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AIR UNIVERSITY review

DETERRENCE 2010

strategic offense and defense in the future

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SINCE President Reagan's initial announcement on 23 March 1983 of the Strategic Defense Initiative (SDI) as an alternative path to the strategic future, much has been written speculating on the transition to, and the role of, strategic defense (SD) in the years to come. This article offers an operational rather than a purely theoretical viewpoint of a strategic future in which defense by new technologies may play a role.

SDI is a research program to investigate the feasibility of ballistic missile defense (BMD)

with the technologies that are emerging today. As such, SDI is essential for our strategic future in two ways. First, it will prepare us for a future in which more defense may be necessary to maintain deterrence. Second, it is accelerating the exploitation of technologies that can enhance all of our military forces. SDI is necessary and very useful in this regard.

The real debate in all of this centers on the decisions that will have to be made when SDI research has accomplished its objective. SDI is tasked to produce a potential system architecture for BMD that is cost-effective at the margin. To eliminate confusion in this discussion, I will term this system as elegant, or enhanced, BMD (EBMD). Decisions about deployment of EBMD will be entered into the overall Department of Defense (DOD) budgetary competition. It is an understatement to say that DOD budgeting is complex, convoluted, very competitive, subject to many external and internal pressures, and unpredictable for any given program. Strategic systems have the additional factor of high public visibility and extensive legislative debate. The future strategic debate factors are being shaped today.

Strategic factors are being formed by a confluence of events. Because of the lack of predictability of the outcome of these events, there is a natural tendency to treat the resultant factors in isolation. Unfortunately, this does not create an overall direction but leads to a reassessment of and a reaction to each new event. At a minimum, the factors include arms control treaties and initiatives; the status of strategic force capability; blurring between strategic and tactical force requirements; accelerating technology (potential, costs, and requirements); building requirements for space systems; EBMD potential and the associated air defense requirements; the budget and deficit; and an adversary who patiently works all of the angles. These factors, in combination with others such as historical experiences and our national psyche, will determine our strategic future.

Strategic Offense/Defense

For now and the foreseeable future, strategic offense will provide the cornerstone of forces supporting the US deterrent strategy. We are currently receiving the initial manifestations of the President's Strategic Modernization Program, which is restoring the viability of our strategic forces. We have learned in the past 15 years that the strategic force capability must be maintained, even under negotiated treaty constraints, because the Soviets will continue to work at reducing its effectiveness. Thus, we must continue to maintain our strategic forces or their successors. Strategic defense, active and passive, is deeply embedded in the current programs. Passive strategic defense is represented by mobile and deceptive ballistic missiles—intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs)—continued assured positive control launch of the bomber force, and stealth technology. Active strategic defense is currently in the form of improved US antisubmarine warfare (ASW) capability and some limited antisatellite (ASAT) capability.

SDI brings the high payoff potential of EBMD into the defensive discussion, with the Aircraft Defense Initiative (ADI) adding the absolutely essential complement of air defense to EBMD. The strategic discussion centers on whether these proposed systems, considering both their cost and added military value, are required in addition to the current strategic programs. Complicating the argument for EBMD and air defense, even if they are found to be potentially cost-effective, is the historical evidence that deterrence supported by offensive forces has apparently worked and that deterrence based on defensive systems alone is at best an untested proposition. The most likely outcome is one of strategic offense and defense in combination.

The value of this combination has to be evaluated in the face of many uncertainties.

Strategic force capability is perishable by the very nature of strategic force competition. Up to this point, we have relied on our Triad (ICBMs, SLBMs, and bombers); however, with the virtual explosion in certain technologies in the future, this may not be adequate. The consequence of the Soviets using to full advantage the technology explosion, especially in the medium of space, could be a rapid shift in the balance of power.

Our Adversary

The Soviets pursue all angles of strategic offense and defense, including civil defense, while maintaining a numerically superior conventional force. They do this with a patience and diligence that gives new meaning to the tortoise-and-hare analogy. One can argue that some of their programs are cumbersome or not very effective, but the problem for us is that we cannot ignore these programs or systems, and the Soviets realize this. They maintain a "warm" base for programs in almost all areas, and this has great payoff as well as cost-effectiveness. With their numerically superior force and broad-based research efforts, the Soviets can utilize technologies they have developed, or taken from the free world, to alter significantly the correlation of forces (COF) on many fronts. The technology explosion will offer the Soviets new opportunities to exploit, and their capability to deploy in space further exacerbates our problem.

Compounding our problem is the Soviet penchant for camouflage, concealment and deception, political and military misinformation, and special forces. New technologies used in these areas will further confuse our ability to predict correctly the outcome of engagements and the COF for our national leadership. The lack of confidence in COF predictions can result in coercion of the United States or, in conflict, the inability to gain control of the initiative from the Soviets.

As the initiator of a conflict, the Soviet Union would have initial control over surprise, initiative, and time lines of conflict—all of which would work significantly to its advantage. Control of conflict time lines would allow the Soviets to achieve expectations in correlation of forces before escalating or threatening to escalate the conflict. For example, by prolonging conventional phases of conflict, the Soviets could use ASW to destroy US nuclear-powered ballistic missile submarines (SSBNs) before escalation to nuclear conflict occurs. This could logically contribute to damage limitation as effectively as BMD. The Soviets realize that by stretching time lines, however, they may suffer reversals and loss of initiative. Heavy emphasis in technologies to accelerate ASW success would indicate tighter time-line control and positioning to be able to coerce the United States into submission prior to nuclear conflict. This would also give future Soviet BMD assets higher leverage, especially if weapon numbers are reduced by current arms control proposals. US strategic defenses, both active and passive, can mitigate these Soviet advantages. We may gain some insight into the approach and planning of the Soviets by observing where they dedicate their efforts and apply new technologies. We must remember that they will continue to approach the problem with a Soviet mindset that is incongruent with our motives and with our expectations for the future world.

Ourselves

The US approach to strategic forces and deterrence can be characterized as reluctant recognition of a necessary evil and is generally economically oriented. Because of this, we struggle with strategic offensive force procurement and eventually will face the same situation with EBMD and air defense. We very conscientiously decided, for economic reasons, to maintain nuclear deterrence in lieu of conventional superiority or parity. For economic and technical reasons, we dropped

previous BMD and air defense systems for strategic offensive forces deterrence. Strategic offense has been our choice in the past and may well be in the future for similar economic and technical reasons. It even could be argued that strategic arms control and force reductions have economic underpinnings as well as moral grounds. We want the cost of our choice to be minimized.

Anyone who has argued for Peacekeeper, the B-1, the small ICBM (SICBM), or the advanced technology bomber (ATB) painfully understands several apparent things about the US psyche. In the United States, we strive to make our strategic systems perfect before we buy, wanting our investments to be minimized and to yield exacting results. These results have to be portrayed in the simplest, cleanest COF calculations with no fog of war allowed. A 50 percent effective system is alien to our psyche. We also tend to buy about one-half of what we start out to get; for example, the military requirements were for 200 Peacekeepers and 244 B-1s. We justify the systems for their lack of use, thus "hold at risk" replaces "destroy targets" and "deterrent value" supplants "military capability." Our society has avoided discussion of nuclear conflict and does not like the visible manifestations of our armament. This all has very ominous indications for the EBMD and air defense debate.

These influences will drive the expectations for EBMD and air defense to the impossible. The expectations will likely be for a 100 percent effective system that ends nuclear conflict forever, eliminates the need for strategic offense, has no visible basing in the United States, and maintains the "virginity" of space—all at 50 percent of the estimated cost. Many discussions will be extremely emotional. Unfortunately for those who argue for EBMD and air defense, the systems by their very nature will run counter to the aforementioned expectations.

Buying even 50 percent levels of stated military requirements of offensive forces can be viewed as adding bullets to your magazine—it still leaves you armed. EBMD and air defense, on the other hand, cannot meet capability expectations and have visible deficiencies due to reduced deployment and funding levels. Although a less than "full up" system would be militarily beneficial, it would not lead to the long-term moral objectives of a leakproof system; and if some potential for leakage exists, the perceived consequences will lead people to question why we are doing it at all.

The debate on whether to procure nuclear offensive systems is influenced by the destructive power of US nuclear weapons. EBMD and air defense, on the other hand, lacks such influence and raises the question of the continuing effectiveness of high-technology solutions in a very technologically competitive environment. EBMD will be less than 100 percent effective. Proving how effective it has to be will be subjective and a source of endless debate. (Try selling an expensive car that runs 70 percent of the time.) Strategic defense, by itself, cannot fill the requirement for future deterrence due to the inherent requirement in deterrence to threaten punishment; therefore, maintenance of the offense must be argued simultaneously with the promotion of EBMD and air defense.

In order to portray the effectiveness of strategic defense, the failure of nuclear deterrence needs to be discussed as a possibility. Tactics to counter the defensive technology, a library of scenarios, and the unknowns of Soviet technology will all be paraded through every audience who will listen. If the EBMD and air defense protagonists are successful in arguing these points and in convincing the antagonists, they may unwittingly enhance the potential for another undesirable outcome. By removing the total terror of nuclear conflict that reinforces deterrence today, conventional conflict, particularly between the superpowers, may become more likely.

In view of all of this, it is no wonder that we continue to cling to the hope of molding So-

viet behavior. If they would just change, it would eliminate the need for this painful discussion. Unfortunately, our experience with this has been anything but reassuring. Multiple independently targetable reentry vehicles (MIRVs), past BMD, arms control, détente, and economic initiatives all reflect our past attempts at modifying Soviet behavior. We have altered their course of action in some cases, but they continued the new course of action with their own particular proclivities and idiosyncrasies. The results, therefore, were not necessarily what we predicted or desired. EBMD and air defense will be no different because the Soviets will react as Soviets and draw their own picture of the future strategic world.

The Four Worlds

In giving form and substance to the future strategic world, it helps to capture some general cases. In simplified terms, four cases, or worlds, come to mind.

The first world is the projected case of today's circumstances: numerically superior Soviet conventional forces, approximate parity in the number of nuclear weapons, the Soviets standing almost alone in the world of defenses, and no major technical breakthroughs. Maintenance of this status quo requires at a minimum that arms control treaties currently in the works be enacted and that there be absolute adherence to existing treaties. However, evolution of strategic offensive forces within treaty constraints will still occur on both sides. Working against continuation of the current status is the lack of treaty control over Soviet defense initiatives on all fronts. Their work in many technologies and our own SDI and ADI make the first world an unlikely future, as does the moral dilemma of nuclear war. Add to this the potential of space and we can safely assume that we will not be left where we are.

In the second world, the Soviets have con-

vinced us to ignore the potential of SDI and ADI. This is the first world with Soviet EBMD and their air defense radically enhanced, and with no corresponding US systems. We cannot afford to be in this world, but it is where the Soviets want us to be.

The third world would be just as unpalatable to the Soviets as the second world would be to us. This is the world used in some strategic defense analyses under the scrutiny of the people worrying about transition phases. It is the world with US EBMD and air defense and with no comparable Soviet capability. It could be argued that because of their experiences in the 1950s and 1960s, the Soviets could survive more comfortably in this world than could the United States in the second world. However, having dealt with strategic inferiority before, the experience has convinced them that a recurrence is not permissible.

The most likely future is in the fourth world. It would be the world where both sides have a form of EBMD, air defense, and strategic offensive forces. If the defenses are viable and not countered by offensive changes, it will be a world that also includes forces for attack of the opponent's defenses *and* as the counter to those forces. The form of the systems and style of combat will be radically altered by the technologies involved and by the space medium. Near-speed-of-light weapons will be side by side with missiles, airplanes, and advanced vehicles. Stealth technology will be further developed. Overall force structure may be smaller and mobility of ballistic missiles on the ground or in the oceans will be devalued. A clear strategic picture will be extremely elusive and a believable COF will be next to impossible. The demand for dollars for strategic assets will be accelerated.

Affordability—The Economic Corner of the Fourth World

EBMD and air defense procurement will come at a time of extreme stress on the mili-

tary and national budget. The demands on the non-DOD portion of the budget will continue to expand. The burden of a continuing deficit will be heavier, and the temporary solution of inflation will be resisted because of its long-term implications. Even if DOD funding levels remain constant, other factors will stress the "bang-for-the-buck" factor with space and technology at the front of the list.

Until recently we procured systems for land, sea, and air warfare. We bought hardware for the 3^2 or 9 medium-to-medium combat environments (air-to-air, air-to-land, air-to-sea, sea-to-sea, and so on). Space, the fourth medium, is now a permanent and expanding factor in Soviet and US planning. The addition of this fourth medium nearly doubles (16 versus 9) the number of medium-to-medium environments for which we must be prepared, and space assets are expensive. It may be unreasonable to expect a correlative expansion in appropriations. The result will be either an overall thinning of the military force structure to pay for space or negligence of that medium, neither of which is a palatable alternative.

Compounding this are the rising technical requirements for systems to counter Soviet technology and numbers. The cost of new technology adds to the cost of research and systems, again leading to a thinning of the force structure. In this vicious cycle, less force structure leads to even more requirements on system capability, increasing system costs.

The offset to rising technical and capability requirements and cost will have to be the ability to utilize these assets in combined arms operations with multiple system tasking in many theaters of operation. If this happens, the distinction between strategic and tactical systems will blur, demanding operational versatility of high-technology systems in strategic and tactical missions with extreme speed from one theater to another or immediate access to many theaters—for example, space basing. Strategic defensive systems for sensing and for battle management will have to have capabilities for assisting in missions other than homeland defense.

The Historic Choice

Because of the economic factors, very capable strategic offense may again be suggested in deference to the offense/defense combination. After all, we have chosen that path before. Maintaining offensive capability will be required, and incremental monies applied to ensure capability may be more attractive than large sums of money for new defensive programs. There are competitive strategy benefits in continuing to modify our offense and to keep the Soviets spending on both defenses and offenses. The problem with this solution is that it has higher risk than when we chose it in the past. Soviet technology evolution for EBMD has the potential to negate mobile missile benefits—ICBM and SLBM—and holds at risk the majority of offensive assets we are building on today. Any shift to other offensive systems will be met by more elegant Soviet defenses.

A second alternative that comes to mind is procurement of defense-suppression systems to ensure offensive force effectiveness in lieu of defensive systems. Certainly if the United States deployed an EBMD and air defense system that was cost-effective at the margin, we would expect the Soviets to pursue counter-defensive systems rather than giving up. We may be faced with the same choice. Strategic offense plus counterdefense may be more economically attractive than offense and defense, especially in light of ultimately using counterdefense anyway. Unfortunately, neither alternative assures US ability to gain control of the time lines of conflict and initiative in the fourth world.

The "We-Need-a-Strategy" Factor

Dealing with the fourth world will require a

strategy. There are currently many efforts to create a defensive strategy. This is an awesome task because EBMD and air defense systems do not exist, so their contribution cannot be evaluated. Unfortunately, our current strategy has recently been mislabeled as offensive. What we actually have is a deterrent strategy that is sound, and we have chosen to support it with offensive systems. Our current strategy could be well served by offensive and defensive systems in combination. However, until there is a defensive system to evaluate, the search for a defensive strategy may only be so much running to the port rail to give the indication that the ship is changing direction.

What is more important in the near-term is a sound evaluation of operational tactics and strategies for strategic offense and defense that will work to maintain escalation control, deter nuclear conflict, prevent coercion, and preserve the ability to terminate conflict in the fourth world. We will have to continue to ensure that the Soviets believe the nuclear option is a nonoption so that if conflict at lower levels cannot be prevented, at least escalation is avoided. Current arms control efforts, however, may serve to complicate deterrence in the future.

Arms Control

At the risk of sounding heretical, I believe that the current approach in strategic arms control reduction efforts may make conflict between the superpowers more likely in the fourth world. It does not control comparative defense systems on both sides. ASW, air defense, and BMD should be reduced in proportion to the opposing side's offensive forces to maintain stability and preserve the nuclear war option as a nonoption. Apparently, the Soviets realize the relationship between arms reductions and the viability of their defenses. This, coupled with an apparent fixation by the United States on total numbers of weapons rather than relative measures and with the

fact that there are fewer strategic targets in the United States, makes the potential Soviet benefits outweigh the losses in weapons through arms reductions. It also reduces the economic burden of maintaining many old systems. In the future, much better defenses and less offensive weapons for the Soviets reduce the escalatory risks of involving themselves in tactical conventional conflict with the United States. If US SDI can be killed in the bargain, so much the better.

Whatever the outcome of arms reduction efforts, our strategic offensive forces will have to maintain the military capability to uphold the structure of deterrence that keeps the United States and Soviet Union militarily disengaged. The current bargaining should take into account the value of offensive and defensive systems in the fourth world to create a solution that is not just good for today's world but also for the future.

The Value of Strategic Offenses in the Fourth World

Today it is often said that EBMD has the potential to devalue ballistic missiles, the forgotten phrase being "land- *and* sea-based" ballistic missiles. This statement is straightforward and appears to be sound but it misses some key logic. A stated purpose of EBMD in warfighting would be to stretch out the time lines of conflict. I must admit that stretching time lines of conflict by introducing near-speed-of-light weapons appears a bit incongruous, so I will restate this to say that it is intended to stretch out the ballistic missile phases of conflict by making barrage launches impractical. What then will be the value of offensive systems in this environment?

SLBM weapons are a sizable portion of the US, not the Soviet, force structure. In the fourth world, their value will be significantly altered. The missiles themselves will be held at risk by EBMD and the submarines by ASW. Even the most conservative submariner

should feel there will be a drastic change in the ability to detect submarines by the year 2000. He would also recognize that submarines can be attacked in conventional as well as nuclear phases of conflict. The current Soviet and US arms control proposals could trap the United States in an SLBM-heavy force that may be good for now but bad for the future. If US ballistic missiles are held until EBMD attrition takes place, there could be more opportunity for the Soviets to attack our boats, with a resultant loss of 24 missiles per boat destroyed. This can radically and quickly alter the balance of power.

ICBM weapons are a sizable portion of the Soviet force structure and the smallest portion of that of the United States. It is true that in the first hours of a fourth-world conflict they would have reduced value. As the conflict wears on and EBMD is attrited by defense suppression, however, they will increase in value if maintained survivable by active and passive defenses. ICBMs may well end up being the most valuable offensive asset in the later phases of a conflict. Certainly a robust ASAT capability, such as a ground-based laser, could be invaluable in maintaining SSBN and land-mobile ICBM survivability during the defense-attrition phases of future conflict.

Air-breathing forces in the future will have combinations of the features of air-launched cruise missiles (ALCMs), sea-launched cruise missiles (SLCMs), and stealth. All tend to reduce the value of EBMD and to significantly raise the cost of air defense. The new attributes of stealth and increased speed also change the time lines of conflict and potential for surprise. Strategic bombers may well be the key to both conventional and nuclear phases of conflict in the fourth world. A logical outcome of our current arms control position is to move the Soviets toward an aircraft-heavier force structure. But given their advantages in air defense and our geographic vulnerability to cruise missiles, this may give them enormous future advantage. Prompt bomber weapons may replace some missions currently filled by ballistic missiles. Missiles may be held for longer-term conflict, thus the value of active and passive defenses.

So What Should We Do?

We have a chance to premeditate an integrated approach for our strategic future, but we cannot afford for it to be a near-term future. It must account for our legitimate defense requirements but also be tempered with our psyche, mentality, and historical choices. It must presume that Soviet behavior will remain consistent and that deterrence will have to be maintained. We must plan for a strategic future that will include the strategic offensive Triad (SLBMs, bombers, and ICBMs), the strategic defensive Triad (ASW, air defense, and EBMD), strategic defense countermeasures, and space systems for the Soviets and the United States. Affordability and arms control have the potential to modify any one of these facets. But they should be pursued in a balanced approach toward offense and defense to ensure the vitality of deterrent forces to reduce the likelihood of conventional as well as nuclear conflict. The assets have to be evaluated in the fourth world, not the next decade. New technologies must be broadly applied for maximum potential and affordability, with combined arms operations being more than an afterthought. We must continue to investigate technologies that may be useful in defense of or attack on satellites and be better prepared for the future in space. Comprehensive long-term funding strategies must be developed under realistic defense budgets.

There are currently several opportunities that we should exploit. The Air Force has recently completed Project Forecast II to determine key technologies and programs for the future. Such a program for the entire DOD would provide the incentive and direction to

more economically exploit new technologies for all military applications. The DOD reorganization may help provide the focus for higher technology arms development programs for combined arms use. It can also help iron out the affordability issue. Recent arms control fervor and the pressure for an agreement can be exploited using a realistic future viewpoint. Reasonable arms reductions that leave a balanced Triad can provide a numerically constrained offensive maintenance program which hopefully will keep offense expenditures at a consistent level. We might use the Soviet desire to contain SDI development as leverage to control all strategic defensive systems numbers, but we should not limit technology development—the US trump card. The topic of defensive arms control could be exploited to evoke rational discussions at the national level of *all* strategic defenses and their role in protecting the United States and our allies as well as enhancing deterrence. Armed with such opportunities, we can forge a pragmatic strategic future for the United States.

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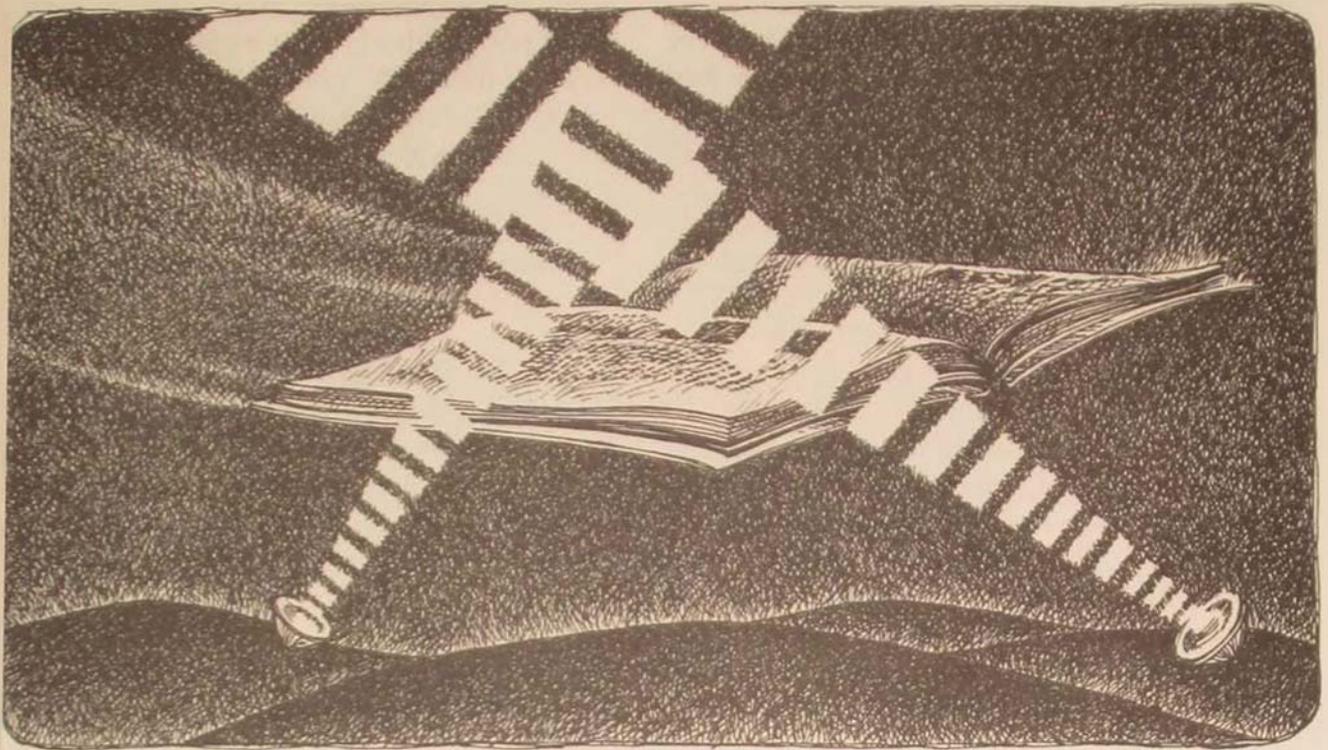
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IN this edition, we focus on strategic issues. As US Air Force professionals, we have to understand the implications of strategic bombing because destroying the enemy's vital centers is at the heart of what the Air Force is all about. This is our reason for being.

The US Air Force won its independence because of its contributions to victory in the Second World War, and in large part because the marriage of the B-29 to the atomic bomb meant that air power could, in and of itself, be decisive in war.

History flows like a river and, like a river, is ever changing. There will come a time when events or technology may negate the need for an independent Air Force. The manned bomber, like the horseborne soldier, could at some point be a thing of the past. Until then,

however, we have to live with the reality of the present and deal with warfare as it is. For the military professional, understanding the awful reality of war is what we are all about.

"Peace Is Our Profession" has long been the motto of the Strategic Air Command. As slogans go, it's not bad. I am reminded, however, of an old college chum who had served a hitch in the US Marines before finishing his education. Before leaving the Corps, he toured Vietnam as an enlisted aide to a general. He told me that his general gave a pat speech at every stop. When visiting a rifle unit he would say, "Infantry, you ain't got infantry, you ain't got squat." At an artillery company he would say, "Guns, you ain't got guns, you ain't got squat." And so it went, right on down to transportation and the guards at the disciplinary

barracks. The predictable rhetoric rolled out.

War is too serious for rhetoric. To prepare ourselves properly for the awesome responsibilities of war, we have to look beyond the facile and the obvious to question the very substance of our beliefs. The military profession is, because it involves matters of life or death, the most demanding of all callings. If we are to practice our profession properly, we have to escape from the pat answers and saccharine phrases that offend no one and say absolutely nothing.

The changes that are afoot in warfare make this a challenging and dangerous time. The introduction of stealth technologies, for instance, may change the entire nature of aerial warfare. Stealth is more than a dandy engineering breakthrough. It is a departure as significant as that of the submarine, which, if you will recall, radically altered naval warfare, changed the institutional organization of the US Navy, and played no small part in getting the United States involved in two global conflicts. Beyond invisible airplanes, there lies the question of what the Air Force will be like if, either because of advances in technology or the implementation of arms limitation treaties, the manned bomber is relegated to the Air Force Museum. These are not popular questions, but if we fail to address them we assure ourselves of answers that are unpalatable.

From the time of the birth of the Air Force, *Air University Review* has served as our professional journal. In the past few years it became a truly open forum for presenting ideas and stimulating thinking on military doctrine, strategy, tactics, force structure, readiness, and other national defense matters. Hopefully, we enlightened those who sought a wider perspective in their thinking. Undoubtedly, we irritated those who feel that the Air Force must "speak with one voice." Unfortunately, perhaps tragically, far too many officers never bothered to read their professional journal.

Because of a devastating budget cut, you are reading the final edition of *Air University Review*. There is, however, a flicker of hope in that the Center for Aerospace Doctrine, Research, and Education (CADRE) plans a publication called the *Air Power Journal*. It will focus on the operational art of war and hopefully reach some of those officers who never read the *Review*. The *Air Power Journal* will need our support if it is to overcome what I perceive to be the prevailing anti-intellectualism that dominates our service and which, in my opinion, played a large role in the demise of the *Review*. I wish Col Keith W. Geiger, the designated editor of *Air Power Journal*, the very best.

