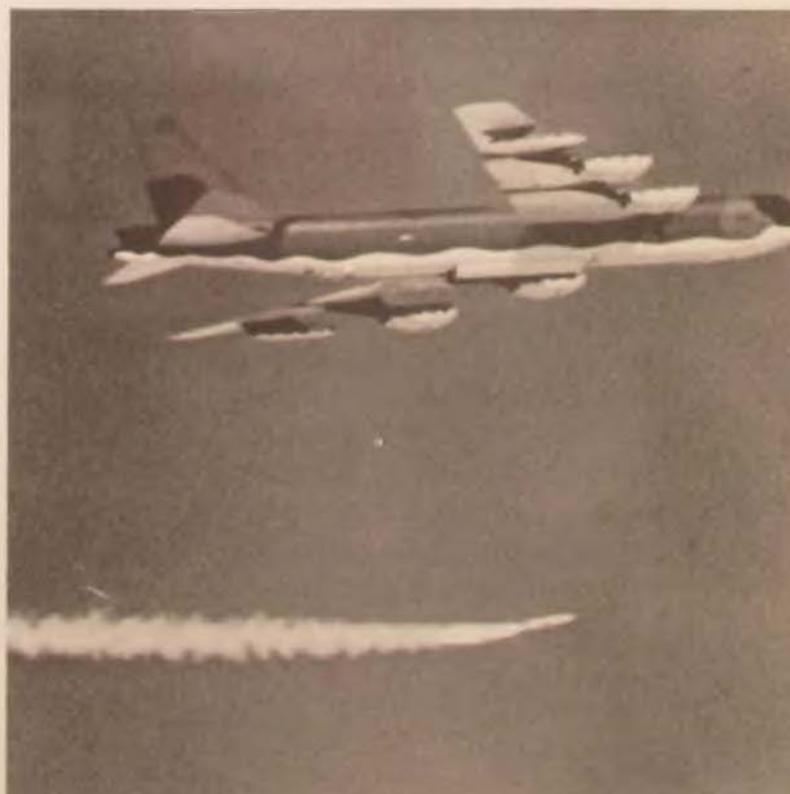
Perhaps the greatest attributes of strategic bombers are their range and payload. B–52s are capable of low-level attack at 390 knots, while the B–1B can exceed 500 knots. These aircraft can deliver 60,000 to 70,000 pounds of general purpose bombs, cluster bombs, mines, and standoff munitions at unrefueled ranges of over 6,000 nautical miles. A single B–52 can carry a combined internal and external load of twenty-seven 500- or 750-pound bombs and twenty-four Gator mine pods. A B–1B can carry thirty-two Gator mines or up to eighty-four 500-pound bombs internally.[10] ATB specifications are classified but are assumed to equal or exceed the B–1B.

These characteristics theoretically enable a single bomber to carry what could require up to an entire squadron of fighter-type aircraft. Further, their range allows the flexibility and security of deep-rear basing or of flanking enemy defenses. When we consider forward-based bombers, range equates to long loiter time, which could translate to immediate strikes on lucrative targets by bombers orbiting just outside lethal areas. When flown in concert with air-to-air and air-to-ground suppression of enemy air defenses (SEAD), bombers can enhance their probability of success and survivability.

Campaign Planning and Execution

In order to use bombers effectively in a formally planned, conventional scenario, commanders and planners must be certain that the bombers and crews will be available to the theater/joint forces commander. The best way to ensure this is to assign the bombers to the operational command of the theater commander at the outset of the war by means of a change of operational control (CHOP). These can be either dedicated conventional or dual-role B–52s, B–1Bs, and ATBs. Incorporating these bombers into theater operations will require peacetime practice between tactical aircraft, bombers, and command and control entities. The risk of not having all bombers available for the nuclear single integrated operational plan (SIOP) will be offset if their implementation in a theater conventional war will keep the conflict from going nuclear.

Planners must be intimately familiar with both the characteristics of combined arms forces and the theater terrain—where the enemy armor/mechanized forces cannot go and where they must go. Planners then can select optimum target areas to block, detour, and set up the advancing forces for destruction.

Natural barriers afford the most efficient obstacles. Combined with man-made barriers, these channel the enemy where and when you want him. For instance, if an advancing force must cross a river, bombing all bridges and cratering and mining fords will create impassable barriers and force the enemy to halt and mass into a desirable "killing zone." Knowing the prime avenues of approach, bombers can strike prior to the enemy force advancing on the crossing rather than having to overfly a heavily defended site. The enemy also can be detoured to a place of our choosing by not destroying or mining selected bridges and fords. He would then be forced either to move to the area we elect or to delay his advance to reconstruct destroyed crossing sites. In either case, his momentum and timing would be adversely affected.

A valuable lesson in delaying tactics can be learned from Allied attempts to cross the Roer River in February 1945. German engineers destroyed the floodgates on river dams and created a flood lasting two weeks, preventing Lt Gen William Simpson's US Ninth Army from fording the river. According to Gen Omar Bradley, this "slow-leak" technique was much more effective than

The B–1 (above) can carry up to eighty-four 500-pound bombs or various quantities of standoff weapons and air-deliverable mines. This ability to deliver large quantities of weapons gives each B–1 sortie the striking power of up to an entire squadron of fighter aircraft. Although actual capabilities remain classified, it is assumed that advanced technology bombers such as this flying wing concept (left) would have similar capabilities.

27

blasting entire dams and causing a violent but brief torrent.[11] This same technique can be employed today to create a barrier to enemy bridging and fording attempts by using munitions that are either delivered by air with precision guidance or put in place during Ranger-type operations on the ground.

These munitions also can be used to create chokepoints. Valleys between steep hills, mountain passes, routes flanked by impassable terrain (rivers, bogs, etc.), and urban areas can form natural chokepoints or become chokepoints with the delivery of air-scatterable mines and the bombing and cratering of roads, railroads, tunnels, and so forth. A few bombers can sow minefields hundreds of meters wide and long, denying access to advancing columns. Even with mine-clearing techniques, the enemy will be forced to funnel through, gather behind, or detour around the chokepoints. In the least case, he will lose the momentum and timing of his attack. In the best case, he will present a lucrative "killing zone" to be exploited further by bombers delivering wide-area munitions. In the meantime, each minefield crossed should cause more enemy attrition.

Before enemy follow-on forces can join the battle, they must maneuver from rear echelon locations into an attacking position. For their own protection, enemy forces will not willingly "bunch up" in "killing zones" that are easily identified and attacked. The bombers can aid in forcing the enemy to congregate in numbers and areas not of his choosing. This can be accomplished only by carefully planning and precisely executing well-rehearsed, coordinated bomber attacks on follow-on echelon targets.

Integrating bomber missions with SEAD missions will ensure the mass, economy of force, and surprise necessary to overcome sophisticated, Soviet-style air defenses. This frees fighters for the air superiority battle while bombers simultaneously strike the close-in second echelon. Tactics must be practiced often on ranges in the continental United States and, where possible, in the proposed theater of operations to develop and hone the composite strike force concepts. Additionally, bombers must develop independent tactics for those missions where range or weather prevent composite operations. Bomber attrition is a vital concern, but the cost of not employing these systems may well outweigh combat losses. The key is to reduce attrition to an acceptable level throughout the campaign.

Think Crecy, Survival, and Self-Defense

Due to the carnage and confusion envisioned along the forward line of troops (FLOT), no aircraft—fighter or bomber, friend or foe—will survive for long flying directly over the FLOT. Likewise, flying directly over the enemy follow-on echelons, especially for more than one pass, will probably be terminal for the aircrew. Therefore, the problem is how to solve the time-critical, follow-on echelon dilemma using strategic bombers without committing suicide.

A lesson can be taken from the Battle of Crecy in 1346, when English archers using the longbow with its cloth-yard shaft (37-inch arrow) defeated the "combined arms army" of the day, crossbow-wielding Genoese infantry and mounted French knights. English bowmen rapidly firing long-range, accurate missiles prevented closure between the forces and spelled defeat for a superior French force.[12] In a similar vein, bombers launching accurate, wide-area, standoff munitions can "sow the seams" and wreak havoc on massed enemy echelons from outside lethal air defense range. Used in this way, bombers can safely create and then exploit "killing zones."

If a serious airborne or ground-based defense threat is anticipated, bombers should be part of a composite strike force. However, bomber tactics away from lethal defenses can include direct overflight of the target employing either single aircraft or several aircraft striking nearly simultaneously from multiple axes. Survival can be enhanced by low-level, terrain-following air strikes and by passive self-defense (flares, chaff, and electronic countermeasures). An alternative, consistent with independent bomber strikes, is to equip the bombers with lethal self-defense, including antiradiation and air-to-air missiles. These additions to the bombers' arsenal can enhance survival, especially when the bombers are flown beyond fighter coverage, such as in Southwest Asia.

Conclusions and Recommendations

Faced with a determined, powerful combined arms enemy force, US and allied ground commanders need immediate support against the echeloned follow-on forces. Currently, Air Force doctrine gives priority to air superiority missions. This may leave the Army "naked" against the close-in threat. The range, payload, and munitions menu of bombers make them an ideal choice to destroy Soviet-style tactics, tempo, and troops. Bombers employing low-level tactics and carrying precision standoff, gravity, or air-scatterable munitions can effectively delay, disrupt, detour, or destroy the attackers before they can close with friendly forces.

As indicated, the Soviet model of warfare stresses attacking with massed combined arms units. These units must come together in rear assembly areas and move forward in concert to attack. One or two bombers can wreak havoc on enemy columns on road march. Bombers striking staging areas and critical rail and road networks can also prevent or delay the linkup of enemy units. Early identification of these targets can lead to preplanned, deeper strikes at the outset of hostilities, complicating enemy command and control. Psychological disruption and confusion can be as crucial as physical destruction when enemy success depends upon the timing and mass of their attack. Once located, individual units can be further isolated using bombing and mining techniques to create barriers and chokepoints.

Integrated tactics using composite forces of fighters and bombers to simultaneously strike enemy air threats and the follow-on echelons can close the interservice doctrinal gap and support the Army's doctrine. Further, bombers can operate singly or in cell, independently from fighters if weather or range prohibits composite operations. This capability is especially important when the only alternative might be for the allied forces to resort to nuclear weapons to halt the onslaught.

Current munitions, command relationships, and tactics need to be refined for bombers to be effective against Soviet-style forces. We must develop new generations of accurate standoff munitions for use when lethal air defenses prevent target overflight, as well as new air-scatterable munitions capable of halting armor, mechanized artillery, and personnel. Finally, bombers should be modified to carry self-defense weapons and tactics should be developed for their use against enemy air and ground threats.

Command relationships that place bombers under the operational control of theater commanders for timely execution and control must be developed and agreed upon before bombers can be thoroughly integrated into conventional warfighting plans. Then planners must develop target packages and

strike tactics for use in lethal and nonlethal conventional environments. Both fighter and bomber units must practice the new tactics and operations together, under realistic conditions, to perfect the skills and timing required to conduct composite air strikes. In this way, the B–52s, B–1Bs, and ATBs can accomplish the mission of halting follow-on forces and can correct the mismatch between Air Force and Army doctrines.   □

Notes

1. FM 71–100, *Armored and Mechanized Division Operations,* 29 September 1978, 2–1.
2. Ibid., 2–3.
3. Ibid.
4. FM 100–5, *Operations,* 5 May 1986, 14.
5. *US Army Forces* (Maxwell AFB, Ala.: Air University Press, 1985), 5–1.
6. AFM 1–1, *Basic Aerospace Doctrine of the United States Air Force,* 16 March 1984, 2–11.
7. FM 100–5, 42.
8. Christopher R. Gabel, "Seek, Strike, and Destroy: U.S. Army Tank Doctrine in World War II," *Leavenworth Papers* (Ft. Leavenworth, Kans.: US Army Command and General Staff College, September 1985), 71.
9. AFM 1–1, 10, 11.
10. Lt Col John E. Frisby and Maj Grover E. Myers, *Strategic Forces in Transition: A Doctrine for Indivisible Aerospace Application* (Maxwell AFB, Ala.: Air University Press, 1985), 138–40.
11. Gen Omar N. Bradley and Clay Blair, *A General's Life* (New York: Simon and Schuster, 1983), 395–96.
12. Lynn Montross, *War Through the Ages* (New York: Harper & Row, 1960), 167–72.

US AIR FORCE OPERATIONS AND INTELLIGENCE

Getting It Together

CAPT BRIAN P. TICE

ONE OF the most important priorities for the military lately is the emphasis on "jointness." We stress the need for better cooperation between us and our allies and also between our own services in order to make the most of our limited resources. Based on personal experience, I firmly believe an important issue for those of us in Air Force intelligence is "jointness" between ourselves and the people we support—those in operations.

A good operations/intelligence interface is critical in peacetime because it is critical in wartime. Such an interface provides operations people with the intelligence support they need to fight effectively in a war. It

also gives operations a good "feel" for the type of information that intelligence can realistically provide them during a conflict. At the same time, it makes intelligence more responsive to operational needs while creating more knowledgeable and credible intelligence personnel. The resulting trust between both parties will serve us well in a future confrontation.

However, there are two obstacles to good interface that must be overcome if we want to make the most of our limited resources. First, junior intelligence people at the wing level often lack job knowledge, and this sometimes results in a lack of credibility. Second, the lack of unity between operations and intelligence results in unrealistic expectations from both parties because one side does not know how the other side does business. The following ideas are proposed solutions to help overcome these obstacles.

The lack of job knowledge on the part of junior intelligence people at the wing level can be corrected in several ways. First, assignment selection procedures must emphasize picking the best students from the US Air Force Academy, the Reserve Officer Training Corps, or Officer Training School who are entering the intelligence career field for wing assignments. These positions demand people who require the least supervision, yet who are closest to the cutting edge of the Air Force. Second, operations people should be sent TDY to the intelligence school to orient future wing intelligence officers on what operators need and do not need from their intelligence people before the latter arrive at the wing. Since students at the school already know where they are being assigned, the appropriate Tactical Air Command, Strategic Air Command, and Military Airlift Command operators could orient the appropriate students to make them smarter faster. This would be especially helpful in short-tour areas like Korea. This step would also force operators

to think about (in a more structured way) what they really want from their intelligence people. Third, to correct the experience shortfall at the wing, intelligence personnel should be highly encouraged by the Air Force to serve two wing tours before promotion to lieutenant colonel or master sergeant. Fourth, when a new intelligence person arrives at a wing, he or she should start a training program that emphasizes three areas: the threat, our forces, and exercises.

The threat should be learned first and in depth. Knowledge should go beyond enemy force capabilities to include enemy *weaknesses* and how he intends to use his capabilities against our aircrew. In other words, we need to know enemy operating doctrine. Next, wing intelligence people should learn all they can about our aircrew and aircraft, along with their capabilities and weaknesses. They should be briefed by operations on how our aircrew are selected and trained, the capabilities of the wing's aircraft, and how we plan to use them (our operational doctrine). They should be given a walk around the aircraft as well as an opportunity to sit in the cockpit and to ask questions. Systems on the aircraft that deal with the threat (i.e., radar warning receivers) should be highlighted. Finally, within six months of arrival, new intelligence personnel should be sent to an exercise similar to Tactical Air Command's Red Flag. This allows them to see how their wing works with other units as part of the "big picture." It also allows them to work with the aircrew away from home station, which should facilitate relations between operations and intelligence.

A second obstacle to achieving good interface is the lack of unity between operations and intelligence. This results in unrealistic expectations because one "specialty" does not know how the other does business. For intelligence, knowing the air-

crew, aircraft, and the mission is just the beginning. To break down this barrier, the squadron intelligence officer should not merely be attached to the squadron but should be assigned to it. He or she should live at the squadron, wear a flight suit, take an occasional flight, attend aircrew meetings, and have his or her officer effectiveness report written by the squadron commander or director of operations. In short, he or she should actually be a part of the squadron. By living with squadron mates, he or she will have a much better idea of how operators work and what is relevant to them and what is not. This would result in much more interesting and informative aircrew intelligence training and mission briefings. Similarly, operators would know what intelligence can do for them in both peacetime and wartime. The two "specialties" will become closer because each will understand on a regular basis how the other side does business.

For example, one of the ways intelligence supports operations is by extracting information from the aircrew during flight debriefings to learn more about the enemy. By accompanying operations personnel on simulated combat missions, intelligence people can learn what type and how much information an aircrew can reasonably be expected to provide. These simulated missions—especially those in which the aircraft is flying at low altitudes, evading simulated ground threats, and getting "jumped" by aggressor aircraft—will help give intelligence personnel an idea of what crewmembers can and cannot see or hear from the cockpit concerning the enemy. This experience will also give them a greater awareness of the physical and psychological stresses an aircrew must endure.

The Air Force constantly emphasizes that there is no substitute for an aircrew "being there" in a simulated combat environment. Is not this also true of intelligence people who must support them in a war? And yet you would be surprised how tough it is for intelligence people to fly even one such mission. One example from my own experience comes to mind. Our wing was subordinate to an air division commander who thought such flights were strictly joy rides. He believed that any Air Force officer who needed an "incentive ride" should be selling insurance for Prudential. This senior operations officer clearly did not understand the intelligence business. Otherwise he would have known that such flights would improve the chances of his crews living to fight another day. Although operations people are beginning to gradually accept this idea, we still have a long way to go in this area.

In summary, good operations/intelligence interface is critical, and there are many things we can do to improve this interface. Although the recommended proposals are not all-inclusive and some of these measures have been adopted in piecemeal fashion, they can serve as standardized guidelines for improving relations between the two parties throughout the Air Force. Working together better will make maximum use of our limited resources and give us the edge we need to fly, fight, and win!□
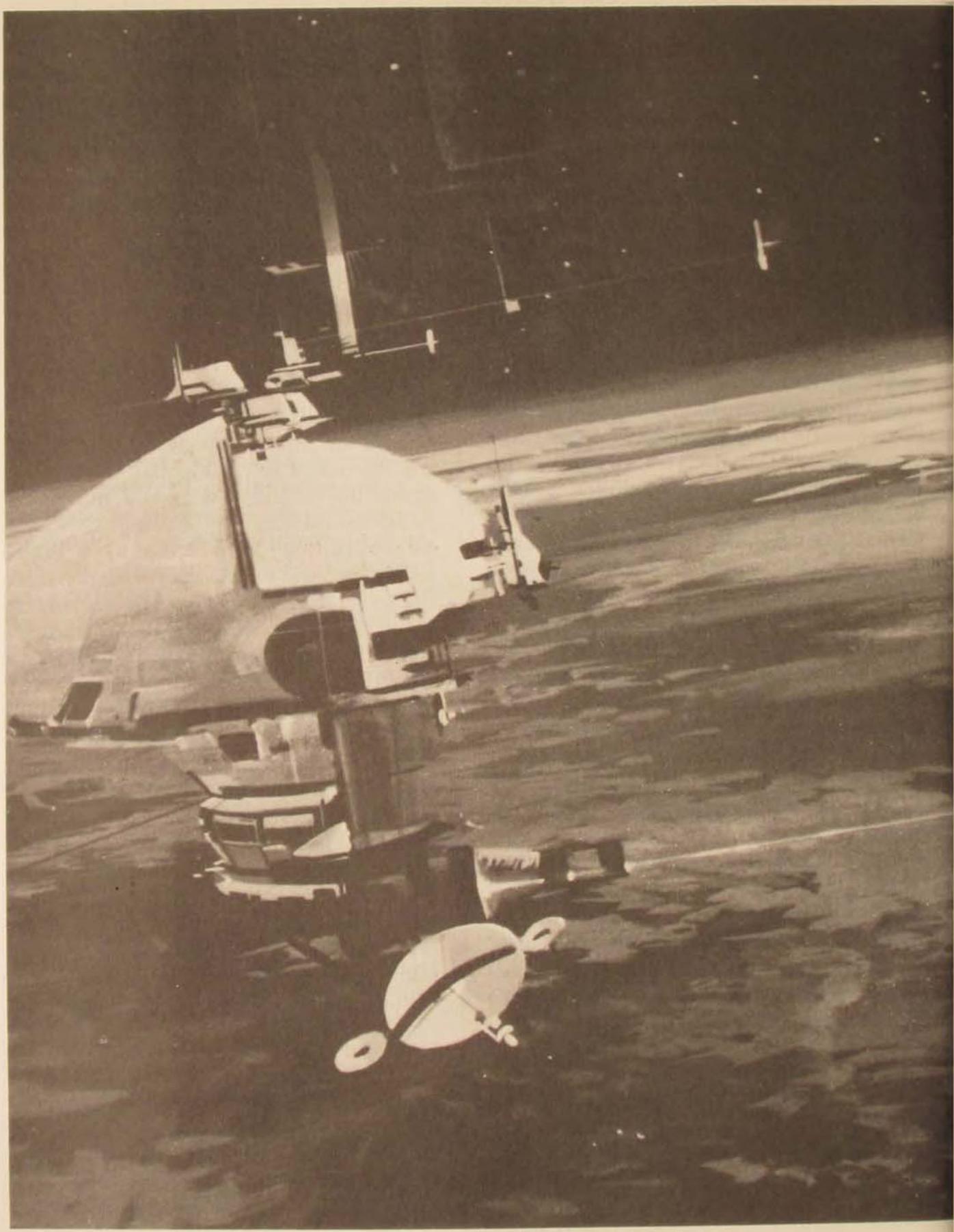
FROM PROJECT THUMPER TO SDI

The Role of Ballistic Missile Defense in US Security Policy
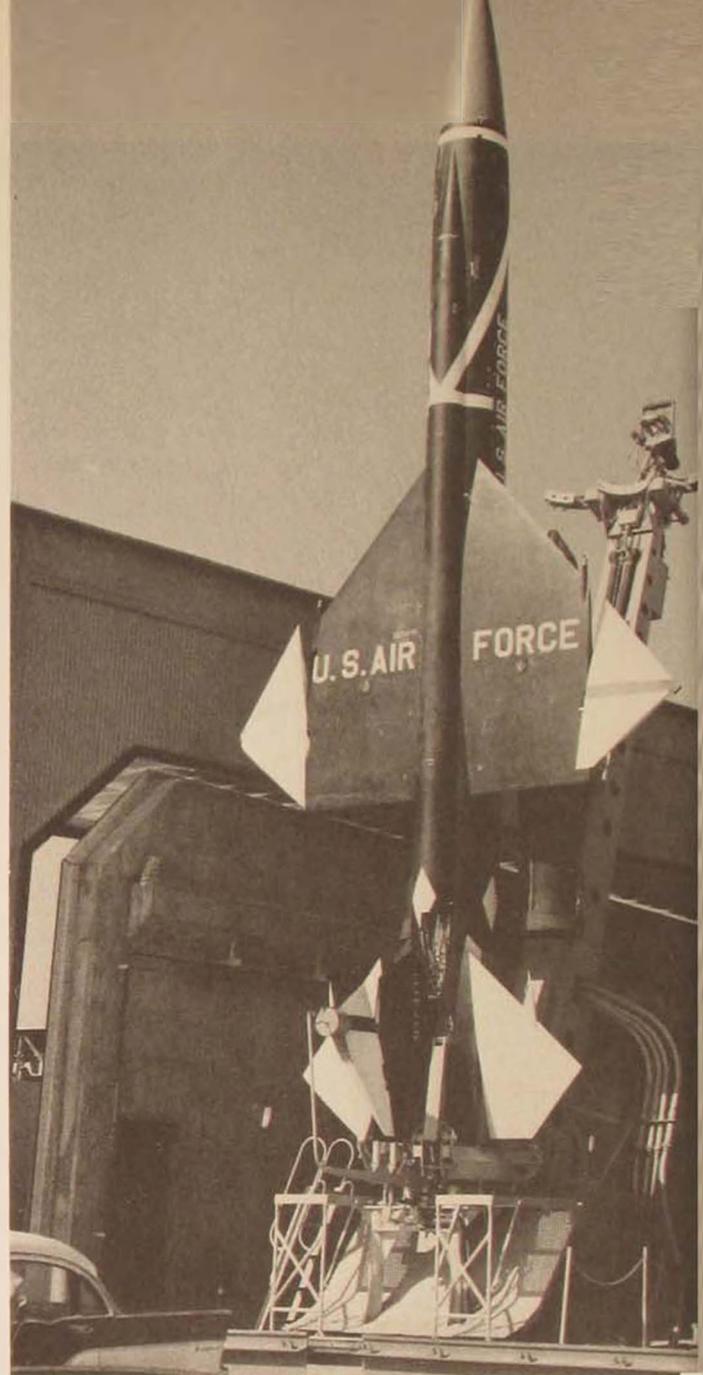
Dr Daniel S. Papp

R ONALD REAGAN'S 23 March 1983
call to the American scientific and
technical community to undertake
a "comprehensive and intensive ef-

fort'' to define a long-term research and development program designed to "achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles" revived a debate over ballistic missile defense that had slumbered since the signing of the ABM Treaty in 1972.[1] In the years since President Reagan reopened the debate on the public level, disagreement over strategic defense has been one of the dominant defense issues both in the United States and abroad.

To a surprising extent, the strategic defense debate of the 1980s is similar to ballistic missile defense (BMD) debates of earlier decades. In the three preceding decades, concerned citizens ranging from defense intellectuals and military officers to housewives and religious leaders debated the wisdom and feasibility of defending against, rather than responding to, a ballistic missile attack. And the questions so familiar in the late 1980s were asked during that earlier period also. Was BMD technically feasible? Would it be too costly? Would it be too dangerous and perhaps send the other side the wrong signal, a signal that the United States intended to attack first? Would BMD weaken Western alliances, and would it make war more likely rather than less likely? Could offensive weapons penetrate it easily, and could offensive weapons be added to arsenals less expensively than could defensive capabilities? The technologies of today's strategic defense debate are different from those of earlier debates, but many of the issues are the same.

The purpose of this article, then, is to lend a degree of historical depth to the Strategic Defense Initiative (SDI) debate of the 1980s by examining the precedents of that debate. Put simply, it will examine the role that ballistic missile defense has played in US defense policy. Particular attention will be paid to past discussions about the objectives of ballistic missile defense, the cost-

exchange ratio, interservice rivalry, and potential Soviet responses to BMD. Before turning to this examination, however, we should look at SDI's predecessors.

American Ballistic Missile Defense Programs: Nike-Zeus and Nike-X

The origins of US interest in ballistic missile defense may be traced to September

Despite extensive research and development, debate over the feasibility of ballistic missile defense resulted in the deployment of only antiaircraft systems, such as this BOMARC missile (left) designed to intercept supersonic targets and the ballistic missile early warning system radars like these at Thule, Greenland (above).

1944, when Nazi Germany began launching V–2 rockets against Allied targets. Within a year, the General Electric Company's Project Thumper report concluded that defense against V–2 rockets was not possible given the state of then-current technology.[2] This pessimistic conclusion about the possibility of defense against rockets did not deter Project Thumper from pursuing its primary mission of developing a high-altitude antiaircraft defense, nor did it deter Bell Telephone Laboratories and the Western Electric Company from pursuing work on Project Nike, also designed to serve as a high-altitude antiaircraft defense.[3] Both Thumper and Nike were funded by the US Army.

Project Nike evolved from Nike-Ajax, the antiaircraft project, to Nike-Zeus, the first true US antiballistic missile project. But this evolution was a slow process, both because of the uncertainties of the technologies evolved and because of the slow growth during the early 1950s of the Soviet ballistic

missile threat. Indeed, despite Germany's World War II successes with V–2s, several noted American scientists, including Dr Vannevar Bush, were skeptical about the feasibility of an intercontinental ballistic missile.[4]

The move toward BMD accelerated significantly in 1955 as evidence accumulated that the USSR had begun to devote extensive resources to intermediate-range ballistic missiles and ICBMs. In November 1955 the Army let a contract to Bell Telephone Laboratories for a feasibility study on ballistic missile defense, and the following year the Army Rocket and Guided Missile Agency funded Bell, Western Electric, and the Douglas Aircraft Company for basic research on BMD. In 1957 the US Army established the Nike-Zeus Guided Missile Defense System Project, and in 1958 the Army authorized Nike-Zeus as a full-scale BMD development program.[5]

Even before this, however, the Air Force and the Navy had initiated air defense programs designed to cope with their own concerns. These programs gradually took on BMD potential and eventually led to interservice rivalry in BMD. The Air Force, in conjunction with Boeing, began work on a ground-to-air missile, which the Navy recommended for BMD purposes in 1959.[6]

Army-Air Force rivalry over BMD development was particularly intense during the middle and late 1950s despite the efforts of two consecutive secretaries of defense to resolve this and other Army-Air Force conflicts. For example, on 26 November 1956 Secretary of Defense Charles Wilson issued a directive that gave the Army responsibility for developing and deploying surface-to-air missiles for point defense; the same directive gave the Air Force responsibility for area defense. Although the directive never explicitly defined the threat as aircraft or missiles, the Army and Air Force pursued both tracks, the Army with its Nike-Her-
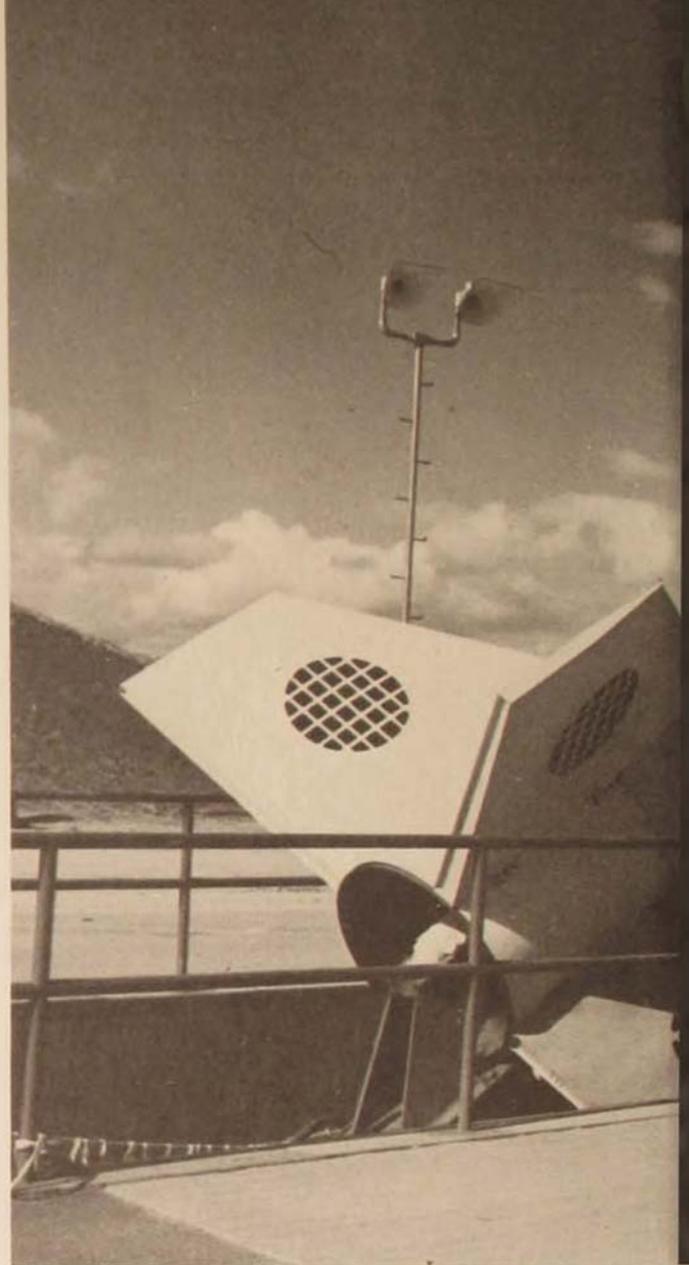
The Nike program of the 1950s and 1960s brought tremendous increases in the capability of interceptor missiles. The Nike-Hercules (right) antiaircraft mis siles were deployed, but the Nike-Zeus antimissile version (above) remained in the test and development mode.

An outgrowth of the Nike-X program, the Sprint missile (far right) was the point defense weapon for the Safeguard ballistic missile defense system. The system achieved operational status but was deactivated in 1976.
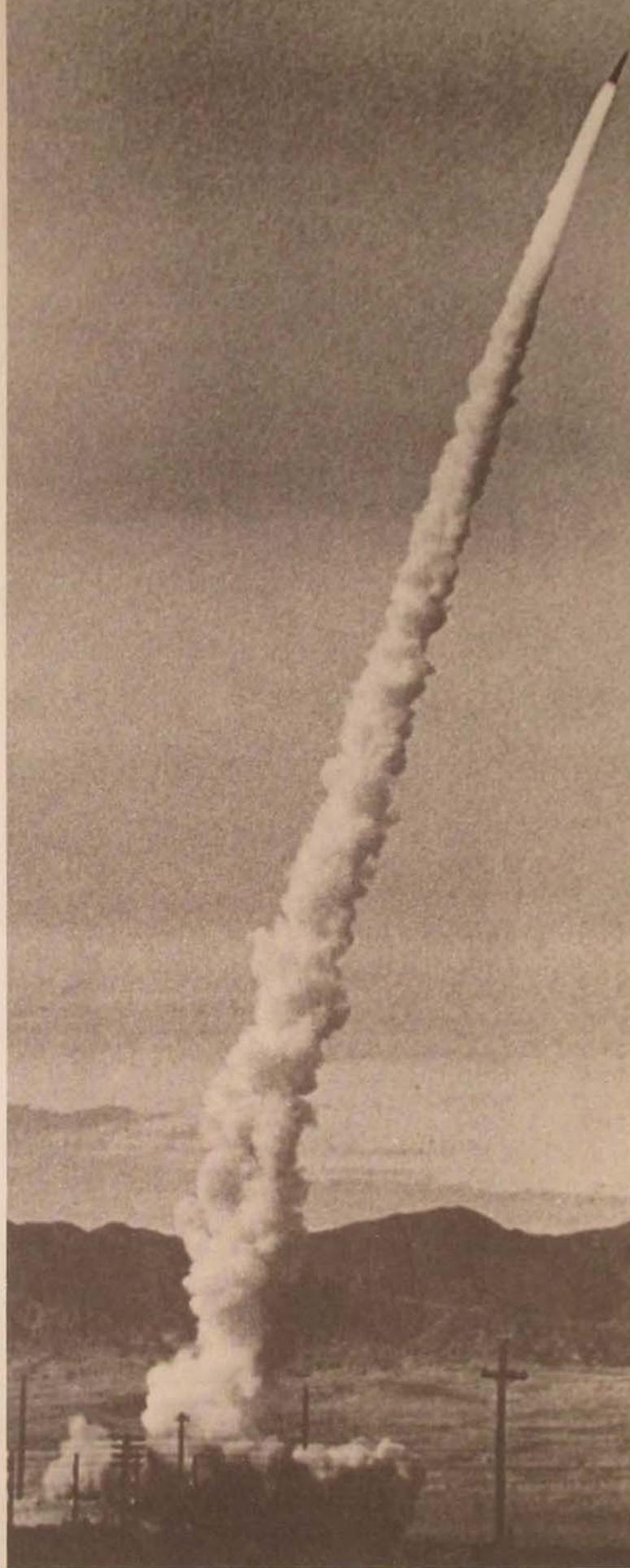
The latest version of ballistic missile defense is the Strategic Defense Initiative, including such concepts as this neutral particle beam weapon (above) and chemical laser weapons (far right), that are designed to destroy ICBMs in space. Other systems would defeat enemy warheads as they reentered the atmosphere, such as these Soviet MIRV warheads from an SS–9 test launch (right).

cules and Nike-Zeus programs and the Air Force with its Bomarc and Wizard efforts.[7] It was not until January 1958 that new Secretary of Defense Neil McElroy effectively curtailed the Air Force's Wizard project by ordering that Wizard develop only early warning radars, tracking and acquisition radars, and communications links that would be compatible with Nike-Zeus missile and launch system components. Equally important, in January 1958 the Advanced Research Projects Agency (ARPA) was formed and given responsibility to direct all other BMD research. This ARPA-directed effort was known as Project Defender.

Despite McElroy's preference for Nike-Zeus, he still had doubts about the system. Appearing before the Senate Preparedness Subcommittee on 22 January 1958, McElroy emphasized that the $195 million he was requesting for BMD would be "devoted primarily to research and engineering instead of actual production and development"

since the latter would be "premature."[8] The Air Force, meanwhile, launched a rear-guard action to revive the Wizard project, arguing that the Zeus did not have an ability to be upgraded to meet a threat environment that included enemy evasion, decoys, and countermeasures.

Increasingly during late 1958 and throughout 1959, the technical feasibility of BMD in general and Nike-Zeus in particular became an issue of contention. The Army argued for development, production, and deployment funding for Zeus, requesting $1.3 billion for fiscal year 1960. This request was eventually funded at $300 million.[9] ARPA, meanwhile, stressed that a deployed BMD had to be technically feasible, be able to respond to all types of missile threats in all types of environments, be economically affordable, and be operational as soon as possible. Other commentary from ARPA officials made it clear that ARPA questioned Nike-Zeus capabilities on all counts, particularly its ability to destroy warheads.[10]

The Air Force position was even more fascinating. By 1959 the Air Force had abandoned its earlier arguments for missile defense and had begun to argue that monies previously targeted for defensive research and development would be better spent on more and better offensive capabilities.[11] This was a fundamental alteration in the Air Force's position. At the same time, it further legitimized the Air Force's continued emphasis on long-range bombers and growing interest in ICBMs.

Other voices outside ARPA and the Air Force had also begun to question the intellectual basis of BMD. Edward Teller, for example, argued that while BMD might be technically feasible, the increased cost to an enemy of penetrating a BMD screen would be less than the cost of strengthening the screen to prevent penetration.[12] (This argument has been resurrected in the SDI debate under the concept of the cost-exchange ra-

tio.) And in December 1960 Jerome Wiesner argued at the Sixth Pugwash Conference that BMD was destabilizing; indeed, he even suggested that ballistic missile defenses be banned by an international agreement while offensive weapons be based in invulnerable basing modes.[13]

By the advent of the Kennedy administration, then, Nike-Zeus as a program and BMD as a concept were increasingly open to question. The pros and cons of Nike-Zeus and BMD as a concept as understood in 1961 were succinctly summed up by Secretary of Defense Robert S. McNamara in his 4 April 1961 testimony to the Senate Armed Services Committee:

> Successful development [of Zeus] may force an aggressor to expend additional resources to increase his ICBM force. It would also make accurate estimates of our defensive capabilities more difficult for a potential enemy and complicate the achievement of a successful attack. Furthermore, the protection that it would provide, even if for only a portion of our population, would be better than none at all. . . .
>
> There is still considerable uncertainty as to its technical feasibility and, even if successfully developed, there are many serious operating problems yet to be solved. The system, itself, is vulnerable to ballistic missile attack, and its effectiveness could be degraded by the use of more sophisticated ICBMs screened by multiple decoys. Saturation of the target is another possibility as ICBMs become easier and cheaper to produce in coming years. Finally, it is a very expensive system in relation to the degree of protection that it can furnish.[14]

As a result of these considerations, McNamara and Kennedy opposed production of Zeus but supported continued development expenditures for Zeus ($270 million in fiscal year 1962). Other BMD projects also continued, notably Project Defender at ARPA. Interestingly, despite the Air Force's stated preference for strategic offensive over strategic defensive systems, the Air Force had itself reentered the BMD arena, this time under the auspices of its ballistic mis-

sile boost intercept (BAMBI) program. Additionally, even in the early 1960s, the Air Force was also studying ways to destroy ICBMs from space-based defense platforms.[15]

During 1961 an additional factor became increasingly important in the BMD debate as intelligence sources indicated that the USSR was proceeding apace with its own antiballistic missile programs. Indeed, sometime during 1961 or 1962 the USSR successfully intercepted and destroyed two ICBMs during a Soviet atmospheric nuclear test,[16] and at the 22d Congress of the Communist Party of the Soviet Union in October 1961, Soviet Minister of Defense Malinovskii proclaimed that "the problem of destroying rockets in flight has been successfully solved."[17] The specter thus emerged that unless the United States proceeded with BMD, the USSR could gain an immense strategic advantage. American concern over Soviet progress in BMD was so intense that when President John Kennedy announced on 2 March 1962 the resumption of US atmospheric nuclear testing, he specifically tied that resumption to ballistic missile defense and defense penetration.[18]

While feared Soviet strides in BMD heightened the United States' sense of a need for its own BMD, concern over the capabilities of Nike-Zeus remained. It was somewhat ironic that this concern escalated even as the system for the first time proved in tests that it could work against small-scale unsophisticated ICBM attacks.[19] The Army pointed to these successful tests as proof that Nike-Zeus should be procured and deployed, but Secretary of Defense McNamara and Director of Defense Research and Engineering (DDR&E) Harold Brown continued to have reservations, particularly over Zeus's ability to discriminate between decoys and warheads.[20] As a result, the Department of Defense opposed procurement and deployment of Nike-Zeus, al-

though it again requested continued development funds for fiscal year 1963.[21] Nevertheless, the continued refusal of McNamara to support deployment of the Nike-Zeus clearly indicated that the Zeus was for all practical purposes a program of the past.

But the concept of BMD survived and even flourished. McNamara often emphasized the need for active defense against ballistic missiles,[22] and Brown of DDR&E declared that BMD research should continue "even if we think it will never be satisfactory" since research would yield data that could lead to "possible deployment of other systems."[23] It was amid this aura of technical skepticism about then-present BMD capabilities and technical optimism about future BMD capabilities that Nike-Zeus faded into the past and Nike-X was born.

Although classified discussion of and work on Nike-X had begun during 1962, public revelation of the new program did not occur until 1963, when McNamara testified before the House Armed Services Committee. Citing the heightened and more sophisticated threat environment that would exist in the late 1960s and beyond, McNamara proposed to take advantage of new advances in radar technology and missile technology to create a layered defensive system.[24] In simplest terms, whereas Nike-Zeus employed a single type of low-acceleration missile armed with an atomic warhead and was guided by a vulnerable radar system, the Nike-X employed two types of missiles: the Nike-Zeus for intercepts at 70 to 100 miles and the new high-acceleration Sprint missile for intercepts at 20 to 30 miles after the atmosphere had filtered out decoys. Newly developed phased-array radars were also to be incorporated in the Nike-X system, enhancing both survivability of the radar subsystem and the accuracy of the missile intercept. Both Nike-X and Sprint missiles used nuclear weapons as kill mechanisms.

As in the past, however, McNamara supported only research and development, not procurement and deployment. He argued that while deployment of a BMD, perhaps even the Zeus, could reduce US casualties in the event of a small Soviet attack and would complicate Soviet attack planning, deployment should not take place because target discrimination work still needed to be significantly improved. Additionally, McNamara argued, more had to be learned about the effect of nuclear detonations from defensive missiles on other parts of the BMD system.[25] Equally noteworthy, McNamara stated he would "never" recommend deployment of a BMD system unless it were accompanied by an adequate civil defense program, including an extensive fallout shelter program.[26] He took this position because of the threat to the population generated from radioactive fallout from the explosion of defensive nuclear weapons.

Throughout 1963 and on into 1964, Nike-X and the concept of BMD were inextricably bound to the debate over the nuclear test ban treaty and the strategic doctrine of damage limitation.[27] The debate over BMD's relationship to the test ban treaty of 1963 centered around whether the risk of concluding a treaty was acceptable; no disagreement existed over whether the test ban treaty would slow BMD research—it would. At the same time, the strategic doctrine of damage limitation broached by McNamara during 1964 provided rationale for the United States not only to develop an improved strategic offensive retaliatory force, but also to move forward with research and development on the Nike-X and to pursue new programs in civil defense. Indeed, to McNamara, civil defense remained a higher priority than BMD. Given these contending pressures, then, it was little surprise that US BMD decisions during 1963 and 1964 with

Nike-X were much like they had been before with Nike-Zeus: research and development would be continued, but procurement and deployment would be deferred.