When I became editor, I enthusiastically endorsed the efforts of my two predecessors who worked to make the *Review* the one Air Force publication that did not hew to the imperatives of policy. In that spirit, let me end by warning that if the current trends in our approach to thinking and writing continue, the elimination of the *Air University Review* will be only another step toward the Air Force's unilateral disarmament in the war of ideas.

<div align="right">E.H.T.</div>

SAC LOOKS TO THE FUTURE

Lt Gen James P. McCarthy
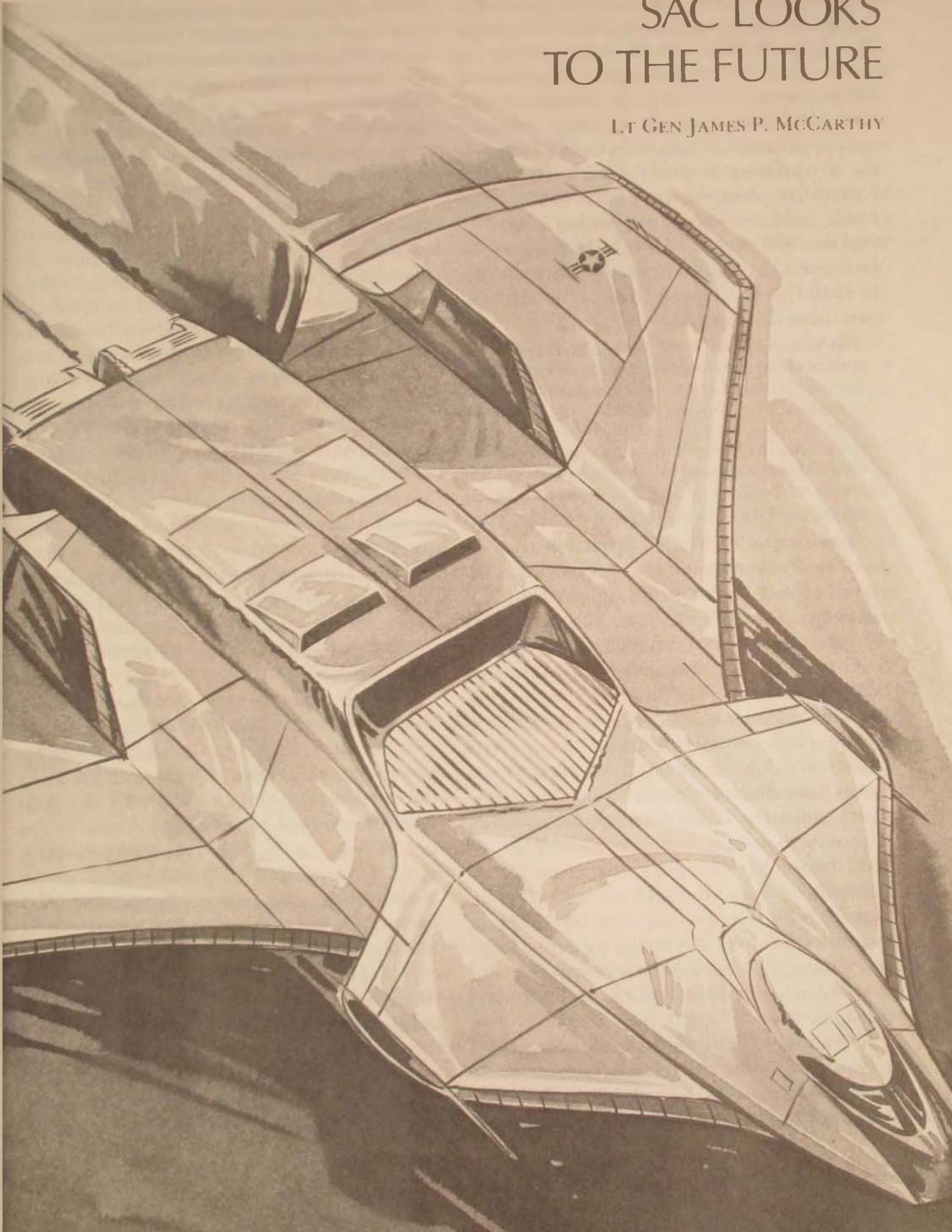
As we rapidly approach the dawn of a new century, the Strategic Air Command (SAC) stands ready to meet the challenges and to exploit the opportunities of the future. Ours is a dynamic command with bright, dedicated people working energetically to provide the necessary combat capability to underwrite deterrence effectively. Exhaustive planning will ensure SAC's invaluable contribution to our nation's security well into the next century. In looking to the future, we have a rich heritage to draw from. In 1946 Gen Carl Spaatz laid out the first mission statement for SAC:

> The Strategic Air Command will be prepared to conduct long range offensive operations in any part of the world either independently or in cooperation with land and naval forces; . . . to provide combat units capable of intense and sustained combat operations employing the latest and most advanced weapons . . . [and] to train units and personnel for the maintenance of the strategic forces in all parts of the world.[1]

Since that time, SAC's impressive array of nuclear and conventional capabilities has inspired caution and restraint in our principal adversary, the Soviet Union. For more than 40 years, the combat capability embodied in SAC manned bombers and intercontinental ballistic missiles (ICBMs), and Navy sea-launched ballistic missiles (SLBMs), has convincingly deterred Soviet nuclear attack. As a backdrop to US-Soviet relations, these robust forces have discouraged direct Soviet aggression against the United States and its allies. The enormous conventional capabilities of SAC long-range bombers, airborne reconnaissance platforms, and aerial refueling tankers have strengthened the US ability to respond flexibly to any attack scenario. Since its creation, SAC has led the way in preserving the peace and protecting America's vital interests.

A realistic look at the future international system reveals the existence of a number of nations with interests contrary to our own. Some of these nations will have sufficient military power and resources to endanger American security. To counter those threats, the United States must maintain highly capable, diverse, and resilient military forces. SAC will continue to play a critical role in that endeavor.

It is reasonable to assume that the Soviet Union will remain the greatest threat to American security in the future. Despite a change in leadership and publicly professed peaceful intentions, the Soviets have never deviated from their ultimate goal of expanding Soviet influence and control around the globe. This goal is buttressed by a Communist ideology committed to the global extension of its principles and a massive military arsenal far in excess of that necessary to defend the Soviet sphere. This massive arsenal has resulted from a relentless Soviet drive to achieve military superiority over the United States. Since the early 1960s, the Soviets have invested tremendous sums in modern weaponry. We fully expect them to continue plowing immense resources into the modernization, readiness, and sustainability of their armed forces; into military research and development; and into their military-industrial capacity.

This prospect is especially worrisome in that an extensive military capability is the Soviet Union's only legitimate claim to superpower status and world influence. The Soviets cannot compete economically with the West since their highly centralized system strangles productivity and prevents economic development. On a political and ideological level, the Soviets have experienced comparable failures. They have had virtually no success in persuading other Communist nations to accept a pure Kremlin ideological line. With these failures, the Soviets are left with only military power to pursue their objectives on the world stage. And the Soviet Union has repeatedly demonstrated a willingness to threaten and use force to achieve its objectives (e.g., Hungary in 1956, Czechoslovakia in

1968, and Afghanistan in 1979). We readily expect continued Soviet reliance on force as the principal instrument of its aggressive, expansionist policies. Certainly, the Soviet Union will sustain its ongoing efforts to expand, modernize, and deploy increasingly capable weapon systems designed for the entire spectrum of conventional and nuclear conflict.

In this light, we will rely on our time-tested defense strategy of deterrence "to prevent war by maintaining forces and demonstrating the determination to use them, if necessary, in ways that will persuade our adversaries that the cost of any attack on our vital interests will exceed the benefits they could hope to gain."[2] SAC's primary responsibility in this endeavor will remain constant and unalterable—to maintain the combat capability required to deter nuclear attack on the United States and its allies or to prevent coercion under threat of attack. Faced with intensive Soviet efforts to modernize, harden, disperse, defend, and make mobile many of their critical warfighting assets, we have wisely laid the foundation for modernizing our strategic nuclear forces. This modernization will assure the vitality of our forces and underwrite credible deterrence well into the next century.
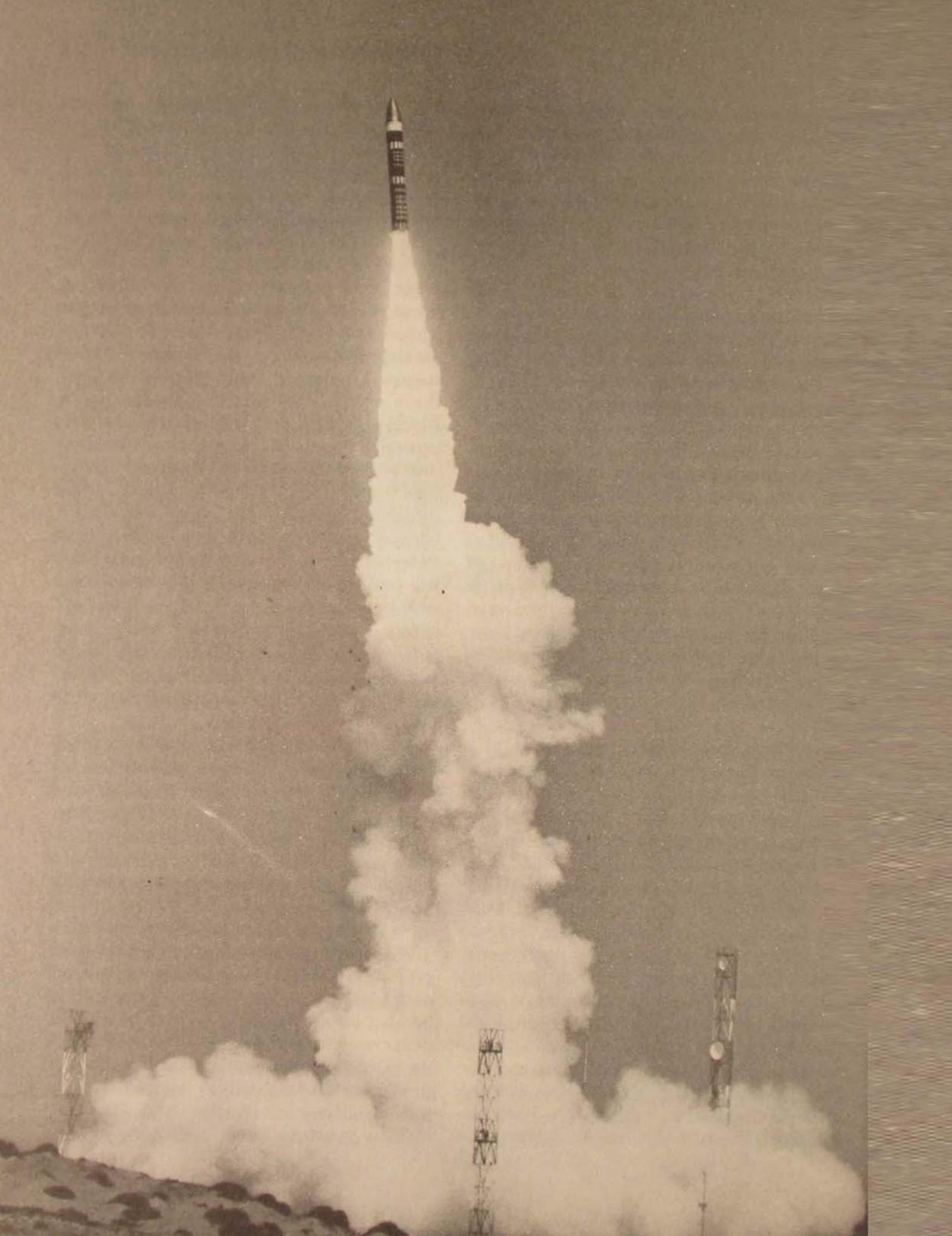
The first and most important modernization step is to deploy the full complement of 100 Peacekeeper missiles. Currently, our greatest shortfall lies in the capability to hold at risk hardened Soviet ICBM sites and command centers with prompt weapons. High-confidence deterrence requires that Soviet planners be convinced we have the ability to disrupt an attack promptly and prevent successful follow-on strikes. The only near-term solution to our destabilizing shortfall in prompt, hard-target capability lies in 1,000 Peacekeeper warheads. Their exceptional accuracy offers an extraordinarily effective capability to strike hardened Soviet warfighting assets promptly. Fielding the first 50 Peacekeepers in Minuteman silos is by far the quick-est and most economical steppingstone toward achieving the required capability. Deployment at F. E. Warren AFB in Wyoming is off to a good start, and we anticipate the first 50 missiles will be on alert by the end of 1988.

After evaluating several more survivable basing modes for deploying the second increment of 50 Peacekeeper missiles, the Air Force recommended rail garrison basing as the most promising mode. President Reagan agreed and on 19 December 1986 directed development of rail garrison basing for Peacekeeper. This basing mode will provide maximum flexibility at the lowest cost. Peacekeepers on alert in garrisons capable of a prompt response to a Soviet attack will deter the "bolt out of the blue." Dispersal on strategic warning will provide survivability, make the system virtually unattackable, and add stability in a time of increasing tensions. Fifty Peacekeepers in this survivable basing mode will provide increased flexibility to the president in responding to a Soviet attack and will offer a prompt counterforce capability to defeat residual Soviet strategic forces. In the near-term, fielding 100 Peacekeeper missiles is the best foundation for deterrence, no matter what the basing mode.

To complement Peacekeeper, we are developing the small ICBM for deployment in the early nineties. Its single warhead will have comparable accuracy to that of the Peacekeeper. Survivable basing on hardened mobile launchers will further enhance deterrence by complicating Soviet targeting and providing a flexible retaliatory capability against counterforce targets throughout a nuclear conflict.

We are actively pursuing a dual-track modernization program to ensure the continued contribution of the manned penetrating bomber to our deterrent forces well into the next century. Deployment of the B-1B fulfills the need for a penetrating bomber while we proceed with development of the advanced technology bomber (ATB). The B-1B will be able to penetrate Soviet defenses into the
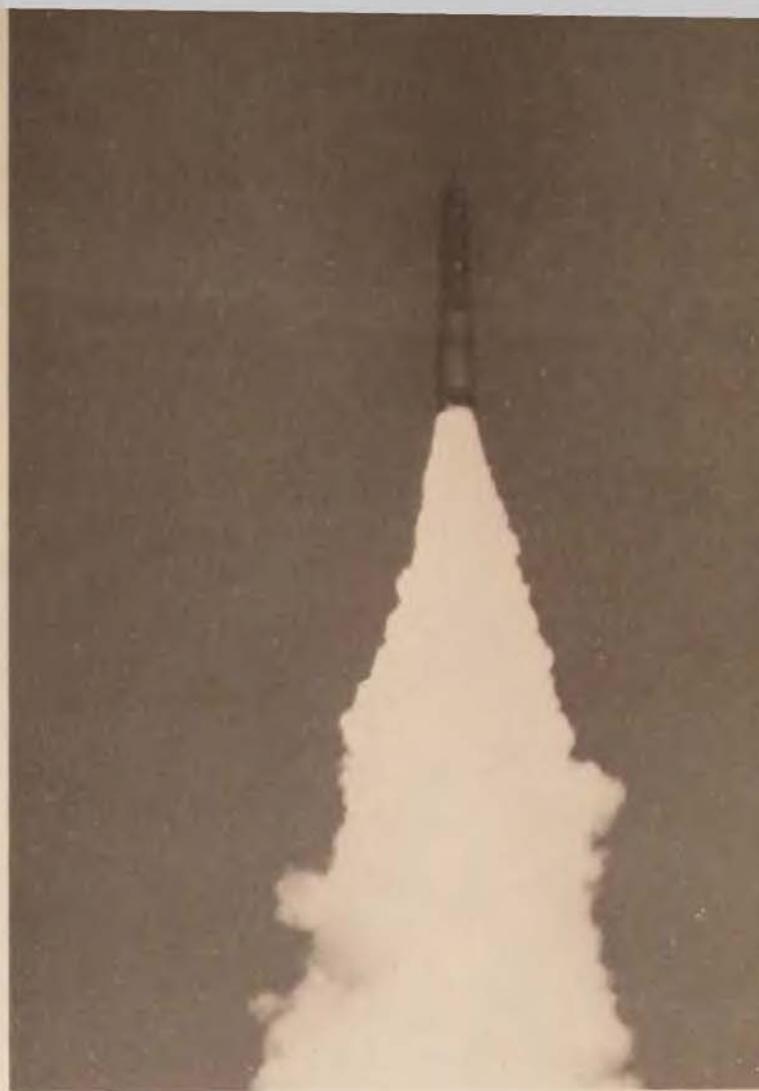
1990s because of its small radar cross section, high speed, adaptive defensive systems, and low-altitude flight. As the ATB enters the inventory, the B-1B will begin to assume both a cruise missile carrier and penetration role. Thus, the B-1B will serve as an effective strategic delivery platform for decades to come.

The ATB is the penetrating bomber of the future that will carry us well into the twenty-first century. Development of the ATB is proceeding at a rapid, yet prudent, rate with deployment planned for the early nineties. The ATB will provide the capability to penetrate the most sophisticated Soviet defenses and attack the full spectrum of targets well into the future. It incorporates an effective, highly survivable design, the latest advances in propulsion and airframe technology, and modern sensors and avionics. It promises a long-range, efficient cruise capability with a variety of weapon loads. With low observables (stealth), the ATB will be highly adaptive to the evolving threat and will provide a new dimension in flexibility and capability for both nuclear and conventional operations. A combined force of B-1Bs, ATBs, and cruise missiles will place maximum stress on Soviet air defenses, force extensive Soviet spending on improved defenses, and ensure the effectiveness of the bomber leg of the Triad.

As the capabilities of our strategic nuclear forces improve, it is equally important that we have reliable, flexible, and redundant command and control (C^2) capabilities to support those forces. Our current C^2 network is undergoing an extensive technological update to ensure a robust capability in the face of more capable Soviet forces. This network must be as survivable and enduring as the forces it supports. Completion of our planned C^2 programs will greatly enhance deterrence by assuring reliable and timely warning, un-

ambiguous attack assessment, enduring force management, and survivable and enduring communications connectivity from the national command authorities (NCA) to the forces, even under the most stressful conditions.

Strategic offensive nuclear forces will remain the cornerstone of deterrence for many years to come. However, the intense research efforts of the Strategic Defense Initiative (SDI) hold great promise of producing advanced systems to counter ballistic missiles. SDI researchers are examining a number of concepts involving a wide range of technologies. The research is intended to exploit technological evolution and provide a prudent
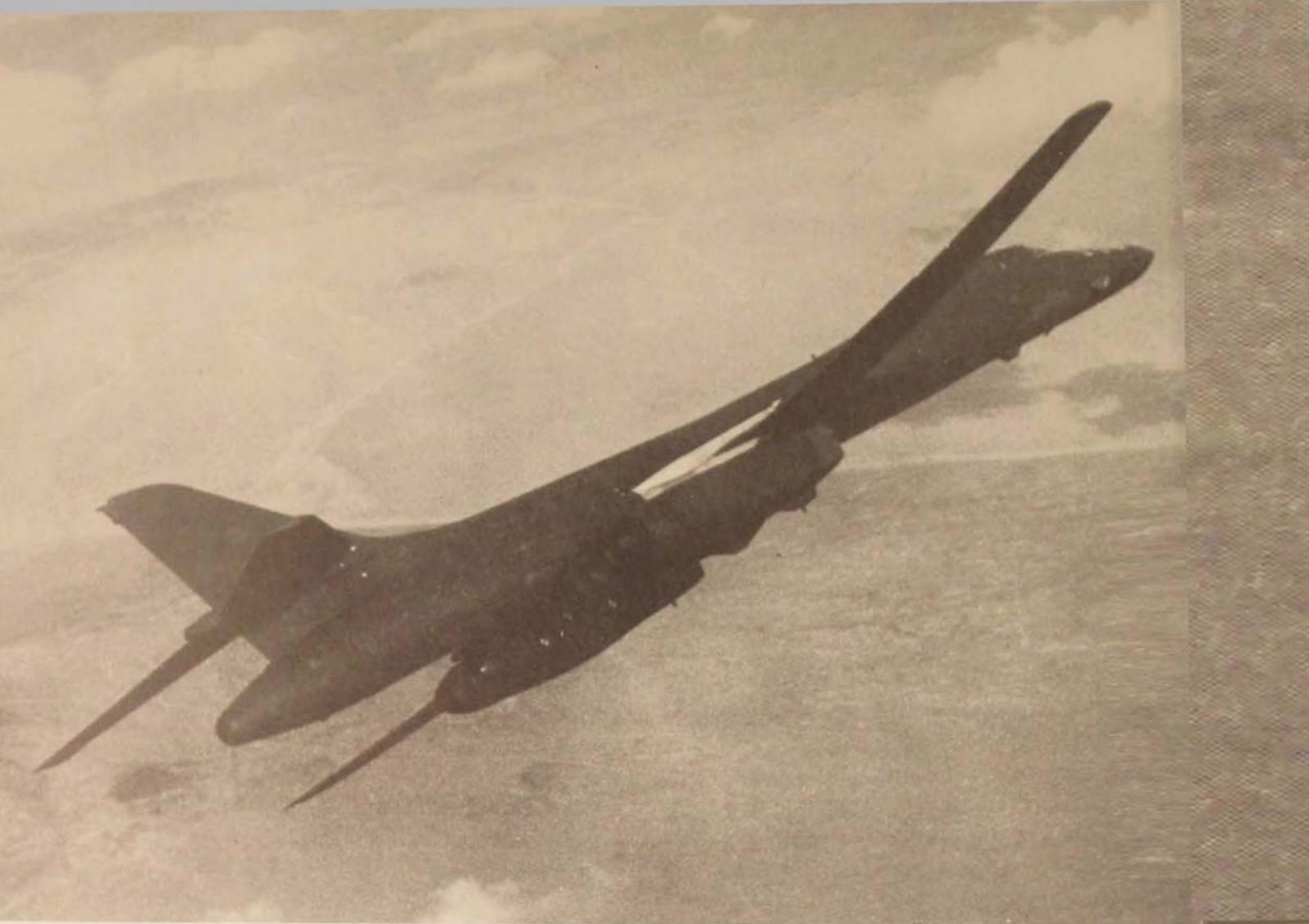
The B-1B (above) will ensure the continued contribution of manned penetrators into the next century. The air-launched cruise missile (below) adds a new dimension to the bomber force, ensuring that 50 bombers can do the work of 500.
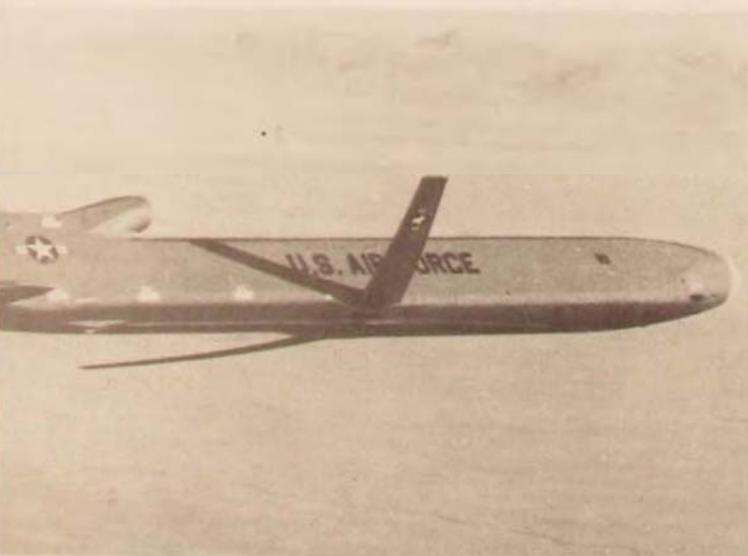
response to aggressive Soviet research and development of ballistic missile defenses. Heavy Soviet reliance on ICBMs and SLBMs makes their nuclear forces particularly susceptible to an effective US ballistic missile defense system. Moreover, such a system would complement rather than replace offensive nuclear forces. Additionally, the result of SDI research will substantially expand the US technology base for application in other areas.

Ongoing arms control negotiations will likely impact SAC's future nuclear role. SAC fully supports efforts to achieve mutually verifiable and equitable arms reductions as an integral part of US efforts to reduce the risk of nuclear war. We consider arms control issues in planning for the future, analyze force structure implications of proposals, and evaluate the likely impact of force reductions on

our ability to maintain deterrence. Our strategic modernization efforts produce leverage in arms negotiations by demonstrating US resolve and pressuring the Soviets to bargain in good faith. These efforts preclude the Soviets from using arms control to lock in current advantages in force capabilities. Moreover, if negotiations result in agreements that significantly reduce US and Soviet strategic forces, continued modernization will provide the best combat capability possible to underwrite credible deterrence.
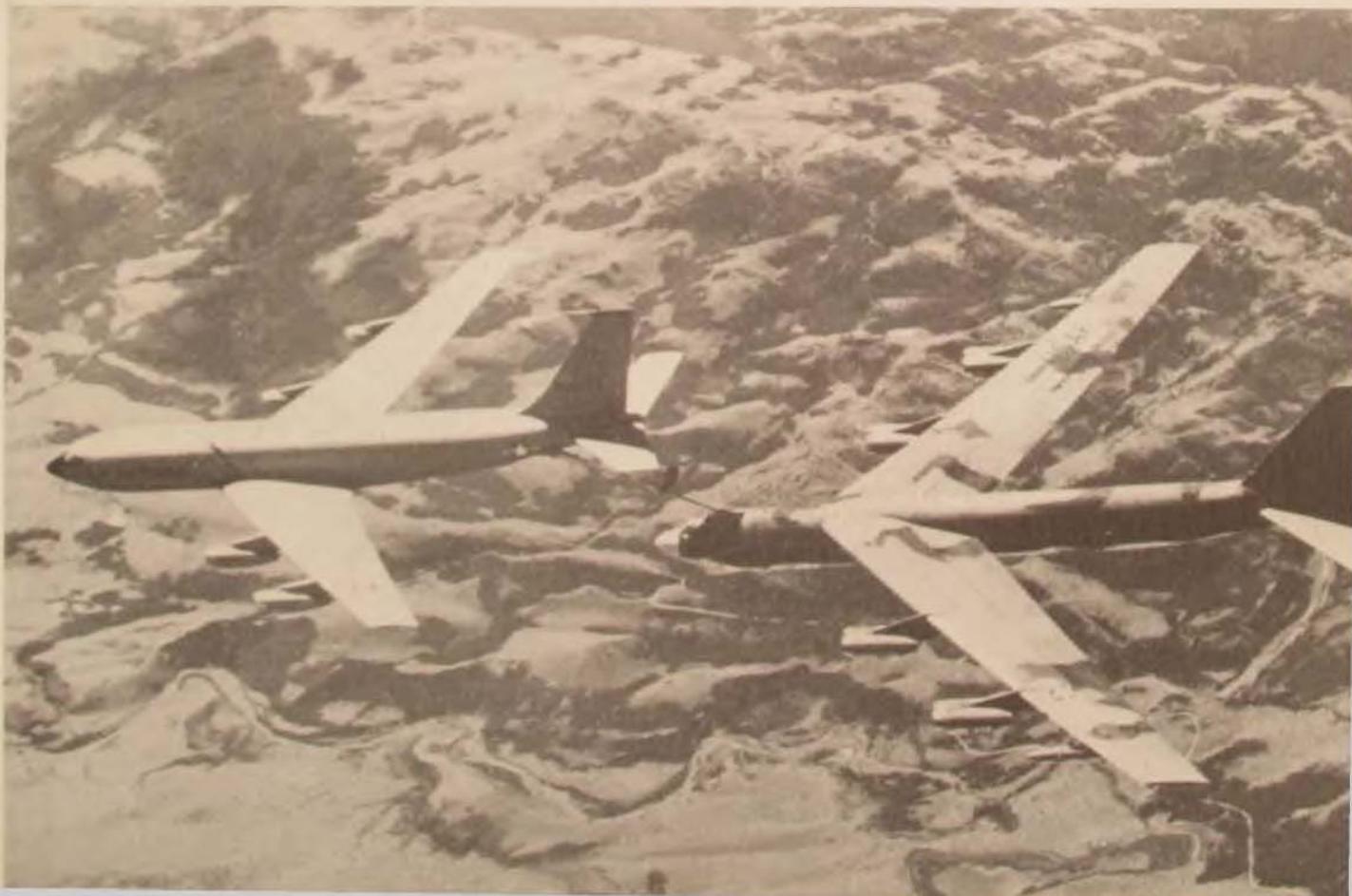
Reductions in nuclear forces, if achieved, will increase US reliance on strong, versatile conventional forces to discourage and combat aggression. Thus, it is imperative we maintain and enhance SAC's conventional capabilities. Our current tanker, reconnaissance, and bomber assets contribute immensely to US

Since the 1950s, aerial refueling has enhanced the flexibility of American air power. Even as the B-52 enters its fourth decade of service, with aerial refueling it can strike any foe, anywhere, anytime.

global force projection and theater combat capabilities. Additionally, we have a number of programs under way to increase SAC's conventional capabilities.