The relationship of BMD to the test ban treaty and to civil defense also made it increasingly evident that BMD was more than a technical issue. It was a political issue as well, and one that extended beyond the confines of interservice rivalry between the Army, Air Force, and Navy. Harold Brown made this exceedingly evident in testimony before a Senate subcommittee in 1964:

> The decision on Nike-X will not be made, or should not be made, merely on the basis of technical capability. That is, even though the system does what we say it will do, that does not mean necessarily that we should deploy the system.[28]

Despite the political content of the debate over BMD and Nike-X, technical progress continued on the system. New radars and radar nets were developed and tested, and the Zeus missile received a new aerodynamic profile, new propellants, and new third-stage components—all of which made Zeus a credible exoatmospheric interceptor with a range of 400 miles. Successive iterations of improved performance capabilities led to the evolution of Zeus into DM15X2 and eventually Spartan. At the same time, Sprint improvements proceeded apace, with the first successful Sprint launching from an underground silo taking place on 15 November 1965.

Increasingly, however, the uncertain strategic environment of the mid-1960s led proponents and opponents of BMD alike to ask, against whom and what would Nike-X, or any BMD, defend? Such questions became more acute as China moved closer to attaining ICBMs and as the US-Soviet "détente" of 1963 and 1964 continued. By May 1965, reports circulated that any US decision to deploy Nike-X would depend on the speed of Chinese ballistic missile development and on the nature of the Chinese threat.[29] At the same time, the United States was concerned lest a US deployment decision be viewed by the Soviets as a threat to the USSR. This concern existed despite uncertainty about the direction of the USSR's own strategic rocket program and despite growing intelligence that the USSR had begun to deploy its own ballistic missile defense system.[30]

The layered nature of Nike-X also raised questions about the wisdom of area defense versus point defense. The upgraded Zeus gave proponents of area defense and a light defensive shield ammunition for their arguments, while proponents of point defense or a heavy shield turned to the Zeus-Sprint combination to buttress their case. Indeed, with the Zeus-Sprint combination, a variety of different defensive systems was possible. Key questions emerged. What sorts of threat environments were expected? Which potential targets should be defended? How much money should be spent on BMD, especially in light of escalating costs of social programs at home and the war in Vietnam? These uncertainties led different observers and analysts to different conclusions. Indeed, during 1966 the Joint Chiefs of Staff recommended production of long lead-time items for eventual Nike-X deployment, and the House Armed Services Committee agreed. However, McNamara remained opposed to production, arguing that the cost of Nike-X would be too high, that Soviet reaction would be uncertain, that the Chinese threat was not well-enough defined or developed, and that civil defense was a needed adjunct to any BMD program. Debate also took place in the Senate over the wisdom of Nike-X production.[31]

But the debate that truly mattered was the one that President Lyndon Johnson engaged in with himself over Nike-X deployment. In January 1967 Johnson indicated on at least two occasions that he had serious reserva-

tions about ballistic missile defense,[32] and other administration spokesmen indicated that a BMD freeze with the Soviets would be pursued. At the same time, however, Johnson indicated that he had not excluded BMD deployment in the near-term future if negotiations with the Soviets failed. Thus, in his 1968 budget message, Johnson observed that if discussions with the Soviets proved unsuccessful, "approximately 375 million dollars has been included in the 1968 budget for the production of Nike-X for such purposes as defense of our offensive weapons systems."[33]

Throughout 1967 Johnson was buffeted by a succession of arguments opposing and supporting deployment. Secretary of Defense McNamara remained an ardent opponent of BMD deployment, arguing that a "mutuality of interests" existed between the United States and USSR in "limiting the deployment of anti-ballistic-missile defense systems." McNamara remained convinced that the USSR sought an assured destruction capability and would increase the number of ICBMs it had deployed to maintain this capability if the United States moved to deploy BMD. He therefore asserted that all that BMD deployment would accomplish would be "to increase greatly our respective defense expenditures, without any gain in real security for either side."[34]

At the same time, McNamara believed that the United States had ample time to make a future decision to deploy BMD for defense against a Chinese ICBM threat. Other senior Defense Department civilians—including the secretaries of the Army, Navy, and Air Force—agreed with McNamara but made it exceedingly clear that should negotiations with the Soviets fail, they favored deployment of a light BMD screen.

Significantly, the Joint Chiefs of Staff disagreed with McNamara. The chiefs asserted that the United States should move forward with a light BMD deployment that they felt would provide damage limitation capabilities against a Soviet attack, complicate Soviet attack planning, stabilize the nuclear balance, demonstrate to the Soviets that the United States had no first-strike intentions, and deny the Soviets an "exploitable capability."[35] Additionally, reports circulated throughout 1967 that the USSR was making substantial progress in BMD research and development. Congress remained internally divided over BMD deployment. At the same time, it quickly became evident that the Republican party intended to make nondeployment an issue in the 1968 presidential campaign as two leading Republicans, Richard Nixon and Ronald Reagan, both called for BMD deployment.[36]

Political pressures on Johnson to move forward with BMD deployment were further heightened as it became evident the Soviets no longer were interested in reaching an agreement with the United States to ban or limit BMD.[37] Having argued for standby monies in the 1968 fiscal year budget for BMD production if negotiations failed, being confronted with evidence of Soviet progress in and deployment of BMD capabilities, having the US military leadership support BMD deployment, and being faced with Republican criticism in the upcoming presidential campaign over nondeployment decisions, Lyndon Johnson finally authorized BMD deployment. Robert McNamara, long an opponent of ballistic missile defense, announced the decision on 18 September 1967 in San Francisco.[38]

From Sentinel and Safeguard to SDI

McNamara listed four "marginal grounds" that legitimized the administration's decision to pursue a "light deploy-

ment'' of ABMs designed primarily to protect against a future Chinese threat. First, it would be "relatively inexpensive" and would have "a much higher degree of reliability" than a heavy screen designed to thwart a possible Soviet attack. Second, it would serve as an indication that the United States intended to "deter China from nuclear blackmail." It would therefore discourage nuclear proliferation, McNamara asserted. Third, a thin shield could also be used to defend Minuteman silos, thereby enhancing the survivability of the US offensive missile force and lessening the need for its expansion. Finally, a light ABM system would also provide protection of US cities against an accidental launch of an ICBM.

The decision, then, had been made. A thin Nike-X system would be deployed beginning in late 1967. It would cost about $5 billion. The deployed system, to be called Sentinel, would be oriented against China and have 17 sites, 15 in the continental United States and one each in Alaska and Hawaii. All sites would have Spartan and Sprint ABM missiles, with the exception of Hawaii, which would have only Sprints. Despite assurances that Sentinel would remain a thin BMD system, the fact that 10 of the 15 continental sites were near major urban areas gave Sentinel the appearance that it could at some future time be upgraded to a heavy defensive system whose orientation could be changed to defense against the Soviets.

As might be expected, the Sentinel deployment decision evoked considerable response both pro and con. Benson Adams, a noted analyst of ballistic missile issues, has identified seven distinct areas of debate over the Sentinel deployment decision: (1) the validity of the deployment rationale; (2) impacts on international affairs, including the cold war and alliance relationships; (3) impacts on arms control; (4) cost; (5) implications for domestic programs; (6) contri-butions to US security; and (7) Sentinel's effectiveness and technical feasibility.[39] The debate over each of these issues was heated and extensive, and it was not satisfactorily resolved in any of the issue areas.

Throughout late 1967 and 1968, debate over the wisdom of the Sentinel deployment decision, land acquisition, site surveys, construction of missile sites, and procurement of long lead-time system components proceeded. In the eyes of many, Richard Nixon's 1968 election to the presidency guaranteed that Sentinel deployment would proceed despite questions about the system and lack of resolution of the issues under debate. It was a rather surprising development, then, when on 6 February 1969 new Secretary of Defense Melvin Laird ordered a halt to the entire Sentinel program for one month during which the program would be reviewed.[40] It was widely assumed that the halt resulted not only from Laird's and Nixon's desire to acquaint themselves thoroughly with the program, but also from Nixon's desires to build bridges to the Democratic leadership in Congress and to send a friendly and accommodating signal to Moscow.

On 14 March 1969 Nixon announced that the Sentinel program would be scrapped since it could not respond to the growing Soviet threat to US strategic offensive forces. At the same time, a defense against a large-scale Soviet attack was not yet possible. Even so, research and development on BMD systems by themselves were not sufficient to answer the many remaining questions about BMD; hence deployment of a new revised BMD system must take place.[41]

Nixon named the new program Safeguard. The primary objective of Safeguard would be to protect US ICBMs, but it could also defend US urban areas against a limited Chinese nuclear threat or against accidental launches from any country with missile capabilities. Original deployment of Safe-

guard would start with protection of two ICBM fields, with periodic reviews and revisions of the program to determine whether deployment should be accelerated, altered, or stopped. When completed, the entire Safeguard system was projected to have 12 sites and to cost about $7 billion.

But Nixon's rationale for Safeguard deployment was not the only rationale. Secretary of Defense Laird asserted that a BMD system had to be deployed to protect cities and people from a large-scale Soviet attack, to protect retaliatory forces from a Soviet attack, and to defend cities and population from a Chinese attack. He also maintained that an ABM system would protect against accidental ICBM launches and against a "demonstration launch."[42] The Joint Chiefs of Staff meanwhile continued to argue for a thick BMD defense to protect US cities from a large-scale Soviet attack.[43] Obviously, within the Nixon administration itself there was no consensus over the rationale for Safeguard deployment.

Debate over Safeguard deployment was, if anything, more intense than debate over Sentinel. For the most part, the same seven issue areas served as focuses for debate. Again, none of the issues of debate were ever resolved. A series of congressional attempts to delete Safeguard funding from the fiscal year 1970 budget failed, and the program eventually was funded at $1.5 billion for 1970.

Meanwhile, as a result of faster-than-expected Soviet deployment of large SS–9 ICBMs, the Nixon administration began to argue that Safeguard expansion was required immediately, with one more Minuteman site to be defended. Additionally, four other sites were to be prepared for defense, including one more Minuteman site, Washington, D.C., and two other cities. The increased emphasis on city defense implied that the rationale for BMD was once again changing.

But by mid-1970, with the Strategic Arms Limitation Talks between the United States and the USSR making progress, the strongest and most pressing rationale for Safeguard had become its role as a bargaining chip with the Soviets. And indeed, throughout late 1970 and 1971 up until the time that the 1972 ABM Treaty was signed,[44] the most effective administration argument for continued deployment of Safeguard was its utility in arms control negotiations.

The rest of the Safeguard saga need not be detailed here. Suffice it to say that one site, at Grand Forks Air Force Base, North Dakota, achieved operational status but was placed on inactive status in 1976. A protocol to the original ABM Treaty was signed in 1974 that further limited ABM deployment to only one site in the United States and the USSR, either defending the national capital or an ICBM field.[45] As a result of the ABM Treaty, interest in and concern over BMD for all practical purposes disappeared during the 1970s. One indication of this disappearance of interest and concern was the funding level of ABM expenditures. During the late 1960s, US ABM expenditures averaged approximately $1 billion per year (in 1980 dollars), but by 1980, expenditures on ballistic missile defense had fallen to $100 million per year.[46]

Nevertheless, by the early 1980s, US interest in BMD had been revived by a combination of technical advances, the collapse of détente, and a changed political leadership. Technical breakthroughs in radar, high-speed computers, boost technologies, command, control, and communication (C[3]) capabilities, and lasers increased the feasibility of BMD; and the growth of US-Soviet hostility in the late 1970s and early 1980s removed many of the political constraints on renewed BMD emphasis. By fiscal year 1982, then, US BMD expenditures had grown to $462.1 million, a fourfold increase from only two years before.[47] And with Ron-

ald Reagan's March 1983 call for a "comprehensive and intensive effort" to "achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles,"[48] more growth would come. By fiscal year 1987, funding for strategic defense had grown to $3.5 billion.

The Role of Ballistic Missile Defense in US Security Policy

If this brief survey of the evolution of US ballistic missile defense programs has illustrated anything, it is that there has rarely, if ever, been a consensus on what role BMD should play in US defense. Although the ideal objective of all BMD programs was to provide a perfect and impenetrable shield for all potential American and allied targets, the recognition of technical, economic, political, and other limitations of deployable BMD system continually forced proponents of BMD to provide a variety of rationales for why BMD should be deployed. This was true of Nike-Zeus, of Nike-X, of Sentinel, and of Safeguard. And it is true of those defensive technologies being developed under the rubric of the Strategic Defense Initiative as well. President Reagan is prone to describe SDI as intended to provide eventually a perfect or near-perfect shield for the United States and its allies, while Gen James Abrahamson, the director of the Strategic Defense Initiative Office, frequently argues that SDI will enhance the survivability of US strategic offensive forces, complicate Soviet attack planning, and strengthen US deterrence.[49]

This disagreement over the objectives of SDI is not unique to that particular BMD effort, and neither is the Reagan administration's decision to pursue research into BMD with the hope of sufficiently improving technical capabilities so that future BMD deployment would be warranted. Throughout the Nike-Zeus and Nike-X programs, similar decisions were made to pursue research and development, to forgo current deployment, and to improve technical capabilities so that future deployment might be pursued.[50] Only in the case of Nike-X under the auspices of Sentinel and Safeguard were deployment decisions ever authorized, and only in the case of Safeguard did deployment actually proceed.

The recurring phenomenon of positive research decisions and negative deployment decisions bears further examination, if only because of the inevitable question, if deployment never (or almost never) occurs, why pursue research? Two answers are immediately apparent. The first is the prevailing fear that if US research does not proceed, the USSR may attain a technical advantage, perhaps even the defensive equivalent of a "breakout," and as a result gain a decisive military-strategic advantage over the United States. The second is a continuing sense of technical optimism that leads political, military, and scientific-technical leaders alike to believe and argue that a credible defense against ballistic missiles is possible. This technical optimism is couched in a variety of scientific, strategic, and even moral terms, but at its root the argument is always the same: a certain percentage of attacking ICBMs will be eliminated by BMD, and the elimination of that percentage will justify the economic cost of deploying BMD, whatever its objectives. The combination of a fear of a Soviet defensive breakout and US technological optimism has consistently provided sufficient rationale for BMD research even if deployment was, in most cases, not seriously considered.

But at the same time, one should not overlook the role that strategic doctrine has played in influencing American attitudes

toward BMD. Before the era of mutual assured destruction, US emphasis on damage limitation made BMD seem a desirable policy alternative, especially when coupled with a counterforce targeting posture and civilian civil defense. Acceptance of mutual assured destruction as a strategic concept during the late 1960s and throughout much of the 1970s led to decreased emphasis on counterforce targeting, civilian civil defense, and BMD.

Nevertheless, as American nuclear strategy began to move away from assured destruction and toward a modified damage limitation posture in the 1980s,[51] BMD and other earlier aspects of damage limitation once again became feasible, logical, and even inevitable subsets of nuclear policy. If a nation contemplates fighting and surviving a partial nuclear exchange, it must obviously seek to limit damage in order to survive to the greatest extent possible. And so, the Carter administration in 1978 promulgated Presidential Directive (PD) 41, which committed the United States to a program of population relocation during crises. This was carried to a higher level under the Reagan administration with National Security Decision Directive (NSDD) 26 in 1982, which stressed the importance of civil defense. Carter's emphasis on counterforce targeting put forward in PD 59 was carried further under Reagan with NSDD 13, which argued that the US strategic posture was to deter at all levels but, should deterrence fail at the nuclear level, prevail in a conflict. All that was left was for the Reagan administration to reemphasize BMD, a step taken with SDI. A historian might be excused for having a sense of déjà vu; in some ways, Ronald Reagan's strategic posture is similar to that of Robert McNamara.

But one cannot overlook the technological changes that have taken place, nor the changes in political and economic environment that have transpired during the history of BMD. Under early BMD programs, nuclear weapons were the preferred BMD kill mechanism, and only a few visionaries such as those who worked in early 1960s projects such as BAMBI contemplated space-based defense. The changes in the political environment that rendered nuclear defense unacceptable significantly heightened the technical requirements needed for BMD; proximity was no longer sufficient for target destruction, but exact accuracy was needed. This, in turn, heightened the cost of BMD, which reduced the political acceptability of BMD.

The cost factor has been and continues to be one of the most significant drawbacks to BMD from three different perspectives. The first drawback relates directly to absolute expenditures. How much will BMD cost, and what other societal opportunities will not be achieved because of BMD expenditures?

Closely related to opportunity cost is the second drawback, cost benefit. As we have seen earlier, proponents of BMD have rarely been able to agree on the objectives of a deployed BMD system, and thus the benefits of such a system have been difficult to identify specifically. Cost benefit advantages of BMD in general and SDI in particular have been rendered even more questionable in a perceptual sense by the currently popular political perception that any nuclear exchange regardless of size will lead to cataclysmic destruction of unprecedented proportion. In many instances, then, BMD proponents who admit that BMD systems will be less than perfect are placed in a classic dilemma: if BMD is not perfect, then cataclysmic destruction will result, so where is the cost benefit in deploying a less-than-perfect BMD?

But the third drawback is perhaps the most problematic for BMD, the so-called cost-exchange ratio. From Nike-Zeus to SDI, there has been concern that additions to of-

fensive forces will be able to enhance penetration of defensive systems less expensively than additions to defensive systems will be able to prevent that penetration. Hence, from all three perspectives—opportunity cost, cost benefit, and cost exchange—BMD and its proponents have failed to present convincingly persuasive cases.

Even so, the attractiveness of BMD remains immense. Who can deny the desirability, the wisdom, and even the morality of a weapon system that defends against destruction rather than destroys? And that remains the core of attractiveness for SDI, even as it has for all earlier forms of BMD.

Nevertheless, problems remain. BMD advocates have never reached consensus on the purpose of SDI or on the purpose of earlier BMDs. Is it to defend cities? Is it to defend strategic offensive forces? Or is it to do both? And against whom, at what costs, and at what levels of attack?

The variables are many, but until they are answered it is probable that no BMD will be deployed, at least if history is a teacher. First and foremost, BMD is a technical question: what is the future threat environment, and what success rate may a deployed BMD system be expected to have against it? The technical question merges rapidly with economic, political, and strategic concerns. What level of strategic defense can be acquired for a given dollar total, and what is the cost to the opponent of penetrating that given level of defense? Politically and strategically, who and what should be defended, and why? Can deterrence be maintained by mutual assured destruction, in which case SDI is not needed, or must deterrence be maintained by warfighting capabilities, civil defense, and BMD?

This essay has offered few answers, but it has raised many questions. Few of these questions are new. Nevertheless, unless these questions are answered and answered convincingly, history implies that proponents of SDI will be no more successful in moving toward deployment of their preferred BMD systems than earlier BMD proponents were in deploying their preferred systems.

While a perfect defense is a laudable objective, the technical, economic, political, and strategic difficulties that SDI proponents face are immense. The chances are great that a perfect defense is not attainable. And if SDI and its proponents fail in their effort to achieve a perfect defense, SDI proponents must put forward alternate rationales to legitimize SDI, even as proponents of earlier BMD systems sought to legitimize their own less-than-perfect BMD programs. So, despite whatever technical marvels SDI may achieve, it is probable that the fate of SDI will be much the same as the fate of Zeus, Nike-X, Sentinel, and Safeguard. While some limited deployment may occur, SDI—and BMD—will remain a technology of the future. It is too attractive to ignore but not yet sufficiently advanced to cope with the projected threat environment. Hence, research will continue, but deployment will be deferred. With only a single exception, it has been that way from Project Thumper to SDI.   □

Notes

1. For the transcript of President Reagan's 23 March 1983 "Star Wars" speech, see the New York Times, 24 March 1983, A20. Most of Reagan's speech was devoted to military spending, not strategic defense.

2. See Science: The Key to Air Supremacy, the introductory volume of Toward New Horizons, a report submitted to Gen H.

H. Arnold on behalf of the Army Air Forces Scientific Advisory Group by Theodore von Karman, December 1945, 73–75.

3. Senate, Preparedness Investigating Subcommittee of the Committee on Armed Services, The United States Guided Missile Programs, prepared by Charles Donnelly, 86th Cong., 1st sess., 1959, 4.

4. Vannevar Bush, *Modern Arms and Free Men* (New York: Simon and Schuster, 1949), 83–87. The Army Air Forces Scientific Advisory Group also expressed doubt about ICBM feasibility in *Toward New Horizons*.

5. Benson D. Adams, *Ballistic Missile Defense* (New York: American Elsevier, 1971), 20. In addition to Nike-Zeus, the Army also began work on a mobile field BMD systems named Plato, initiated under the auspices of Sylvania Electric Company. The project was canceled in 1958. See *Anti-Missile Defense* (Washington, D.C.: Government Data Publications, 1965), 59.

6. Adams, 18.

7. For the text of the directive, see *The United States Guided Missile Programs*, 114.

8. Secretary of Defense Neil McElroy, as quoted in Adams, 28.

9. US Library of Congress, Legislative Reference Service, *United States Defense Policies in 1959*, 86th Cong., 2d sess., 1969, H. Doc. 432, 24.

10. See "Nike-Zeus May Be Inadequate, Top Defense Scientist Warns," *Aviation Week and Space Technology* 69 (10 November 1958): 33.

11. *FY 1960 Defense Appropriations*, 164–74.

12. US Library of Congress, Legislative Reference Service, *United States Defense Policies in 1960*, 87th Cong., 1st sess., 1961, H. Doc. 207, 57.

13. See Jerome Wiesner, "Comprehensive Arms Limitation Systems," *Conference Proceedings of the Sixth Pugwash Conference*, 1960, 247. See also the special arms control issue of *Daedalus*, Fall 1960.

14. House, *Department of Defense Appropriations for 1962: Hearings Before a Subcommittee on Appropriations*, 87th Cong., 1st sess., 1961, pt. 3:16–17.

15. Adams, 44.

16. *New York Times*, 5 February 1967, 76.

17. Ibid., 24 October 1961, 1.

18. John F. Kennedy, "Nuclear Testing and Disarmament," *Department of State Bulletin* 46, no. 1186 (19 March 1962): 445. See also the *New York Times*, 8 February 1962, 15, for another Kennedy comment linking atmospheric nuclear testing and BMD.

19. On 21 December 1961, a Nike-Zeus successfully destroyed another missile in flight. On 20 July 1962 a Zeus missile fired from Kwajalein destroyed an Atlas ICBM that had been launched from Vandenberg Air Force Base, Calif. See US Library of Congress, Legislative Reference Service, *United States Defense Policies in 1961*, H. Doc. 502, 87th Cong., 2d sess., 1962, 161; and the *New York Times*, 20 July 1962, 1–2. Adams reports (p. 240) that the 1961–62 Zeus tests resulted in 10 hits out of 14 attempts.

20. House, *Department of Defense Appropriations for FY 1963: Hearings Before a Subcommittee on Appropriations*, 87th Cong., 2d sess., 1962, pt 5:85.

21. The final request was for $272.1 million. Ibid., pt. 2:348.

22. Ibid., 43.

23. Ibid., pt. 5:85.

24. House, Committee on Armed Services, *Hearings on Military Posture and H.R. 2440*, 88th Cong., 1st sess., 1963, 324–25.

25. US Department of Defense, *Statement of Secretary of Defense Robert S. McNamara Before the House Armed Services Committee on the Fiscal Year 1964–68 Defense Program and 1964 Defense Budget*, 30 January 1963, 48.

26. House, *Department of Defense Appropriations for FY 1964: Hearings Before a Subcommittee of the Committee on Appropriations*, 88th Cong., 1st sess., 1963, pt. 1:439. See also ibid., 49.

27. For detailed discussion of this period, see Adams, 76–91.

28. Senate, *Department of Defense Appropriation 1965: Hearings Before the Subcommittee on the Department of Defense of the Committee on Appropriations and the Committee on Armed Services*, 88th Cong., 2d sess., 1964, pt. 1:397.

29. "Chinese Nuclear Threat Pushes of Nike-X Options," *Missiles and Rockets*, 31 May 1965, 17. See also the *New York Times*, 15 May 1965, 2; and the *Washington Post*, 26 May 1965, A9.

30. This was the Tallin Line, which by the early 1970s had come to be viewed by US experts as an advanced antiaircraft system with some potential for upgrade to BMD capabilities.

31. For details, see Adams, 125–42. For a totally different perspective of the same period, see Ernest J. Yanarella, *The Missile Defense Controversy* (Lexington: University of Kentucky Press, 1977), 102–42.

32. *New York Times*, 11 January 1967, 1; and 18 February 1967, 1, 6.

33. Ibid., 25 January 1967, 17.

34. US Department of Defense, *Statement of Secretary of Defense Robert S. McNamara Before a Joint Session of the Senate Armed Services Committee and the Senate Subcommittee on Department of Defense Appropriations on the Fiscal Year 1968–72 Defense Program and 1968 Defense Budget*, 23 January 1967, 44, as cited in Adams, 147–48.

35. Senate, Committee on Armed Services and the Subcommittee on Department of Defense of the Committee on Appropriations, *Military Procurement Authorizations for Fiscal Year 1968*, 90th Cong., 1st sess., 1967, 251–52.

36. *New York Times*, 15 September 1967, 9.

37. See the *Washington Post*, 26 June 1967, A11.

38. For the text of McNamara's speech, see the *New York Times*, 19 September 1967, 18.

39. Adams, 182.

40. *New York Times*, 7 February 1969, 1.

41. Ibid., 15 March 1969, 1, 17.

42. House, *Safeguard Antiballistic Missile System Hearings Before Subcommittees of the Committee on Appropriations*, 91st Cong., 1st sess., 1969, 16–17.

43. See the *New York Times*, 18 March 1969, 1, 9.

44. For the treaty text, see *Arms Control and Disarmament Agreements* (Washington, D.C.: US Arms Control and Disarmament Agency, 1982), 139–42.

45. For the protocol text, see ibid., 162–63.

46. E. C. Aldridge, Jr., and Robert L. Manst, Jr., "SALT Implications of BMD Options," in *U.S. Arms Control Objectives and the Implications for Ballistic Missile Defense*, ed. Michelle Marcouiller (Cambridge, Mass.: Center for Science and International Affairs, 1980), 55–56.

47. Senate, *Department of Defense Authorization for Fiscal Year 1984: Hearings Before the Committee on Armed Services*, 98th Cong., 1st sess., 1983, 337.

48. *New York Times*, 24 March 1983, A20.

49. See, for example, Gen James A. Abrahamson, "An Overview of the Strategic Defense Initiative," in *The Strategic Defense Initiative: New Perspective on Deterrence*, ed. Dorinda G. Dallmeyer (Boulder, Colo.: Westview, 1986), 3–6.

50. Decisions under Zeus and X were "similar" rather than "identical" to the Reagan administration decisions on SDI in that Zeus and X decisions were to proceed with "research and development" while the SDI decisions have been to proceed with "research." SDI's elimination of "development" is a direct result of the 1972 ABM Treaty, which forbids either side "to develop, test, or deploy ABM systems or components which are sea-based, air-based, space-based, or mobile landbased." See Article V of the ABM Treaty, in *Arms Control and Disarmament Agreements*, 140.

51. This movement began publicly in 1980 with Jimmy Carter's Presidential Directive 59.

COUNTERREVOLUTION in NAMIBIA

Maj Robert C. Owen

The American view of war is generally incompatible with the characteristics and demands of counterrevolution.

—Sam C. Sarkesian[1]

THE SOUTH African counterrevolutionary experience in Namibia merits attention for two reasons. First, through careful coordination of an effective military strategy with political reform, the South Africans have fundamentally altered the direction of Namibian politics. They have militarily contained the principal revolutionary force in the country, the Marxist-oriented South West African People's Organization (SWAPO), and they have established a moderate political movement that may be able to govern Namibia successfully despite SWAPO's still-considerable political power and resistance. Second, the Namibian conflict offers *indirect* insight into American capabilities in this sort of struggle. Unfortunately for American military thinkers concerned with counterrevolutionary war, the unique social and political conditions making South Africa's successful efforts possible suggest more about American limitations than strengths in counterrevolutionary war.

Background

South Africa's continued presence in Namibia is most effectively challenged by SWAPO. There are several other political groups antipathetic to continued South African rule in the country, but they all have limited constituencies and none have undertaken armed resistance. SWAPO's origins lie in the Ovambo People's Organization, which was formed in the late 1950s to provide social support and political representation for the Ovambo people of Namibia.[2] The organization's name was changed in 1960 to reflect its intention to represent all of Namibia's ethnic groups in the struggle for independence from South Africa. Frustrated with South African resistance to less-violent protests, SWAPO's

leaders decided in 1961 to begin preparations for armed struggle.[3]

The ensuing war has had two phases, both militarily unsuccessful for SWAPO. Phase one began when a small group of SWAPO soldiers infiltrated into the Ovambo area of north-central Namibia in August 1966. Despite their training and preparations, the members of this first group were quickly discovered and were killed or captured by the South African police.[4] From that time until 1975, SWAPO continued a sporadic infiltration of small guerrilla units from Zambia into the extreme northern parts of Namibia, mostly into the remote Caprivi Strip. Inexperience and the presence of Portuguese colonial forces in southern Angola kept SWAPO's operations limited to mainly a police problem for the South Africans. The second phase began in 1976, when the Marxist Popular Movement for the Liberation of Angola (MPLA) ousted two other Angolan nationalist movements from the coalition government of newly independent Angola. With MPLA support, SWAPO moved its bases of operations from Zambia to locations in southern Angola. SWAPO's military wing, the People's Liberation Army of Namibia (PLAN), quickly increased the flow of political cadre and soldiers into Ovamboland. PLAN also began to launch annual "invasions" of 500-1,500 troops into northern Namibia. The South Africans countered by reinforcing the South African Defense Forces (SADF) already in the area and soundly defeating any significant PLAN force entering or approaching Namibia. Consequently, while PLAN has never threatened the SADF's control of Namibia, the liberation army's continued presence in Angola has forced the South Africans to continue costly military operations.

PLAN's persistence has also earned strong domestic and international support for SWAPO. SWAPO is the only political

entity in Namibia with something close to
national political support in Namibia. The
Ovambo people, comprising nearly half of
Namibia's 1.2 million population, strongly
support the movement. SWAPO's presi-
dent, Sam Nujoma, and most of the move-
ment's key leaders are Ovambo. SWAPO
also has limited followings in each of Na-
mibia's 10 other ethnic groups, including
whites. Internationally, the United Nations
General Assembly has declared SWAPO
"the sole legitimate representative of the
Namibian people."[5] Various UN agencies,
along with a number of countries and
church groups, are SWAPO's main sources
of nonlethal aid.[6] Military equipment, in-
cluding tanks and antiaircraft missiles,
comes mainly from the Soviet Union and its
allies.[7]

Although regionally powerful on paper,
South Africa's resources for fighting the Na-
mibian war are more limited than generally
recognized. With a reserve-heavy structure
of 83,000 active and 320,000 reserve troops,
SADF probably fields a permanent force of
about 20,000 soldiers in Namibia.[8] SADF
troops are generally well trained and armed
for counterinsurgent duties. But due to the
international embargo on arms sales to
South Africa, SADF high-technology weap-
ons, particularly aircraft and helicopters,
are aging and in short supply.[9] Thus far,
SADF's declining technological and logis-
tics base only threatens their ability to con-
duct punitive cross-border strikes against

the increasingly sophisticated defenses of
SWAPO and the Angolan military (along
with its Cuban and Eastern-bloc allies).
SADF counterinsurgency operations within
Namibia require weapons, vehicles, and
equipment well within the capacity of
South African industry to produce. How-
ever, since offensive cross-border strikes are
a critical part of South Africa's overall strat-
egy for dealing with the insurgency, re-
duced conventional capabilities threaten
the country's ability to "stay the course" in
Namibia. The South African economy may
well be unable to both finance the war in
Namibia and sustain SADF conventional

strength.[10] It is suffering a recession brought on by the strains of falling gold prices, the war in Namibia, the economic inefficiencies of apartheid, and strained relations with most of the world.

Policymaking and Policies

South African national security policy is made by a very small, cohesive group of leaders, a group increasingly dominated by military officers. Since winning the na-tional elections of 1980, President Pieter K. Botha has focused more power in the pres-idency, replacing a government character-ized by what have been called "feudal ministries" to bring the maximum of gov-ernment resources to bear on the country's security problems. The political infighting and realignments involved in these pro-cesses have tended to increase the influence and presence of military officers in a broad range of government ministries and committees.[11]

These developments do not portend in-stability, weakness, or significant policy changes in the South African government.

55

What pressure there is toward instability is largely counterbalanced by the ideological consistency and quality of civil service and military leaders. Political and military leadership in South Africa is almost exclusively the domain of white, Afrikaans-speaking men. Few members of the English-speaking white community hold significant political power, though they control the bulk of the economy. Nonwhites, except when they strike or riot, still do not wield decisive political influence.

Because they usually attend the handful of Afrikaans-medium universities in the country, are usually members of the Dutch Reformed Church, and share a carefully vetted commitment to white power and the cultural preservation of the Afrikaaner *volk*, South African leaders are a remarkably unified group politically and ideologically. Promotion within the political and military power structure emphasizes merit, thus assuring quality and consistent leadership.

South African Defense Forces have succeeded in keeping SWAPO guerrillas away from such strategically important areas as the port at Walvis Bay (right) and the capital at Windhoek (below).

Thus, to a degree that many would envy, South African policy is prepared and executed by a cohesive group of technically proficient experts, and it remains consistent over the long run. Of course, the long-term wisdom of an effort to preserve the nineteenth-century agrarian social institutions of apartheid in a twentieth-century industrialized nation is in some dispute.[12]

Reflecting the focus and general consistency of other government policies, South African policy in Namibia has, above all else, served the fundamental objectives of security and white power. From its assumption of rule in 1915 until the early 1970s, South Africa treated Namibia as a political and economic extension of itself and rejected international and domestic demands for reform or independence. International criticism of the South African presence in Namibia included an International Court of Justice decision in 1971 declaring South Africa's rule illegal. In 1974 the South African government apparently reversed itself by acknowledging the "inevitability" of independence and authorizing the creation of political parties to participate in elections for a constitutional assembly.[13] But subsequent developments revealed the continuity of South African objectives. Although SWAPO was offered the opportunity to participate in South African-sponsored elections (SWAPO refused), South African sponsorship and financial support clearly focused on the moderate political alternative to SWAPO, the Democratic Turnhalle Alliance (DTA).

The DTA was a coalition of small, moderate, and ethnically based political parties formed in late 1977 to participate in South

The Democratic Turnhalle Alliance (DTA), created by South Africa as a moderate alternative in Namibia, once appeared to be the answer to the political problems in the area. Lack of both popular support and international recognition resulted in South Africa seeking other solutions to the insurgency.

African-sponsored elections for an interim government prior to independence. The DTA advocated a "multiracial" constitution that would define politics and establish political representation on the basis of racial rather than ideological or economic groupings. Under such a constitution, each ethnic group in Namibia would vote for, and only for, local and national politicians from that ethnic group.

For the South Africans, a DTA government would enhance security because DTA moderates would not make Namibia a possible haven for Soviet influence and proxy troops. A multiracial constitution could also protect the interests of white Namibians through disproportionate representation and by restricting the kinds of laws a presumably black majority national government could impose on ethnic groups.[14] Finally, multiracialism is more in keeping with South African concepts of ethnic separation in society and government.

Creating a viable moderate political movement from the confusion and animosities of Namibian politics of the 1970s was obviously going to take some time. Few whites were prepared to relinquish their favored position, and few blacks could tolerate any plan involving continued South African presence or one so obviously serving South African interests. Significant economic and political reforms were necessary to pursuade the small number of middle-class black Namibians to give credibility and leadership to the moderate political movement. Providing the time and protection required to create the moderate movement was the SADF's job.

A Strategy of Maneuver War

The strategies and operations of South African military leaders reflect their often-stated conviction that the war would be won at the conference table rather than on the battlefield. Thus, they have apparently sought, or at least been satisfied, only to limit PLAN's ability to dominate Namibian politics militarily, not to destroy the guerrilla army in the field. The recognition that restricting a revolutionary army's political influence is not necessarily the same as destroying it reflects a subtle appreciation of the political-military interrelationhips of liberation wars. The issues in these wars are human loyalties and time, not military victory.

This political-military strategy also allows the South Africans to conserve their limited military resources. Since political protection is their goal, they can avoid the costly war of annihilation that a purely military solution would require. Instead, the SADF has limited PLAN's political importance through raids against PLAN installations and formations in Angola, backed up by a relatively thin occupation of the areas of northern Namibia exposed to PLAN infiltration. What the South Africans have in fact done is use maneuver war to keep PLAN forces off balance to make the costs of protracted counterrevolutionary war logistically and politically bearable.

The essence of maneuver war is to use movement, surprise, and deception to bring concentrated force against an enemy's center-of-balance—that part of his military power that, when destroyed, most seriously degrades or dislocates his fighting ability. The aim is economy of force and minimum casualties by applying maximum force against critical targets. SADF strategy has focused on restricting PLAN's ability to dominate Namibian politics and on reducing the liberation army's credibility as a military force with a reasonable hope of liberating the country or of even protecting SWAPO followers from SADF retaliation.

Between 1978 and 1985, the South Afri-

cans launched at least seven major cross-border raids, and many smaller actions, against SWAPO forces based in southern Angola.[15] These "sanctuary-denial" operations amounted to raids in force. They emphasized shock, surprise, aggressive advance, intelligence, and maximum disruption of the PLAN forces engaged. Raiding units usually were about brigade size or smaller. These strike forces were supported by artillery and multiple rocket launchers, and a limited number of close-air-support strikes. Airborne and air mobile assaults were also normal features of these operations.

Few risks were taken to pursue PLAN units beyond the battlefield, and only a few strategic points in Angola, such as the Ruacana Dam, were occupied for any length of time. As part of the February 1984 "disengagement agreement" between South Africa and Angola, SADF troops were pulled out of Angola in April 1985.[16] But even as SADF troops left southern Angola, South African covert intelligence-gathering and sabotage operations continued in northern Angola.[17]

The casualty rates inflicted on PLAN by these operations were extremely high. In 1978, for example, the SADF lost three soldiers and killed about 1,000 PLAN soldiers and civilian supporters during Operation Reindeer.[18] Operation Super cost PLAN 201 soldiers in exchange for three SADF commandos.[19] These casualties plus those of other raids reduced PLAN's combat strength from some 14,000 troops in 1980 to about 8,000 in 1984.[20] PLAN's ability to send troops into Namibia declined dramatically when cross-border raids forced removal of its base camps about 300 kilometers farther into Angola after 1980.[21]

PLAN's reduced capabilities allowed SADF troops in northern Namibia to deploy for efficient occupation rather than for defense against large-scale attack. Consequently, the SADF effectively controls an area of about 60,000 square miles with about 40,000 troops, counting South West African territory forces. The thinness of this occupation is clearer when compared to the 1.5 million allied troops required to occupy South Vietnam's 66,000 square miles in 1970.[22]

It is important to understand that the South Africans apparently do not pursue an airtight occupation of northern Namibia. SWAPO cadre do infiltrate and operate covertly, especially among the Ovambo. As one South African official told this author in a conversation in Windhoek, the so-called internal wing of SWAPO is even allowed to conduct "legitimate" political activities throughout Namibia to "keep it out in the open, and keep the faint-hearted from going to Angola." In the early 1980s firefights between SADF and PLAN patrols were fairly frequent occurrences, especially during the January-to-March rainy season. Hostile contacts are less common now, although SWAPO does maintain a presence. The South Africans seem willing, or at least are resigned, to live with a certain amount of SWAPO activity so long as it does not amount to overt political or military control of any Namibian territory.

Allies

The South Africans appreciate the material and moral value of allies in the struggle against SWAPO. They currently receive military support from the South West African Territory Force (SWATF) and the Union for the Total Independence of Angola (UNITA). These forces contribute importantly to SADF military success and reduce the war's human and material costs for South Africa.

South Africa created SWATF in August 1980 to mobilize Namibians more effectively and eventually provide the country

with a national army.[23] SWATF draws troops and officers from all Namibian ethnic groups. By 1984 SWATF fielded about 11,000 troops, generally equipped and trained for local defense and counterinsurgency operations. Current strength is over 20,000 personnel. By 1984 SWATF carried about 60 percent of the occupation burden in northern Namibia and participated in cross-border operations.[24]

As one of the Angolan liberation movements ousted from the Angolan coalition government in 1976, UNITA is at war with the MPLA. SWAPO forces, as MPLA allies, come under frequent UNITA attack. SWAPO and Angolan forces and camps are often intermingled for mutual protection.[25] SWAPO camps attacked during the SADF's Operation Daisy were found laid out as much for defense against UNITA as for defense against the SADF.[26] The South Africans estimated in 1985 that UNITA occupied the defensive efforts of 65 percent of SWAPO's troops. South Africa remains UNITA's principal source of arms and (occasionally) direct military support. UNITA's president, Jonas Savimbi, and South Africa's president, Pieter Botha, maintain coordination through occasional meetings.[27]

The Political Front

As anticipated, the creation of a viable, multiracial, moderate political alternative to SWAPO in Namibia has been difficult. The Democratic Turnhalle Alliance's promising start, winning 85 percent of the vote for a National Assembly in 1978, foundered on its inability to develop a new constitution or to gain international recognition as a legitimate representative of the Namibian people. In January 1983 the South African administrator-general of Namibia allowed the DTA-dominated National Assembly to dissolve without new elections. The Multi-Party Conference (MPC), a new coalition that included remnants of the shrunken DTA, is now the officially approved and supported moderate alternative to SWAPO. Although international recognition is still a problem, the South Africans gave Namibian moderates a chance to form another interim government in June 1985. Called the Transitional Government of National Unity, the moderate coalition remained organized and active in December, but it was also "beset with internal dissent and threats of defection" over constitutional issues.[28]

The ability of moderates to form a stable government in Namibia remains murky. Many observers would agree that "any fair elections would almost inevitably bring to power SWAPO."[29] But extensive Namibian participation in the national elections of 1978 and the local elections of 1981, despite SWAPO demands for boycotts, may suggest that SWAPO's support stems from its position as the vanguard of the liberation struggle, not from a popular acceptance of its Marxism, militancy, or multiethnic political platform. Another indication of the uncertain extent of SWAPO's power base was indirectly revealed when some 13,000 people gathered in 1986 to "attend the liberation movement's first legal meeting in many years."[30] One wonders what the other 120,000 Namibians living in the area who were "solely represented" by SWAPO were doing at the time.

The dogged survival of the moderate movement suggests SWAPO is not the shoo-in for political power that the movement and its supporters assert it to be. Perhaps the end of liberation as a political issue would see SWAPO's political base shrink to an awkward coalition of committed radicals and Ovambos. Then again, SWAPO might retain its political strength and continue the ideological struggle. American military planners considering our own involvement

in counterrevolutionary situations would probably prefer more concrete and declarative terms than *may suggest, could,* and *might.* But such terms reemphasize that there is no certainty in counterrevolutionary war except that it is usually protracted and expensive in blood and treasure.

Some Comparisons

Namibia is obviously unique. In addition to the usual problems of a counterrevolution, the South Africans were obliged to create an "incumbent" government to benefit from moderate reforms and give the South African part of the conflict a logical place to end. Historically, other colonial powers left their colonies in the hands of a political party with at least some sort of popular legitimacy, if not actually in the hands of the revolutionary party. Namibia's moderate coalition is clearly the creation of the South African counterrevolution. Whether a generation of political and social reform can overcome the barrier to legitimacy remains to be seen. But the viability of the incumbent government can never be really tested until the sponsor has left. Whether in Vietnam, Malaysia, Namibia, or El Salvador, at some point the sponsor government must withdraw support for the incumbent government and hope for the best. There are no guarantees of success, and little possibility of reintervention if the incumbent fails.

The South Africans enjoy significant advantages in the conduct of counterrevolutionary war. Policy and strategy-making are disciplined, coordinated, and answerable to far fewer interests than in the United States. The South African government is relatively less sensitive to international moral and political criticism than is the American government. Public opinion in South Africa is strongly behind the war effort. Whatever

other divisions they may have, South Africans, including many blacks, are deeply concerned with the growth of Soviet influence in their region. The same is true in Namibia. The SADF's freedom to attack SWAPO's sanctuaries in sovereign Angola and take full advantage of all available allies greatly enhances its ability to fight the war effectively. The proximity of the Namibian war certainly enhances South African motivation to fight.