SAC's KC-135 and KC-10 fleet provides critical deployment and employment air refueling to US general purpose and airlift aircraft. Refueling greatly enhances the flexibility of these aircraft by extending their presence in the combat area, increasing their range, enabling them to avoid en route stops and overflight of troubled areas, and reducing their vulnerability to attack. The importance of air refueling was dramatically demonstrated by the successful US raid on Libya in April 1986. Extensive tanker support enabled F-111s to stage out of Britain, strike their targets in Tripoli, and return nonstop to their base in Britain.

To expand our capability to meet the growing demand for aerial refueling, SAC is completing a buy of 60 KC-10s and is continuing the KC-135R conversion program. The R conversion is a comprehensive modernization

program for all SAC KC-135s that incorporates new jet engines and replaces or modifies 25 other systems or subsystems. The program increases off-load capability by 50 percent, improves fuel efficiency by 27 percent, significantly enhances reliability, and extends the useful life of the KC-135 far into the next century.

SAC airborne reconnaissance assets provide essential intelligence support to theater commanders. SAC's SR-71, U-2R, RC-135, and TR-1 aircraft offer versatility, timely response, and global coverage. Their missions support peacetime planning, strike preparation, indications and warning of attack, and damage assessment. The TR-1 was developed specifically to satisfy the theater commander's intelligence needs. We have a number of cost-effective upgrades under way to improve and

Soon SAC will complete its acquisition of 60 KC-10s. Extensive tanker support enabled TAC F-111s to strike at Libyan terrorist camps from their bases in Britain.

sustain the long-term effectiveness, reliability, and survivability of our reconnaissance assets.

SAC is dedicated to supporting the conventional warfighting capability of theater commanders with our long-range bombers. From the historical perspective, strategic conventional air power has proved its efficacy in preventing war and waging it. Our current force of B-52 bombers provides theater commanders with highly responsive platforms able to rapidly deliver large, varied payloads in support of a broad range of missions on land or at sea. Its capability to project tremendous conventional power anywhere in the world is unrivaled by any other weapon system.

The B-52 offers a number of employment options. It is particularly effective in delivering gravity bombs on area targets. The B-52 is an excellent platform for conducting maritime operations in support of the Navy. It is the most capable aircraft in performing aerial minelaying. No other aircraft can deliver such a large payload of mines to such great dis-

tances in order to delay or deny enemy movement at sea. To further enhance SAC's maritime capabilities we have modified selected B-52G aircraft to carry the Harpoon antiship missile. Our current operational capability enables us to support the Atlantic and Pacific fleets with the capability to destroy or immobilize enemy surface vessels from stand-off range.

The reality of Soviet conventional superiority in Europe and the evolving threat of increasingly capable third world countries makes it essential to increase SAC's conventional capability in the future. Gen John T. Chain, commander of SAC, has directed extensive efforts to

> make fuller use of the huge latent capabilities of our bomber force to give the President, Secretary of Defense and Joint Chiefs of Staff more flexibility in military operations. . . . In particular, SAC's long-range bombers carrying conventional explosives would help stave off the need to use nuclear weapons against the Soviet Union's larger conventional ground and air forces.¹

To capitalize on SAC's inherent conventional warfighting capability, we intend to fully integrate today's technology into our long-range bomber force. SAC is expanding the delivery capability of our B-52 bombers; improving the delivery accuracy of our systems; implementing a realistic training program to fully qualify all of our flying and maintenance crews in conventional operations; and pursuing a family of conventional weaponry that provides precision strike capability, standoff range, and suppression of enemy air defenses. Our planned conventional enhancements will provide theater commanders an enormous warfighting capability at an affordable price and will increase their flexibility in applying air power in their area of operations. Further, an improved bomber force will provide the NCA a flexible, responsive option

The Strategic Air Command's TR-1 can provide day or night, all-weather surveillance of any battle area to support US and allied ground and air forces.

that is global in scope and that defuses forward operating base and overflight issues.
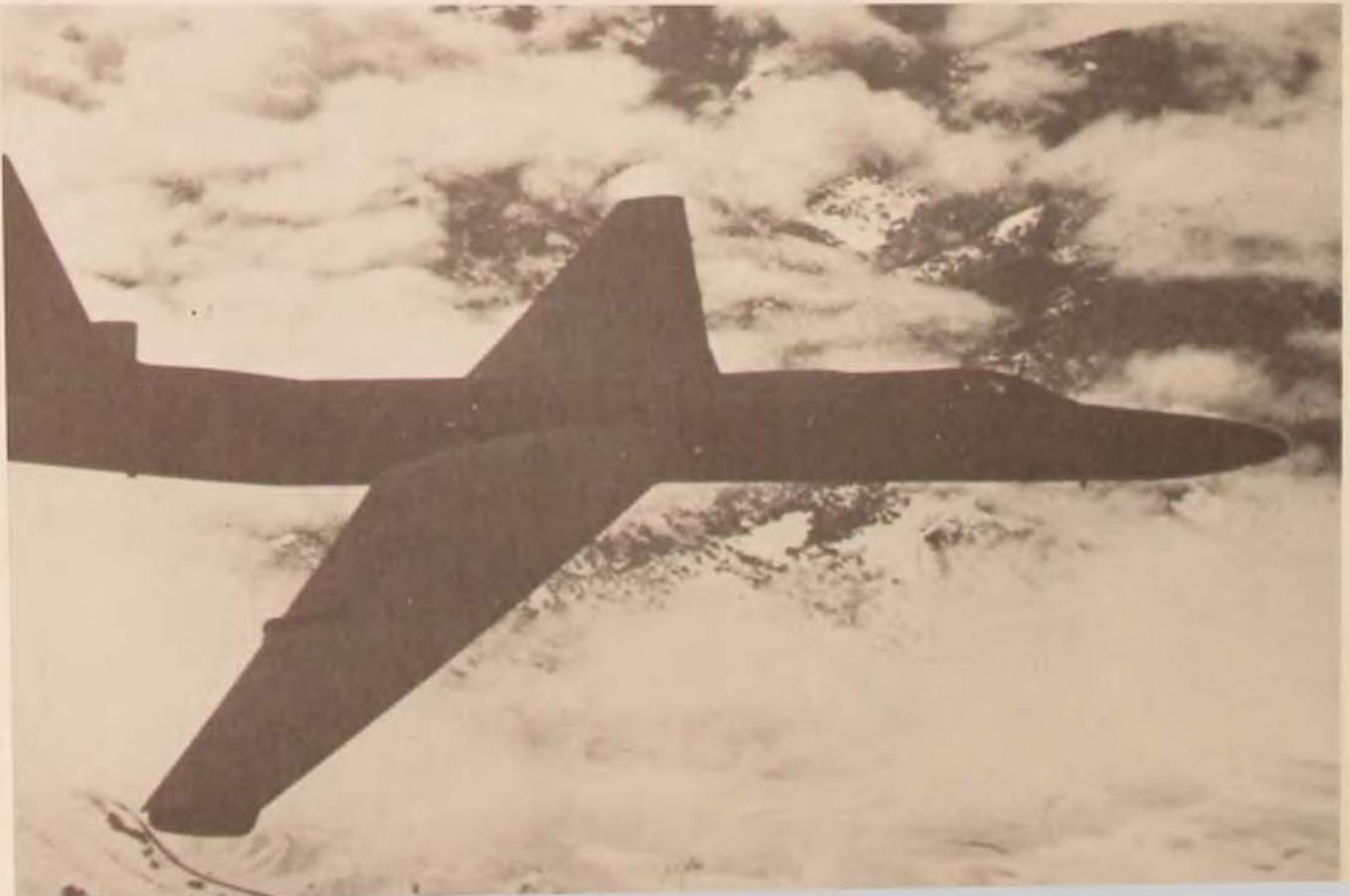
Similarly, our modernized bombers will offer exceptional conventional capabilities. Initially, the B-1B will be able to carry up to 84 conventional weapons. This large payload, combined with its long-range and low-level capability, will make the B-1B an effective conventional asset. The ATB will add a new dimension to our conventional capability. Its low observable characteristics will make it an outstanding conventional penetrator against the most robust air defenses. The combination of ATB's inherent survivability and the application of standoff weapons will ensure a precision strike capability across the target spectrum. Theater commanders need a large, long-range, fully capable conventional bomber force that complements their tactical fighter forces in performing theater air mis-

As early as the late 1950s, U-2s were soaring over the Soviet Union. By 1959 the president had decisive proof that Soviet boasts of strategic missile superiority were groundless. U-2s can still overfly most countries with impunity.

sions. Our conventional enhancements and modern bombers will fulfill that need.

As we look to the future, there are two reasons why I remain optimistic that we will continue to deter the Soviets: technology and people. What is unsaid in this unclassified forum are the many improvements that technology will provide between now and the year 2000. As new technologies expand our horizons, the potential benefits are enormous. We will continue to push the limits of the technological envelope to provide capabilities we cannot yet fully envision.

In SAC today you will find a new vitality in our units as the investment we have made in new equipment and facilities achieves fruition. Our people consistently meet or surpass demanding standards and exhibit great pride in turning potential capability into tangible deterrence. We must continue to challenge our dedicated people to find better, more productive ways to perform the daily tasks of building and maintaining SAC's combat capability. The key to success is coupling bright minds with the advanced technological prod-

Even though it has been around for over two decades, the SR-71 is still the world's fastest and highest flying aircraft.

ucts of a free society. One of our nation's greatest strengths lies in the open and free nature of American society. The free enterprise system encourages diversity, promotes competition, rewards excellence, and engages the creative in the task of advancing technology.

The closed society of the Soviet Union will never be able to compete effectively with our open society. The United States will always operate along the leading edge of technology with the Soviets following in trail, trying to steal what they cannot develop. The key to our advantage will remain our continuing ability to exploit the technological advantage that comes from bright minds employed in a free enterprise system.

Barksdale AFB, Louisiana

Notes

1. Letter, Gen Carl A. Spaatz, CG/AAF, to CG/SAC, subject: Interim Mission, 12 March 1946.

2. Caspar W. Weinberger, "US Defense Strategy," *Foreign Affairs,* Spring 1986, 676–77.

3. Richard Halloran, "US Preparing Long-Range Bombers for Nonnuclear Missions," *New York Times,* 25 October 1986.

US STRATEGIC NUCLEAR DETERRENCE
technical and policy challenges

Stephen J. Cimbala

THE US strategic nuclear forces of the future will have to meet expected and unexpected challenges. Those that can be foreseen are sufficiently intimidating. These challenges fall into the categories of policy and technology demands on the performances of US forces. The connection between force and policy will be strained in future decades by the requirement to reconcile an exuberant technological environment with a discordant policy process. The planning process for US nuclear deterrence and warfighting may suffer from special debilities, given what is now foreseeable.

Technology

Three aspects of the technological environment bear examination. These are defensive technology, offensive force modernization, and new "smart" technologies.

Defensive Technology

President Ronald Reagan in a speech on 23 March 1983 called for a program in research

and development toward possible deployment of nonnuclear missile defenses that would make strategic offensive ballistic missiles obsolete.[1] His reasons for doing so were complex. The initiative had not come from the bureaucracy but from the president. As a result, the public relations offensive for the Strategic Defense Initiative (SDI), as it came to be called, was poorly prepared.

Closely read, the president's speech does not mandate anything other than an exploratory program in research and development. This is quite realistic. The United States is not now in a position to choose among competing technologies for boost, postboost, midcourse, and terminal ballistic missile defense (BMD). Experts, including the authors of the Fletcher Commission Report and the Office of Technology Assessment's 1985 study on ballistic missile defense technologies, agree that imminent deployment would be premature and infeasible. Even Project High Frontier is now only one of a number of possible architectures under study for various phases of a missile defense system; earlier it had been the only candidate system.[2]

The news media and the academic community assumed the Reagan speech foreshadowed a departure from the preexisting bases of US strategic deterrence policy. This assumption was widespread despite repeated and frequent statements from the administration reaffirming those aspects of US nuclear strategy and policy that were built on earlier precedents.[3] The Reagan SDI program was attacked by critics who assumed conclusions about questions of technology left unanswered by the program and then disputed the conclusions.

US Ambassador Paul H. Nitze, special adviser to the president and secretary of state on arms control matters, explained the administration's short- and long-term SDI objectives. In a widely reported speech in Philadelphia that was subsequently published by the US State Department, Nitze outlined the administration's strategic concept of the future US-Soviet relationship.[4] These relations would evolve through near-term, transitional, and long-term phases. In the next decade, deterrence would continue to be based on the threat of nuclear retaliation. Reductions in US and Soviet strategic offensive weapons would be sought during this period. In the transition phase, we would begin to deploy defenses *if* they meet two stringent criteria: they must be survivable and cost-effective at the margin. The ultimate or long-term phase (following BMD deployments) would witness reductions in offensive nuclear weapons as close to zero as possible.[5]

Offensive Modernization

Hopeful optimism about the transitional and long-term phases for BMD development and deployment was constrained by the administration's recognition that its program for offensive force modernization was in suspended animation. The US Congress has put an effective "hold" on MX/Peacekeeper deployments unless and until it can be satisfied that the administration has found a survivable basing mode for the missile. Congress has imposed a ceiling on MX deployments well below the administration's objective of 100 silo-based missiles. The Reagan modernization program could be forced to settle for a token MX deployment, or none.

Were MX aborted or diluted, efforts to modernize the Triad of US strategic offensive forces (land-based intercontinental ballistic missiles [ICBMs], submarine- or sea-launched ballistic missiles [SLBMs], and bombers, with cruise missiles available for sea-based and airborne platforms) would be restricted to other near-term and long-run programs. The land-based leg of the Triad would be augmented by possible deployment in the 1990s of the small ICBM (Midgetman) in fixed or mobile basing, by interim deployment of the B-1B bomber and follow-on deployment of the advanced

technology (stealth) bombers, and by deployment of additional Trident ballistic missile submarines (SSBNs) and Trident II (D-5) missiles. Nuclear-armed cruise missiles would also be deployed on US surface ships, submarines, and aircraft; some of these would be "strategic" under previous arms control agreements between the superpowers.

Without MX, US ICBM modernization stands or falls on Midgetman. The General Accounting Office has expressed reservations about whether the Midgetman program can meet congressional specifications, such as weight restrictions to preserve mobility, and still fulfill policy requirements for deterrence.[6] According to the recommendation of the President's Commission on Strategic Forces (Scowcroft Commission), Midgetman would be capable of attacking hard targets promptly with sufficient accuracy to ensure a high probability of destroying those targets.[7] Combined with MX, Midgetman would improve survivability of the ICBM force while supplementing prompt hard target capabilities of MX and Minuteman. To fulfill these objectives, Midgetman must be survivable against Soviet barrage attacks that could be made against its deployment areas. The probable success of those barrages is directly related to total throw-weight. Thus, the US-Soviet arms control process must result in significant reductions in USSR ICBM throw-weight or payload before survivable scenarios for national Midgetman deployments can be guaranteed.[8]

It might be possible in theory for the United States to shift away from survivable Triad to a "dyad" of forces based at sea and aloft. This process would require reshuffling the deck of cards that now allocates one leg of US strategic retaliatory power for each of the armed services.[9] Reallocation of service missions is politically difficult to accomplish. It may also not be strategically prudent. Advocates of a dyad assume that US fleet ballistic missile submarines and bombers with cruise missiles can

fulfill both prompt and slow counterforce missions. Others argue that some missions now calling for prompt, hard target counterforce could be accomplished with slower counterforce weapons. For example, under some scenarios it might not make much difference whether the United States attacked Soviet strategic command bunkers promptly or later. Indeed, we might want to preserve some of the Soviet command structure through the earliest exchanges of weapons into the postattack phase in order to make possible war termination by other than exhaustion of arsenals.[10]

Were the United States blessed with a truly "general staff" engaged in the full-time business of strategy from the perspective of national interest, the decision about Triad versus dyad might be addressed by confronting the question of policy objectives for US forces. Such prioritizing is unlikely to result from the present structure, which permits coordination at the lowest common denominator through the Joint Chiefs of Staff and the Office of the Secretary of Defense.[11] (We return to this theme later.) Even our decentralized system of policymaking could frame more appropriate questions than those usually asked by advocates of diverse strategic postures in the various services and civilian branches of government. This verdict is not unduly harsh, although it is not pronounced with any smugness. The US policymaking system is designed for conflict resolution and for smoothing over sharp policy differences, and it focuses strategic choices on marginal adjustments in the status quo.

The paradigmatic product of this strategic policy process is the MX. Conceived in the early 1970s as a way to redress the US-Soviet imbalance in prompt, hard target capabilities, it is now becalmed in the waters of "analysis paralysis" over basing modes and arms control. The process of bringing MX from concept to fruition lasted so long that by the time of its deployment as scheduled by the Reagan

administration (if then), it will seem almost anachronistic. And the Reagan administration, very much aware of the need for survivable, hard target counterforce, accepted the Scowcroft compromise of deploying MX in a presumably nonsurvivable basing mode.[12] The Reagan Peacekeeper MX was decoupled from the objective of ICBM survivability solely through technical means such as mobility, hardening, and deception. ICBM survivability following Peacekeeper silo deployment now depends on the synergy among the two and one-half strategic forces of dubiously survivable ICBMs, ballistic missiles deployed on submarines, and bombers with their cruise missiles.[13]

"Smart" Technology

Some have suggested that the US political climate does not augur favorably for rational strategic choice. The technology environment within which future choices must be made is also becoming more complicated. Several aspects of this anticipated technology environment deserve further comment.

First, new technologies for endoatmospheric and exoatmospheric defense against ballistic missiles (and possibly cruise missiles) will complicate previously established baselines for deterrence stability. In the past, US and Soviet leaders could pay less attention to the problem of penetrativity against the active defenses of the opponent because those defenses could be assumed to be weak or nonexistent. They could assume that those retaliatory forces surviving a surprise attack would have reasonably high probabilities of penetrating to their assigned targets. This lopsided ratio of high expected penetrativity and uncertain survivabilities (for various forces at various stages of the US-Soviet arms race) led to diversified and, in the view of some critics, redundant strategic offensive deployments on both sides. Multilayered active defenses will change this ratio of survivability

to penetrativity. Even crude defenses will exact a higher "attack price" against offenses not designed to foil them compared to the situation before capable BMD existed for either side. Current Soviet deployments indicate the Soviet Union's serious interest in exploring BMD options against theater and strategic US/NATO offensive forces.[14]

Second, new offensive technologies will complicate attack and defense plans. Two of the most imminent "over-the-horizon" technologies are strategic nonnuclear weapons and new developments in computer technology. Strategic nonnuclear weapons might make possible attacks over intercontinental ranges, traversing those distances either rapidly or slowly. At various speeds, these weapons would use precision guided reentry vehicles (PGRVs) and possibly maneuvering reentry vehicles (MaRVs) to home in on targets within tens of feet, compared to the standard hundreds of feet now characteristic of the most accurate US and USSR ICBMs.[15] Some of these weapons could also use space-based navigational updates for even more precise target acquisition, in addition to their ability to compare prestored information with visual data collected during flight.[16] Small-yield nuclear weapons could also take advantage of this first generation "smart" technology in order to deliver more calibrated and selective attacks against the opponent's military objectives while sparing damage to cities.[17]

Strategic nonnuclear weapons of the first generation may not stabilize at that plateau. A second generation of such weapons could evolve that are truly "brilliant" rather than smart. They would have adaptive optics and memory modifiers which allow problem-solving behavior that duplicates some highly complicated human learning behaviors.[18] Some of the research attendant to brilliant systems has already been done and needs only to be tested under conditions simulating realistic battlefield scenarios.[19] (The most popular generic
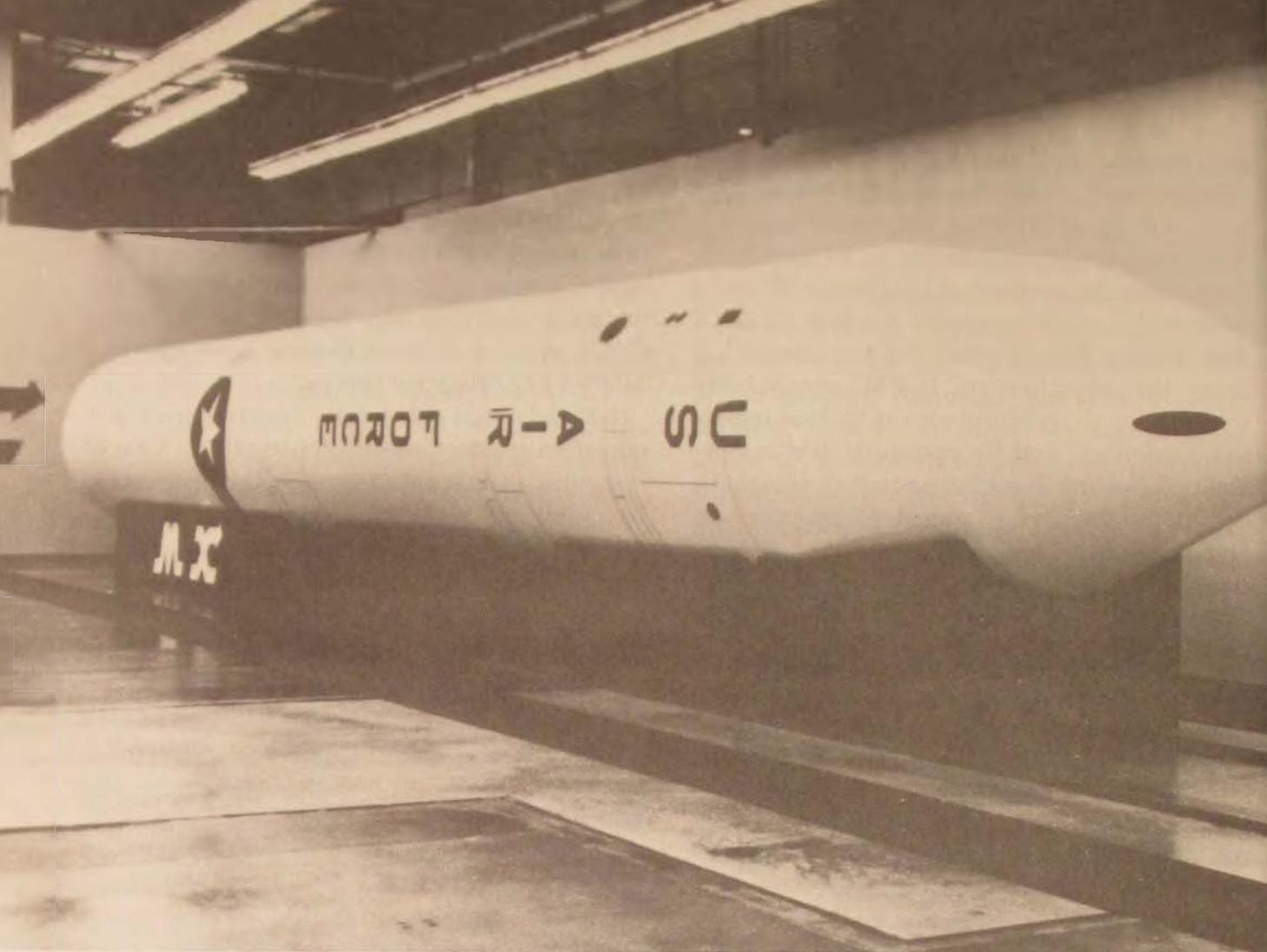
The Peacekeeper was conceived in the early 1970s as a way to redress the US-Soviet imbalance in prompt, hard target capabilities.

label for this activity has been "artificial intelligence." The Defense Advanced Research Projects Agency [DARPA] has already begun to demonstrate some successes in developing prototypes for pilots' associates, autonomous land vehicles, and other precursors of think-for-yourself adjuncts to the state of the art.)[20]

It has been said correctly that artificial intelligence and related technologies have been the victims of premature boomlets that proved counterproductive. Whatever the evaluations of the past, the direction of future trends cannot be doubted. Drone remotely piloted vehicles (RPVs) have already found successful use by the Israelis and by other armies under operational wartime conditions. US space-based navigation, photoreconnaissance, and electronic listening satellites have already developed from crude and vulnerable platforms into sophisticated sensors with real-

time information processing and transmitting capabilities.[21]

Some of the applications of these smart and brilliant weapons to the survivability and penetrativity of US strategic offensive forces can now be imagined, if not fully funded. The sea-based strategic deterrent could be spread over a larger number of smaller and stealthier platforms, providing a more formidable challenge to Soviet preemptive neutralization of the US SSBN force. Those more numerous mini-SSBNs could also be provided with advanced postattack communication suites and cruise missiles for land attack, providing a more survivable and possibly enduring postattack sea-based deterrent under control of

surviving national command authorities (NCA).

For mission effectiveness, land-based and sea-based forces as well as bombers will rely on the robustness of early warning and communications systems, including satellites, which must be survivable against enemy attacks. Otherwise they invite preemption. The United States, as previously noted, has conceded that this is the case with space-based BMD, but it also applies to those space-based assets that are required to support offensive force survivability and retaliation. Current generations of communications and warning infrastructure will not suffice for the future. Future US forces may face greater-than-expected Soviet preemptive attacks, while being required to survive and to penetrate Soviet defenses that are at least partially completed. Reliable warning and communications connectivity cannot be assumed unless it is planned for and improved on in conjunction with force improvements. The record of preceding administrations in this regard is, for the most part, regrettable. While the balance of US and Soviet forces appeared to provide for US force survivability even against "worst-case" attacks, the US strategic command, control, and communications (C^3) system was vulnerable to less-omnivorous strikes that would have precluded all but ragged, and possibly ineffective, retaliation.[22] It was this recognition of C^3 vulnerabilities that led the Carter administration to reverse its field from calls for nuclear purgation at the beginning of 1977 to the advocacy of protracted nuclear warfighting capability in 1980.