The United States also has some potential strengths in this type of conflict. Unlike South Africa, whose motives are more self-serving and better articulated, American objectives in counterrevolutionary wars have been more balanced between self-interest and concern for the uncoerced desires of the local people. Awareness of the American position could reduce the damage done to the credibility of a host government by our support. This, in turn, would bring about a potential reduction in the degree of American involvement needed to stabilize the situation. Moreover, the United States is less likely to be in the position of having to create and support a political entity as initially artificial and narrowly supported as the moderate movement was in Namibia. Last, American resources for fighting counterrevolutionary war, or any war, are certainly greater than South Africa's.

Of course, as America learned in Vietnam, an abundance of force can be more a hindrance than a help in limited wars. Attempting to hurry the political process through intensive military operations is much like overwatering a plant. A little water is good, but too much only rots the roots and defeats one's purpose. In counterrevolutionary war, no more military force can be usefully employed than the slow rate of political and social change can accommodate. During 21 years of active conflict in Namibia, the leaders of South Africa have shown the cohesion and patience to under-

take this kind of protracted conflict. They have also made their job easier by taking full advantage of good strategy and the availability of allies. A moderate government has yet to stand alone in Namibia, but conditions for its success are certainly better now than only a few years ago. One wonders if the leaders of the United States, a country that Gen George Marshall said could not fight a seven-year war, can ever generate this same level of endurance and national consensus in a counterrevolutionary conflict. Any national policy for such war should begin with a clear answer to that question.   □

Notes

1. Sam C. Sarkesian, "Low-Intensity Conflict: Concepts, Principles, and Policy Guidelines," *Air University Review*, January–February 1985, 15.

2. Department of Information and Publicity, SWAPO of Namibia, *To Be Born A Nation: The Liberation Struggle for Namibia* (London: Zed, 1981), 176.

3. Ibid., 172–78.

4. Michael S. L. Morris, *Armed Conflict in Southern Africa* (Capetown: Jeremy Spence, 1974), 3–15.

5. United Nations General Assembly Resolution 3111, December 1973.

6. International Defense and Aid Fund, *Namibia: The Facts*, London, 1980, 44.

7. "Interview with Mr Theo-Ben Gurirab, SWAPO's Permanent Observer to the United Nations," *Third World Diplomacy*, Winter 1982, 86.

8. International Institute of Strategic Studies, *The Military Balance 1984–85* (London, IISS, 1984), 82–83; John Reed, "Frontline Southwest Africa," *Armed Forces*, February 1985, 60.

9. Dora Alves, "The South African Air Force in the Early Eighties," *Air University Review*, July–August 1983, 72–79.

10. Christopher Coker, *South Africa's Security Dilemmas*, Washington Papers: No. 126, Center for Strategic Studies, Georgetown Univ. (New York: Praeger, 1987), 28–29, 48–62.

11. Robert I. Rotberg discusses recent alterations in the government and bureaucracy in "Decisionmaking and the Military in South Africa," *South Africa and Its Neighbors: Regional Security and Self-Interest* (Lexington, Mass.: Lexington Books, 1985), 13–26.

12. This paragraph is based on an excellent discussion of the workings of the South African government in Leonard Thompson and Andrew Prior, *South African Politics* (New Haven: Yale University Press, 1981), 107–16.

13. Department of Information and Publicity, 214–15.

14. "SWA/Namibia: Political Settlement or Mobile Warfare?" ISSUP: Bulletin of the South African Institute of Strategic Studies, Pretoria, June 1981, 4.

15. They were Operations Reindeer (May 1978), Smokeshell (June 1980), Protea (August 1981), Daisy (November 1981), Super (March 1983), and Askari (December 1983).

16. "Remaining SADF Members Withdrawn from Angola," Johannesburg Domestic Service, *Foreign Broadcast Information Service*, 18 April 1985, U2. Hereafter cited as *FBIS*.

17. "Captured RSA Commando Reveals Mission, Tactics," Luanda Domestic Service, *FBIS*, 29 May 1985, U1; "The Threat from the South," *Africa News*, 23 September 1985, 7.

18. Government of South Africa Fact Sheet, "Operation Reindeer (4 May 1978): The SADF's Most Successful Operation Against SWAPO to Date," undated.

19. "Operation Super: Crushing Defeat for Terrorists," *Paratus*, April 1982, 5.

20. John Reed, "Frontline Southwest Africa," *Armed Forces*, January 1985, 19.

21. Ibid., 20.

22. Guenter Lewy, *America in Vietnam* (New York: Oxford University Press, 1977), 147 and 455.

23. International Defense and Aid Fund, *Apartheid's Army in Namibia*, London, 1982, 33.

24. "Van Niekerk Comments on Military and Economic Situation," Johannesburg International Service, *FBIS*, 11 February 1985, U1.

25. "Operation Protea," *Paratus*, October 1981, 69.

26. Arnold Kirkby, "Life and Death in Operation Daisy," *Cape Argus*, 7 December 1981.

27. "Van Niekerk Comments," U1.

28. "Namibia: Dissent Threatens Coalition," *Africa News*, 23 September 1985, 26.

29. George W. Shepherd, Jr., "Breaking the Namibia Impasse," *Africa Today*, July 1982, 27.

30. John A. Evenson, "Namibia: The Question Still Stands," *Africa Report*, September–October 1986, 65.

*Female Air Force Pilots
and Combat Aircraft*

"The Right Stuff"
Has No Gender

Maj Sandra L Bateman

WOMEN HAVE volunteered to serve their country in combat throughout history and have displayed numerous examples of courage, heroism, and combat skills.[1] Yet women are still faced with disbelievers in their combat abilities. Jeff Tuten, an operations analyst specializing in manpower mobilization, states, "Women's unsuitability for combat is made apparent by the fact that they have never engaged in it. Thus ... women are unsuited for combat."[2] This continuing problem is best exemplified by female pilots in the United States Air Force who are still prevented from flying aircraft that could be engaged in combat missions. The question that begs to be answered is why.

Before addressing the question of combat exclusion, the reader should first under-stand what this article is not about. It is *not* a discussion of whether women should be drafted. It is *not* about females fighting in hand-to-hand combat. It is *not* about women serving on combat vessels in the Navy. This article is specifically restricted to those women who have *volunteered* and have been selected to serve in the United States Air Force as pilots, navigators, and aircraft crewmembers. These women, though fully trained and capable, have been excluded from operating certain aircraft that are considered combat related. One must remember that the Air Force is a unique service. It fights its battles in the air in combat engagements requiring skill, cunning, courage, and that evasive quality known as "the right stuff"—and not one of these qualities is restricted to one gender. A seemingly harmless protective measure for

In a time of pilot retention problems and as more female officers complete pilot training, the Air Force will need to address the issue of how to best use its pilot assets. With more and more combat oriented career fields, such as security police, open to women, the justifications for keeping women out of fighter and bomber aircraft will become continually less defensible.

females becomes, under close scrutiny, the very core of inequality and discrimination based on gender.

In the search to understand how this situation could exist in America today, we must look at Title 10 US Code, section 8549, of the Women's Armed Services Integration Act of 1948. Section 8549 made it unlawful for Air Force females to fly aircraft on combat missions regardless of their capabilities, training, or time in service. In trying to understand the reason Congress included the combat-exclusion provision in its legislation and why it remains today, this article will explore the history of female pilots who volunteered to serve their country. Next, it will review section 8549 of the Women's Armed Services Integration Act in depth to determine if such a provision is discriminatory in relation to current social attitudes. It will then examine the law's constraints on mission readiness and will dispel prevailing myths on why Air Force women should not fly combat missions. Finally, the article will review the present environment within the 100th Congress and the possibility of a discriminatory law enacted 40 years ago being repealed or revised.

Those Who Have Served

In exploring the history of female pilots, one should be aware that congressional opposition to women serving their country in combat was also evident during the formation of the nurse corps, which is now completely accepted as being indispensable. It is interesting to compare the beginnings of the military nurse corps to the evolution of female military pilots.

The record of Civil War nurses provides one of the finest examples of dedication, ability, and simple courage to be found in American military history. Yet military leaders were not ready to accept the fact that

female nurses were an integral part of an effective medical service. So, when the war ended in 1865, the Army reverted to the practice of using enlisted men for patient care and sent the females home.[3] During the Spanish-American War, more than 1,500 female nurses volunteered to serve at home and abroad. Opposition to granting military status to nurses was again strong. Surgeon General George Sternberg was reluctant to have women with the troops in the field, expressing concern that women would probably need luxury items not necessary for men. In spite of his concerns, he soon found female nurses were invaluable in the field and requested commissions for female doctors. Congress responded that only persons "physically, mentally and morally qualified" could be commissioned, and women were obviously not physically qualified.[4] That was accepted as fact in 1917. In 1948 Congress *exempted* Air Force female medical personnel from the combat exclusion so they could serve aboard aircraft flying into combat areas and in war zone field hospitals.[5]

Ironically, female pilots are still excluded from flying those same aircraft that could carry female nurses to war zones. This could lead one to the dubious conclusion that Congress no longer sees a need to protect all females from serving in combat areas but only certain females such as pilots and crewmembers. The question is why.

It is not surprising to find that the evolution of women pilots in the Air Force closely resembles that of the nurse corps. It was not until late November 1941, as we faced World War II with severe manpower shortages, that Gen George C. Marshall, the Army chief of staff, told Congress, "Women certainly must be employed in the overall effort of this nation."[6] In August 1943 an auxiliary unit named the Women Airforce Service Pilots (WASP) was formed, and more than 1,070 WASPs served their coun-

try through 1944. Thirty-seven WASPs were killed and 36 injured while performing duties as pilots, copilots, and students. In all, women ferry pilots completed 12,650 missions, encountering similar flying conditions and problems faced by male pilots. They sometimes guarded their own planes at understaffed airfields and frequently flew open-cockpit aircraft in subzero weather.[7] In January 1944 Gen Henry H. Arnold and the Army Air Corps had sought congressional approval of full military status for the women pilots, but in June 1944 the bill was defeated on the House floor and the WASP program was deactivated in December. On 7 December 1944 General Arnold, commanding general of the Army Air Forces, stated to the last graduating class of WASPs:

> You, and more than nine hundred of your sisters, have shown that you can fly wingtip with your brothers. If ever there was a doubt in anyone's mind that women can become skillful pilots, the WASP have dispelled that doubt. It is on the record that women can fly as well as men. . . . If the need had developed for women to fly our aircraft overseas, I feel certain the WASP would have performed that job equally well.
>
> Certainly we haven't been able to build an airplane you can't handle. . . .[8]

At the time of deactivation, 916 WASPs were on duty with the Army Air Corps. It is interesting to note that during the 1944 debate for full military status, Congress was deluged with letters from male pilot trainees, male civilian instructors, and their friends protesting the militarization and instruction of women pilots while the men were being put in the "walking Army."[9] Apparently, the decision of Congress was influenced by these male pilots, and it ignored the WASP's flying capabilities and devoted service to her country. Once again women had been used by Congress to alleviate a manpower shortage and were soon forgotten. It was not until 33 years later, in 1977,

that Congress granted the WASP veterans status so they could receive the military benefits they so richly deserved.

Ironically, just four years after the deactivation of the WASP program, women were fully integrated into the military by the Women's Armed Services Integration Act of 1948. During the hearings on the Integration Act, Gen Hoyt S. Vandenberg, Air Force chief of staff, testified emphatically that the new Air Force, while it wanted women, had no intention of using them as pilots. The Air Force policy decision to exclude women from flying duties denied even those WASPs who had logged thousands of wartime hours in military aircraft the opportunity to fly.[10] Could it be that the WASPs came too close to proving women had "the right stuff" to compete with men in the air and therefore were restricted from flying Air Force aircraft? Not until 1975 was this gender discrimination overcome, but Congress still restricts female pilots from flying combat-related aircraft.

A Closer Look at the Act

To find the reason why Congress included the combat exclusion provision in the 1948 act and to determine if it is still appropriate today, one first needs to be aware of the exact wording of section 8549 as amended in 1956:

> Female members of the Air Force, except those designated under section 8067 of this Title, or appointed with a view to designation under that section, may not be assigned to duty in aircraft engaged in combat missions. [The section 8067 exceptions pertain to medical personnel, judge advocates, and chaplains.][11]

There was debate in Congress in 1948, but the issue was not whether women should be allowed to serve in combat; that was never seriously considered. It was instead how best to ensure that women would not be em-

ployed as combatants. Congress felt that delineating women's noncombatant position in the Air Force and Navy was a simple matter—just ban them from combat aircraft and ships. But because the Army was unable to come up with an adequate definition of combat, Congress elected to leave the combat matter to be cleared up by the secretary of the Army through Army policy, not law.[12] Therefore, women in the Army are not prohibited from combat by law as they are in both the Air Force and Navy.

In actuality, the law provided the services with a convenient device for excluding women from any skill, position, or organization merely by declaring it combat or combat related. The prohibition from duty in "combat aircraft engaged in combat missions" was initially interpreted by the Air Force to mean that all pilot jobs should be closed to women because a pilot should be available for duty in any type of aircraft on any type of mission at any time. This restrictive interpretation of the law automatically excluded women from participation in the primary mission of the Air Force, thus assuring their second-class status.[13] As Maj Gen Jeanne Holm, USAF Retired, saw it:

> Viewed in the context of the 1980s, Public Law 625 (Women's Armed Forces Integration Act) would be classified as a classic sexist legislation. But the law accurately reflected the prevailing cultural attitudes of the postwar period concerning women's roles and legal status.[14]

Does the law accurately reflect current cultural and military attitudes concerning women and their legal status today? Women have made great strides in their role as equal citizens since 1948, and Congress needs to accept the fact that there is no turning back the clock. For example, Title VII of the Civil Rights Act of 1964, as amended by the Equal Employment Opportunity Act of 1972, and Executive Order 11478, as quoted in *A Guide to Federal Laws and Regulations Prohibiting Sex Discrimination*, states:

> Equal employment opportunity in the Federal Government prohibits discrimination based on race, color, religion, sex, or national origin in employment with the Federal Government. The law requires a federal agency to provide to all persons an equal opportunity to be hired and promoted into all types of jobs.[15]

While Title VII does not apply to military personnel, this law is extremely important to female Air Force personnel who remain in the service for extended periods of time because of what it implies about prevailing attitudes toward women. The 1984 Inter-University Seminar on Armed Forces and Society pointed out that

> the service, as it is currently structured, benefits men more than women. Although women have the potential to earn salaries in the military equal to men, they remain barred from occupational specialties that are associated with combat, which remain important for promotion to the highest ranks.[16]

The combat-exclusion legislation supports the continuing discrimination against females in the Air Force, and it is outdated based on the Equal Employment Act of 1972. Many social values and attitudes changed between 1948 and 1972, which is why Congress passed such strong legislation for equal opportunity. For unknown reasons, Congress cannot accept that these societal changes also encompass the idea of Air Force females in combat. All female pilots in the Air Force today are volunteers, and for the first time in history, they are joining without a national wartime emergency in the making. Today women join the Air Force for the same reasons other females become policewomen or fire fighters—simply because they have the ability to do the job and want to serve their country. They are not blind to the possible consequences of war or police action. But Congress continues to stick to the tired story that "society" will not accept its "daughters" coming home in body bags.[17] When will Congress

stop thinking of women who devote 20 years of their life in training to defend their country as someone's daughter instead of the military professionals they are proud to be?

A recent national tragedy is a stunning example of America's acceptance of female equality even when death is involved. When Christa McAuliff and Judith Resnik were killed in the *Challenger* disaster in 1986, the country mourned their deaths equally with their five male crewmembers. It was interesting to note that Christa received a great deal of attention because she was a civilian observer, while Judith received virtually no special attention for being a female crewmember. Despite the known dangers, "society" has not called for restrictions to be placed on future space launches requiring male-only crews.

Why Congress believes society would react differently to trained, capable, volunteer female pilots and crewmembers is still a mystery. For example, in 1983 a sample of Maryland residents were asked, "Do you think that young women should be allowed to volunteer to fight in combat in the armed forces, or not allowed to volunteer to fight in combat in the armed forces, or don't you have any opinion on this?" Sixty-five percent—considerably more than a majority—answered that women should be allowed to volunteer for combat.[18] In addition, even though the Equal Rights Amendment (ERA), which would have allowed women in combat, fell short of being ratified by the required three-fourths of the states, 36 states did ratify the amendment by 1982.

Even the Department of Defense (DOD) sent a proposal for repeal of the combat-exclusion law to Congress as early as May 1979:

> In November, 1979, the Military Personnel Subcommittee of the House Armed Services Committee held hearings on the DOD proposal, but rather than being a debate on the merits of women flying combat aircraft and the need for flexibility in the utilization of Air Force personnel, the congressional subcommittee allowed the hearings to degenerate into a heated, emotional debate over women in combat with emphasis on ground combat and the horrors of war in general.[19]

Why the congressional subcommittee would even allow testimony pertaining to ground combat (Army) when the combat-exclusion law only pertains to the Air Force and Navy poses an interesting question. Could it be that there just was not enough credible opposition to females flying in combat and that listening to the horrors of ground combat gave the subcommittee a clearer conscience when they tabled the proposal?

Instead of allowing the emotional appeals concerning war in general, the subcommittee should have directed its energies toward the main issues involved. The first issue that was discussed by General Holm explained that

> the restrictive laws enacted in the post-WW II period had outlived their usefulness and had become counterproductive to the development of an optimum fighting force in the event of war. She argued that the service secretary should have the widest possible flexibility, particularly in time of war, to make personnel policy. The service secretaries should not be hamstrung in peacetime by laws they may not be able to live with in wartime.[20]

Under Secretary of the Air Force Antonia Handler Chayes also testified in support of repeal due to a second overriding issue:

> Moreover, there is the question of equity—of equal opportunity to fight and die for country as opposed to the risk of death women have always faced in roles as nurses and other support functions during wartime. . . . It is also a matter of equity for men who should not be forced into greater danger than the women who take the same oath and wear the same uniform. . . . What we achieve by barring women from combat roles is an obstacle to career advancement, and little advancement in protection.[21]

Lawyer Diana A. Steele reminded the congressional subcommittee that "men do not have a monopoly on patriotism, physical ability, desire for adventure, or willingness to risk their lives. Until both share in the rights and responsibilities of citizenship, women will continue to be considered less than full-fledged citizens."[22]

It is also interesting to look at the arguments against repealing the combat-exclusion legislation. The Moral Majority testified that "leadership and authority are male attributes ordained by God and women in combat roles violates the order of creation, will of God."[23] Retired Rear Admiral Jeremiah Denton said that "it would be moral and social insanity to subject women to war."[24] Retired Brigadier General Elizabeth P. Hoisington felt that mixing men and women in units in close situations gave rise to "man-to-women relationship" problems that could cause "costly distractions" in combat.[25] And retired General William Westmoreland summed up the testimony against repeal by stating that "no man with gumption wants a woman to fight his battles."[26]

This author's assessment of the above statements both in favor of and opposed to the 1948 combat-exclusion law is clear. The present law is outdated, and discriminatory, and does not reflect the present attitudes toward women held by a large portion of the American population. Congress must accept the fact that today women have a new role in society that includes volunteering to defend their country.

Mission Constraints

Today numerous women have volunteered and are now thoroughly integrated into the Air Force. In fact, they have advanced so far in key specialties that withdrawing them could seriously hamper the country's combat readiness. Even the words *combat* and *combat support* are ambiguous. For example, a woman cannot fly a fighter or a bomber, but she can fly a tanker to refuel them. "In some cases, support positions may be more tempting enemy targets than the frontline posts," stated Lawrence Korb, past assistant secretary of defense for manpower. "Now let's have an intellectual exercise. You are a Soviet fighter pilot and you've got one missile. What do you shoot down? You get the tanker, you got the bombers!"[27]

No one expresses more frustration with the combat restriction than military women themselves. "Don't train me for a job and then tell me I can't do it because I'm female; that's a waste of the taxpayers' money and a waste of my time," says Lt Diane Mills. She is an air weapons controller trained to direct fighters to intercept enemy aircraft, and she performs her job while flying in an airborne warning and control system (AWACS) aircraft.[28]

Supposedly, the Air Force is totally integrated except for combat, but female pilots flew troop- and cargo-carrying missions to Grenada during the initial phases of the 1983 invasion. They landed on the Carribean island aboard C-141 aircraft when US paratroopers were still fighting Cuban troops. Said a male pilot who flew to Grenada, "The significant thing is that they went in, did the job alongside us, came out, and nobody made a huge fuss about it. Nobody made a special effort to include them and nobody thought for a moment about excluding women."[29] In addition, Maj Gen William Mall, who commanded the first wave of air forces to hit the island, said, "To have excluded an aircraft from the mission simply because there was a women on board would have lessened our response and reduced our effectiveness."[30]

Another example of how reality has overcome an outdated law is the counterterrorist

attack the Air Force flew against Libya in 1986. Seven women—six officers and one enlisted—served in the raid. One of the women was a backup pilot on a KC–135 tanker, and four served as copilots—three on KC–10s and one on a KC–135.[31] Secretary of the Air Force Edward Aldridge, Jr., stated, "Women flew on these aircrews as a natural evolutionary growth of the contribution of women members to the Air Force."[32]

Congress cannot continue to use women to alleviate manpower shortages and at the same time impede mission readiness in the form of combat exclusion. In her book *Women in the Military: An Unfinished Revolution,* General Holm states:

> It is time to end this charade and recognize that the entire defense establishment is a combat organization whose mission is to deter war and, when required, to fight. It is time Congress accepts that modern wars are "fought" not just by an elite class of people categorized as "combatants," but by all who serve.[33]

Some Myths

There are many myths confusing the issue of why Congress cannot bring itself to repeal the portion of section 8549 that prohibits female pilots from flying aircraft engaged in combat missions. Let us look at some of the more prevalent reasons given for excluding women from combat that may be preventing Congress from acting on this issue.

First and foremost is the quote at the beginning of this article stating that women have never fought in combat. Nadya Popova, a Russian bomber pilot during World War II, would probably disagree. In a recent interview, she sounded like she knew exactly what combat was:

> We flew combat missions each night. With up to three hundred kilos of bombs strapped to our wings we took off an average of fifteen times a night, bombing railways, bridges, supply depots and troop positions that were heavily fortified with anti- aircraft guns. The planes were unheated and we suffered from frostbite and exposure. I could see burning planes crashing with my girlfriends in them. . . .[34]

The Soviet Union formed two bomber regiments and one fighter regiment in which women filled all aircrew and support positions. "During WW II women participated with their male counterparts in every resistance organization in occupied Europe; they were captured, tortured, and executed by the Nazis in the same manner and proportion as men."[35] These combatants may not have been American but they were women and they fought as well as the men.