Smart technology bedevils planners of future offensive, defensive, and C^3 systems even if their tasks are isolated. In practice, we know they are not and cannot be. The United States quite properly goes about the business of improving offensive reentry vehicles (under the Advanced Strategic Missile Systems, or ASMS program), while the Strategic Defense Initiative Organization (SDIO) designs measures to defeat hypothetical, future Soviet offenses. The technologies of 2010 will be more stressing to US offenses and defenses if they are not correctly anticipated and if countermeasures are not designed. The example of satellite defense and attack illustrates the relationship. US planners should now be anticipating how Soviet planners might attack early warning, communications, or BMD satellites should they decide to do so. Possible methods include space mines, ground-based and space-based ASATs of the kind already tested and deployed, and various electronic countermeasures designed to blind or spoof satellite systems.[23]

It has been noted that smart technology will create dilemmas for planners of the Strategic Defense Initiative. Congressional and public interest was piqued by the possibility that a space-based "boost phase" missile defense system might intercept targets after a computer program automatically triggered the appropriate response. Such automaticity bothered those who wondered whether the president could remain "in the loop" to make the final decision about beginning strategic war. But we have lived with serious dilemmas with regard to strategic offensive forces (armed with nuclear warheads) for many years without comparable anxiety. Few have noted that current US deployments place high reliance on strategic warning of Soviet attack; a "launch-on-warning" or "launch-under-attack" response might be unavoidable or impossible given only tactical warning, due to the uncertain survivability of US ICBM forces.[24] Another difficulty ascribed hypothetically for SDI has also applied to offensive forces for some time. SDI critics question whether computer programs of the appropriate length (perhaps some ten million lines of code) could be constructed. Yet the work of such programs depends less on their length than upon their complexity and fidelity under wartime conditions, which are difficult to simulate. Offensive C^3 software and hardware suffers

similar potential limitations. Computer-generated false alarms at the North American Aerospace Defense Command in 1979 and 1980 triggered problematical, although not fatal, responses from the system for a short time. And the worldwide military command and control system (WWMCCS) connecting strategic command posts and primary or secondary force commanders has a troubled history of failure at the most inopportune moments.[25]

The not very hypothetical C[3] problems attendant to offensive force survivability have also been acknowledged for current and near-term US attack warning and assessment systems. These systems are few in number and can be easily destroyed, jammed, or otherwise prevented from performing their assigned missions to provide reliable and accurate information.[26] Soviet attacks against 400 primary and secondary C[3] targets during the 1980s could probably disrupt postattack NCA control over US retaliatory forces.[27] Because of this possibility, submarine commanders have operated under the assumption that they may be required against their instincts to initiate retaliatory launches if postattack communications between SSBNs and the NCA are permanently disrupted.[28] This situation has been wrongly described as attractive to naval commanders and planners.[29] It has, on the contrary, come about because postattack communications with the most survivable strategic platforms, the ballistic missile submarines, are allegedly the most unreliable of the three legs of the Triad.[30]

War Plans and Policy Objectives

The process of reducing assumptions about national commitments, threats, and capabilities into realistic options is called war planning. War plans need to do a number of things if they are to provide feasible options to policymakers. First, they must be based on the best professional military judgment about

what is possible under given circumstances. Second, that judgment must be subject to review and modification by policymakers who know what political objectives they want to accomplish. Those objectives should not be stated in broad and comprehensive terms when they are ingredients in the military planning process. Instead, they should be specified to the extent possible. "Nation building" and "winning hearts and minds" are illustrations of well-meaning phrases that defy definition in operational terms.

Third, as Harry Summers has so rightly pointed out, war plans must take into account the relationships among the American public, its government and constitution, and its armed forces.[31] There are some things that the US armed forces cannot or should not be asked to do, either because those things are not part of our national psyche or because the US Congress could never be persuaded to concur. Thus one can ask, for example, whether under any circumstances the US Army can be charged with the conduct of major counterinsurgency wars in the third world given public abhorrence of the kinds of tactics necessary to defeat insurgents. This is not just another admonition about "no more Vietnams"; there are some scenarios being written for commitment of US forces to other non-European conflicts where it is doubtful the US public, media, or Congress would be supportive in the face of sustained heavy costs. The experience of American marines in Beirut, Lebanon, especially following the bombing of their barracks, is instructive.

The process of strategic nuclear war planning is an extremely complicated one. General policy guidance is supposedly provided by the National Security Council (NSC) in the form of national security decision memoranda, or National Security Decision Directives (NSDD) as they are now known. Under the Carter administration, the terminology changed to Presidential Directive (PD), the best known among students of nuclear strat-

egy being PD-59, the Carter administration guidelines for strategic nuclear war planning. The Reagan equivalent is reportedly NSDD-13.[32] The secretary of defense is then charged with preparing the Nuclear Weapons Employment Policy (NUWEP) and the Joint Chiefs of Staff, through the Joint Strategic Target Planning Staff (JSTPS), with development of the single integrated operational plan (SIOP).[33]

There are several questions that can be raised about this planning process. The first is the question of what we are planning for. What is to be accomplished by US strategic nuclear forces other than the obvious imperative that they are there to deter war in the first place? The second question is whether the planning process can provide the appropriate connection between means and ends, between policy objectives (however they are defined) and military operations. A third question is whether the American people understand the process and its results and, if they do, support them.

Deciding what to do with strategic nuclear forces if deterrence has failed is a major challenge in itself. Much effort has been expended over the years to refine operational plans. Reportedly, the war plans of the 1950s called for massive unleashing of the entire US arsenal against targets in the Soviet Union, Eastern Europe, and the People's Republic of China. The Kennedy administration began the process of attempting to build more numerous and more selective options into the SIOP, even while US declaratory policy, as presented to the public and the US Congress, remained "assured destruction."[34] The American public and our European allies were given a misleading appreciation of the character of American war plans. The misperception was not the result of deceit but of a divergence between declaratory policy explained publicly and operational policy as it appeared in war plans.[35] Because operational plans cannot be stated publicly in meaningful

detail for obvious reasons, some discrepancy in nuance and interpretation is unavoidable. The discrepancies were more than a matter of emphasis during the McNamara years, however, because the secretary of defense used "assured destruction" as a metric to restrict the numbers of strategic launchers, especially ICBMs, for budgetary reasons.[36]

The problem of a credibility gap between war plans as publicly explained and war plans as actually developed has continued. Former Secretary of Defense James R. Schlesinger attempted the quite sensible refinement of US targeting objectives in order to allow for limited nuclear options in the event that deterrence failed. Schlesinger did not assert that it would be easy to limit or to terminate strategic nuclear war. Nor did he argue that the USSR would necessarily cooperate if we attempted to do so. What he sought to do was to build on the work of his predecessors, who had recognized that *multiple* options were useful. However, Schlesinger was concerned that the more numerous options were all too large to be useful in responding to initiatives by adversaries that involved less than total war.[37] When Schlesinger went public with his explanations for these changes in declaratory and (eventually) operational policy, a public furor resulted.

The Carter administration stepped into the hot water of justifying nuclear war plans as a result of a comprehensive review of US strategic targeting, which it undertook on assuming office.[38] The results of this review were neither revolutionary nor unexpected; they continued the trends established under Schlesinger toward the incorporation of more, and more selective, options. When elements of these revised plans leaked, administration officials attempted to explain publicly the rationale for "countervailing strategy," as it came to be known.[39] Former Secretary of Defense Harold Brown soon repeated Schlesinger's unpleasant experience of attempting to explain how selective options reinforced
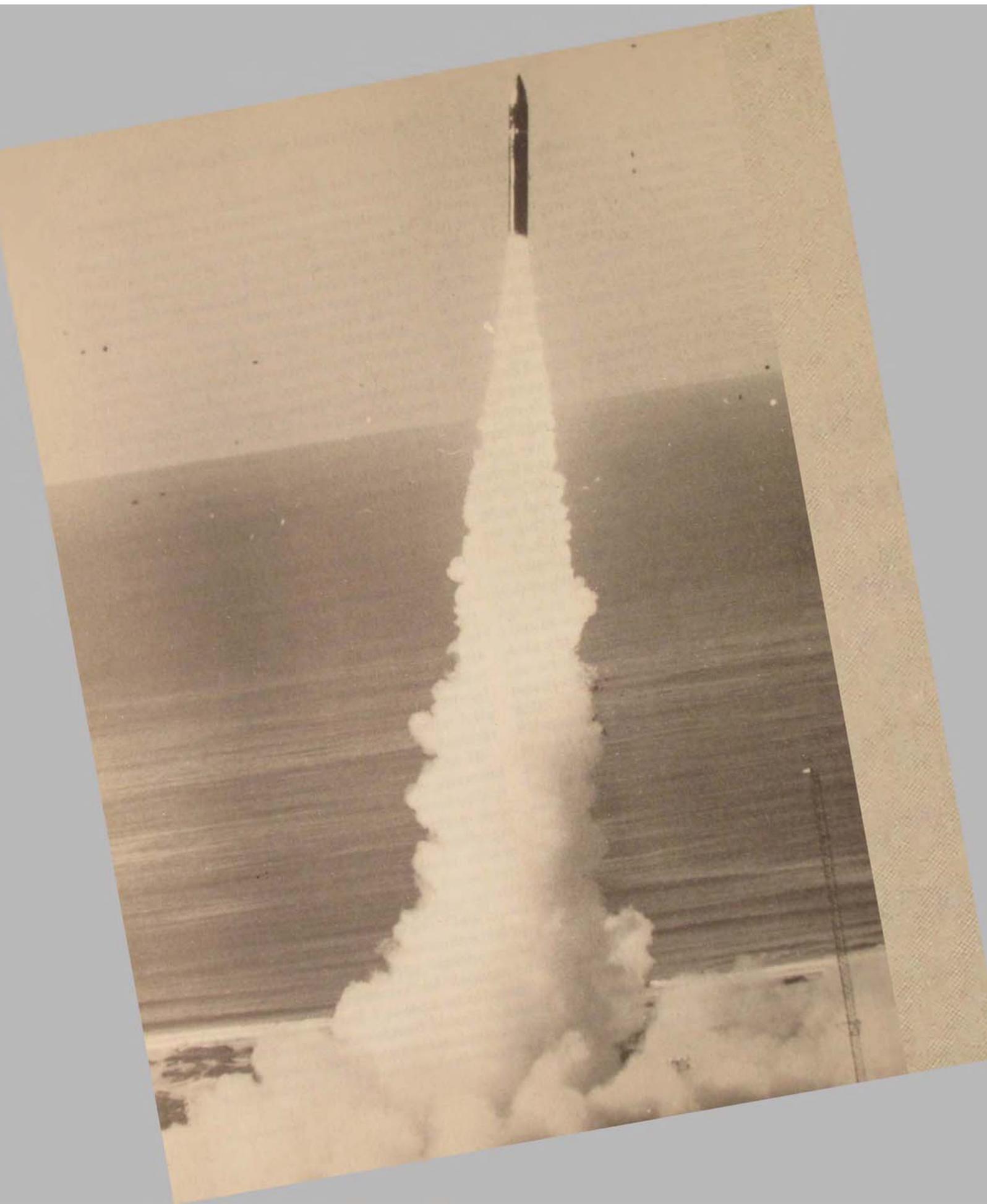
Peacekeeper testing went smoothly. This mid-November launch from a modified Minuteman silo hoisted four una Mk-21 warheads some 4,800 miles downrange.
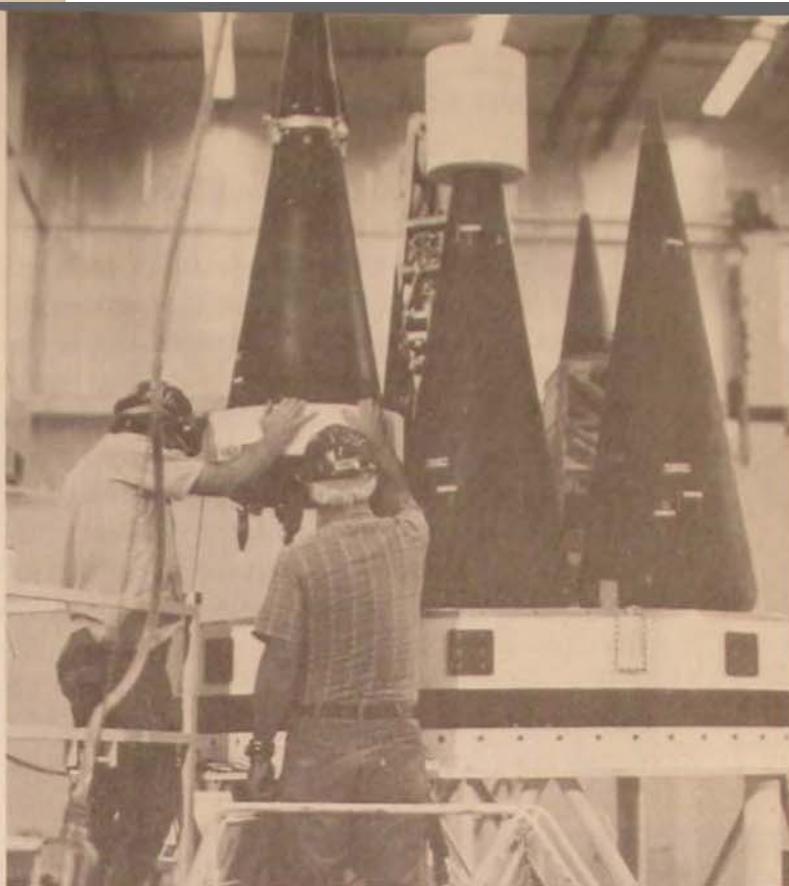
(Above) The "business end" of the Peacekeeper. (Below) The result of a test is six unarmed warheads on target near Kwaje Atoll in the western Pacific.
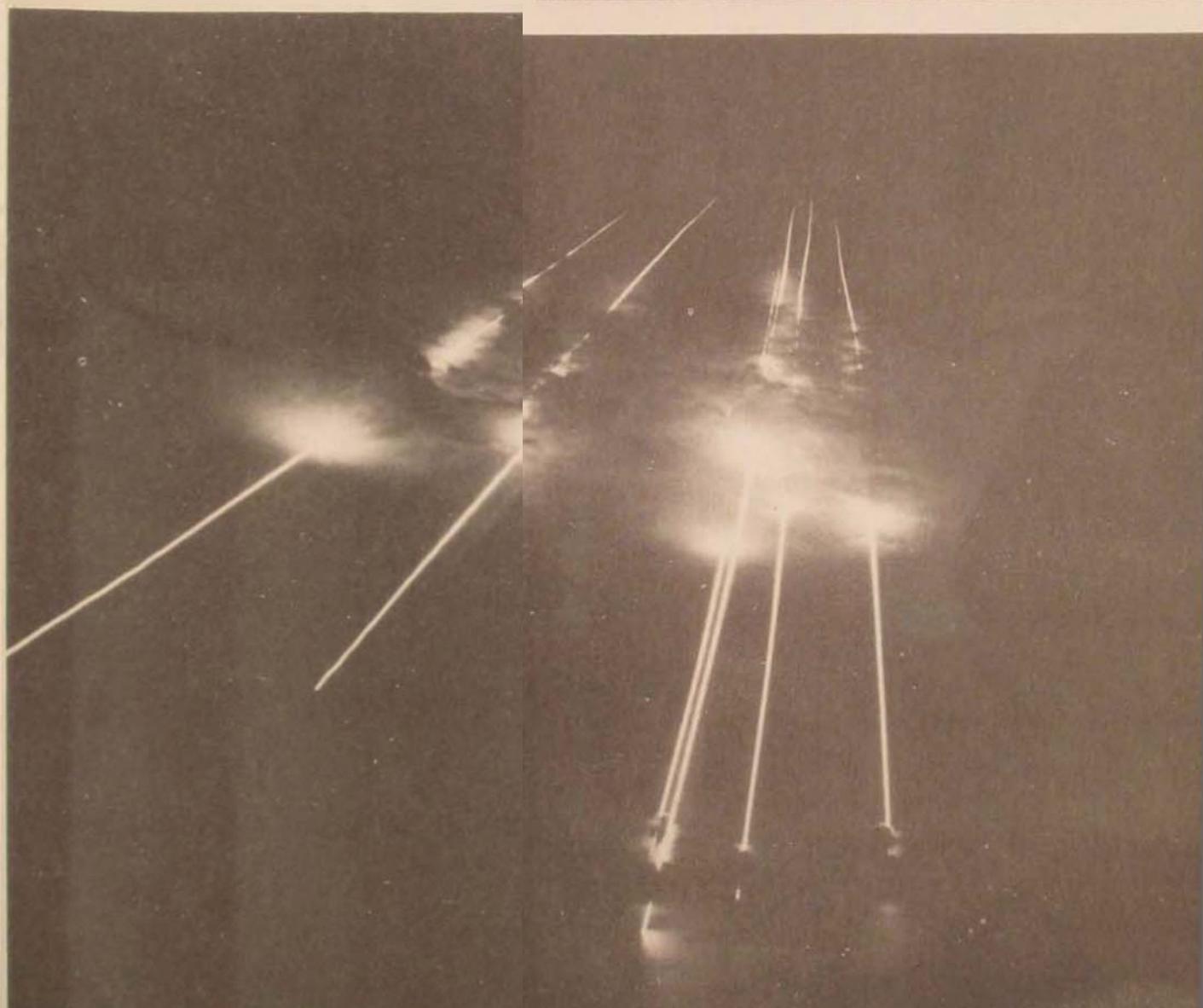
deterrence without making nuclear war more likely. In a public forum this was extremely difficult to do, and Carter administration efforts to do it during the presidential campaign of 1980 were thought by some critics to be self-serving.

The Reagan administration has continued the evolutionary trends that began with Schlesinger, although it has apparently endorsed the most contentious of the Carter PD-59 criteria for war planning: the possibility of a protracted nuclear war must be prepared

for and fought if necessary.[10] The Carter formulation of the concept of fighting protracted nuclear war proved as difficult to explain to the press, Congress, and the public as did the subsequent Reagan continuation of it. Apparently both administrations sought to develop additional options for extended warfighting, which, if Soviet planners were aware of those capabilities, would be more deterring. This message, that the extended war plans were related to deterrence and not to any real interest in fighting nuclear wars, was lost in the translation.

If the contents of strategic nuclear war plans are problematical, the process by which they are developed is also subject to question.

Although basing Peacekeepers in relatively vulnerable Minuteman silos is not the best alternative, it will have to suffice.
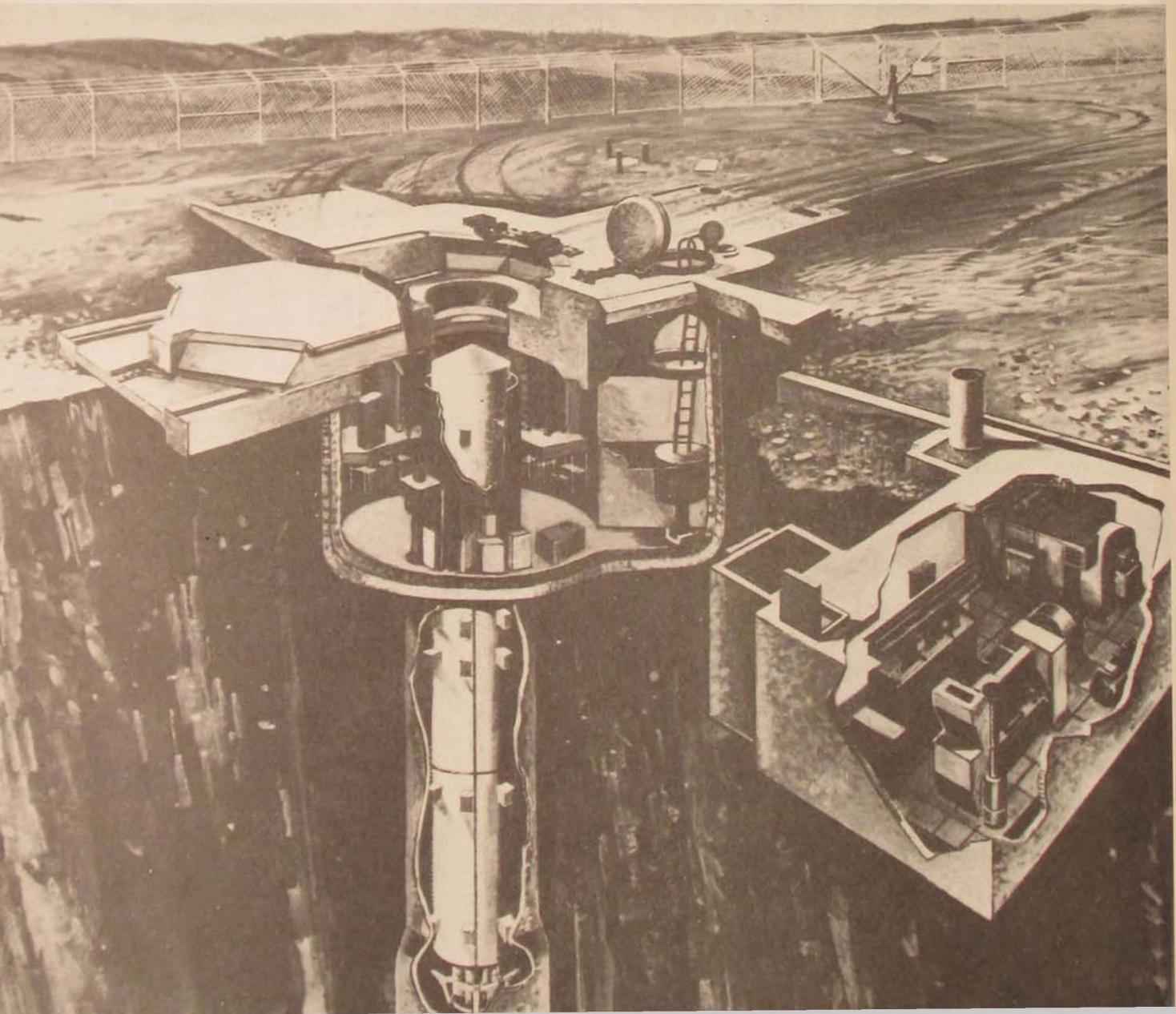
There is all the difference in the world between drawing up a list of targets and fighting a nuclear war. Destroying any number of things in the Soviet Union, whether those things are cities or silos, does not fulfill the requirements of any sensible policy. Policy must explain what we want to accomplish; that is, it must explain how the postattack world after we retaliate should be "better" than the postattack world if we did not. Broadly speaking, there are three general sets of objectives for the postattack period (the period following the first and relatively preplanned sets of exchanges). These are as follows: to *disarm the opponent* by destroying his forces and strategic command and control, to *terminate the war* at the lowest possible level of violence consistent with avoiding unacceptable losses for us, and to *destroy the opponent's war-supporting economy* so that even if his armed forces and government want to continue the war they will be unable to do so.

Notice that there is no mention of the destruction of cities or people as such. It is not now the objective of US war plans, nor has it been since the early 1960s, to destroy cities. The residual capacity of US and Soviet arsenals creates the potential to do this, and it is that potential that can be threatened in order to bring any war to a conclusion. Once cities are destroyed, they are no longer of any value to the attacker. Thus, it is unfortunate that US policy has been described publicly as "assured destruction," implying to the reader that our operational objective was to kill large numbers of people. This misconception was also fostered by misguided efforts to quantify the numbers of persons who would be killed in US-Soviet nuclear wars, as if the estimates were precise and verifiable.[11] Cities are of value as hostages; they can be destroyed if the adversary is threatening to disarm us and if no

termination of the war can be negotiated.

Of the three objectives, the first, counterforce/countercommand attacks designed to disarm the opponent, are achievable under current conditions only by a US or USSR first strike, and perhaps not even then. Factors having to do with "friction" or the "fog of war" might make countersilo attacks that look good on paper self-defeating in actual combat.[12] The "window of vulnerability" scenario for Soviet annihilation of the US Minuteman ICBM force following a surprise first strike was treated very gingerly and, in effect, repudiated by the Scowcroft Commission Report of April 1983.[13] It would make no sense for the USSR to attack the Minuteman force
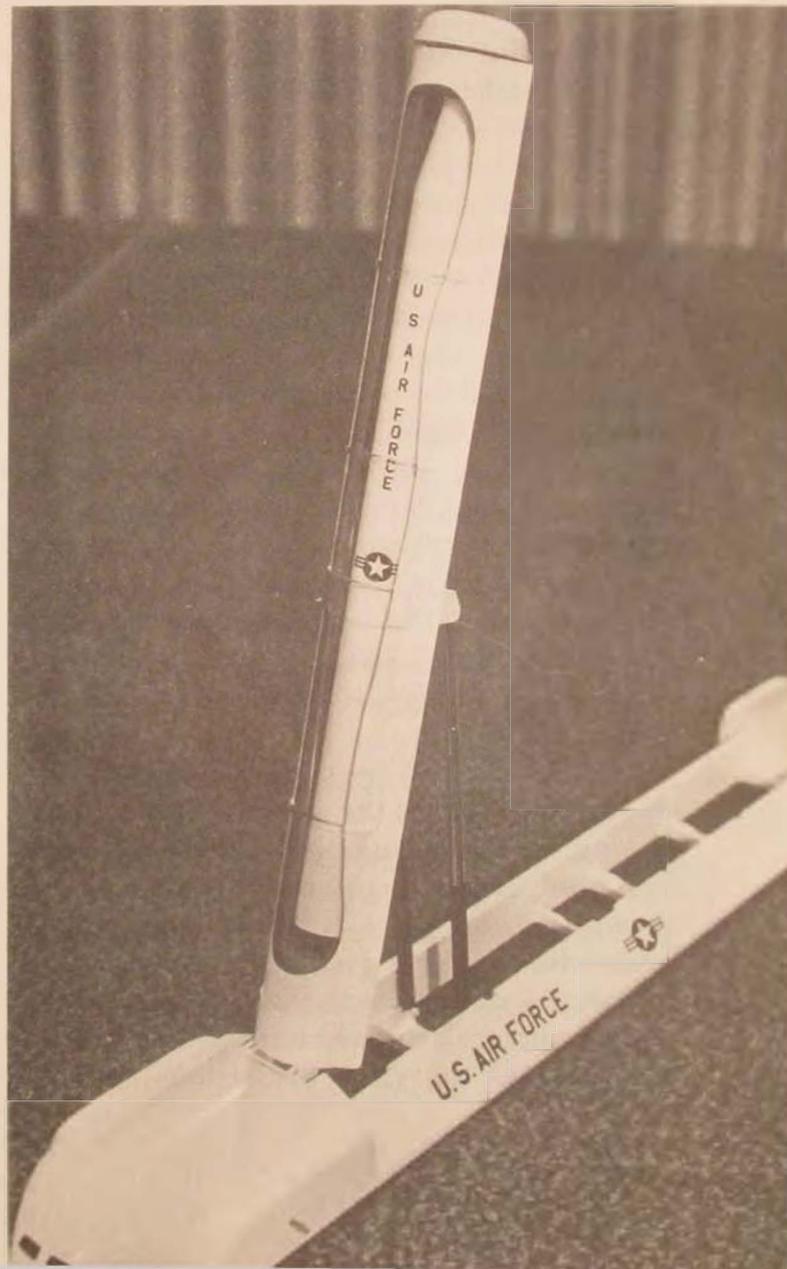
Various mobile basing modes have been explored. Railroad basing of a portion of the Peacekeeper force seems likely.

and then accept retaliation delivered from the surviving US forces without some antisubmarine warfare (ASW) breakthrough and improved active defenses for the Soviet command structure. Moreover, the expectation that counterforce/countercommand attacks could disarm the opponent early in war could produce "lose-it-or-use-it" temptations during crises. Bruce Blair has shown that US strategic command and control have been more vulnerable for several decades than the retaliatory forces themselves.[44]

Not only may we not be able to destroy the Soviet countercommand components, but it might not be advisable to succeed if we could. The Soviet control structure is not easily destroyed because it permeates the entire economy and society down to the "grass-roots" level.[45] And if the United States successfully decapitates the top of the structure (party, military, and KGB leadership, for example), then no one would be able to turn off isolated fragments of the Soviet war machine. The postattack, disrupted Soviet C³ system might not be able to coordinate further strategic nuclear attacks against US forces or society, but elimination of that option does not exhaust Soviet potential for postattack destruction, including attacks against our allies with conventional forces. The most understudied problem of the US military establishment (in addition to war plans) is the role of US and NATO conventional forces in the aftermath of nuclear war; the USSR has paid careful attention to this issue, however pessimistic they and we must be about what can be accomplished.

The third set of postattack objectives involve destruction of the opponent's war-supporting economic and social infrastructure. This would obviously cost the lives of many innocent civilians, which is why the priority of counterforce targeting is often asserted. But it is a mistake to suppose that in any wars other than exemplary demonstration salvos that are not followed up, clear distinctions can be made between targeting the Soviet war economy and destroying the Soviet population. Nor does it help when policymakers tabulate levels of Soviet civilians killed as percentages required to fulfill deterrence requirements.[46] Targeting the war economy of the opponent means destroying bridges, dams, power plants, manufacturing centers, transportation networks, and other societal assets that would include millions of "incidental" civilian deaths. Such lethal attacks against the economy and society might also trigger "nuclear winter," which several scientific studies postulate will result from atmospheric by-products of nuclear detonations above certain cumulative thresholds.[47]

Thus, the second set of objectives, war termination, is regarded by this writer as the one that is most consistent with US capabilities, traditions, and ethical commitments. However, the process of explaining to the Congress and the public how war plans provide for war termination is a challenging one. One wants, for example, to threaten the destruction of cities but not actually have to carry it out. In similar fashion, the Soviet government should have some realistic fear of loss of its coherence in prosecuting an extended war but not have the fear of imminent and total destruction.

The most difficult issue to be faced is how the subtlety of policy guidance can be mated, if at all, to the actual construction of nuclear options in the SIOP. Target planners will focus on the destruction of the maximum number of targets with the most efficiency, and options reflecting those priorities will loom large in the preplanned components of the SIOP. Yet, war aims might change during the process of war, especially if some alternatives for stopping the conflict appear in midstream. It may be difficult or impossible for the United States to do other than to execute a few large and preplanned nuclear sorties against the most obvious Soviet target base under realistic conditions of nuclear attack.

Whether this would allow for flexible intervention in the postattack environment by policymakers in order to bring about an end to the war on any terms is doubtful given current procedures and policies. If current and future plans cannot tell us how to end a strategic nuclear war, then it makes little or no sense to aspire to fight such a war over many weeks and months. As Christopher Branch has noted, the planning process has apparently neglected some of the important "nuts and bolts" prerequisite for fighting extended wars, including reconstitutable airfields, fuel supplies, and maintenance for strategic bombers.[48]

Should the SDI program lead to the deployment of strategic defenses for the United States and the Soviet Union, its implications for the selection among these three broad categories of postattack options will be enormous. There is not space here for a complete discussion of the possible implications of SDI, but a few observations relative to the discussion above are pertinent. First, SDI may make the pursuit of postattack war termination more realistic if it can contribute to preservation of the US command and control system against early decapitation. Soviet deployment of comparable defenses would not necessarily interfere with this objective; it appears that the USSR, which has deployed the only ballistic missile defense system now operative, has already placed a priority on protection of its leadership and command and control.[49]

SDI could also improve protection for the US ICBM force, both for fixed silo and mobile-based ICBMs such as the proposed Midgetman small intercontinental ballistic missile (SICBM). This could create more reliable threats to destroy the Soviet prompt counterforce base and thus contribute to deterrence if the Scowcroft Commission's judgment that the Soviets value most their leadership and military forces is correct.[50] However, SDI has

a "dark side" if it presents Soviet planners with the problem of a credible US first-strike capability against their land-based strategic retaliatory forces, which carry approximately three-fourths of their warheads.

The Reagan administration has called for defenses that can protect US society against any attack and ultimately render offensive nuclear weapons obsolete.[51] The near-term fallout from SDI is obviously not going to include such comprehensive accomplishments. Should SDI provide even credible defenses for retaliatory forces, it could help to stabilize deterrence by making first strikes less promising.[52] However, we have already seen in the superpower arms race that one side's damage limitation is another side's first-strike potential. SDI deployments without bilateral arms control agreements could result in self-defeating arms race spirals. Future war plans for the postattack period will have to prioritize among counterforce/countercommand warfighting, war termination, and countersocietal attacks in a defense-pregnant environment, although how effective those defenses will be even a decade from now is unknown.

Conclusion

US planners will be racing themselves and the Soviets to stay "up to speed" in the 1990s and thereafter. US technology is competent and competitive, if not superior in most areas. Strategy making within a democracy is another matter. Whether the US policy process can guarantee strategically consistent decisions in the face of unprecedented challenges is unknown. Multiple options pulling in different directions, plus some good fortune, have gotten us through in the past. If the past is prologue, we will somehow manage the future however untidy our efforts prove to be.

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Notes

1. *The President's Strategic Defense Initiative* (Washington, D.C.: The White House, January 1985).

2. US Office of Technology Assessment, *Ballistic Missile Defense Technologies*, OTA-ISC-254 (Washington, D.C.: Government Printing Office, 1985), reviews technology options.

3. Leon Sloss and Marc Dean Millot, "U.S. Nuclear Strategy in Evolution," *Strategic Review*, Winter 1984, 19–28.

4. Paul H. Nitze, "On the Road to a More Stable Peace," *Department of State Bulletin*, April 1985, 27–29.

5. Ibid.

6. US General Accounting Office, *Status of the Intercontinental Ballistic Missile Modernization Program*, report of the Comptroller General of the United States to the Congress, 8 July 1985, 7–13.

7. *Report of the President's Commission on Strategic Forces* (Scowcroft Commission), Washington, D.C., April 1983.

8. For technical discussion of small ICBM policy choices, see Jonathan Medalia, *Small, Single-Warhead Intercontinental Ballistic Missiles: Hardware, Issues and Policy Choices* (Washington, D.C.: Congressional Research Service, Library of Congress, 26 May 1983).

9. This is well discussed in John M. Collins and Thomas P. Glakas, *U.S. Strategic Nuclear Force Options: A Framework for Analysis*, Congressional Research Service, Issue Brief IB77046, 2 November 1983.

10. Withholding US countercommand attacks assumes Soviet reciprocation, which might not be forthcoming. See Fritz W. Ermath, "Contrasts in American and Soviet Strategic Thought," in Derek Leebaert, ed., *Soviet Military Thinking* (London: Allen and Unwin, 1981), 50–69.

11. For a critique of the US command system, see Edward N. Luttwak, *The Pentagon and the Art of War: The Question of Military Reform* (New York: Simon and Schuster, 1984).

12. How vulnerable US fixed silos were to realistic Soviet attacks was not clear. See Barry R. Schneider, "Soviet Uncertainties in Targeting Peacekeeper," 109–34, in Barry R. Schneider, Colin S. Gray, and Keith B. Payne, eds., *Missiles for the Nineties* (Boulder, Colo.: Westview Press, 1984).

13. Cruise missiles on SSBNs and SSNs might form part of the strategic reserve for postattack strikes as well. See D. Douglas Dalgleish and Larry Schweikart, *Trident* (Carbondale, Ill.: Southern Illinois University Press, 1984), 252.

14. US Department of Defense, *Soviet Military Power, 1985* (Washington, D.C.: Government Printing Office, 1985), 43–50, describes Soviet BMD and air defense programs.

15. See Carl H. Builder, *Strategic Conflict Without Nuclear Weapons* (Santa Monica, Calif.: Rand Corporation, April 1983).

16. Benjamin F. Schemmer, "Microelectronics Advances Will Pace Dramatic Changes in Future Wars," *Armed Forces Journal International*, September 1984, 86.

17. Albert Wohlstetter, "Between an Unfree World and None," *Foreign Affairs*, Summer 1985, 962–94.

18. For the strategic implications of future very smart weapons, see Builder, 43–64; and Robert Jastrow, *How to Make Nuclear Weapons Obsolete* (Boston: Little, Brown, 1985).

19. See the comments by Norman R. Augustine, "Brilliant Missiles on the Horizon," *IEEE Spectrum*, October 1982, 96–97.

20. Defense Advanced Research Projects Agency, *Strategic Computing*, 28 October 1983, passim.

21. Jeffrey Richelson, *The U.S. Intelligence Community* (Cambridge, Mass.: Ballinger Publishing Company, 1985), 107–70.

22. Bruce G. Blair, *Strategic Command and Control: Redefining the Nuclear Threat* (Washington, D.C.: Brookings Institution, 1985); Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven: Yale University Press, 1983).

23. US Office of Technology Assessment, *Anti-satellite Weapons, Countermeasures and Arms Control* (Washington, D.C.: Government Printing Office, 1985).

24. One who has noticed is William R. Van Cleave. See his comments in "U.S. Defense Strategy: A Debate," in George E. Hudson and Joseph Kruzel, eds., *American Defense Annual 1985–86* (Lexington, Mass.: D.C. Heath, 1985), 21–24.

25. A review of strategic C³ programs and improvements proposed by the Reagan administration appears in Blair, 248–80.

26. Blair, 182–211; Desmond Ball, *Can Nuclear War be Controlled?* Adelphi Papers, no. 169 (London: International Institute for Strategic Studies, Autumn 1981).

27. Blair, 182.

28. Bracken, 229.

29. Daniel Ford, *The Button: The Pentagon's Strategic Command and Control System* (New York: Simon and Schuster, 1985).

30. This is acknowledged officially by the *Report of the President's Commission on Strategic Forces* (hereafter cited as Scowcroft Commission Report).

31. Harry G. Summers, Jr., *On Strategy: A Critical Analysis of the Vietnam War* (Novato, Calif.: Presidio Press, 1982).

32. Sloss and Millot, 19–28.

33. See Richard Lee Walker, *Strategic Target Planning: Bridging the Gap between Theory and Practice* (Washington, D.C.: National Defense University Press, 1983).

34. David Alan Rosenberg, "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945–1960," *International Security*, Spring 1983, 3–71; Aaron L. Friedberg, "The Evolution of U.S. Strategic 'Doctrine'—1945 to 1981," in Samuel P. Huntington, ed., *The Strategic Imperative: New Policies for National Security* (Cambridge, Mass.: Ballinger Publishing Company, 1983), 53–99.

35. For accounts of McNamara's policies and European reactions, see Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough? Shaping the Defense Program, 1961–69* (New York: Harper and Row, 1964).

36. As Lawrence Freedman notes, "Emphasizing counter-city capabilities in preference to the counterforce was a declaratory policy. It was adopted to warn of the dangers of nuclear war rather than to describe how a nuclear war should be fought if it had to be fought." (Freedman, *The Evolution of Nuclear Strategy* [New York: St. Martin's Press, 1983], 246). Freedman's statement is undoubtedly correct, and raises the question whether Defense Department declaratory policies should be in conformity with actual targeting or appeasing of the popular instinct.

37. For Schlesinger's rationale, see Lynn Etheridge Davis, "Limited Nuclear Options: Deterrence and the New American Doctrine," 42–63, in Christoph Bertram, ed., *Strategic Deterrence in a Changing Environment* (Montclair, N.J.: Allenheld, Osmun and Co., 1981). There are some reasons to be skeptical about Soviet reciprocity for US threshold restraints during nuclear exchanges. See Benjamin S. Lambeth, "On Thresholds in Soviet Military Thought," in William J. Taylor, Jr., Steven A. Maaranen, and Gerrit W. Gong, eds., *Strategic Responses to Conflict in the 1990s* (Washington, D.C.: Center for Strategic and International Studies/Lexington Books, 1984), 173–82.

38. See J. Richelson, "PD-59, NSDD-13 and the Reagan Strategic Modernization Program," *Journal of Strategic Studies*, June 1983, 125–46.

39. See Sloss and Millot, 24–25; and Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1984).

40. For comparisons and evaluations, see Colin S. Gray, *Nuclear Strategy and Strategic Planning* (Philadelphia, Pa.: Foreign Policy Research Institute, 1984).

41. Freedman, 246. By some paradox, elaborate quantification of numbers of prompt fatalities attendant to US-Soviet nuclear exchanges is accepted as admirable by most members of the US policy-analysis community. Equally rigorous efforts to quantify the results of countermilitary salvos are disparaged as counterproductive to peace and deterrence. Even those who do the latter are obliged to point out repeatedly that escalation control is dif-

ficult, as if anyone doubted it.

42. See Desmond Ball, "U.S. Strategic Forces: How Would They Be Used?" *International Security*, Winter 1982/83, 31–60; Barry R. Schneider, "Soviet Uncertainties in Targeting Peacekeeper," in Schneider, Gray, and Payne, 109–34.

43. Scowcroft Commission Report.

44. Blair, passim.

45. Harriet Fast and William F. Scott, *The Soviet Control Structure: Capabilities for Wartime Survival* (New York: Crane, Russak and Co., 1983); Stephen J. Cimbala, "Countercommand Attacks and War Termination," in *Strategic War Termination*, ed. Stephen J. Cimbala (New York: Praeger, 1986), 134–56.

46. In point of fact, US planners have never targeted civilian populations per se, at least not since the first SIOP was constructed. The difficulty is in isolating "population" from military forces and their bases, command centers, and economic infrastructure relevant to war. See Desmond Ball, "Counterforce Targeting: How New? How Viable?" *Arms Control Today*, February 1981, reprinted with revisions in John F. Reichart and Steven R. Sturm, eds., *American Defense Policy* (Baltimore: Johns Hopkins

University Press, 1982), 227–34.

47. Carl Sagan, "Nuclear War and Climatic Catastrophe: Some Policy Implications," *Foreign Affairs*, Winter 1983/84, 257–92

48. Christopher I. Branch, *Fighting a Long Nuclear War: A Strategy, Force, Policy Mismatch* (Washington, D.C.: National Defense University Press, 1984).

49. Soviet planners regard it as prudent to hedge against the possibility of deterrence failure with active defenses and with possible preemption. See Stanley Sienkiewicz, "Soviet Nuclear Doctrine and the Prospects for Strategic Arms Control," in Leebaert, 83; Soviet strategic defense and space programs are described in US Department of Defense, *Soviet Military Power: 1985* (Washington, D.C.: Government Printing Office, 1985), 43–59

50. Scowcroft Commission Report, 6. This statement is highly judgmental.

51. US Department of State, "The Strategic Defense Initiative," *Special Report*, no. 129, June 1985.

52. For assessments of alternate possibilities, see US Office of Technology Assessment, *Ballistic Missile Defense Technologies* (Washington, D.C.: Government Printing Office, 1985).

THE FUTURE OF MILITARY SPACE FORCES

Gen Robert T. Herres

I CHOSE the subject of the future of military space forces because I feel obligated to respond to recent suggestions that we will soon need a fourth military department in the Department of Defense—a Department of Space. There are quite a few proponents of this view, and they argue that an Army, a Navy, and an Air Force will soon be insufficient for carrying out those tasks required for national security. These proponents sug-

gest—with a confident sense of inevitability—that on the horizon is a "Space Force" or perhaps a "Space Defense Force." The "theater" or "area of responsibility" of this future Space Force would be, of course, that medium we all commonly call "space."
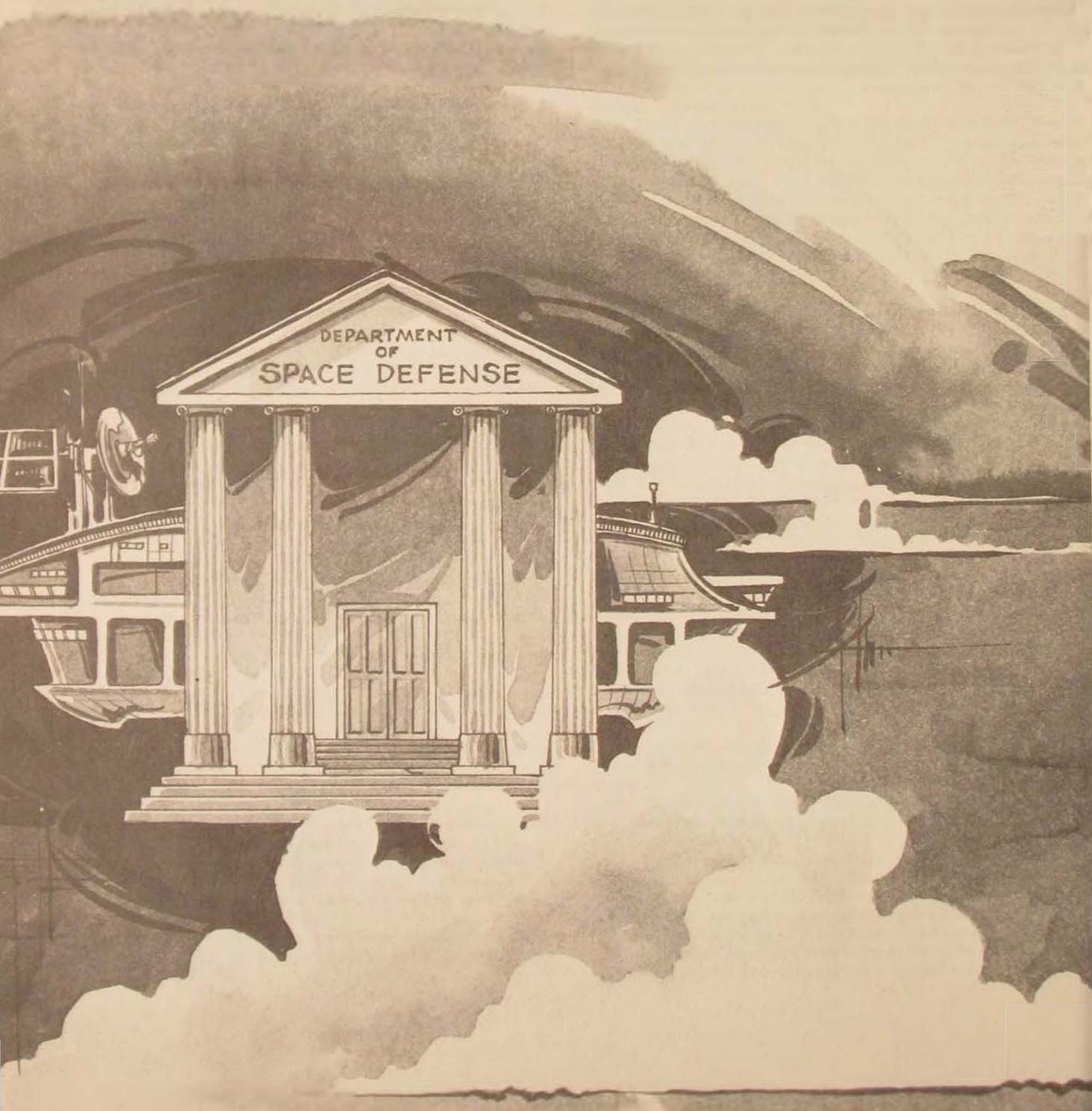
My view of the future is quite different. I do not see a Space Force on the horizon. Moreover, I think creation of a separate Department of Space would be the wrong thing to do. I arrive at this conclusion on the basis of an examination of the Department of Defense infrastructure and how it has evolved since well before the time there was a Department of the Air Force, along with consideration for the future adequacy of this infrastructure.

From the earliest days of our Republic until 1947, our military forces were organized into two departments: the War Department and the Navy Department. The civilian secretaries who headed these departments were members of the president's cabinet, and powerful members at that. All military capabilities, all roles and missions, had to be somehow incorporated into this structure.

When Gen William "Billy" Mitchell argued for a unique role for air power in 1924, his arguments struck at both the War Department and the Navy Department. Those two powerful departments viewed aviation as an adjunct to either ground operations or fleet operations. Mitchell asserted that a larger and more independent role was necessary, a role that would permit long-range strategic bombardment.

It took the Second World War to prove his point. By the end of the North African campaign, we had learned that air power could not be subordinated to the ground commander, and thus "piecemealed," if there was to be tactical success. Protecting ground forces by close air support was only one of many roles that air forces were capable of performing, and indeed *had* to perform. Air superiority was a prerequisite for unhampered ground operations. The interdiction of rear

echelon supplies and reinforcements provided tremendous assistance to the ground commander in contact with the enemy. And long-range strategic bombardment showed the effectiveness of destroying an enemy's resupply capability by striking at its source—factories, energy supplies, and transportation nodes. The development of the atomic bomb made the argument for a long-range air force even more convincing. In fact, it actually had the effect of closing the door to any further debate. The Second World War proved Mitchell's point, but it took postwar legislation to create a separate air force.

From 1945 to 1947, we debated just how we would structure the military establishment to incorporate a separate air force. The National Security Act of 1947 created a "National Military Establishment" as the forerunner of what is now the Department of Defense. The establishment included a Department of the Air Force, along with the Departments of the Army and the Navy. The act also created a secretary of defense, who had administrative control over the three departments. Each department had a civilian secretary charged with administering the forces that were under the command of a service chief of staff. The Joint Chiefs of Staff were given legal status and were charged to bring about coordination of plans and functions among the services.

The Reorganization Act of 1958 reorganized the Department of Defense to increase its effectiveness and to centralize its authority. Until the fall of 1986, this was the most significant change made to the 1947 law. The 1958 act removed service secretaries from the operational chain of command. Their planning responsibilities were reassigned to the Joint Chiefs of Staff, and their operational responsibilities were assigned to the commanders in chief of the unified and specified commands. The services became resource managers. As resource managers, they were responsible for organizing, training, and equipping the forces that unified and specified commanders

in chief would employ. The services were to build the force structure, and operational commanders were to employ it.

Military space forces were, of course, affected by the changes in the law. When the US Air Force was created, it took most of its force structure from the US Army. The Army retained responsibility for development of an intermediate-range ballistic missile, which was considered analogous to long-range artillery. The Air Force, however, was charged with developing a long-range intercontinental ballistic missile (ICBM)—an analogous extension of its strategic bombardment role. The US Navy missile program grew out of its initial partnership with the Army.

Space operations were seen as a natural outgrowth and extension of air operations. As early as the 1950s, Gen Thomas L. White coined the word *aerospace* to describe the medium for Air Force operations. Since then we have considered "air" and "space," while two separate entities, as constituting a single realm—an "operationally indivisible medium." Even before the Soviets launched Sputnik, the senior leadership of the Air Force was looking ahead to a role for the Air Force in space. Clearly this is quite different from the view the Army took toward aviation in those earlier years when General Mitchell and others argued for a distinct role for air power. The Army of General Mitchell's era rejected a large role for aviation; the Air Force of today eagerly awaits the growth of space activities as part and parcel of aerospace.

Of all the aerospace forces, the space-related one with the longest lineage and largest force structure is our ICBM force. Today the Air Force has nearly ten thousand people in the missile operations and missile maintenance career fields, most of them in the Strategic Air Command.

Ballistic missiles *are* space systems; about 98 percent of the ballistic missile trajectory occurs in space. The business end of that missile—its warheads—are carried by a very specialized spacecraft called a "postboost vehicle." This spacecraft has its own reaction control system, onboard computers, and maneuvering capability. A missile lifts this spacecraft into space, and the spacecraft maneuvers to release its warheads. The Soviet SS-18, for example, travels more than a thousand miles above the surface of the earth—higher than 40 percent of the satellites in low-earth orbit. Its 10-warhead platform transits space across a distance of more than four thousand miles for approximately 20 minutes. By any definition, the postboost vehicles of ICBMs *are* spacecraft. In fact, the time an intercontinental ballistic missile spends in the atmosphere is almost negligible. I hasten to caution that these points are not made to suggest moving ballistic missiles to Space Command. *Space is not a mission.* It is a *place* from and within which military missions are carried out. Ballistic missiles are strategic offensive systems and, as such, belong in the command that bears responsibility for that unique mission, no matter how much time those systems spend in space.

The significance of already having land- and sea-based intercontinental ballistic missiles in the force structure should not be lost. It is one of four reasons why I do not see a Space Force on the horizon. Let me enumerate and explain those four reasons.

First, we have intentionally avoided establishing a precise definition of where this medium, or place, called "space" begins. Physiologists have an aeromedical definition, the personnel folks who define astronaut ratings have another definition, aeronautical and aerodynamic engineers have a third definition, and legal experts have their definitions. Some countries have tried to impose a definition on other countries, but our country has not accepted any of these.

Failing a precise distinction between the mediums of air and space, it would be extremely difficult to separate the two operationally. Where would the responsibilities of a

Space Department begin, and where would those of the Air Force end? Similarly, to call space a military "theater" or an "area of responsibility" would be to suggest that space was a "mission" and not a "place." That's a view I also reject. Even if we could make a clear distinction between air and space, the problem of dividing up the force structure we already have would still remain. That leads me to the second reason I do not think we will have a separate Space Force—and do not think we should have one.

The aerospace operations force structure is largely provided by the Air Force. Since the 1950s the Air Force has continued to fund, research, and develop those military systems designed to exploit the full medium encompassing all of aerospace. The Air Force has accumulated a wealth of experience in space operations and accumulated it at a great price. It is incorrect to think those investments have been made and are being made without a full appreciation of the force structure that must be provided for air and space operations. It is also quite unlikely that early aerospace power advocates—Arnold, Spaatz, White, von Karman, Vandenberg, Schriever, and Twining, just to name a few—somehow might have missed the conceptual boat. I believe they had the foresight to understand that aerospace operations would embrace space as well as the sensible atmosphere.

The early efforts by Chuck Yeager, Frank Everest, Milton Apt, and Ivan Kincheloe to fly higher and faster were driven by the requirement to understand and exploit as much of the aerospace medium as technology would allow. Years of lifting-body research, progressing from the delta wing reentry gliders of the ASSET and PRIME programs, evolved into the manned PILOT missions—the launch of X-24As from B-52 "mother ships."*

Years of supersonic flight research beginning with the X-1 series culminated in the hypersonic X-15. It was the convergence of these research efforts that made possible the concept validation and design of the space shuttle. It was the Air Force that sponsored and funded a large part of those efforts, of course. More than three decades ago, the Air Force began to pave the way for the day when technology would make aerospace planes possible. On the horizon *are* aerospace planes, vehicles capable of operating both in the atmosphere and in orbit. Eventually aerospace planes will operate in both mediums on the same mission. I see the day in the not-too-distant future when aerospace vehicles will routinely conduct operations in and between space and the atmosphere on a single mission. It would be most unwise and very likely impossible to try to separate what man and nature have intertwined. And that leads to the third reason why I do not think a Space Force is on the horizon.