Another frequently heard belief supporting female combat exclusion is that females in fighter units will impede the "bonding cohesiveness" of the unit, which will degrade mission effectiveness.[36] The fact that this has not happened in squadrons where females have flown for the past 10 years does little to discourage the myth. Many female pilots have said once the men realized the women could fly as well as the men, the discrimination evaporated. Astronauts have to work closer together and under more extreme conditions than the average pilot, yet they have exhibited no problems "bonding" with their female crewmembers. And dare we try to remember the ludicrous statements made concerning black pilots when the Air Force was forced to integrate their flying squadrons? Lt Gen James Doolittle made a statement concerning integration of flying units that is as appropriate for women today as it was for blacks 40 years ago: "I don't like to be naive about this but I am convinced that the solution of the situation is to forget they are colored."[37]

Another principal theme is that women ought not to suffer the ordeal of being a prisoner of war, the implication being that women will suffer sexual abuse as well as

the customary abuse of that status.[38] One wonders why Congress is so concerned with the possible sexual abuse of at most 400 rated female personnel (assuming they all were taken prisoner of war), when in 1974, 55,000 rapes occurred in the United States.[39] By 1985 the number of forcible rapes had increased to 87,340.[40] In addition, a study done in 1978 concluded that in any one year about 1.8 million wives in the United States are beaten by their husbands.[41] These figures are so telling one must conclude that any testimony concerning the physical abuse of women as prisoners is for sheer emotional impact. If Congress is so concerned about the physical well-being of American women, they do not need to wait for a war to protect them.

A related argument is that men are really more worried about how the sexual abuse of a female prisoner will affect the judgment of other military personnel.[42] Will a male prisoner really react differently when a female is tortured than he would if it were his best flying buddy for the past five years? Not likely! These people are military professionals who are well aware that "war is hell" and are prepared for the consequences. It must also never be forgotten that women are no strangers to prison camps. During World War II at Ravensbrück concentration camp alone, over 65,000 civilian women died from starvation, disease, the gas chamber, and medical experimentation.[43] The next war will spare no one, including civilians, from its horrors. The question remains, why does Congress continue to "protect" female military professionals?

Another reason given to keep women out of combat aircraft is that the flight leader would be more protective of a female on his wing and possibly get shot down himself.[44] It is well known that leaders always feel protective of their men and vice versa. There are numerous stories of untold brav-ery and heroism in order to save a buddy's life. In many cases these feats have resulted in the award of the Medal of Honor for placing one's life at risk above and beyond the call of duty. For example, on 7 January 1945 over Los Negros Island, Maj Thomas B. McGuire, Jr., was killed while trying to save a comrade from attack by an enemy fighter. Would his bravery have been viewed as protectiveness if the comrade had been female? Or consider the feat of Maj Bernard F. Fisher, who observed a fellow airman crash-land on a damaged airstrip. "He believed the downed pilot was seriously injured and faced capture. Although aware of extreme danger and likely failure, he landed, taxied the length of the runway littered with battle debris, and effected the rescue."[45] Soldiers have always risked their lives for each other in war; hopefully, they will continue to do so for their female comrades as well.

One of the final arguments the critics make is that there is no need to change the law at this time. "While true as far as it goes, it misses the point. It is precisely at this time when no emergency exists that action should be taken to carefully plan and implement measures that can be applied in an emergency."[46] It is now that Congress needs to allow the secretary of the Air Force the flexibility to utilize his pilots in the most efficient and cost-effective manner possible to adequately prepare for future conflicts.

The Outlook

In fact, there is new hope that section 8549 could be repealed or revised during the 100th Congress. In late 1986 Senator William Proxmire of Wisconsin said:

> Current assignment policies do not really protect women from combat and are a waste of talent. The range and effectiveness of modern weapons make it impossible to isolate female soldiers from the danger of combat. The sup-

port jobs they are allowed to take are often as dangerous as the front-line jobs they are now prevented from taking. Women in the military is no longer an experiment, it is a reality that our assignment policies should reflect.[47]

Senator William Cohen of Maine said that

> every position should be available to every individual who possesses the necessary experience, qualifications, and motivation—regardless of gender. Women and men who have chosen to devote their lives to serving their country deserve their nation's commitment to ensure them equal opportunities.[48]

These statements are welcome in light of the Reagan administration's opposition to removing the combat restrictions on women. On 3 September 1983, White House spokesman Larry Speakes said, "The President strongly feels that women should not be sent into combat. That's bedrock Reaganism."[49] But we now have a Democratic Congress. It has been a full eight years since DOD sent its first proposal to Congress for repeal of section 8549. During those years, female pilots and crewmembers in the Air Force have continued to meet all challenges and to perform superbly.

As the 100th Congress charts the course for the future of our country, we must continue to ask the question, why are female pilots excluded from combat? We have seen not only American women but women of all nationalities who have a rich heritage in defending their country. It has become obvious that section 8549 of the Women's Armed Services Integration Act is no longer

in consonance with society's attitudes toward women and, in fact, represents blatant discrimination against women. Numerous examples are cited that show that women are already fully integrated into the Air Force and that mission readiness will be degraded by continuing to exclude women pilots from flying combat aircraft. Finally, this article has exposed the critics' excuses for what they are—myths propagated against a minority group to ensure exclusion from the most prestigious positions.

So the questions remain, with the only plausible answer being the same one that has plagued mankind for centuries: resistance to change for no real reason at all; resistance to a modern military where smarts and skills are more important than biceps; resistance to the fact that brains do not have gender and great leaders can be male or female; resistance to the fact that the last bastion of male chauvinism, flying combat aircraft, is slipping away; and resistance to the fact that "the right stuff" has no gender. As the 100th Congress debates this issue today, it would do well to keep in mind the words of economist John Stuart Mill more than a hundred years ago:

> Is there so great a superfluity of men fit for high duties, that society can afford to reject the services of any competent person? Are we so certain of always finding a man . . . for any duty or function of social importance which falls vacant, that we lose nothing by putting a ban upon half of mankind and refusing beforehand to make their faculties available, however distinguished they may be. . . ?[50]   □

Notes

1. Kenneth P. Werrell, "Should Women be Permitted in Combat? Yes," *Air University Review*, July–August 1977, 66.
2. Jeff M. Tuten, "The Argument Against Female Combatants," in *Female Soldiers—Combatants or Noncombatants? Historical and Contemporary Perspectives*, ed. Nancy L. Goldman (Westport, Conn.: Greenwood Press, 1982), 239.
3. Maj Gen Jeanne Holm, *Women in the Military: An Unfinished Revolution* (Novato, Calif.: Presidio Press, 1982), 8.

4. Ibid., 8–14.
5. Congressional Research Service, *Women in the Armed Forces*, CRS–9 (Washington, D.C.: Library of Congress, 25 September 1985).
6. Holm, 23.
7. House, *To Provide Recognition to the Women's Air Force Service Pilots for Their Service During World War II by Deeming Such Service to Have Been Active Duty in the Armed*

Forces of the United States for the Purposes of Laws Administered by the Veterans Administration: Hearings Before the Committee on Veterans' Affairs, 95th Cong., 1st sess., 1977, 262–63.

8. Ibid., 310.

9. Ibid., 264.

10. Holm, 316.

11. 10 U.S.C., section 8549.

12. Holm, 118.

13. Ibid., 126–27.

14. Ibid., 127.

15. US Commission on Civil Rights, *A Guide to Federal Laws and Regulations Prohibiting Sex Discrimination*, Clearinghouse publication 46, July 1976, 16–17.

16. Nancy H. Loring, ed., *Women in the United States Armed Forces: Progress and Barriers in the 1980s* (Chicago: Inter-University Seminar on Armed Forces and Society, 1984), 12.

17. Jennet Conant et al., "Women in Combat? Withdrawing Them in a Crisis Could Hamper Readiness," *Newsweek*, 11 November 1985, 38.

18. Loring, 45.

19. Holm, 339.

20. Ibid.

21. Ibid., 340.

22. Ibid., 342.

23. Ibid.

24. Ibid.

25. Ibid., 341.

26. Ibid., 397.

27. Conant, 37.

28. Ibid.

29. Paul Dean, "More and More Women Are Finding the Skys Friendly in the Air Force," *Equal Opportunity Current News*, 1 April 1986, 36.

30. Ibid., 31.

31. Jim Garamore, "Warner Praises Women's Role in Libya Raid," *Air Force Times*, 12 May 1986, 15.

32. Sharon Young, "A.F. Opens 1,645 More Positions to Women," *Air Force Times*, 29 December 1986, 4.

33. Holm, 396.

34. Shelley Saywell, *Women in War* (New York: Viking Penguin Inc., 1985), 144.

35. Joe Poyer, " 'G.I. Jane': Should Women Be Allowed to Fight?" *International Combat Arms*, November 1986, 55.

36. Judith H. Stiem, "Women and the Combat Exemption," *Parameters*, June 1980, 53.

37. Bernard C. Nalty, *Strength for the Fight* (New York: The Free Press, 1986), 233.

38. Stiem, 52.

39. *National Institute of Law Enforcement and Criminal Justice, Forcible Rape: A National Survey of the Response by Prosecutors* (Washington, D.C.: Government Printing Office, 1977).

40. Department of Justice, Federal Bureau of Investigation, *Uniform Crime Reports for the United States, 1985* (Washington, D.C.: Government Printing Office, July 1986), 13.

41. *Forcible Rape*, 1.

42. Stiem, 52.

43. Saywell, 61.

44. Louise Thistle, "Women in Combat: Aground on Tradition," *Equal Opportunity Current News*, 1 April 1980, 17.

45. The Orientation Group, *United States Air Force Medal of Honor, 1918–1968*, USAF Hall of Heroes, Headquarters USAF, Washington, D.C.

46. Werrell, 66.

47. Rick Maze, "Bill Would Let Women Work Closer to Combat Zone," *Air Force Times*, 13 October 1986, 3.

48. Ibid., 3.

49. *Women in the Armed Forces*, CRS–9.

50. As quoted in Holm, 397.

BETTER WRITING

A Heretic's View

Col Samuel E. Riddlebarger, USAF, *Retired*

IN RECENT years most of the guidance on better writing in the Air Force has articulated a common theme: make it simple. Write with small words. Keep sentences short. Write the way you speak. Be informal. Write for your audience.

Baloney! (Is that sufficiently short and simple?) Get the fire ready; I'm a heretic. If the nation and the Air Force want better writers, I believe they need a different approach. The current game plan is taking us in the wrong direction. Our society is losing the keys to advanced civilization: progressive reading and writing skills.

Now, if you're not interested in what I've got to say on this subject, stop here and read something else. No one reads anything unless he wants to (pleasure, curiosity) or needs to (profession, trade, business, personal welfare), a point I'll return to later.

After pushing a pencil for the Air Force from the mid-1950s to the mid-1980s and from the squadron swamps to the Pentagon peaks, I've seen lots of briefings and bro-

chures on how to write more effectively. Much of that guidance stressed simplified writing. And much of that advice came from ivory-tower types with little "combat time" when it comes to writing. My scar tissue says it ain't necessarily so; simpler is not always better.

Why must we continue to write down? What's wrong with writing up? If grade-level literacy is declining, why should we steadily retreat instead of fighting to gain ground? As we continue to downgrade vocabulary, grammar, formality, accuracy, and other aspects of good writing, we can look forward to communicating with grunts and sign language.

Consider where the nation is now. "We are creating a new nation of illiterates," says a federal Department of Education official in a recent issue of *Time*.[1] In an article entitled "The Illiteracy Blight," *Publishers Weekly* calls the situation a national crisis.[2] One observer claims that nearly 60 million Americans can't read or write adequately.[3] Evidence abounds, and there is a consensus that we are in trouble.

Why?

Experience and logic tell me that we are emphasizing the wrong things. Why must writing be aimed at the fourth-grade level, or the sixth, or whatever? Why set limits? Why create "fog count" directives that stultify efforts to properly express ourselves? (The Air Force says, "Aim High," but don't try that with a pencil in your hand.)

Let's get serious. If we want good writing, we will have to go about it the old-fashioned way—by working for it!

By now some of you think I'm arguing the pedant's view: big words, fancy sentences, and lots of ostentatious obfuscation.

Wrong! I'm calling for a return to freedom and progress in writing.

I believe in using the *right* word, not necessarily the shortest or longest. The most accurate term is usually the best. If the word

has three letters and *best* represents what you want to say, use it! But if a bigger word more precisely or more powerfully communicates your thought, use *it*! Using the shorter word just because it's shorter is losing sight of your writing objective. Complicated subject matter isn't going to get simple by being addressed via a bunch of one-syllable words—it's only going to get screwed up.

A good writer also needs a synonym now and then to avoid repetition.

A healthy vocabulary equals power, communicative power. Just as a great painter uses a variety of colors and strokes to create a meaningful image, the writer well armed with words and phrases can convey messages that move the reader. The dictionary is full of evocative words, and we ought to use them!

Using a more precise word can save time by taking the place of a phrase or sentence, thereby making the communication both sharper and shorter. If I write "anorak" instead of "a heavy jacket of a bulky material, with a hood, worn in very cold climates," haven't I saved words? As to the argument that a reader may not understand the word *anorak*, let him look it up! Better communication is a two-way street. Readers have responsibilities, too. Why are we so quick to blame the writer when a reader doesn't know a word's meaning? *Anorak* is used in a novel by an author who sells books just as Elvis Presley sold records.[4] Or how about the eminent news magazine that wasn't afraid to use the term *morganatic* recently to describe the marriage of Wallis Simpson to the Duke of Windsor?[5]

Just as short, simple words aren't always best, staccato sentences aren't always going to get the job done right. Sentences may need to have more than three or four words. *I* don't like to read something written with short, choppy words and sentences; it often resembles a telegram or a computer print-

out, with the loss in subtle human communication characteristic of such transmission modes. Complex objects and thoughts often require complex words and sentences. Why should that surprise or aggravate us?

Society and the Air Force are becoming increasingly sophisticated. Do we really think that complicated equipment and systems can be managed with rudimentary language skills? If our people can't read and write adequately, how can we handle F–15s and advanced logistics systems? Legal documents concerned with subtle points of law are written the way they are because they must be as precise and unequivocal as possible, not because lawyers and jurists are playing games.

The long and the short of the writing function ought to be articulated as follows: use the right words and sentences—even if they're long rather than short.

The chiefs, colonels, and generals know that. When the hucksters tell you that *you* have to straighten out the senior folks and get them to write at the fourth-grade level, just remember that the general got to be a general by writing the way he or she does.

We also are advised to write for our audience. Well, as I've already asserted, readers need to hold up their end, too. There are only two reasons why you or I have ever read anything: interest and need. In neither case must the writer compromise his meaning because of possible deficiencies in potential readers. The writer's primary allegiance is to his subject, not his readers. (How's that for heresy?) If the author is preparing a nursery rhyme, common words are consistent and appropriate. If the subject is the metaphysical connotations of Nietzsche's *Zarathustra*, grab your reference books.

My experience is that good writing requires a degree of loyalty to the subject.

As for the reader, if he picks up something for pleasure, he's on his own. If the

material is pertinent to his job or personal life, he ought to know the terms and concepts. We may have our thinking backward when we insist the writer is wrong because the reader doesn't understand.

Before you light the fagots at my feet, let me say that I'm not advocating *overwriting*. What I'm suggesting is that we shouldn't *underwrite*, either. Furthermore, I do not deny that *some* Air Force writing needs to be simplified, only that *all* of it can or should be.

To cite just one example, an Air Force writing manual (a good one, for the most part) criticizes the following sentence: "Request this office be notified when your activity's supply of paper clips falls below the 30-day level." The manual suggests that "Let us know when you need more paper clips" would have been better.[6]

I don't agree. First, the original sentence is close enough (see Rule 2 in the attached guide). Rewriting a memo concerning paper clips is wasting time. There isn't that much wrong with the original version. (Don't call me a pedant if *you* are the kind of nitpicker who would revise a reasonably comprehensible sentence!)

Second, the revision doesn't pass the stupidity test (see Rule 1). Do we actually believe that folks won't ask for more paper clips when they need them unless we send them such a memo? The revised memo is rhetorical, a waste of time, because it only states what the reader already knows.

Thus, the third problem with the rewrite is the most serious and clearly illustrates my point. The revision significantly changes the message, making the communication less precise and therefore less informative (see Rule 4). Who defines "need" in the second version? Sergeant Bilko may order a two-year supply of paper clips, just to be safe or for trading, even though he has enough on hand to last six months. The point is that the original version *said some-*

thing, contained useful information, and therefore was worth preparing. By trying to be simple and informal, the revision lost sight of the message to be transmitted.

Another so-called good writing tip that disturbs me is the suggestion that we should write the way we speak. I don't enjoy conversations laced with "you know," "like, man," and "I mean," so I certainly don't want to read such drivel. If many of us were to write the same way we speak, the written word would constitute a new Tower of Babel.

Speakers use mannerisms, tone, body language, inflection, and other devices to help convey the message. Writers function in a sterile environment. The two modes of communication are distinctly different. As the eighteenth-century French naturalist Buffon observed, "Those who write as they speak, however well they speak, write badly."[7]

Having criticized some of the current guidance on better writing, I have included with this article some suggestions of my own for improving Air Force prose.

Good writing, I believe, has three characteristics: substance (important information, serious statements—worth); clarity (organized, sequential words and sentences, using precise and meaningful words—communication); and force (style, originality, format—impact). And you won't acquire these writing skills by trying to reduce your prose to the "see-Jane-run" level.

As for winning the paper wars in the Air Force, the attached guide briefly outlines some tips (learned the hard way!) that I've used and added to over many years of blue-suit writing and teaching. These 10 rules may help you. Try them; you'll like them. And concentrate on the *subject* when you write. We need readers who are more erudite, not writers who are less literate!

The Heretic's Guide to Better Air Force Writing

1. **Is this Paper Necessary?**
   - Does it pass the "stupidity test"?
   - Don't contribute to the "paper mill."
   - Pick up the telephone or walk down the hall.
   - Avoid CYA files. (Most MRs are sissy.)

2. **Use the "Close Enough" Rule**
   - All paperwork is not equal.
   - If it's routine, don't sweat grammar, spelling, neatness; and longhand may be okay.
   - Speed may be more important than perfection.

3. **Clocks, Chiefs, and Colonels Won't Wait**
   - Don't waste time arguing about the suspense.
   - Forget the old cliché "Do you want it right, or do you want it on time?" (The boss wants both.)
   - Avoid overcoordination. (Don't ask for opinions you don't need.)
   - Late can mean useless.

4. **Audiences Aren't First**
   - Readers have responsibilities, too.
   - Concentrate on the *subject.*
   - Say what you *mean.*
   - "KISS" with care. (Cavemen aren't good writers, either.)
   - Use the *right* words (even if they aren't the smallest ones).

5. **Get to the Point**
   - Make the first sentence count.
   - You are not writing a murder mystery.

6. **Longhand Shouldn't be Shorthand**
   - Scribblers never win.
   - Reasonable penmanship saves everybody's time.

- Learn to write legibly or go to medical school.

7. Get a Dictionary and Use It
- Experience the sweet spell of success.
- Don't guess; look it up.
- It's the writer's best friend.

8. Proofread or Perish
- Double-checking *isn't* sissy.
- Don't develop good prose and then submit trash. (To win the race, you must take the lest stap.)
- A tight paper builds credibility.
- Don't blame the typist; if it's your paper, its your responsibility.

9. Avoid the Common, Telltale Mistakes
- Who, which, that—use the right one.
- Principal/principle, affect/effect, farther/further—learn the difference.
- Promiscuous pronouns—they will get you in trouble.
- Misplaced modifiers—they confuse the reader.

10. Keep Learning; Keep Trying
- Writing is the most important skill in getting ahead.
- You build walls and literacy brick by brick and word by word.
- Develop a positive attitude, a striving to be better.
- Read!

Notes On the "Rules"

1. Don't create paper that isn't needed, or to tell people things they already know, or to cover your behind. Maybe a phone call will suffice. And most memos for record just clutter files.

2. Treat paperwork according to its importance. A statement for the base commander to promulgate on Memorial Day needs to be worded precisely and typed impeccably. On the other hand, a note to the boss reminding her that today is her husband's birthday doesn't have to be Shakespearean in composition or prepared by the word processing center on its best letterhead; it's the basic message that matters here, not the nuances or appearance. Save time for important writing by not dawdling over routine stuff.

3. Respect suspenses. Sometimes they're not reasonable, but don't waste half your time arguing about the time limit. The boss usually (not always) has a valid reason for the short fuse (maybe someone else didn't produce). If you *must* complain, do so *after* you get the job done. If the wing commander needs the paper in two hours, and you don't come through, you may never get another chance. And don't try to get everybody to agree with your words unless you have to; remember, coordination often means only to alert certain offices, not necessarily to get their concurrence.

4. Consider your subject. Don't become so engulfed in "Write for your audience," "Check your fog count," and "The paper is no good if the reader doesn't understand it" that you forget what you're trying to accomplish. Good writers get good by making their prose (words, sentences, style, length) fit their subject. Don't ignore your audience, but think about your topic and objective. Use the proper word! Those who read for pleasure are on their own; and those who read for professional or personal reasons have an obligation to learn the pertinent terms. The clichéd admonition "Keep it simple, stupid," known as the "KISS" rule, if overworked can produce documents so generalized and simplified that they're more stupid than simple.

5. Don't beat around the bush. Tell your reader quickly what your paper is all about. Don't make him read it all to find out. The first sentence should be short, simple (but accurate), meaningful, and in active voice. The body of the document can then etch with more detail, rationale, background, and precision. Don't go overboard on length, but don't underwrite either; remember, you can *underwhelm* readers as well as overwhelm them.

6. Take the time to write legibly. The chicken-scratching that Air Force secretaries and horseholders have to ponder over is disgraceful. You are a worthless writer and a sorry supervisor if your penmanship is poor.