The Air Force recognizes that much of its future is in space. Any attempt to separate "space" from "aerospace" would certainly stimulate a debate. Without space, it could be argued that the Air Force's atmospheric missions might gradually be absorbed as ancillaries of the land and naval missions. I think the Air Force would struggle hard to avoid that. But frankly, if there were a fourth military department for space, or a Space Force, I think this would be the inevitable result in the long term.

The argument that someday officers engaged in atmospheric missions will have no shared identity with officers performing space missions has so far also proved incorrect. Missile operations and space operations people are doing fine and getting along well with aviators. There does not appear to be a "brown-shoe" Air Force growing out of the "black-shoe" one. It is incumbent on Air Force leaders to ensure that steps are taken to continue that sense of corporateness among all its officers.

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*The acronyms refer to the Aerothermodynamic Structural Systems Environmental Test, Precision Recovery Including Maneuvering Entry, and Piloted Low-Speed Test.

Finally, and perhaps most important, the suggestion that we will someday have a new and separate Space Force fails to appreciate how the Department of Defense is structured today and why it is so structured.

Implicit in the organization of the Department of Defense are *four* fundamental principles. The first principle is that the Department of Defense is organized to serve the people of the United States. We in our nation's military establishment are public servants. Our collective role is ultimately to do no more and no less than the people we serve direct us to do. The mandate of the people is expressed by their choice of our commander in chief, our nation's president and chief executive, and by their choice of the legislators that represent them. The will of the people is transmitted by executive orders and by public law. This representational system is obviously only perfect to the degree that all the people involved are perfect. Whatever real or perceived imperfections that may exist are the cost of a system organized by the many to serve the many. On balance, however, there is no better model.

Throughout the history of our Republic, our citizens have, through our laws, thoughtfully and carefully limited the power of the military establishment. They have limited its power not so much to hamper its effectiveness or essential operations, but rather to ensure that adequate and concrete checks and balances keep it dependent on and responsive to the people it is designed to serve.

The second principle ensures that we have a resource management chain of command *and* a separate operational chain of command to avoid concentration of excessive authority in any senior office below that of the civilian secretary of defense.

Next, our unified and specified commands are created and are structured to accomplish specific military missions and objectives. Unified commands are organized either to accomplish a broad continuing mission requiring execution by significant forces of two or more services and necessitating a single strategic direction, or to achieve a unity of effort when single responsibility is required for effective coordination of the operations in a large geographic area and when common utilization of limited logistic means is a necessity. Specified commands have a broad continuing mission and "are composed of forces from but one service."

A fourth fundamental principle is that the resource management chain of command is not built around specific missions of geographic areas. Rather, it is organized around the homogeneity of its force structure.

The suggestion that we will someday have a new and separate Space Force also fails to acknowledge how dramatically different today's environment and today's structure are when compared to that era when air forces grew out of the Army. The differences are enormous, and almost no parallel exists between Billy Mitchell's era and now.

Today we have three military departments charged by law to organize, train, and equip forces. These departments are resource managers. By law, they lack the authority to employ the force structures they create and sustain. The Army, the Navy, and the Air Force do not have operational missions. Their role is to build and structure forces. They provide these forces through the component commands, which are the major or subordinate commands of each of the three departments, to the commanders in chief of unified and specified commands for employment. Under Title 10 of the United States Code, the unified and specified command structure is the *only* legal structure for the employment of forces. While it appears some are unwilling to accept this, it is in fact the law of the land.

We have operational commands that are capable of, and that are legally charged with the responsibility for, employing forces in every conceivable medium. Nearly all of our unified commands have responsibilities in the areas of

land, sea, and aerospace. Among these unified and specified operational commands is the United States Space Command.

The United States Space Command is a joint-service, unified command, that is just over a year old. Its components provide representation and space expertise from all three services. The command has been assigned responsibilities in three broad areas: space operations, surveillance and warning, and ballistic missile defense planning and requirements development. Our mission is *not* "space." Our mission is to accomplish certain specific tasks *in* space pursuant to national security objectives. Although the potential for growth in each of these three areas of tasking is dramatic, advocates of a Space Force most often concentrate on the growth that will occur in the space operations area. Let me highlight the space operations missions we are already tasked with.

Our space operations missions include controlling space, directing space support operations for assigned systems, and operating systems that are designated or assigned by the Joint Chiefs of Staff in support of the national command authorities, the Joint Chiefs, and other unified and specified commands.

Space control is analogous to sea control. It includes ensuring the right of passage through space, ensuring that operations in space can be conducted without interference, and—when necessary and directed—denying an adversary the use of space-based systems that provide support to hostile military forces.

Space support operations include supporting the launch and on-orbit requirements that are established by operational commanders and providing support to terrestrial-based forces as required and as the capabilities of assigned systems will permit. In addition, the command is responsible for ensuring that the appropriate space system requirements of other operational commands are advocated, integrated, and supported.

That is a full plate. In organizing to accom-

plish those missions, we are building an infrastructure that will endure. This infrastructure will enable us to conduct unified and integrated military space operations for deterrence far into the future. It will also enable us to integrate technological change and transform it into military space capabilities.

I accept the fact that technological change is inevitable, but I do not accept the idea that we are powerless to influence the ways in which we assimilate technologies into military capabilities and military structures just because we do not have a Department of Space. The proper arena for the Air Force embraces air and space, and I believe the Air Force has accomplished much in both of those areas. The service departments have provided a superior structure for the advocacy and funding of military air and space systems. The unified command—the United States Space Command—has the infrastructure built to employ them. Our infrastructure is also designed to incorporate and employ the space systems required by other commanders in chief.

The new Goldwater-Nichols DOD Reorganization Act of 1986 will buttress our nation's unified and specified command structure. It will strike a more effective balance between the Department of Defense's resource management chain of command and its operational chain of command. Commanders in chief will be given a greater voice in the requirements, acquisition, and resource allocation processes. This greater influence, I believe, will have tangible paybacks in military capability and effectiveness.

There is, however, an instructive element in the suggestion that we create a Space Force. It does argue that we probably need to do a better job of explaining how the Department of Defense is organized and, given its structure, how it should operate. We also need to increase our efforts to normalize the ways in which we approach the "space" portion of aerospace missions. Failing to do this, we run the

risk of failing to truly unify our operations, and our ability to deter in the future could be affected.

Our nation's policy of deterrence—of preventing conflict—hinges on our ability to maintain the credible capabilities to always deny an adversary whatever it is he might seek by aggression. These capabilities include not only military forces but also the entire range of elements contributing to national power. Military forces themselves do not derive their capabilities just from the numbers and the quality of the people and equipment possessed. Capability is also a function of the effectiveness of the structure that would employ them, the quality of the employment plans, and the degree to which land, sea, and aerospace forces are integrated. The 20-year trend toward unification and integration, while still preserving the sanctity of two separate command chains, is one I see as both necessary and desirable.

I do not see a new and separate Space Force on the horizon. The creation of a separate Space Force would provide me, as commander in chief of a unified command, the United States Space Command, with another component—a Space Force component. What capabilities would this space component provide that the three components we already have cannot provide? I think that proponents of a new department are attracted by an illusion that a Department of Space would have "the operational mission of space." I hope my arguments have shown that this is just not possible. USCINCSPACE would still be the force employer—by *law*—of whatever force structure such a Space Force might include and provide for my use. What useful purpose would be served by establishing another military department in that context? In an era of finite resources and growing interdependence, can we really afford to neglect the hard-learned lessons of the past?

In the early days of the Second World War, we initially labored under the belief that the "medium defined the mission." However, we quickly learned that in order to meet tactical and strategic objectives, all missions in all mediums had to be subordinated to and contributory with respect to the objective. Heads of state specified the objectives and provided strategic direction of a combined chiefs of staff. The chiefs represented Allied military forces and capabilities in all mediums. They translated global strategic objectives into smaller but still massive theater military objectives. Theater commanders translated these into integrated taskings for all the military forces—land, sea, and air—in a theater. Subordinate commands used combined forces to win victories, and these paved the way to strategic success.

This combined forces approach required an intermingling of capabilities. We saw that the medium could no longer be the sole criterion for defining missions. The creation of a separate Department of the Air Force did not take the Army and the Navy out of aviation. The natural forces set in motion by the combined forces approach to meeting the strategic objectives of World War II could not easily have been artifically inhibited. While the Air Force has a dominant role in aviation, it clearly does not, and cannot, have the exclusive role.

The same will continue to be true with space. The Air Force is not the only military department involved in space. To suggest that 50 years from now we will have a Department of Space with exclusive roles in that medium or that the only command with space missions will be the United States Space Command is too shortsighted to merit serious consideration.

Given the choice of taking the path of rational continuity or fantastic discontinuity, the most prudent course is the path of continuity. I sense we are on that path, and I see nothing on the horizon that could or should sway us from that course. In fact, everything I see leads me to conclude that we are already

properly postured for the future. The task that lies ahead is to build carefully on the foundation that has been built, one sound layer at a time.

Future military space forces will be the "fleshing-out" of the structure that we have today. Our basic structure has served us well. I see no need to fragment it under the guise of improving it. Rather, I see us taking the skeletal structure we have today and adding muscles here and muscles there. Our country has significant real and potential space capabilities residing in all three military departments. Most by far reside in the Air Force. The ability and the legal responsibility to employ these forces resides in the unified and specified command structure; it would not reside in a new Department of Space, even if one were formed. When I look on the horizon, I see us doing the smart thing by slowly and surely actualizing the potential that already exists. The Department of the Air Force *is* our space force, and we certainly do not need another.

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LINEBACKER II

the decisive use of air power?

KENNETH P. WERRELL

THERE are many who see the bombing of North Vietnam in December 1972 as decisive. They see this operation as *the* example of how air power should have been used in Vietnam and how it might, or should, be used in the future. They speculate that if air power had been used this way earlier, the war would have been won or we would have gained better terms.

I disagree. First, the bombing of North Vietnam was fatally flawed by the lack of proper targets. Second, while political restrictions inhibited the airmen, inadequate tactics and equipment contributed significantly to the high losses and lack of results. Third, the bombing did not have decisive political/diplomatic results.

From the start, the United States used air power against the North as a political tool. The objectives of this air campaign, code-named Rolling Thunder (1965–68), were to stiffen the morale of the South Vietnamese, to interdict Communist supplies, to inflict punishment and cost on the North Vietnamese, and to demonstrate American will.[1]

But many, then and now, adamantly proclaim that the operation was restricted, some say decisively, by the civilian decision makers.[2] Sortie levels were controlled, areas of North Vietnam were put off limits to air attack, bombing halts were frequent, and targets were carefully selected from Washington. For example, MiG fields were off-limits until 1967, as were missile sites until an American aircraft fell victim to them. In addition, the campaign was graduated, robbing the airmen of the elements of shock and surprise and permitting the North Vietnamese to build and adjust their defenses. From the beginning, there were those in high places who doubted the bombing could achieve its objectives.[3]

Military men emphasize the civilian-imposed constraints, but there are other reasons why strategic bombing was not, and could not be, decisive in Vietnam. The most substantial of these concern targets: what do you bomb? This was not World War II. North Vietnam was not Germany or Japan, and this was neither a total nor a conventional war. Germany and Japan surrendered after suffering terrible personnel and physical losses due to the fierce land, sea, and air war. Bombing was not the sole cause of the Axis defeat, but it was very effective against industrialized enemies supplying their own war materiel and fighting a conventional war. North Vietnam fit none of these categories. The North got its sustenance from the outside, the fighting (except in 1972 and arguably in the 1968 Tet offensive) was irregular, and the war was not total, certainly not for the United States. The only targets within North Vietnam upon which the bombing might have had a decisive effect were the people themselves or the people indirectly (that is, the dikes). But despite the writings of the theorists, aptly called the "Prophets of Gloom," attacking morale has not proved to be a war winner. It is also difficult to see how a democracy could deliberately target people in a limited war. A 1972 congressional report summarized the problem: "This study calls into serious question the efficacy of strategic and interdiction bombing against a highly motivated guerrilla enemy in an underdeveloped country."[4]

As a result of the scarcity and nature of targets and the cost of the bombing operations, the dollar value of the attacks greatly ex-

ceeded the dollar value of the targets destroyed. One CIA estimate put the ratio at 8:1.[5] Moreover, Chinese and Soviet shipments to North Vietnam exceeded the damage by a 6:1 margin. Meanwhile, US intelligence studies indicated that the bombing would not bring the war to a successful conclusion.[6]

Further, the airmen were ill-prepared to fight a sustained, conventional air campaign.[7] American aircraft were unsuited for these operations in a number of ways. Ironically, "strategic" bombers were used against "tactical" targets in the South, while "tactical" fighters were used against "strategic" targets in the North. The lack of all-weather aircraft presented a considerable burden, especially in the winter monsoon season (December through mid-May). The United States fought a conventional air war with aircraft designed for nuclear warfare. The best example of this mismatch was the F-105. A fighter with an internal bomb bay, a contradiction in terms, it was the Air Force's workhorse, flying many of the missions over the North and suffering the majority of its casualties.[8]

The United States, for all of its technological prowess, was ill-equipped in other areas as well. At the beginning of the air war, the United States was still using unguided ("dumb") munitions, just as airmen had used 50 years earlier in World War I. Thus, aircrews had to overfly their targets, which proved dangerous and often fatal.[9] Second, the United States had neither sufficient nor adequate electronic countermeasures (ECM). While Strategic Air Command (SAC) was reasonably equipped, fighters were not. Until late in the war, however, SAC operated unopposed over South Vietnam while fighters carried out the war against increasingly lethal defenses over North Vietnam. A third example is that the United States did not have adequate identification, friend or foe (IFF) systems. This meant that long-range, air-to-air missiles, which should have given American airmen a considerable advantage over their foes, were constrained by fears of hitting friendly aircraft.

Perhaps the most important factor contributing to American unpreparedness was the underestimation of the power of the defense and the abilities of the North Vietnamese. The airmen focused on the weapons and type of warfare on which airmen always focus—where the glory is—fighters and air-to-air combat. It is true that the North Vietnamese built up their air force. But this air force proved as elusive as the Vietcong, using guerrilla tactics of hit and run and fighting only when circumstances were favorable. With the major exception of Operation Bolo in January 1967, when US fighter pilots lured MiGs into an air battle and then dispatched seven without a loss,[10] American airmen did not engage in massive air battles and thus were unable to rack up scores as they had in World War II and Korea.[11] Air-to-air combat was neither frequent nor important in the Vietnam air war.

More significant than North Vietnamese aircraft were their surface-to-air missiles (SAMs). The American airmen first observed a North Vietnamese SAM site in April 1965, and SAMs claimed their first victim in July 1965. After the initial shock, the airmen were able to effectively counter these weapons.[12] The major impact of the SAMs, however, was to force American aircraft lower and into the sights of the North Vietnamese antiaircraft gunners.

Flak was the principal North Vietnamese weapon against US aircraft. American airmen not only underestimated the North Vietnamese defenses, they especially underestimated the impact of flak. Both were serious mistakes. Between 1965 and 1973, enemy antiaircraft artillery engaged one-fourth of all flights over North Vietnam and accounted for 66 percent of US aircraft losses over the North.[13]

The Tet offensive changed the war for the United States. Following President Lyndon B. Johnson's speech of March 1968, American

bombing of the North stopped above 20 degrees north latitude, and then, just before the November election, stopped in all of the North. Americans elected Richard M. Nixon, who began to withdraw US troops and turn the burden of the war over to the South Vietnamese.

In March 1972, the North Vietnamese attempted to knock the South Vietnamese out of the war with a massive, conventional invasion.[14] Just as the North changed the rules of the game, so did the United States. Nixon was not Johnson, and 1972 was not 1965 or 1968. Nixon's policy of détente gave him flexibility that his predecessor, who feared intervention by the Russians or more likely by the Chinese, lacked. The president made clear that he intended to punish the enemy and to use his weapons with great determination. In his words, "The bastards have never been bombed like they're going to be bombed. . . ."[15] The president not only used air power as it had not been used before, he authorized the mining of North Vietnamese ports, long requested by the military.

US air power played a major role in stopping and inflicting terrible losses on the North Vietnamese forces. As never before, American airmen had targets they could see, hit, and destroy. The impact of air power in this conventional war was awesome; the impact of air power in the North, code-named Linebacker, was also different than it had previously been.

The airmen were better able to use air power because they had fewer political restrictions, although some targets and areas continued to be denied to them.[16] More important, they had better weapons.

While introducing no new aircraft since the 1968 bombing of North Vietnam, the airmen did use other equipment that improved bombing effectiveness. The airmen began Loran bombing in 1970, which made it possible to operate in the worst weather conditions and still get bombs within hundreds of meters of the aiming point.[17] Although this was not precision bombing, it was certainly an improvement.

The most spectacular change was the introduction of guided munitions ("smart bombs") that could be placed within 10 meters or less of the target. A number of bridges that had withstood numerous, costly American strikes quickly fell to these new weapons. For example, in May 1972 four flights of F-4s dropped one span of the Thanh Hoa bridge and caused other critical damage with guided bombs. There were no losses on this strike compared with the previous 871 sorties during which 11 aircraft, but not the bridge, went down. The airmen considered the guided bombs to be ten to a hundred times more effective than unguided weapons.[18]

The Americans also introduced new equipment to give them a further edge over the North Vietnamese MiGs. A device that permitted US aircraft to identify North Vietnamese IFF (Combat Tree) was very helpful. In addition, a powerful radar and control system (Tea Ball) gave American airmen warning of the MiGs.[19]

The Americans employed new ECM and anti-SAM tactics to combat other Communist defenses. Against North Vietnamese electronics, they employed more chaff, a World War II device that still worked.[20] The Americans also changed their anti-SAM tactics (Wild Weasel) from Iron Hand (four F-105s using antiradiation missiles) to Hunter Killer teams of two F-105s with the missiles flying with two F-4s with antipersonnel cluster bombs.[21]

As the bombing took its toll in the North and the invasion of the South stalled and then was pushed back, negotiations prompted Kissinger's "peace at hand" comment on 26 October. Although peacemakers got close to an agreement, they did not get a treaty.[22]

On 14 December 1972, President Nixon gave the North Vietnamese 72 hours to get back to serious negotiations "or else." The "or else" was a three-day bombing offensive against North Vietnam Nixon ordered that

day and then changed on 19 December to an indefinite period.[23] The object of Linebacker II, the code name for the December bombing, was to get negotiations going again. The airmen had already prepared plans for such a task; in August they had studied all-weather targets suitable for attack by the B-52s. The Boeing bombers were used because they had an all-weather capability required by the winter monsoon, carried a heavy bombload, and symbolized US determination, as they were our primary nuclear bomber. The planners selected targets that would get a strong message across to the North Vietnamese and, at the same time, minimize civilian casualties. To ensure the latter, they not only picked targets to avoid population centers but established procedures (bomb runs and instructions) that would also avoid people.[24]

US airmen returned to the home of the SAMs, flak, and MiGs on the night of 18 December.[25] For three consecutive days, the script was about the same. F-111 attacks on airfields and various other targets began at 1900 and lasted about nine and one-half hours.[26] About 20 to 65 minutes later, the first of three waves of B-52s unloaded its bombs. The second wave followed about four hours later and was, in turn, followed by the third wave about five hours later. Each wave consisted of between 21 to 51 B-52s supported by 31 to 41 other aircraft, and each wave flew ex-

actly the same pattern—the same heading from the west and, after a sharp turn after bombing, the same exit heading to the west. There were also daylight attacks by Air Force, Marine, and Navy aircraft.

The bombing rocked Hanoi, but US losses rocked the airmen as well. During this opening phase, 12 aircraft went down, not a large number and certainly bearable; however, the B-52 losses, three on the first night and six on the third, were shocking. For up to this point, the Air Force had lost only one B-52 to enemy fire, although 17 had been lost to other causes. While the overall B-52 loss rate of 3 percent of effective sorties on the three missions appears acceptable, bear in mind that the loss rate on

the third mission was 6.8 percent and that the Air Force had deployed only 170 to 210 B-52s in Southeast Asia and had only 402 in service in 1972.[27] This is reminiscent of the summer and fall of 1943 over Germany.

The B-52 losses highlighted a number of problems. First, the B-52 fleet was of mixed quality, consisting of 107 of the older but modified D models and 99 of the later G models. Only half of the latter had upgraded ECM equipment, which proved to be one of the critical factors as to which aircraft got hit by the SAMs, the killers of the B-52s.[28] In addition, compared to the Ds, the Gs carried a smaller bombload, had problems with their bomb release mechanisms, and stationed their tail gunners forward with the rest of the crew and therefore depended entirely on electronics.[29]

A second problem was that the B-52s were controlled or, better put, overcontrolled from SAC headquarters in Omaha. SAC literally formed the basic battle plan and tactics thousands of miles from the actual combat. Initially SAC used a policy of no maneuvers on the bomb run, although such maneuvers often permitted aircraft to elude the SAMs.[30] SAC also mandated a "press on" procedure which dictated that bombers continue their missions despite the loss of engines, computers, and, most critically, ECM equipment.[31] Not surprisingly, with one headquarters controlling the bombers and another the support aircraft, there was a lack of coordination between the bombers and their escorts, including two instances in which B-52s fired on US aircraft.[32] Other coordination problems included US radios jammed by EB-66 ECM and friendly radar severely degraded by B-52 ECM.[33]

Third, clearly American ECM, the key to fending off the SAMs, was not doing the job.

B-52s await their crews as others take off during Linebacker II operations.
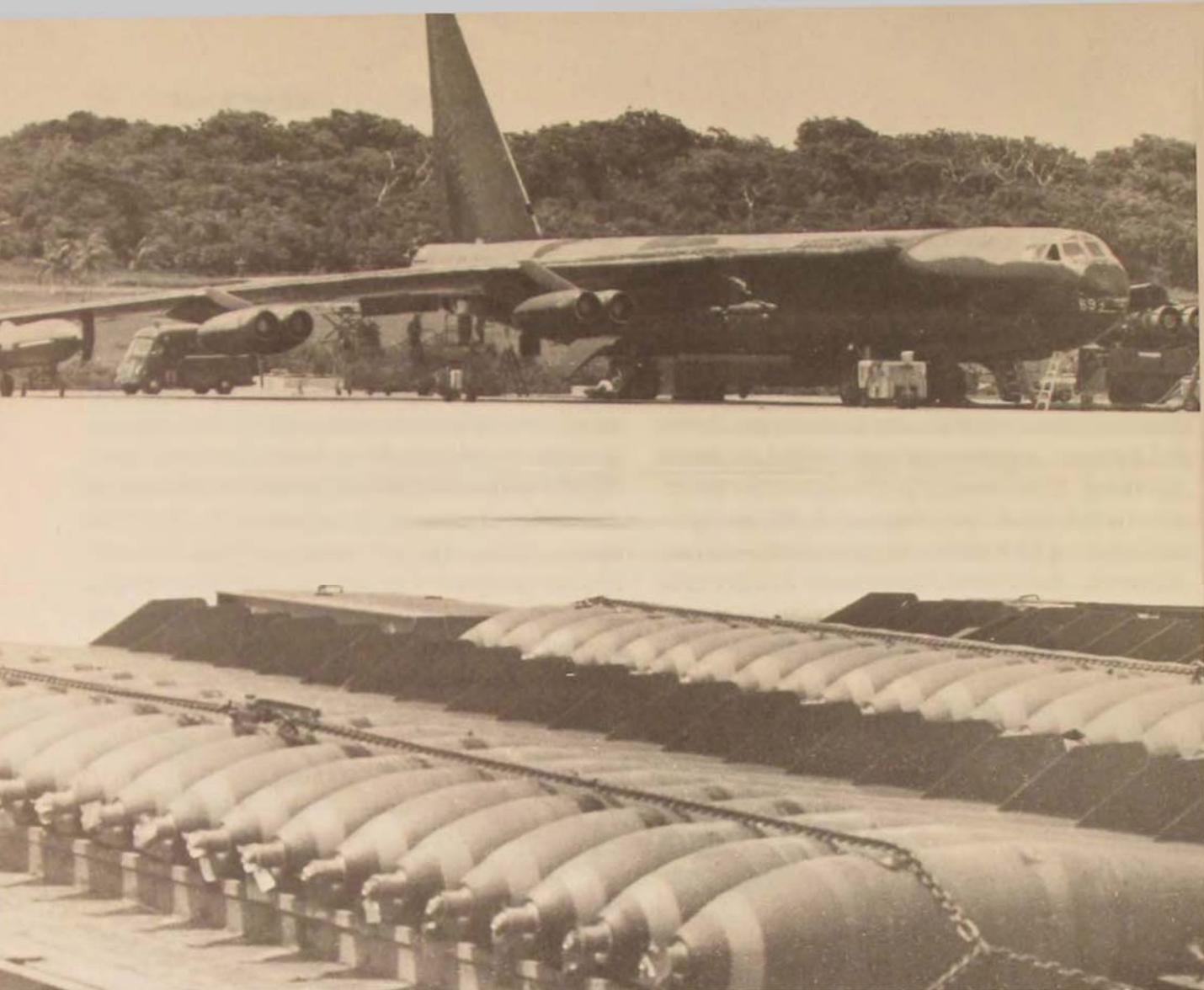
The B-52 could carry up to 105 500-pound bombs or a lesser number of 750-pounders. Either way, a B-52 strike was an awesome experience for someone on the ground.

The B-52's ECM protection markedly declined in the 100-degree turn immediately after bomb release as the bank reduced the effectiveness of the bomber's spot jammers.[34] Winds that differed from forecasts in direction and speed dispersed the chaff corridors and thus reduced ECM protection. For example, on 20 December only four of 27 B-52 cells were in chaff cover at the bomb release line, and all of the B-52s downed were 5 to 10 miles from chaff cover.[35]

There were other problems. The concentration on the MiG threat while placing the SAM threat last proved in error. But most of
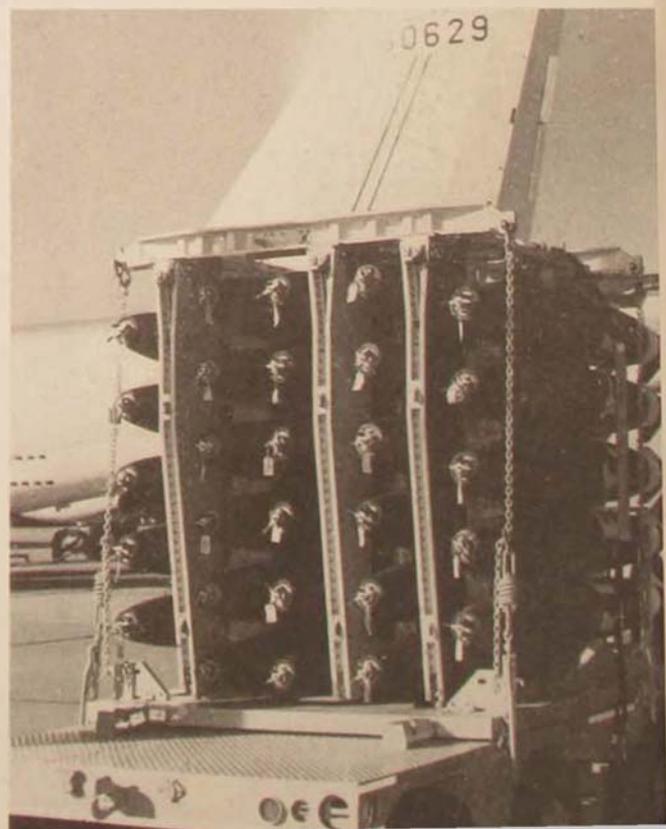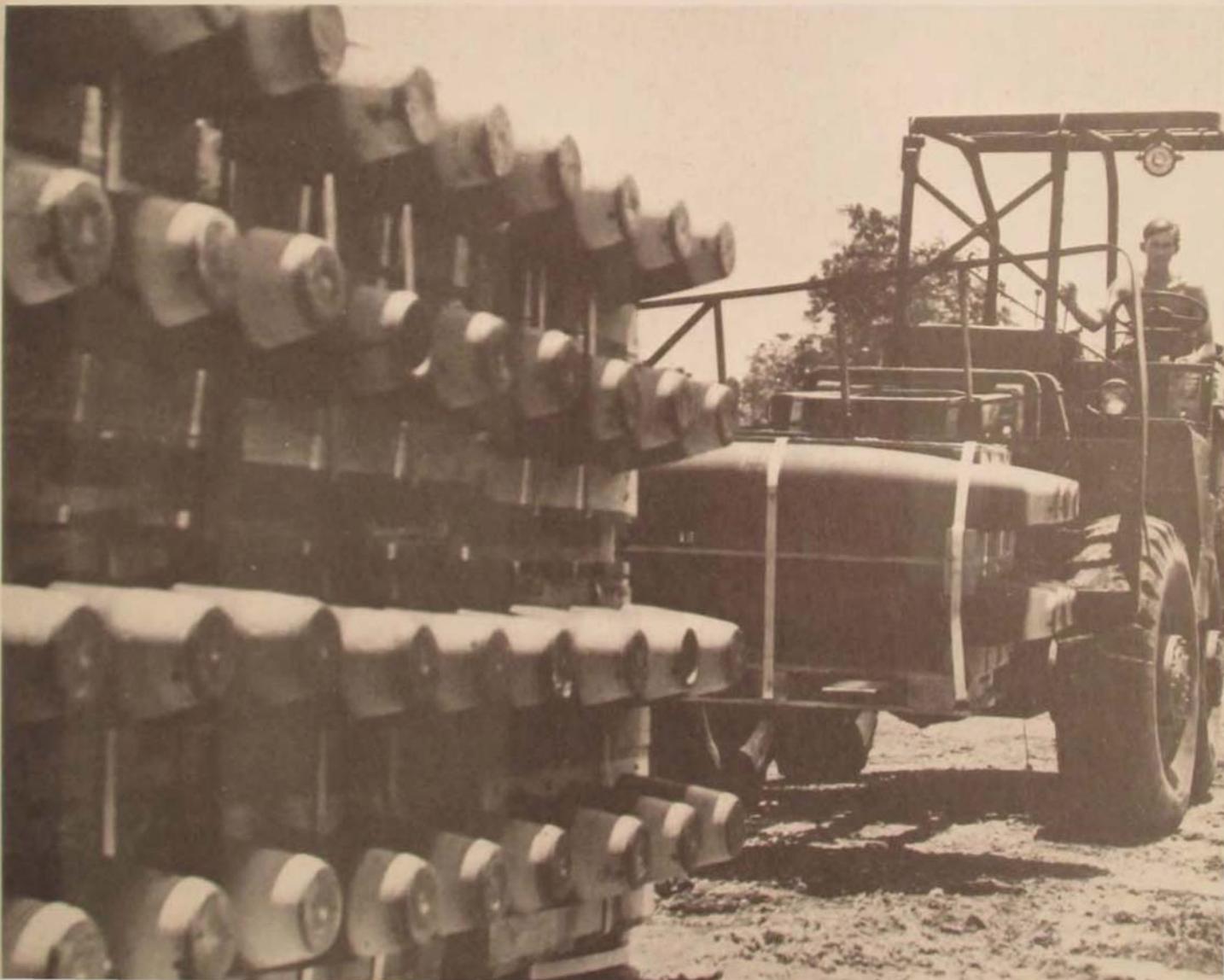
all, the bomber tactics were unvarying. I trust that the above description makes clear the fact that the bombers attacked the same way three nights in a row.

Little wonder then that the Air Force formed a tactics panel and changed tactics.[36] Although most US aircraft continued to fly their missions about the same way, this was not true for the B-52s. On the four missions between 21 and 24 December, only 30 B-52Ds were employed in a single wave. In addition, the planners varied the timing, headings, and altitudes. The airmen increased the amount

Ground crews, rushed to Thailand and Guam in Operation Bullet Shot, made Linebacker II work. The successful coordination of maintenance crews and bomb loaders was vital to the rapid turning of bombers.

of chaff, attempting to lay a chaff blanket instead of a chaff corridor. Thus, instead of 15 percent of the bombers receiving chaff protection at the bomb release point, now 85 percent did.[37] Night hunter-killer teams were first used on 23 December to better counter the SAM threat. The Air Force also quickly installed jammers and modified antiradiation missiles for use against a new band of radar ("I" band) that had surprised them.[38]

The airmen hit Hanoi with these new tactics on 21 December and lost two B-52s and one A-6A. The next three nights bombs fell on targets in Haiphong and north of Hanoi. The new tactics and new targets paid off as the airmen lost only three aircraft on these three missions. There was no bombing on 25 December, perhaps a gallant, certainly a diplo-

matic gesture that permitted North Vietnamese defenders to rearm.

The attack on 26 December was one of a kind. The United States sent 120 B-52s, the most on any of the Linebacker missions, against targets in Hanoi and Haiphong. Although supported by 99 aircraft, two B-52s went down. Following SAC's "press on" policy, both bombers attempted to attack in broken cells—that is, two-ship instead of the normal three-ship formations—and thus lacked adequate ECM power.

The remaining three missions (27–29 December) employed 60 B-52s each night, but otherwise fit the same pattern. Five aircraft (two B-52s) went down on 27 December. There were no losses on the last days.

In all, the B-52s dropped about 15,000 tons of bombs, while tactical aircraft added another 5,000 tons.[39] Because there were only 12 hours of visual conditions during the operation, the airmen aimed the bulk of their ordnance by nonvisual techniques such as radar and Loran.[40]

Linebacker II cost 27 aircraft (15 B-52s)

B-52s flew 740 sorties, and fighter-bombers added 2,000 sorties to the 11-day effort; 15 B-52s were lost, and 8 or 9 fighter-bombers went down.

and 43 crew members listed as killed or missing in action, 41 captured, and 33 recovered.[41] Compared to the 3 percent expected losses,[42] the overall loss rate of below 2 percent and a B-52 loss rate slightly above 2 percent was not all that bad. Thus, the airmen compared the loss rates in Vietnam and those of Linebacker favorably with those in World War II and Korea. Such a comparison, however, obscures the significant fact that Vietnam-era aircraft were much more expensive than their predecessors while inventories and aircraft production were much smaller.[43]

Nevertheless, American airmen throttled two parts of the North Vietnamese air defenses. The small Communist air force launched 32 aircraft, attempted interceptions with 20, but scored no hits on the B-52s and downed only two F-4s for the loss of six MiGs.[44] American tactics (ECM, night, and high-altitude operations), bad weather, and fighter escort nullified the MiGs. All but the latter also largely nullified North Vietnamese flak, which damaged only one B-52 and downed

For the first few days of Linebacker II, SAM defenses remained intact, inflicting higher losses than were expected. Once the North Vietnamese air defense system was wrecked, B-52s could fly over Hanoi and Haiphong with relative impunity.
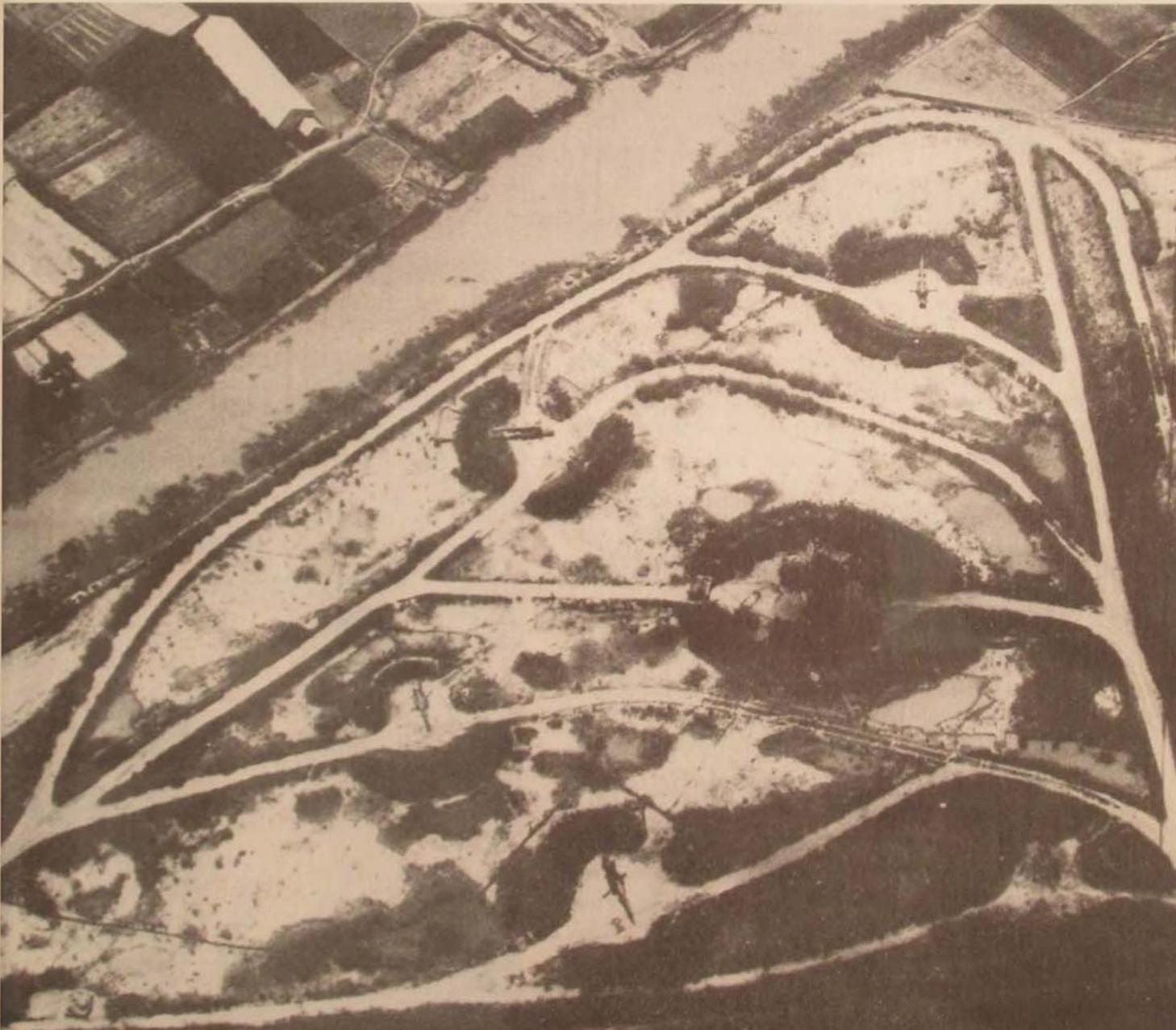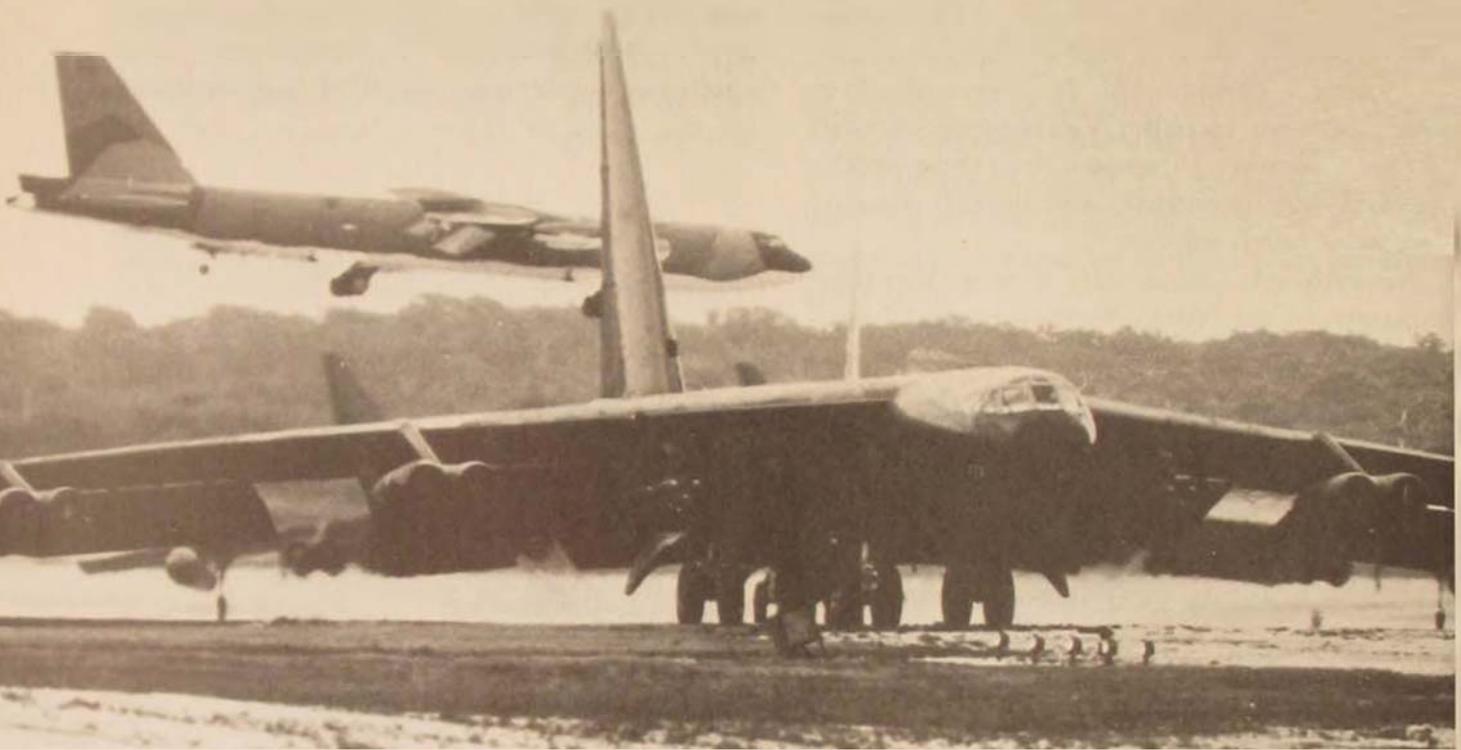
three tactical aircraft.[45] But if the American airmen adequately handled the flak and fighter threats, the same cannot be said of the SAMs.

SAMs downed all 15 B-52s lost, as well as three other aircraft.[46] The American airmen, however, did not target the SAM sites until the sixth mission on 23 December and did not attack them again until 27 December, when B-52s and F-111s attacked the most effective single SAM site.[47] The B-52 and F-111 attacks on SAM sites continued on the last two days of the operation, along with attacks on SAM storage facilities. Despite these efforts, intel-

ligence estimated that only two sites were 50 percent damaged, eight were undamaged, and results against three were unknown. The Americans credited one site with downing five to nine B-52s. As a result, American bomber crews were briefed on 27 December to fly well clear of that location.[48] It should be noted that only 3 percent of the bombs fell on SAM targets as compared with 5.3 percent that fell on airfields.[49] The saving grace was that by 29 December the North Vietnamese had run out of SAMs, leaving the North essentially defenseless.[50]
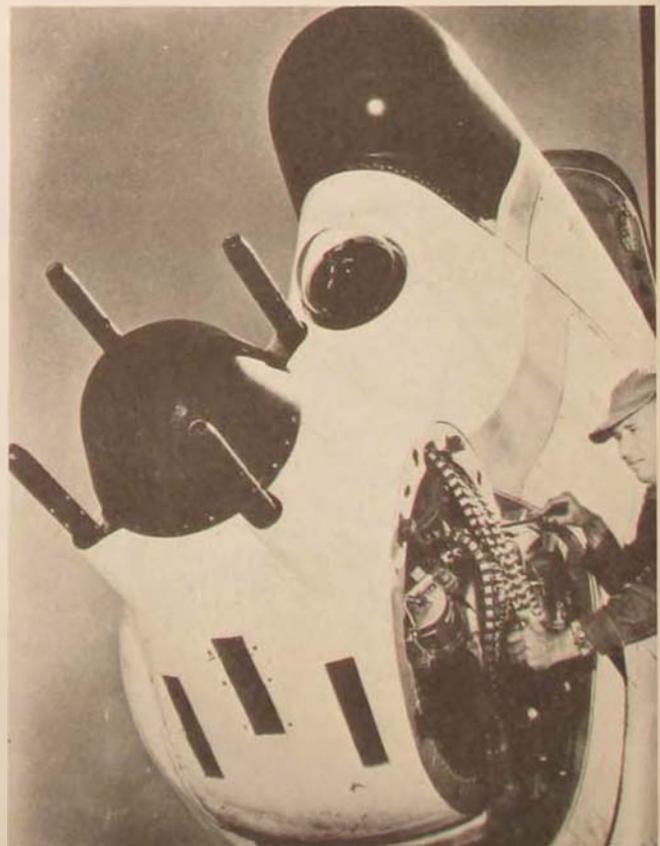
The efficiency of the bombing can be measured not only by low US casualties but also by low civilian casualties. Despite sensational press headlines and North Vietnamese propaganda statements, bombing accuracy was good.[51] We have not only the evidence of aerial photographs and observers but also the North Vietnamese statement that 1,623 civilians were killed. If the World War II experience had held true, the expected civilian losses from 20,000 tons of bombs would have been between 10,000 and 40,000 killed.[52]

There are some who believe that at this point we could have named our terms.[53] Others insist that had we used air power in this manner earlier, the war would have ended earlier.[54] Another author sees Linebacker II as a classic example of the use of military force to achieve a political end quickly.[55] Others think it was an exercise in futility: morally bankrupt, militarily ineffective, and diplomatically unnecessary.[56] Many assert that the bombing brought the North Vietnamese back to the negotiations.[57]

What did the bombing achieve? On the diplomatic front, the North Vietnamese returned to the peace talks apparently with a different attitude. This was the purpose of the bombing, and there were changes to the final treaty. We got what we wanted—our POWs out, the South Vietnamese onboard, and some face

saving. The North Vietnamese got us out; the South Vietnamese got some assurances from the United States.[58] However, the bottom line remains that there were no substantial changes from the agreements made in October.[59]

On the military front, Linebacker II was clearly an outstanding feat of arms. After years of restrictions and frustrations, American airmen were able, in typical blunt American fashion, to take on and defeat a formidable air defense system directly. For the United States, and especially the airmen, this was a proud, satisfactory way to "end" the war, or at least to end American involvement. But the tactical aspects, the "victory," should not obscure the fact that strategic bombing did not achieve decisive ends in Vietnam.

Could bombing have been decisive? Those who believe so emphasize the lack of political will by the civilian decision makers, at least up until December 1972. These critics underestimate the power of public opinion in a democracy, both domestically and internationally, and clearly Johnson felt very much constrained in both areas. He also feared, with good reason, the reactions of the Russians and Chinese. Certainly political factors restricted American use of air power.

Nevertheless, strategic bombing of North Vietnam was unable to achieve decisive results for two other reasons. First and foremost, there were no vital strategic targets in the North, with the possible exception of people. Second, American airmen were neither adequately equipped nor tactically ready to carry out decisive nonnuclear operations. Linebacker II was not, and could not be, decisive in the Vietnam War.

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Notes

Information in brackets is the call numbers for the Air University Library (AUL) and the USAF Historical Research Center (USAFHRC), both at Maxwell AFB, Alabama.

1. *The Pentagon Papers*, the Senator Gravel edition (Boston: Beacon Press, 1975), vol. 3, 269.

2. U.S. Grant Sharp, *Strategy for Defeat: Vietnam in Retrospect* (San Rafael, Calif.: Presidio Press, 1978), xiii, xvii, 271; Lou Drendel, *...And Kill MiGs: Air to Air Combat in the Vietnam War* (Carrollton, Tex.: Squadron/Signal Publications, 1984), 8.

3. *Pentagon Papers*, vol. 3, 294–95; David Halberstam, *The Best and the Brightest* (New York: Random House, 1972), 367–68; conversation with Richard Kohn, chief of Air Force History, June 1986; Lou Nordeen, *Air Warfare in the Missile Age* (Washington, D.C.: Smithsonian Institution Press, 1985), 15, 18.

4. Senate, Committee on Foreign Relations, *Bombing as a Policy Tool in Vietnam: Effectiveness*, 92d Cong., 2d sess., 1972, 19 [CIS 9382–21 10/72].

5. *Pentagon Papers*, vol. 4, 136, 225–26.

6. Ibid., 6, 62, 115, 168, 180, 222, 225; Project CHECO, "Linebacker: Overview of the First 120 Days," 1973, 6 [AUL M38245-221], "Summary of Responses to NSSM–1," *Congressional Record*, 92d Cong., 2d sess., 1972, pt. 13:16773.

7. For especially sharp criticism of the airmen, see Hanson Baldwin, "Introduction," in Jack Broughton, *Thud Ridge* (Philadelphia: Lippincott, 1969), 12–13; and Dana Drenkowski, "Operation Linebacker II," *Soldier of Fortune*, September 1977.

8. The F-105 was poorly designed with essentially no backup for its vital hydraulic controls. Of 617 Air Force aircraft lost over North Vietnam, 280 were F-105s. Michael McCrea, "U.S. Navy, Marine Corps, and Air Force Fixed-Wing Aircraft Losses and Damage in Southeast Asia (1962–1973)," 1976, 6–47 [AUL M31914-22 #305]. In addition to a total of 334 F-105 combat losses in Southeast Asia, there were 63 operational losses. John Granville, "Summary of USAF Aircraft Losses in SEA," 1974, 22, 36, 57 [USAFHRC K417.042-16].

9. Broughton, 22, 96,; William Momyer, *Air Power in Three Wars* (Washington, D.C.: Department of the Air Force, 1978), 126.

10. This was half of North Vietnam's MiG-21 inventory. James Eastman et al., eds., *Aces and Aerial Victories: The United States Air Force in Southeast Asia, 1965–1973* (Washington, D.C.: Government Printing Office, 1976), 35–42.

11. In 1968, the American advantage in air-to-air kills to losses had fallen to a mere 1.4:1. As a result, the Navy instituted its now well-known "Top Gun" program in March 1969 and afterwards did much better, raising its kill ratio from 2.4:1 (1965–68) to 12.5:1 (1969–73). The Air Force did not do as well in this arena, its kill-to-loss ratio declining from 2.25:1 up through 1968 to 2:1 after 1968, although in fairness, its area of operations and opposition proved more difficult than the Navy's. "Southeast Asia Air-to-Air Combat," *Armed Forces Journal International*, May 1974, 38. Air-to-air combat proved different from forecasts; for example, missiles didn't work all that well. The Air Force success rate was 10.5 percent hits per attempt. Military Assistance Command Vietnam, "Uncoordinated Draft: [Linebacker Study]," 1973, 6 [USAFHRC K712.041-19]. In World War II, USAAF fighters had a 3.55:1 edge in air-to-air combat against Germany and 4.25:1 against Japan. The Navy and Marine Corps ratio against Japan was 12.97:1. USAAF, *Army Air Forces Statistical Digest: World War II* (Washington, D.C.: Office of Statistical Control, 1945), 255–61, 263-68; "Statement by Admiral Louis E. Denfeld, USN, Chief of Naval Operations, on Occasion of 37th Anniversary of Naval Aviation," 9 May 1949, 8 [Naval Historical Center]. In the Korean War, Air Force fighter pilots ran up a 6.82:1 score of victories to losses in air-to-air combat. Larry Davis, *Mig Alley: Air to Air Combat Over Korea* (Carrollton, Tex.: Squadron/Signal Publi-

cations, 1978), 70; "USAF Credits for the Destruction of Enemy Aircraft Korean War," USAF Historical Study No. 81, 1975.

12. Losses-per-missile fired dropped from 5.7 percent in 1965 to under 1 percent in 1968. In 1972 the rate rose to 1.15 percent. Momyer, 136; McCrea, 2–21, 2–22.

13. A further 15 percent fell to SAMs, 7 percent to MiGs, 2 percent to friendly causes, and 10 percent to unknown causes. McCrea, 6–29, 6–46, 6–55; Granville, 11.

14. The North Vietnamese introduced new weapons such as the SA-2 and SA-7 (SAMs), 130-mm long-range artillery, and AT-3 (guided antitank missiles) into the fighting in the South. A. J. C. Lavalle, ed., *Airpower and the 1972 Spring Invasion* (Washington, D.C.: Government Printing Office, 1985), 4.

15. Seymour Hersh, *The Price of Power: Kissinger in the Nixon White House* (New York: Summit Books, 1983), 506; Richard Nixon, *RN: The Memoirs of Richard Nixon* (New York: Grossett and Dunlap, 1976), 606–07.

16. Guenter Lewy, *America in Vietnam* (New York: Oxford University Press, 1978), 410; Hersh, 526.

17. Tactical Air Command, "SEA Tactics Review Brochure," II, 68 [AUL M41737-283].

18. Guided weapons, however, were expensive, limited by the weather, and few in number. CHECO, "Linebacker," 21–27; Nordeen, 59, 63; Jeffrey P. Rhodes, "Improving the Odds in Ground Attack," *Air Force Magazine*, November 1986, 48.

19. These measures helped reverse the less-than-sensational Air Force exchange rate from 18 Air Force aircraft lost to 24 MiGs downed between February and July 1972 to 5:19 from August to 15 October. Karl Eschmann, "The Role of Tactical Air Support: Linebacker II," Air Command and Staff College thesis, 1985, 28, 30 [AUL M43122 E741r].

20. The US Navy had used chaff in the 1965–68 campaign, but the Air Force had not because it lacked a suitable dispenser. During Linebacker, Air Force aircraft dropped the Christmas tree-like tinsel using both airborne canisters (June 1972) and bombs (August 1972). Momyer, 129; MACV, "Uncoordinated Draft"; Nordeen, 24.

21. TAC, "SEA Tactics," II, 78.

22. During the bombing from March through October 1972 called Linebacker and later Linebacker I, the Air Force flew 9,315 sorties and dropped 155,500 tons of bombs on the North. The United States lost 63 aircraft (22 to MiGs, 20 to SAMs, and 21 to flak), and in exchange downed 40 MiGs. CHECO, "Linebacker," 70–72; R. Mark Clodfelter, "By Other Means: An Analysis of the Linebacker Bombing Campaigns as Instruments of National Policy," Master's thesis, University of Nebraska, 1983, 77.

23. Marvin and Bernard Kalb, *Kissinger* (Boston: Little, Brown, 1974), 412; Clodfelter, 105, 111.

24. W. Hays Parks, "Linebacker and the Law of War," *Air University Review*, January–February 1983, 16; Nixon, 734.

25. Broughton, 36.

26. Details on the Linebacker II missions are drawn from [Headquarters Air Force], "Briefing Books," 2 vols. [USAFHRC K143.042-12].

27. Norman Polmar, ed., *Strategic Air Command: People, Aircraft and Missiles* (Annapolis, Md.: Nautical and Aviation Publishing Company of America, 1979) 126; Granville, 18; Lavalle, 30; James McCarthy and George Allison, *Linebacker II: A View from the Rock* (Maxwell AFB, Ala.: Airpower Research Institute, 1979), 12; Eschmann, 70–72.