7. Let a dictionary help you. You will be a better writer if, as you compose, you verify meaning, check spelling, and seek synonyms (to provide variety). You are not in a spelling bee; it's fair to look up the word. If you ensure that you've used the proper word and spelled it right, you've saved time and avoided possible grief. (Did you use "princip*al*" when you meant "princip*le*"? No one will know if you checked it to be sure, but everybody will know you *didn't* if you mess up the usage and the secretary doesn't catch your carelessness.)

8. Read what you sign. The refusal to proofread is a serious problem in the Air Force and in our society. The boss isn't going to blame the typist if there's a glitch in your paper. If the document is important (remembering Rule 2), don't weaken the impact of careful composition by careless proofreading; if the words are spelled wrong or put together poorly, the reader may conclude that your thinking and message are just as error-filled. If the paper reflects meticulous preparation, the credibility and reputation of the writer are enhanced. (And if you found three typos in Rule 8, you've got a good eye.)

9. Don't continue to make the typical mistakes that brand

the poor writer. Pick one problem or weak area each week (or even one each month) and take the time to learn the correct usage. You will enjoy the increased respect your writing will receive. Those who know when to use "affect" instead of "effect," or that "consensus" is proper (not "concensus" or "consensus of opinion"), will get more opportunities to use, and benefit from, their writing skills. Sure, you may need an hour or more to check one of these points, but once you learn it, consider the time you will save over a career—and the rewards.

10. Never stop trying to be a better writer. If you do, don't expect promotion. Writing is the one skill indispensable to advancement. The effective writer is the individual who realizes that there is always more to learn, and goes for it!   □

Notes

1. Robert Barnes, quoted in "Losing the War of Letters," *Time*, 5 May 1986, 68.

2. "The Illiteracy Blight," *Publishers Weekly*, 24 May 1985, 27.

3. Jonathan Kozol, "Dehumanizing the Humanities: Scholars and Adult Illiteracy," *The Education Digest*, December 1985, 6.

4. Lawrence Sanders, *The Fourth Deadly Sin* (New York: Berkley Publishing Group, July 1986), 33.

5. "The Woman Who Cost a Kingdom," *Time*, 5 May 1986, 39.

6. John C. Smith and Maj John R. Grellman, Jr., *Plain English, Please!* (Maxwell AFB, Ala.: Air University, 1982), 43.

7. Georges Louis Leclerc de Buffon, quoted in *The Age of Voltaire*, by Will and Ariel Durant (New York: Simon and Schuster, 1965), 574.

Flight of the Old Dog by Dale Brown. New York 10016: Donald I. Fine, Inc., 352 pages, $18.95.

Dale Brown has given us quite an exciting yarn with his first novel, *Flight of the Old Dog*. Brown, a former Air Force captain and SAC navigator, tells the story of a modern-day raid on the Soviet Union using a motley collection of crewmembers and one old B–52.

There are two apparent messages in the work. The first appears to be that the B–52, despite its age, is still a good old warhorse. The bomber he describes is an old H-model B–52 that has been taken out of service and outfitted with what Hans Solo of *Star Wars* fame would describe as "special modifications." The airplane is then sent to Dreamland, a test site in the Nevada desert, where it serves as a test plane for new avionics, stealth technology, and whatever else the whiz kids in the desert can dream up for it. Because of its age and the ugliness of the airframe, it earns the nickname "Old Dog."

Brown's second message is that the Air Force navigator, an often unsung hero, is the indispensable glue without whom SAC's flying operations could not succeed. While each of the six crewmembers performs admirably in this tale, the protagonist and hero is the crew's radar navigator, Capt Patrick McLanahan.

The author wraps these messages up in a pleasing package of a tale that, if not always believable, is consistently fun. We start with a look at the threat: a super laser situated on the Kamchatka Peninsula that can destroy aircraft in flight, ships at sea, or satellites in orbit. After the Soviets knock out a series of important US assets, the president decides it's time to stop fooling around and to destroy the laser before it's too late.

This is where Old Dog and Pat McLanahan come in. Captain McLanahan, fresh from winning SAC's annual bombing and navigation competition, is asked to go on a "special" TDY. A brief cloak-and-dagger interlude later, he finds himself at Dreamland testing new equipment mounted on the aged B–52. The crew at Dreamland is charged with getting the equipment that will go on the new B–1s ready for service. In fact, when the president decides to attack the laser in the Kamchatka, he sends B–1s to do it.

Just when we think our heroes will be watching from the sidelines, the base at Dreamland comes under attack. As the attackers are charging across the base, a collection of aviators and engineers who have been testing Old Dog fire up the engines. They blast their way out of a hangar and take off seconds before they would have been blown up by the attackers, barely getting airborne in front of the attackers' charging vehicles. Once airborne, the crewmembers discover the B–1s could not complete the mission, and they take their old and somewhat battle-scarred (from the escape) aircraft and assume the mission to destroy the laser themselves.

This book has some notable strengths. Among them are the fun and the engaging, though farfetched, story line. The action seldom stops, and when it does slow down, it is to humanize Pat McLanahan and the book with a pleasing love story. While most B–52 crewmembers would think that a radar navigator who falls in love with his crew's electronic warfare officer, or EWO, has been living far too long at the local alert facility, in this story it is all right. The EWO is a pretty young engineer named Wendy Tork. The romance between Tork and McLanahan provides a rest between the action scenes and is well done.

Another of the book's strengths is the easy explanation of technical equipment. The story revolves on high tech, and without a good explanation of what all the Old Dog's equipment does, the reader would get lost. Brown provides that explanation and, while most of that equipment is not now on any known B–52, its description is credible and adds to the story.

As enjoyable as the story is, it does have its weaknesses. The most prominent is the tremendous stretch of the imagination required to swallow the plot line. For example, as the Old Dog escapes from its hangar at Dreamland during the attack, its left wingtip catches on the hangar door, ripping off the left external fuel tank. It damages the landing gear on takeoff roll, putting a hydraulic system out of commission. The pilot is killed in the attack, and the second pilot breaks his leg getting into the airplane. And then the aircraft and crew proceed to fly a 30-hour mission to the Soviet Union with no charts of the area. R-i-

i-i-g-h-t! They do not have enough fuel to complete the mission, so they lure an aerial-refueling tanker into the air. The Old Dog's pilot, who recognizes the voice of the tanker pilot as an old buddy he has not heard from in years, has no refueling coordinated between the two airplanes. He therefore convinces the tanker pilot to pass the gas by threatening to tell everybody what happened when the two of them were TDY when they were both lieutenants. R-i-i-i-g-h-t!

Despite these weaknesses in realism, the story is fun. If the reader is looking for a realistic novel that accurately portrays the way a B–52 is likely to be used in combat, this is not it. But if an exciting novel with a dash of high tech and a little romance thrown in for good measure is what is required, *Flight of the Old Dog* is sure to please.

Maj Clayton P. Bowen, USAF
Loring AFB, Maine

War Games by Thomas B. Allen. New York 10020: McGraw-Hill Book Co., 1987, 402 pages, $19.95.

Having more than a passing interest in war games myself, I was intrigued with the possibilities of *War Games*, a new book by Thomas B. Allen, a former editor for National Geographic Books. With its author having such credentials, the book promises much. Unfortunately, it fails to deliver on its promises.

The book is subtitled "The Secret World of the Creators, Players, and Policy Makers Rehearsing World War III Today," and the jacket includes ticklers such as "Designers of hobby store war games often design games for the Department of Defense." Tom Clancy is trotted out to say, "Totally fascinating. This book will be the standard work on the subject for the next ten years." Unfortunately, there is too little substance behind the titillation, and such substance as is present is buried in misinformation and errors. For example, the Janus war game from Lawrence Livermore National Laboratory is identified as a relabeled version of the US Army War College's McClintic Theater Model (MTM) when, in fact, the two models have virtually nothing in common. When the author states that "there seems to be no precise date on which the SAGA [OJCS Studies, Analysis, and Gaming Agency] became JAD [OJCS Joint Analysis Directorate]," he loses a great deal of credibility with me.

As I read this book I found myself constantly tempted to recheck the flyleaf to see if Érich von Daniken was listed as the author. The verbiage is overgrown with hyperbole:

> In wargaming stadiums there are no bleachers. The public is never invited to the games that help to determine how the Cold War will be waged, how events could kindle World War III, and how that nuclear war would be fought.

I am left to conclude that it is the author's opinion that the *Washington Post* should sit in on these games.

Chapters are full of anecdotes and homilies, the meanings of which are left unclear. The author tells me that "models . . . are to war games what solitaire is to bridge," but I am left wondering just what that is supposed to mean. I kept having the feeling that I was reading a book review in which segments made no sense because they had been taken out of context, except I was reading the entire text.

There is some worthwhile information about war games and their uses in this book. The author rightly points out that

> no one . . . can predict with any degree of confidence what the U. S. or the Soviets will do in any crisis. So we don't build escalation models to see what will happen. But we put down what strategists worry about. We acquaint people with issues and interrelationships rather than predictions.

Elsewhere in discussing repetition and repeatability of war games he points out that

> it takes hundreds—thousands—of runs, just to have some feel for your basis of uncertainty. If there is one thing about a war game or a simulation about war, it's not going to be the way you have it in your simulation. That is the certainty.

Finally, in discussing models that underlie war games and the wide variety of formulations that are possible for a particular situation, Allen cites a particularly apropos report by the Government Accounting Office that states:

> Different analysts, with apparently identical knowledge of a real world problem, . . . may develop plausible formulations that lead to very different conclusions—none of which are verifiable or refutable. To expect such models to produce objective, scientifically valid results is no more reasonable than to expect that a particular brush will produce fine paintings, or a particular knife fine carvings.

There are a number of irksomely irrelevant portions here. For example, Allen cites an incredible tale of purported military folly:

When the Nixon administration took over in 1969 all the data on North Vietnam and the United States was fed into a Pentagon computer— population, gross national product, manufacturing capability, number of tanks, ships, and aircraft, size of the armed forces, and the like.

The computer was then asked, "When will we win?" It took only a moment to give the answer: "You won in 1964."

The author makes no apology for glossing over such inexplicable details as just how such a question as "When will we win?" was posed to the computer or what constituted "winning." In discussing the classic Lanchester Law, the author mangles the presentation into nonsense with "r and b representing the numerical strengths of Red and Blue and N and M representing the fighting value: $Nr^2 = Mb^2$."

Why Allen erroneously states that total Red strength must equal total Blue strength is unknown. The Lanchester Law in reality makes Red attrition proportional to Blue strength and vice versa via a set of differential equations.

I cannot recommend this book for wargaming novices because they have no basis for judging which portions are irrelevant. Nor can I recommend the book for experienced wargamers since their experience obviates the need for them to wade through the morass of debris in order to pick out the few gems of information present. *War Games* is a book without an audience. It provides more questions than answers, the first question being, what is the point of this book?

Lt Col Daniel B. Fox, USAF
Maxwell AFB, Alabama

The Strategic Air War Against Germany and Japan by Haywood S. Hansell, Jr. Washington, D.C. 20422: Office of Air Force History, 1986, 300 pages, $14.00.

Maj Gen Haywood S. Hansell has written a controversial memoir of his experiences as a staff officer and combat commander during World War II. Hansell believes absolutely in strategic air power and argues that if airmen had been allowed to fight the war by their own lights, the conflict would have been shorter and less bloody. This volume, a revision of two earlier works, is a lucid and forceful memoir, perhaps

the best of its kind, but it suffers from the author's freely admitted biases.

Hansell begins with a discussion of the Air Corps Tactical School (ACTS) in the 1930s. In an excellent chapter, he describes how the theories of strategic bombardment found in the writings of Guilio Douhet and Billy Mitchell evolved at ACTS and became doctrine by 1939. Hansell then served on General Arnold's staff and helped write AWPD–1, the plan that guided the bombing effort against Germany. He describes AWPD–1's genesis—the steps taken to define the problem, collect data, and devise a solution. The description is important, since few of those serving on Arnold's staff in the crucial years from 1939 to 1942 have written memoirs.

The contentious aspects of this book concern the author's view of how the air war was fought—or more precisely, how it was not fought. AWPD–1 stated that the object of strategic bombardment was to destroy the enemy's capability and will to fight. To achieve that end, planners designated specific target systems: aircraft and engine factories, oil refineries, electrical power stations, and transportation centers. The Casablanca Conference of January 1943 officially endorsed this concept, although it was disappointingly vague on details. But political and military considerations prevented the implementation of the plan. Hansell refers to these considerations as "distressing diversions" and states that the failure to follow through on the blueprint articulated at Casablanca was a grievous miscalculation that lengthened the war and greatly increased its cost.

This is the crux of the issue. Although genuflecting toward civilian control and the primacy of politics in war, it is apparent that Hansell actually rejects such notions. With his gaze fixed firmly on the destruction of German factories, he spurns the necessity of air support elsewhere. Yet the use of the heavy bombers in a support role was absolutely essential. For example, the need for coming to grips with the German army was acknowledged by Allied leaders. North Africa was chosen as the initial venue, but chances of success were slim. To help ensure victory, maximum air support was necessary. Over the objections of Carl Spaatz and Ira Eaker, units from England were sent to Africa. What was the alternative? Would the bomber advocates have left the infantry to land on the beaches and fight their campaign alone, thus condemning it to failure? Or would they argue that Torch, or any similar landing, not take place at all? Stalin argued

passionately for a second front, and the Allies, perhaps recalling Russia's separate peace with Germany in World War I, were loath to refuse.

In the Pacific, General Hansell, arriving as a wise and seasoned European veteran, led the XXI Bomber Command. He had learned important lessons over Germany and was determined to avoid mistakes. He quickly realized, however, that his European experiences seldom applied in the Pacific, so he adopted new remedies. By the end of the war there were few similarities between the air doctrine employed against Japan and that which American airmen had so passionately advanced, defended, and executed over Europe. (Is there a lesson here regarding the value of military history to the serving officer?)

In assessing the accomplishments of strategic air power, Hansell insists that bombardment could have won the war if not for the intrusions of unenlightened nonairmen. This is arguable. What is clear, however, is that the doctrine devised by Hansell and his colleagues at ACTS was flawed. Air power was not a unique weapon that could bypass the lengthy, bloody struggles on ground and sea by striking directly at a nation's vital centers. On the contrary, airmen learned that they also had to overcome the enemy forces first. Clausewitz was right—one first had to close with the enemy army, destroy it, and *then* move to the vital centers. This preliminary struggle, shrugged off by ACTS theorists, was neither quick nor easy. In a two-year campaign against the Luftwaffe, the Combined Bomber Offensive cost the British and Americans over 20,000 aircraft destroyed and 120,000 crewmen killed or captured. Hansell blithely assumes the morality of the American bombing offensive. Recent works by Ronald Schaffer (*Wings of Judgment: American Bombing in World War II*) and Michael Sherry (*The Rise of American Air Power: The Creation of Armageddon*) would, however, dispute such a conclusion.

In summary, General Hansell has written a most articulate account of the development of American strategic bombing doctrine and practice. One can argue with his postulates and conclusions, but the arguments are clear. Today's Air Force officers should read this book closely, listen to its logic, and decide for themselves if it is valid.

Lt Col **Phillip S. Meilinger,** USAF
US Air Force Academy

Reaching for the Stars: The Story of Astronaut Training and the Lunar Landing by Dr Stanley H. Goldstein. New York 10175: Praeger, 1987, 208 pages, $35.95.

Reaching for the Stars presents a multifaceted history of astronaut training during the beginning of the US space program and a primer on the basic theory of training and its applications to high-technology programs. Contained within this short volume are the underpinnings of the astronaut program as well as background into many of the management decisions that shaped the US space program.

Dr Goldstein's credentials are impressive and lend substantial credence to the book: assistant personnel officer and director of university programs at Lyndon B. Johnson Space Center (JSC) in Houston; former director of human resources management at NASA headquarters in Washington, D.C.; and 17 years as the director of employee development at JSC. His insight into the manned spaceflight program during the 1960s and 1970s is evidenced by his depth of research and his use of personal recollections of colleagues involved in the development of training at JSC.

Dr Goldstein's brief introduction provides a historical background of man's desire to reach beyond the earth. He introduces several of the major questions encountered by the astronaut training program and relates them to training theory and training for early NASA manned missions.

The author next presents a general treatise on the history, philosophy, and theory of training. This particular section presents an interesting picture of the evolution of training theory and its application in the development of modern technology.

Dr Goldstein then sets the stage for the development of the space race and the US manned spaceflight program in the context of the cold war during the 1950s. He provides additional historical insight into the development of rocket technology and also into the political arena in which many of the issues affecting spaceflight were first raised. This chapter presents an excellent perspective of the personalities and issues that molded the US and Soviet space programs in the 1950s and 1960s.

Dr Goldstein then gives us the history of each of the NASA manned spaceflight programs culminating in the lunar landing of Apollo 11. Each of these programs (Mercury, Gemini, and

Apollo) faced impressive obstacles that had to be overcome before the next phase of the national quest for a lunar landing could begin. The general lack of training theory required the Mercury training team to develop a training program in parallel with the technology. The result was what Dr Goldstein describes as a "shotgun" approach emphasizing environmental training as the Mercury 7 ventured into the unknowns of space.

As missions evolved into programs, it became obvious to NASA management that the involvement of the astronauts in the actual development of hardware and training program was essential to the success of the overall mission. An integral part of this effort was the development of simulators and simulator theories to allow each astronaut the opportunity to experience something beyond his own realm and to practice to perfection outside of the costly real world of spaceflight. As Mercury progressed to Gemini and Gemini evolved into the Apollo program, training became more and more complex as the complexity of the missions increased. Dr Goldstein has painted an admirable picture of the men who flew these first missions and of what it took to get to the moon.

Dr Goldstein identifies several factors contributing to the success of the astronaut training program: the "space race atmosphere" of the 1960s, NASA's role as a public agency, the research and development nature of spaceflight, the role of training as a guarantor of mission success, the motivation and qualification of the astronauts, and the mission-related decisions that drove the training program. These factors, coupled with additional factors contributing to the successful management of the program, produced a highly successful and innovative training program that provided the basis for many similar programs worldwide.

The enjoyable book should provide interesting reading to anyone involved in training or anyone with an interest in space history. It provides new insights into the development of a training program where few precedents existed. Dr Goldstein has shown us the precedents. It is up to the reader to apply them.

Capt Stephen W. Miller, USAF
Falcon Air Force Station, Colorado

Intelligence and Strategic Surprises by Ariel Levite. New York 10225: Columbia University Press, 1987, 220 pages, $27.50.

Ariel Levite's *Intelligence and Strategic Surprises* examines the fundamental problem of intelligence, the problem of furnishing policymakers with timely warning of a serious menace. A former Israeli military officer and currently a senior research associate at the Jaffee Center for Strategic Studies in Tel Aviv, Levite does not presume to tell us how to prevent strategic surprise so much as he offers a closely reasoned basis for understanding the human and organizational vulnerabilities that tend to reduce or distort our perception of impending threats.

Drawing on his own research in the US National Archives, Levite takes the work of other students of the surprise phenomenon a step further by examining the conditions under which strategic warning is (1) most likely to be available and (2) most likely to influence the perceptions and response of policymakers. In the process, he reviews, synthesizes, and critiques recent studies of strategic surprise and suggests an alternative approach for analyzing the subject. (Not the least valuable part of the book, by the way, is Levite's bibliography, which serves as a selective guide to the literature on strategic surprise.)

Levite's principal argument is that strategic surprise occurs when and because reliable warning intelligence is unavailable. To test his hypothesis, he examines and compares the US disaster at Pearl Harbor with this country's stunning success at the Battle of Midway only six months later. Regarding the former, Levite builds an arresting, revisionist case to show that significant US intelligence on Japanese *intentions* (as opposed to Japanese capabilities) was all but nonexistent. The situation was reversed at Midway, where the availability of accurate and exquisitely detailed intelligence on enemy intentions made all the difference.

In the case of Pearl Harbor, Levite also faults existing accounts for employing an excessively broad definition of warning. Even Roberta Wohlstetter's highly regarded study, *Pearl Harbor: Warning and Decision*, does not escape rebuke on that particular score. Though estimable in many ways, Wohlstetter's book is criticized for failing to impose a sufficiently discriminating standard on competing warning "signals," essentially treating each as though it had the same degree of significance. The predictable result was an overloaded "target" (i.e., US intelligence) unable to distinguish the important "signals" from all the irrelevant "noise."

More broadly, Levite believes that a similar lack of discrimination has plagued virtually all

studies of strategic surprise. In his view, scholars routinely have lumped every conceivable indicator of attack under the general rubric of "warning." Levite contends that a definition so all-encompassing is analytically useless. In its place, he calls for a more restrictive standard that measures the credibility of warning reports against the known reliability of the source from whence they come.

Looking ahead as well as at the past, Levite contends that future prospects for strategic surprise are problematical at best, not the least because of emerging technologies that should ease the collection and processing of warning intelligence. In the end, however, the preemption of surprise will depend less on the collection of intelligence than on its effective analysis and swift dissemination to the policymakers who need it the most.

The analysis and transmission of intelligence are, of course, key elements in the complex relationship between warning and response. Although he examines them separately for analytical purposes, Levite argues that, in fact, warning and response coexist in a "dynamic-interactive" relationship involving receptivity to warning on the one hand and willingness to take action on the other. In effect, the remainder of the book is a further working out of these ideas and of the author's aforementioned case for a more discriminating approach to the study of strategic surprise.

One note of warning lest prospective readers themselves be caught unaware: *Intelligence and Strategic Surprises* is not particularly easy going. The outgrowth of a Cornell doctoral dissertation, it is long on theory, full of woolly passages, and written in language only a social scientist could love. Turgidity notwithstanding, Levite's study of warning, threat perception, and response is worth conjuring with.

Lt Col James Titus, USAF
US Air Force Academy, Colorado

Doctrine, the Alliance, and Arms Control edited by Robert O'Neill. Hamden, Conn. 06514: Shoe String Press, 1987, 232 pages, $29.50.

Each year the International Institute for Strategic Studies in London holds a major conference for its members. This past year's conference dealt with NATO and Warsaw Pact strategic doctrines and their effect on arms control and the Western alliance. The papers presented at the conference were edited by the institute's director, Dr Robert O'Neill, and compiled to form this book.

The volume represents the most current thinking on NATO doctrine from some of the finest minds in the American and European defense policy arena. The thoughts of Gen Bernard Rogers, Karsten Voigt, Ambassador Richard Burt, Dr Fritz Earmath, and others are included in the work. Although limited in scope by the conference's topic, the discussions nonetheless tackle a wide range of issues confronting the NATO alliance. Current and proposed NATO warfighting doctrine, the possible impact of the Strategic Defense Initiative on strategy, political and economic constraints on strategy, Warsaw Pact doctrine, and conventional force upgrades are but a few of the many topics covered here.

If there is a particular theme of the papers, it is the problem the Western alliance faces from an increased Warsaw Pact military buildup coupled with the reluctance of alliance members to support the defense expenditures needed to keep pace. While the authors are not willing to discard the current doctrine of flexible response, they do not hesitate to voice their opinions as to what is needed to enhance deterrence. There are the usual calls for increased defense expenditures on the part of the European allies. Unfortunately, most authors are pessimistic that this could be accomplished given current economic and political constraints in the European community. As a result, many of the authors advocate other more acceptable alternatives. Some of the more promising ideas include the use of emerging technologies, better prioritized planning, and changes in force employment and readiness. In that respect, the book represents some of the best in current thinking on NATO strategy.

If the book has one fault it is its omission of opinions from the European political left. With the notable exception of the paper by Karsten Voigt, a member of the Social Democratic Party of Germany (SPD), the book seems to ignore that important political faction. As a result, there is no serious discussion of European nuclear disarmament or of the adoption of a no-first-use nuclear policy and the strategic consequences that those policies imply. While this omission may stem from the largely conservative members who attended the conference, it is nonetheless an oversight that detracts from the work.

On the whole, the book does an excellent job of examining the current issues confronting the alliance. It provides scholarly analysis of current NATO strategy along with proposed alternatives.

Accordingly, this book is a must for any serious student of doctrine and strategy.

Capt Paul S. Raines, USAF
Fairborn, Ohio

The Seeds of Disaster: The Development of French Army Doctrine, 1919–1939 by Col Robert Allan Doughty. Hamden, Conn. 06514: The Shoe String Press, 1986, 248 pages, $27.50.

Reasons for France's sudden and unexpected defeat in 1940 are too often rooted in myth. Some believe that the Maginot Line caused the defeat. Others find failures of political leadership and decadence in society as satisfactory explanations.

Now Colonel Doughty has provided us with an excellent opportunity to understand the fundamental role French army doctrine played in the tragedy. Using a variety of original source material, he traces the development of French army doctrine between the two world wars.

The doctrine of 1940 was greatly influenced by the First World War. The French began that war with a doctrine emphasizing the offensive and morale. When firepower inflicted hideous losses, the French gradually became convinced that they needed to change their doctrine. By the end of the war French doctrine was characterized by its emphasis on carefully controlled, methodical battles that were designed to achieve overwhelming superiority in materiel and firepower.

After the war the French army continued to emphasize the importance of the battle and firepower destruction of the enemy. To achieve the necessary massive firepower, the French required large, well-supplied units. These units were centrally controlled, which increased the complexity of planning and caused speed to be sacrificed in the quest for more firepower.

French military education contributed to these trends. Believing that improper study of history had contributed to their flawed prewar doctrine, the postwar French army applied a correction and attempted to balance the study of history with exercises. However, this approach created distortions when it criticized prewar emphasis on mobility and audacity without questioning what impact new technological developments might have on future combat.

Besides education, a number of other factors such as manpower constraints influenced the development of French army doctrine. Convinced that war required the committal of all resources, French leaders valued a large wartime army more than a small, well-trained peacetime army. The realization that a large army made them more dependent on relatively untrained conscripts who could be "very excitable" further reinforced their desire to fight methodical battles.

Politics, economics, and geography also were important influences. The vulnerable location of Paris and French natural resources and industry mandated defending France at the frontier. One way to make frontier defense more feasible was through the use of underground fortifications. Their great cost, however, limited where they were built. Assuming geography made the Ardennes easy to defend, the French decided they did not need elaborate defenses there. Having estimated that it would take the Germans nine days to cross the Ardennes instead of the less than three days it actually took, the French believed they would have plenty of time to provide any necessary reinforcements.

Relying on firepower, few in the French army saw any role for the independent employment of tanks. Proposing such innovative concepts was made even more difficult by the French army's cumbersome organizational structure. The army's reliance on committee decisions rather than putting identifiable people in charge made it much simpler to retain old concepts instead of adopting new concepts that would have threatened reliance on firepower.

Colonel Doughty has written a very important book that should be mandatory reading for all Air Force officers aspiring to high-level command and staff positions. Reading this book will help officers appreciate how complex the development of doctrine can be and how fundamental doctrine is to success in war. Learning about the development of French army doctrine can also help today's Air Force officer understand why Soviet and US Army doctrine both stress speed and mobility. Finally, and perhaps most important, this book could lead to more effective Air Force doctrine if it helps us identify factors that can flaw our doctrine development process.

Lt Col Price T. Bingham, USAF
Maxwell AFB, Alabama

Soviet Strategic Deception by Brian D. Dailey and Patrick J. Parker. Lexington, Mass. 02173: Lexington Books, 1987, 560 pages, $49.00.

The renowned French Sovietologist Boris

Souvarine once observed that everything about the Soviet Union, starting with its name, is a lie. This penetrating observation has been reinforced over the years by the regime's unedifying and unending efforts to bend human reality to ideological formulas that obscure more than they enlighten. Thus, deception and prevarication are among the fundamental attributes of the Soviet regime, which acts as an outlaw in world politics and sees itself at the center of conspiracies both stimulated by it and directed against it.

This conspiratorial and deceitful mode of thought colors not just the entire political operations of the Soviet state but all of its military activities as well. For instance, *maskirovka*, a word that encompasses all forms of military concealment and deception, is a cardinal principle of all Soviet military doctrine and planning. Therefore, it is of great benefit to scholars, laymen, politicians, and military planners alike to have this collection of essays before us. The authors largely succeed in their attempt to present the many worlds of Soviet deception activities—espionage, disinformation, political fronts (as in the Nicaraguan case), and the forms of military deception at the tactical, operational, and strategic levels.

What emerges is a comprehensive and somewhat redundantly detailed picture of these systematic policies of the Soviet Union across the board of world politics and military affairs. As in any such collection, the quality of individual essays varies; however, most are at a very high analytical level and some are better than that. For the military officers who read this journal, undoubtedly the most valuable of these essays will be those by Notra Truelock on the levels of military deception and the section on arms control and strategic deception. Of particular significance is Brian Dailey's piece on deception and the ABM Treaty, which makes a convincing case for a US strategic defense system. However, readers who ignore the other essays will lose the understanding of the system, conduct, organizational network, and processes—not to speak of the goals—of the extensive deception system fielded by the Soviets.

The importance of this volume is that it forces to the forefront of discussion some unpleasant truths about the Soviet Union's methods. In all likelihood, scholars and experts will be debating these findings, many of which are unpalatable to many sectors of American opinion. Hitherto we have averted our gaze from this subject, and even today many in the media, politics, and perhaps even in the military do not want to know or understand—or perhaps cannot bring themselves to understand—the magnitude of the threat to our society posed by the systematic deception and disinformation tactics of the Soviets. With this volume circulating in the public domain there will be less excuse for such neglect. And the quality of these articles, as well as the hopefully positive quality of the reflection and debate that they trigger, makes it truly an indispensable piece of reading for those sectors of American society charged with deterring the Soviet threat.

Dr Stephen Blank
Maxwell AFB, Alabama

The Never-Ending War: Terrorism in the 80s by Christopher Dobson and Ronald Payne. New York 10016: Facts on File Publications, 1987, 356 pages, $18.95.

The authors contend that terrorism is the hallmark of the 1980s. A vast number of books and articles in the professional journals attest to this and to the fact that that situation is likely to continue. Dobson and Payne have written a book that keeps the reader's attention despite the overload in print.

With all the coverage, the reader is swamped with stories and analyses. The authors' goal is to make some sense of it all, to "sort out [the terrorists] into categories according to the declared aims of their violence." (p. v)

Basically, the book is divided into geographical segments. About two-thirds of *The Never-Ending War* is area-by-area analysis of national terrorist groups pervaded by strains of Marxism and the Palestine issue.

A chapter dealing with the recent air strike against Qadhafi's Libya culminates the first portion of the book, which centers on the Middle East. The authors support the strike and heap criticism on those Western nations that failed to support US efforts and that have attempted accommodation with terrorist organizations. Admittedly, the attack will not stamp out terrorism forever; it does, as the authors maintain, throw a new consequence into the considerations that must be calculated by someone contemplating sponsorship of a series of terror attacks. One chapter shows that Syria's Assad has had a greater hand in terrorism than Qadhafi and another reveals the Soviets open to charges of aiding and abetting it. However, Assad hasn't been as visible as the more vocal Libyan leader. Qad-

hafi's style appears to focus attention on himself and makes for better reading. There is no discussion of power relationships in the attack equation, but they certainly will play a role if punishment is deserved by all involved.

There is an examination of the structure and purpose of cells in various revolutionary and terrorist groups. Necessity has forced many of these organizations into using self-contained, isolated cells and structure to assure the overall survival in the face of better intelligence. The same type of cell organization is found today among radicals in Korea, which explains the difficulty the Korean police have had in quieting the turbulence on their university campuses.

Some themes aren't developed. The authors mention the increasing amount of maritime terrorism. *Violence at Sea*, released by the International Maritime Bureau of London, shows that it is quite extensive and increasing, but there is very little discussion here of this growth.

The reaction of rightists is touched on slightly in the examination of the Red Brigades (Italy) and of the terrorist goal of causing a violent and illegal reaction. These topics should have been developed at the expense of later Indian subcontinent material that seems so out of place, even if the tactics and Marxist tones are similar.

Certain flippant remarks and statements detract from the book and contribute little. For instance, execution by being shot in the back of the head isn't "Russian execution style." (p. 212) The origin of this style of execution is lost in obscurity and cannot be attributed to anyone. Another such remark describes the storming of hijacked aircraft by military rescue teams as "a manhood test of gung-ho chauvinism for any nation." (p. 290)

The authors have done what they said they would. The reader sees the "ties that bind" through the examination of each group separately in terms of its ideology, key leadership, typical techniques, and recent history. The materials can be found in many diverse newspaper articles and feature stories. Here, the authors have put them together and the chronology at the end is well done. *The Never-Ending War* is aimed at the shopping center market. Its price and hoopla cover design strongly hint that it is aimed at the average book buyer. It meets the needs of the average reader and provides a fine review for those with more than a casual interest.

<div align="right">

Peter C. Unsinger
San Jose, California

</div>

First Heroes: The POWs Left Behind in Vietnam by Rod Colvin. New York 10003: Irvington Publishers, Inc., 1987, 355 pages, $19.95.

Few issues related to the war in Vietnam elicit the emotion aroused by the subject of this study. Nearly a decade and a half has passed since our nation celebrated "Operation Homecoming," marking the liberation of American prisoners of war. Yet, doubts linger as to whether the Vietnamese indeed returned all of the Americans they held. Despite continued claims that "no Americans continue to be held in Vietnam against their will," many cling to the hope that others are being held and will someday be released.

The book is written with two parts. The first 11 chapters represent a loosely chronological account of the postwar history of the POW/MIA issue. They outline ups and downs in terms of public awareness and governmental interest.

The second portion of the book presents personal stories of 13 MIA/POW families. This material is, by its very nature, much more subjective. Nevertheless, it is educational to see how these individuals view the past 14 years from their intimate perspective. Particularly pertinent for military readers are these families' perceptions of how the military institution has related to them in their loss.

That the title of this book reveals the perspective from which it is written should not deter potential readers. However, for those whose mind is closed, this book could prove quite unsettling.

While influenced by POW/MIA League of Families sources, the author possesses no personal ties to the issue. Colvin is a radio journalist introduced to the issue only in 1981. Prior to his own investigation, he believed "like so many Americans, that those who still carried the banner for MIAs were overly emotional and unable to accept the cruel realities of war."

The book presents an impressive amount of material, ranging from records of various governmental studies to information about historic Communist treatment of POWs and their repatriation. Included are a helpful index and an appendix listing those still missing in action (including more than 40 civilians).

This book begins with the return of the POWs in a chapter aptly titled "Taking Off the Bracelets." It describes renewed interest in the question arising from the numerous sightings related by Vietnamese refugees. Among important elements of the story is the key testimony of a highly

placed North Vietnamese mortician who, as a refugee, resettled in America. He testified at a congressional hearing that while working in the official Graves Office of Hanoi, he assisted in processing and storing the remains of well over 400 American soldiers. He described in detail their storage in a warehouse and Vietnam's ability to return them at any time.

While primarily directed toward establishing the case that Americans continue to be held as POWs, *First Heroes* discusses possible reasons for their continued captivity. One intriguing theory is that MIAs represent an ongoing "form of psychological warfare."

Related to this psychological hypothesis is a disturbing impression that filters through rather consistently in the accounts of the POW/MIA family members. They generally feel short-changed by a disinterested government. Although they continue to love their nation, they consider themselves victims. The mother of Maj Donald E. Shay, an Air Force pilot lost over Laos on 8 October 1970, speaks for many when she says, "The most frustrating thing about the whole experience is that I've had to fight my own government."

While the picture of the American government painted by the book is not comforting, *First Heroes* ends on a positive note, citing an admission by the Vietnamese last year that "it was possible some Americans, of whom they were not aware, could be held in remote areas." Until the day when something develops from this leading admission, families of MIAs continue to be sustained by faith and hope. In the words of Lynn Standerwick, whose Air Force father's plane was lost in 1971, "I operate on the premise that a POW is coming home tomorrow." However, the other side of the coin is noted by Vince Donahue, father of an Air Force pilot lost three years earlier. He urges our nation to action with the words, "The men who are left over there are dying, one by one. Will we allow the American government to be co-conspirators in the deaths of Americans at the hands of the enemy?"

The book's title comes from a statement by Alexander Solzhenitsyn:

> If the government of North Vietnam has difficulty explaining to you what happened to ... American POWs who have not yet returned, I, on the basis of my experience in the Archipelago, can explain this quite clearly. There is a law in the Archipelago that those who have been treated the most harshly and who have withstood the most bravely, the most honest, the most courageous, the most unbending, never again come out into the world. . . . A part of your returned POWs told you how they were tortured. This means that those who have remained were tortured even more, but did not yield an inch. These are your best people. These are your first heroes. . . .

The plea made by *First Heroes* is that they not be forgotten.

Chaplain (Capt) Robert C. Stroud, USAF
Reese AFB, Texas

notams

Notices of upcoming conferences, seminars, and other professional matters of a noncommercial nature should be sent to: Editor, *Airpower Journal*, Walker Hall, Maxwell AFB AL 36112-5532. We reserve the right to edit material for length and editorial content.

National Space Symposium

The United States Space Foundation has announced its Fourth National Space Symposium, scheduled for 12–15 April 1988. The symposium will be held in Colorado Springs, Colorado, at the Broadmoor Hotel's International Center. Inquiries should be made to the US Space Foundation, National Space Symposium, PO Box 1838, Colorado Springs CO 80901.

USAF Academy Military History Symposium

The Department of History at the United States Air Force Academy has announced that its Thirteenth Military History Symposium will be held 12–14 October 1988. The topic will focus on the role of intelligence in military operations. The department has sponsored a symposium series since 1967, and all but the first symposium proceedings have been published through the Office of Air Force History by the Government Printing Office. For further information please write to: Capt Mark Clodfelter, HQ USAFA/DFH, USAF Academy CO 80840–5701. Telephone inquiries may be made at (303) 472–3230 or AUTOVON 259–3230.

USMA History Symposium

The United States Military Academy, with the generous support of the National Endowment for the Humanities, will sponsor a history symposium titled "The Theory and Practice of American National Security, 1960–1968," at West Point, New York, 13–15 April 1988. Historians and political scientists will present papers on political, strategic, economic, and other aspects of American national security policy during the Eisenhower, Kennedy, and Johnson administrations. For further information contact: Lt Col Charles F. Brower, Department of History, USMA, West Point NY 10996.

Army Aviation Convention

The Army Aviation Association of America will hold its 1988 convention 13–17 April 1988 in St Louis, Missouri. This year's theme is "Army Aviation . . . Near-Term Focus." For further information contact: AAAA, 49 Richmondville Avenue, Westport CT 06880–2000 or phone (203) 226–8184.

Mobilization Symposium

The Industrial College of the Armed Forces and National Defense University's Mobilization Concepts Development Center will host their annual symposium 14–15 April 1988 at Fort McNair. This year's conference is titled "Human and Material Resources Policies: A New Look at Enduring Issues." For more information contact Mobilization Conference Committee, Industrial College of the Armed Forces, Washington DC 20319–6000. Phone numbers are (202) 475–1953 or AUTOVON 335–1953.

Thirtieth Anniversary

January saw the 30th anniversary of the first US satellite in orbit. Explorer 1 was launched 31 January 1958 by a Jupiter C rocket from Cape Canaveral. Explorer 1 weighed 30.8 pounds and led to the discovery of the Van Allen radiation belt.

AUTHOR INDEX

TITLE INDEX

SUBJECT INDEX

contributors

Maj Gen Perry M. Smith, USAF, Retired (USMA; PhD, Columbia University), resides in McLean, Virginia, and was commandant of the National War College at the time of his retirement in 1986. He was a command pilot with more than 3,000 flying hours, primarily in fighter aircraft, including F–84s, F–100s, F–4s, and F–15s. General Smith was a visiting professor at the National War College, has been a faculty member at the US Air Force Academy on three separate occasions, has held various command positions in West Germany, and has served at Udorn Royal Thai AFB. During his career, he served in a variety of positions, ranging from branch chief to Joint Chiefs of Staff planner. General Smith is a graduate of National War College.

Maj Darrel D. Whitcomb (USAFA) is an Air Force reservist currently assigned as an A–10 flight commander in the 303d Tactical Fighter Squadron, Richards-Gebaur AFB, Missouri. While on active duty, he served as a maintenance officer, a T–38 instructor pilot, and two tours as a forward air controller in Southeast Asia. Major Whitcomb is a graduate of Squadron Officer School, Air Command and Staff College, and the Army Command and General Staff College.

Col Martin T. Daack (USAFA; MBA, University of Colorado) is deputy commander for operations, 43d Bombardment Wing (SAC), Andersen AFB, Guam. A command pilot with 3,300 flying hours, including 670 combat hours, he has served as the assistant director of operations and chief, Facilities and Equipment Services Branch, Air Force Materials Laboratory, Wright-Patterson AFB, Ohio; as a strategic offense mission area operations research analyst with the Capability Assessment Division, Directorate of Plans, Headquarters USAF; and as commander, 97th Air Refueling Squadron, Blytheville AFB, Arkansas. Colonel Daack is a graduate of Squadron Officer School and Air War College and a distinguished graduate of Air Command and Staff College.
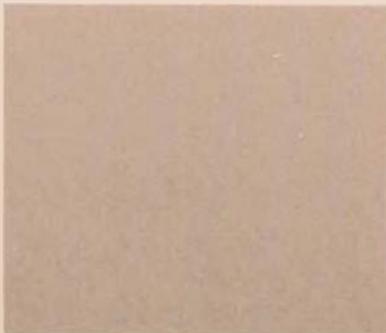
Capt Brian P. Tice is a student at the Defense Intelligence College. From February 1982 to June 1984, he was wing intelligence officer for the 35th Tactical Fighter Wing (F–4) at George AFB, California, and was an intelligence analyst/current intelligence briefer from June 1984 to August 1987 at Headquarters Fifth Air Force, Yokota AB, Japan. Captain Tice is a graduate of Squadron Officer School.

Daniel S. Papp (BA, Dartmouth College; PhD, University of Miami) is professor of international affairs and director, School of Social Sciences, Georgia Institute of Technology, Atlanta. He has served as senior research fellow at the Air University Center for Aerospace Doctrine, Research, and Education; as research professor at the Strategic Studies Institute of the US Army War College, and as visiting professor of Western Australia Institute of Technology. Doctor Papp has published more than 40 articles on various issues on US and Soviet foreign and defense policies and is author of *Vietnam: The View from Moscow, Peking, Washington* (1981) and *Soviet Policies Toward the Developing World During the 1980s: The Dilemmas of Power and Presence* (1986).

Col Samuel E. Riddlebarger, USAF, Retired (BS, University of Maryland; MPS, Auburn University), was commandant of the Air Force Manpower and Professional Personnel Management School, Leadership and Management Development Center, Air University, Maxwell AFB, Alabama, at the time of his retirement. While on active duty, he served as a pilot, personnel officer, administrative officer, war plans officer, and information officer with assignments at Elmendorf AFB, Alaska; Hamilton AFB, California; Eglin AFB, Florida; Tan Son Nhut AB, Vietnam; and the Pentagon. Colonel Riddlebarger is a distinguished graduate of Squadron Officer School, Air Command and Staff College, and Industrial College of the Armed Forces.

Maj Sandra L. Bateman is chief, Protocol Section, International Affairs Division, Office of the Assistant Vice Chief of Staff, Headquarters USAF. She has had assignments as a ground control intercept controller at Malmstrom AFB, Montana, a range safety officer and a protocol officer at Clark AB, Philippines, and commander, 443d Services Squadron at Altus AFB, Oklahoma.

Maj Robert C. Owen (BA and MA, University of California at Los Angeles) has been executive officer of the 34th Tactical Airlift Training Group, Little Rock AFB, Arkansas, since 1987. From 1975 to 1981 he was a C–130 pilot assigned to Dyess AFB, Texas, and Rhein-Main AB, West Germany. He was an associate professor of history at the US Air Force Academy from 1981 to 1985, and in 1985–86 he was an instructor pilot with the 16th Tactical Airlift Training Squadron, Little Rock AFB. Major Owen is a distinguished graduate of Squadron Officer School and a graduate of Air Command and Staff College.

in the spring...

LOOK FOR

- Soviet Tactical Air Doctrine
- Prisoner of War Issues
- Supermaneuverability