28. Eschmann, 49, 70–72; McCarthy and Allison, 86. On these first three missions, 1.6 percent of the Ds and 4.9 percent of the Gs went down per sortie. In the entire 11-day campaign, the Ds suffered 1.8 percent and the Gs 2.7 percent losses. About 10 percent of the missiles fired against the Gs impacted, while only 3 percent of those fired against the Ds did likewise. [Headquarters Air Force], "Briefing Books," I and II; Operations Analysis, "Line-

backer II Air Operations," 31 January 1973 [USAFHRC K168.06-232].

29. The gunners on B-52Ds were stationed in the tail, where they used either electronic or visual sighting. McCarthy and Allison, 70; Eschmann, 49.

30. This policy quickly changed beginning with the second wave on the second day. McCarthy and Allison, 46–47.

31. Robert Clement, "A Fourth of July in December: A B-52 Navigator's Perspective of Linebacker II," Air Command and Staff College thesis, 1984, 18, 49; McCarthy and Allison, 30, 32.

32. USAF, "Linebacker USAF Bombing Survey," 1973, 35 [USAFHRC K717.64-8]; TAC, "SEA Tactics," II, 77; Eschmann, 60.

33. Eschmann, 60, 63; Clodfelter, 121.

34. TAC, "SEA Tactics," II, 76.

35. SAC briefing, "Chaff Effectiveness in Support of Linebacker II Operations," March 1973 [USAFHRC K168.06-223].

36. "The Battle for the Skies Over North Vietnam: 1964–1972," 94 [USAFHRC K239.043-14].

37. "Chaff Effectiveness."

38. Ibid. For a general discussion of the changes, also see Clement, 49; Eschmann, 75–76; McCarthy and Allison, 97, 121; 388th Tactical Fighter Wing History, October–December 1972, 27, 32-33 [USAFHRC K-Wg-388-H October–December 1972].

39. B-52s flew 708, F-111s 148, A-7s 226, and F-4s 283 effective sorties. [Headquarters Air Force], "Briefing Books," II.

40. During the limited visual conditions, the TAC fighters scored some remarkable successes, most notably hitting two especially difficult targets, the Hanoi thermal plant and Radio Hanoi. The latter, protected by a 25-foot-high and 10-foot-thick blast wall, had survived the bombing of 36 B-52s. F-4s got four laser-guided bombs inside the walls and destroyed the target. Clodfelter, 120; Assistant Chief of Staff Intelligence, "Linebacker II: 18-29 Dec '72," Supporting Document III-K1 [USAFHRC TS-HOA-74-197].

41. History of Air Force Intelligence Service, 1 July 1972–30 June 1973: Linebacker II Summary III, K2 [USAFHRC K142.011]; Center for Naval Analyses, "U.S. Navy, Marine Corps, and Air Force Fixed Wing Aircraft Losses and Damage in Southeast Asia (1962–1973), pt. 1: List of Aircraft Lost," 1977, 191-93, 223, 488-92 [AUL M31914-22 #305 (a) v.1]. Eschmann, 103–04, lists 30 aircraft destroyed, including three lost in accidents. Eastman, 17, states that 27 Air Force aircraft were lost. The North Vietnamese claimed that 81 US aircraft (34 B-52s) went down. Gareth Porter, *A Peace Denied: The United States, Vietnam, and the Paris Agreements* (Bloomington: Indiana University Press, 1975), 161–62. Richard Holloran, "Bombing Halt Brings Relief to B-52 Crews in Guam," *New York Times* (2 January 1973), 3. Drenkowski, pt. 2, 55, says that 22 to 27 B-52s were destroyed.

42. Clodfelter, 108; Clement, 47.

43. [Headquarters Air Force], "Briefing Books," I and II.

44. Eschmann, 108; Carl Berger, ed., *The United States Air Force in Southeast Asia: 1961–1973* (Washington, D.C.: Government Printing Office, 1977), 98; Drendel, 47, 73; "Chaff Effectiveness"; McCarthy and Allison, 65, 116; Eastman, 125.

45. Eschmann, 46.

46. The North Vietnamese did not have the most modern equipment. In the 1973 Middle East war the Egyptians and Syrians inflicted heavy losses on Israeli aircraft with the Soviet SA-6, a missile not seen in the Vietnam War. The North Vietnamese may have improved and manned their defenses without the help or knowledge of the Soviets. Porter, 161. Jon M. Van Dyke, *North Vietnam's Strategy for Survival* (Palo Alto, Calif.: Pacific Books, 1972), 61, 217.

47. On the third day of the campaign, a SAC commander or-

dered a search for North Vietnamese SAM storage facilities. Within 18 hours, the intelligence people began to find them, whereupon SAC requested JCS permission to bomb them. Permission for all but one was forthcoming, although it took another 24 to 36 hours. As a result, these targets weren't hit until 26 December. McCarthy and Allison, 97–98.

48. Ibid., 155; Eschmann, 94; George Allison, "The Bombers Go to Bullseye," *Aerospace Historian*, December 1982, 233.

49. While several helicopters and transports were destroyed on the ground, intelligence claimed that only two to three MiG-21s were damaged. The bulk of the bombs fell on railroad yards (44 percent) and storage facilities (30 percent). ACSI, "Linebacker II"; "Linebacker USAF Bombing Survey," 3, 14, 16–17, 40–43.

50. Clodfelter, 127. The airmen had also run out of worthwhile targets in the Hanoi-Haiphong area. McCarthy and Allison, 163.

51. For a detailed study of the press reporting of the Linebacker II offensive, see Martin Herz, *The Prestige Press and the Christmas Bombing, 1972* (Washington, D.C.: Ethics and Public Policy Center, 1980). Other samples include: Kalb and Kalb, 416; Clodfelter, 117–18; "Nixon Blitz Leads to the Table," *Time*, 8 January 1973, 9–13; "Outrage and Relief," *Time*, 8 January 1973, 14.

52. In World War II, two Japanese civilians were killed for every ton of bombs dropped, one German was killed for every two tons of bombs, and one Briton was killed for every ton of bombs. United States Strategic Bombing Survey, *Over-all Report (European War)*, (Washington, D.C.: Government Printing Office, 1946), 1; United States Strategic Bombing Survey, *Summary Report (Pacific War)* (Washington, D.C.: Government Printing Office, 1946), 16-20; Hans Rumpf, *The Bombing of Germany* (London: Frederick Muller, 1963), 154–65; R. J. Overy, *The Air War, 1939–1945* (New York: Stein and Day, 1980), 120. The North Vietnamese also evacuated many civilians from Hanoi and Haiphong. Clodfelter, 123.

53. Thomas Moorer, "The Christmas Bombing of Hanoi—or How the POWs Got Home," *Naval Aviation Museum Foundation*, March 1981; Sharp, 258; Alan Dawson, *55 Days: The Fall of South Vietnam* (Englewood Cliffs, N.J.: Prentice-Hall, 1977), 123.

54. "What Christmas Bombing Did to North Vietnam," *US News and World Report*, 5 February 1973, 18; Alan Gropman, "Airpower in Vietnam: Lost Opportunities," paper delivered 17 January 1986, Raleigh, N.C., 39; George Keegan in *The Lessons of Vietnam*, ed. W. Scott Thompson and Donaldson Frizzell (New York: Crane, Russak, 1977), 143; Barry Goldwater, "Airpower in Southeast Asia," *Congressional Record*, 93d Cong., 1st sess., 1973, pt. 5:5346; *Vietnam Settlement: Why 1973, Not 1969?* (Washington, D.C., 1973), 190; Douglas Pike, "The Other Side," n. 77, and Alan Gropman, "Commentary: The Air War," 84 (both in Peter Braestrup, ed., *Vietnam As History: Ten Years After the Paris Peace Accords* [Washington, D.C.: University Press of America, 1984]).

55. Dave R. Palmer, *Summons of the Trumpet: US-Vietnam in Perspective* (San Rafael, Calif.: Presidio Press, 1978), 259.

56. Porter, 137, 158–59.

57. "Moorer on Airpower," *Aviation Week*, 17 September 1973, 7; Gropman, "Airpower," 39; Lewy, 414–15; Momyer, 243; Clodfelter, 131–32; Timothy Lomperis, *The War Everyone Lost—And Won: America's Intervention in Viet Nam's Twin Struggles* (Baton Rouge: Louisiana State University Press, 1984), 94; Porter, 136–37, 156-65; *Vietnam Settlement*, 120–21; Allan E. Goodman, *The Lost Peace: America's Search for a Negotiated Settlement of the Vietnam War* (Stanford, Calif.: Hoover Institution Press, 1978), 161–63.

58. Kalb and Kalb, 418, 421–22; Arnold Isaacs, "Discussion," in Braestrup, 87.

59. It would be ahistorical to maintain, however, that the same terms could have been reached in October.

ADAPTIVE MISSION PLANNING
squeezing out greater combat capability

COL DAVID F. SEARES

No war has ever been fought according to plan. Commanders who have witnessed or studied the dynamics of military conflict are acutely aware of the difficulty in looking beyond the first encounter. Rigid planning for the application of land, sea, or aerospace power against a predictably unpredictable enemy achieves randomly successful results. Given the high-tech, highly mobile military forces of today, adaptive mission planning, or lack thereof, is a crucial force multiplier (or Achilles' heel) in determining the ultimate victor in a conflict. Adaptive mission planning is a viable means for

managing forces during a battle—a means for squeezing greater combat capability out of our forces. We must be prepared to fight outnumbered and win. That prospect requires effective employment of limited military resources, which demands the kind of leverage available from adaptive planning.

Policy

The mandate for adaptive mission planning is clear. Initially spelled out in presidential directives, there is an absolute requirement—whether in peacetime or at war—to make our war-planning systems more responsive to changes in policy and direction, in the threat, or in friendly forces.[1] These directives indicate that enemy perceptions about our warfighting capabilities are likely influenced by the demonstrated agility of our planning system and that we must be viewed as being adaptive—that is, capable of rapid and effective planning of a dynamic force against a dynamic enemy target system. Faster and better mission planning constitutes a force multiplier that enhances deterrence.

Adaptive Mission-Planning System (AMPS)

An adaptive mission-planning system (AMPS) is defined as an end-to-end, man-machine system for planning missions in a dynamic, and in some cases, time-compressed environment. A mission-planning system is adaptive if it provides timely and effective responses to changes in policy and direction, in the threat, or in friendly forces. An AMPS could respond to an order received from the highest civilian or military command authorities down to the executing unit, crew, or soldier. An AMPS should be viewed as an on-the-spot hedge against the unexpected, whether the unexpected occurs during peacetime or in military conflict.

The data transmissions depicted in the accompanying AMPS model are both end-to-end and interactive. The end-to-end, one-way arrows indicate how planning data flow clockwise from functional element to functional element for AMPS processing. The interactive, two-way arrows indicate how AMPS functional areas (situation assessment, mission planning, and system employment) cross-feed real-time information to effect adaptive planning outcomes. Thus, the transmission of data between the AMPS functional elements constitutes the adaptive planning process (not unlike any planning process); and the transmission of data between the AMPS functional areas constitutes the modification of the process (or the update of the system's knowledge base).

The functional areas and elements shown in the AMPS model are representative of all military mission-planning systems. Depending on the planning system modeled, information flow can be entirely manual or mostly automated, but people are always involved. To replan a weapon system, the mission-planning system must first assess the situation. It must collect information on both enemy and friendly forces and constantly correlate it with policy and direction received from higher levels of command authority. There must then be intelligence production in which all pertinent information derived from the collection/direction function is tailored for the intended user. Within the functional area of mission planning, the system constructs target aimpoints to optimize weapon effectiveness and selects and routes weapon delivery systems with appropriate employment tactics to help ensure mission success. During weapon system employment, the battle unit operates and monitors the weapon system that executes the mission. Reconnaissance to measure mission results updates the situation assessment functional area, recycling the planning system.

A mission-planning system may accommodate either deliberate (scheduled) or ad hoc (unscheduled) planning and may operate in

Adaptive Mission Planning System (AMPS)
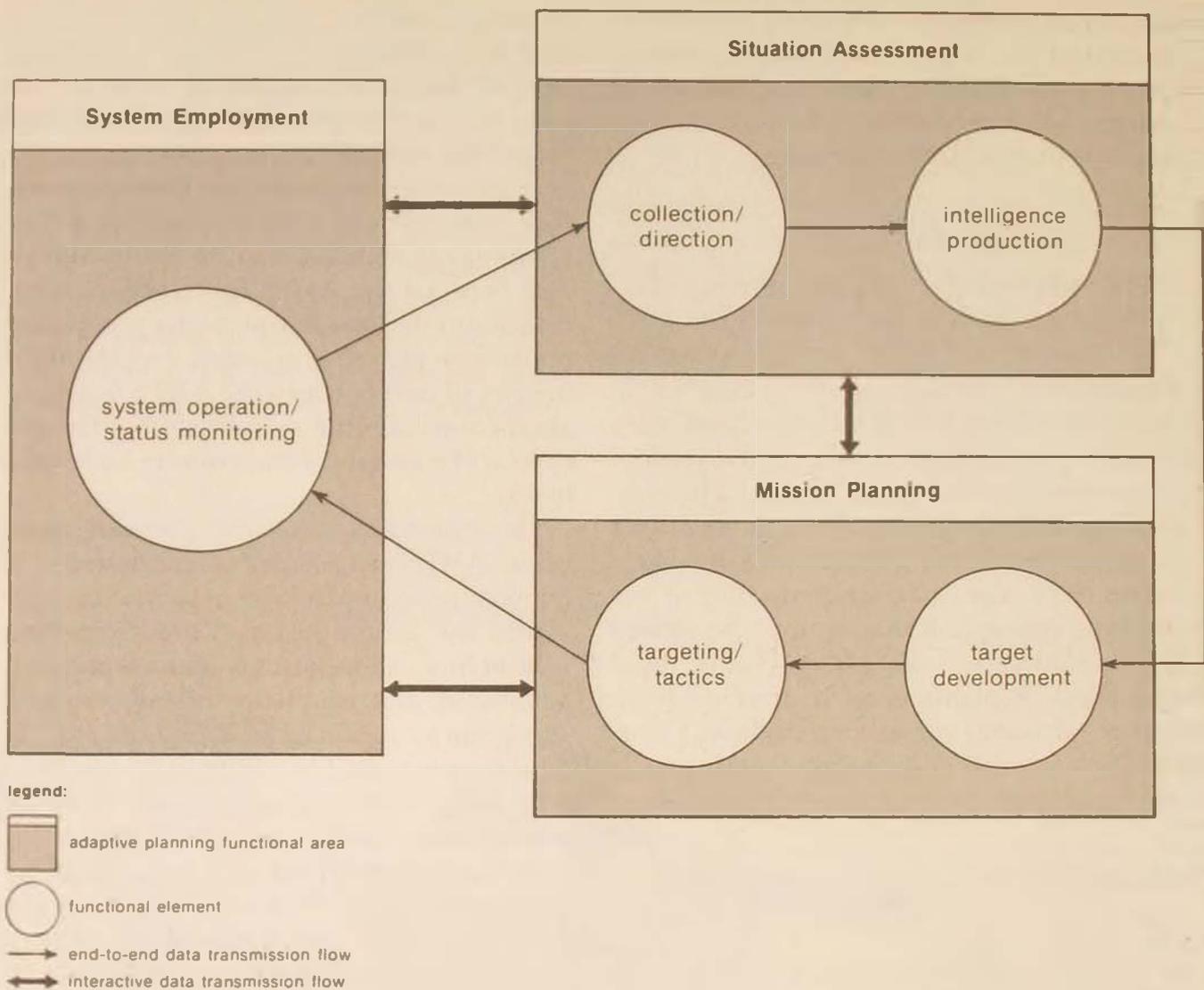
either a benign or hostile environment. Mission planning can occur at a headquarters or in a unit on the ground, in the air, in space, or at sea. Mission-planning systems must interact with other mission-planning systems. For example, the deployment of a B-52 bomber to the theater for conventional weapons employment requires the linkage of Strategic Air Command and theater mission-planning systems. Even though traditional and adaptive mission-planning system architectures have quite similar functional areas and elements as

well as operating environments, the military strategies these planning systems are capable of supporting (and hence their respective information flow requirements) are remarkably different.

A traditional mission-planning system plods methodically and sequentially from functional element to functional element and is usually adequate for peacetime, schedule-driven, detailed, a priori planning that responds periodically to changes in policy, threat, and forces. Unfortunately, the rigor in

the traditional planning process that promotes standardized mission planning and quality control during peacetime also discourages interaction between the functional areas, and thus inhibits system responsiveness to battlefield dynamics. The AMPS, however, can be highly interactive. The ability of its functional areas to adapt quickly, both to new planning data entering the system and to real-time information generated by the other functional areas, allows the system to be the best that it can be. In general, a degree of quality control may be sacrificed to achieve speed on the grounds that a good, timely plan is much better than a perfect plan that is too late to accomplish its intended purpose.

Requirement for AMPS

Adaptive planning, however desirable, may not be appropriate or cost-effective in every mission-planning situation. As just discussed, the scheduled development of a major plan such as the single integrated operational plan (SIOP), produced annually by the Joint Strategic Target Planning Staff (JSTPS) at Headquarters SAC, should be accomplished with traditional end-to-end planning methodology. JSTPS planners typically receive early forecasts about impending changes in the planning parameters (policy, threat, and forces), giving them ample time to effect necessary changes to the SIOP. High standards for quality control are set and achieved throughout the SIOP planning cycle. Conversely, whenever an unexpected change occurs in one of the strategic parameters and the change is of sufficient priority to dictate prompt action, traditional planning methods may be inadequate. Without an AMPS, untimely mission replanning could portend the specter of defeat on the battlefield unless we possess overwhelming superiority over the enemy. For example, target data bases may not reflect the latest position of relocated enemy forces, or our attacking weapon systems

may suffer an unacceptable level of attrition. We could well end up applying the wrong measure of force against the wrong targets at the wrong time. The more rapidly the crisis unfolds, the greater the need for adaptive mission planning.

Principles for Developing an AMPS

When developing an AMPS, the vital system attribute we seek is flexibility, which can be achieved by applying the following principles.

Design an "Expert System"

An "expert system" is a computer program that uses knowledge and inference procedures to solve difficult problems that require significant human expertise for their solution. The knowledge necessary to perform at such a level, plus the inference procedures used, can be thought of as a model of the expertise of the best practitioners of the field.[2] Knowledge-based technology is an attractive engineering approach to complex problems that require time-urgent solutions. Adaptive planning is fertile territory for practical application of this technology. By allowing the diverse intellect of the mission-planning community (intelligence specialists, logisticians, targeteers, tacticians, communicators, unit plans officers, and crew members/soldiers) to define the data bases and rules for an AMPS, there is far more confidence in the practical worth of the ultimate product. The idea is to project the "experts" into the weapon system (e.g., the cockpit), not to usurp the responsibilities of the weapon system operator but to enhance his timely execution of those responsibilities. A knowledge-based AMPS increases speed with minimum loss of efficiency. By allowing the system to make certain inferences, data bases and system logic can be streamlined. Such data compression also allows for more compact systems and therefore greater

system mobility—a definite plus for a battlefield planning element.

An interesting side benefit of applying knowledge-based technology to adaptive planning is the resulting adaptability of the system itself. Military experts—the users more than the engineers—must continuously inject their knowledge into an AMPS by designing and updating the system rules for situation assessment, mission planning, and system employment. Their efforts are expected to pay great dividends. As the AMPS is tested and operated in a battlefield environment, user understanding of AMPS logic would allow for real-time modifications within certain constraints. The AMPS could be programmed to accept operator changes that fall within predefined system or procedural limits.

Decentralize Control and Execution

As one can see in the AMPS model, there are real possibilities for applying autonomous or semiautonomous, decentralized control and execution—frequently at the operator level. Even under the stringent constraints of nuclear warfare, there are significant opportunities for AMPS application, such as in a dispersed command center or a strategic bomber. Given the preservation of legal, centralized authority over the execution of certain weapon systems (e.g., presidential purview of the release of nuclear weapons), decentralized control and execution, where allowable, are needed for adaptive mission planning. As long as the weapon system operator's decision to redirect his mission—based on an adaptive planning input—can be coordinated and deconflicted* with the arrival of other friendly forces, decentralized control and execution build greater timeliness and flexibility into force employment tactics

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*This term refers to the proper timing of weapons arrival on target to prevent these weapons from destroying each other.

and procedures. If given this much responsibility, the operator must have a user-friendly, partially autonomous AMPS. Routine AMPS mission changes could be programmed for autonomous operation; mission-critical changes could be executed only on operator command (semiautonomous).

A High-Leverage AMPS Application: The Strategic Bomber

The SAC bomber is a good candidate for an onboard AMPS. Despite having a "man-in-the-loop," this most flexible leg of our strategic Triad currently flies highly structured missions that are preprogrammed for each aircraft's offensive avionics system (OAS). Once the bomber is airborne, we lack the flexibility we need to change the mission. Should a mission proceed according to plan, the OAS would contribute significant accuracy to weapons employment; but we all know that no mission ever goes exactly according to plan. Accuracy without flexibility fails to account for the unexpected and could diminish the employment contribution of any force. The battlefield faced by the bomber force is dynamic; enemy defenses and enemy targets will relocate and new directions from higher headquarters must be processed. Almost anything could happen. A viable on-board AMPS, if combined with evolutionary improvements to aircraft sensors and command, control, and communications (C^3) systems, would improve the weapon system's capability to deal with these eventualities.

The concept of operations for an AMPS-assisted bomber shifts much of the responsibility for mission success from outside to inside the aircraft. The AMPS situation-assessment module would receive and process new information from aircraft sensors and external sources (overhead sensors, higher headquarters, or other aircraft), correlate this new data with other significant events, and, when necessary, inform the crew. If warranted, the

AMPS mission-planning module would calculate a mission change and display it to the crew. The AMPS system-employment module would execute a critical mission change on crew command or a noncritical mission change by implied consent. Following execution, the AMPS would update affected data bases and report selected actions to external agencies such as higher headquarters or other bombers.

The viability of a bomber AMPS would depend on the careful application of the two principles discussed earlier: (1) an expert system, designed within the constraints of nuclear surety, and (2) decentralized control and execution. The first principle requires a "knowledge engineer" to work with the experts (strategic planners and crew members) to develop the rules that the AMPS can manipulate. "The knowledge base in an expert system stores more than just facts; it also contains heuristic knowledge which replicates the expertise an expert develops in a specific domain."[3] It is this heuristic knowledge that would allow the AMPS to make highly educated guesses to solve in-flight mission-planning problems. Given that the knowledge engineer and the experts designed a credible, nuclear-certifiable AMPS, senior civilian and military authorities would likely approve the application of the second principle (decentralized control and execution).

The fully mature bomber AMPS would provide a battle management system that could respond adaptively to real-time changes in guidance, direction, threat, or aircraft status. It would be able to process, correlate, prioritize, and display mission-significant events to the crew. Some of the events requiring mission replanning would be unexpected threats, new directions from higher headquarters, and aircraft system status alarms. The AMPS, applying heuristic algorithms, would automatically calculate route updates for terrain masking, fuel conservation, aircraft and weapon employment tactics, and dynamic deconfliction. It would execute a new course of action on crew command (autonomously or by implied consent for predefined noncritical actions). The primary objective of the bomber AMPS would be to optimize both the expected damage against the executed target system and the probability of aircraft arrival at the poststrike base.

Further, the system would have growth capability. The AMPS rule tables could be revised and refined as new sensors, communications systems, and computer technologies evolve. When the crew members disagree on the specific actions and sequence and timing of actions taken in response to a new mission event, they could be authorized, within certain approved limits, to reprogram their AMPS to accommodate different flying techniques. The bomber's inherent adaptability in conflict, coupled with its enhanced capability to avoid or destroy threats during the mission, would mean more weapons on target before the aircraft reached its poststrike base. In short, the onboard replanning capability of the AMPS would represent an important force multiplier in that the manned bomber would adapt better to the "fog of war," and hence would realize the full warfighting potential of the "man-in-the-loop."

Applying the Concept

Obviously, there is much to be done before AMPS becomes a reality. First, we must agree, in concept, that AMPS really could make a difference in executing US military strategies, and then decide on how, when, and where an AMPS could be applied to gain the greatest military return on an investment. The Strategic Air Command seeks to capitalize where it can on the benefits of adaptive planning. Accordingly, several SAC adaptive planning initiatives are under way. For example, the second edition of the *SAC Adaptive Planning System Master Plan*, approved by CINCSAC, provides a roadmap for improving adaptive

planning systems and procedures throughout the command until the year 2000. Many AMPS programs, including prototypes for in-flight replanning of the B-1B and the advanced technology bomber, are under development. The Pilot's Associate Program and other initiatives highlighted in Project Forecast II are also evaluating the feasibility of deploying expert systems on board an aircraft. But support for AMPS must also exist at the "grass-roots" level—at the combat unit where plans are executed and the need for adaptive planning is best determined. Both planners and operators must justify their AMPS need to the appropriate authorities. Perhaps every Department of Defense (DOD) organization responsible for developing weapon systems should determine an appropriate level of adaptive planning for each new weapon system and what sort of AMPS already exists or should exist to support that level.

Summary

Adaptive planning is important because it improves our prospects for defeating a numerically superior adversary under unpredictable conditions. Projecting the "experts" into the basic battle unit, in the form of a knowledge-based adaptive mission-planning system, gives the battle unit an important edge: it can quickly compute and execute on command high-leverage mission-planning solutions to highly complex battlefield problems. Some quality control may be sacrificed to achieve speed, but a timely plan is much better than a perfect plan that is too late to carry out the mission. The strategic bomber is one of the many military weapon systems that could benefit from an AMPS. DOD organizations responsible for establishing requirements and developing technology for weapon systems should consider the need to provide adaptive planning support for those systems.

"Systems that can function 'intelligently' as consultants or advisors will become commonplace in the next decade."[4] We must not ignore the tremendous potential that knowledge-based, expert systems offer. By cloning expert knowledge into a weapon system AMPS, that weapon system can adapt more rapidly and effectively to unexpected events. Weapon systems using the leverage provided by adaptive mission planning have greater potential for prevailing in combat.

Minot AFB, North Dakota

Notes

1. National level directives on weapons employment, such as National Security Decision Directive (NSDD)-13, NSDD-178, and Nuclear Weapons Employment Policy (NUWEP)-84 make it clear that adaptability in our forces and C³I, and thus in our planning, are prerequisite to effective war waging.

2. Edward Fiegenbaum, "Knowledge Engineering for the 1980s," Computer Science Department, Stanford University, 1982, 1.

3. Col Pat O. Clifton, *Artificial Intelligence: A User Friendly Introduction* (Maxwell AFB, Ala.: Air University Press, 1985), 19.

4. Ibid., 55.

A CHALLENGE TO EXCELLENCE

Lt Col. David J. Nolting

T HE Department of Defense (DOD) is committed to support President Reagan's request for a 20 percent productivity improvement by 1992. In this era of fiscal constraints, the task of preserving the peace and maintaining the nation's security requires a commitment to excellence from each man and woman supporting the defense mission. This task can best be assured through strong deterrence, the bottom line in any measurement of success for the Strategic Air Command (SAC). SAC has a history of suc-

cess, but history provides no guarantees for the future. We in SAC are committed to sustained excellence, an increasingly difficult job as we are being asked to do more with less. Our task in SAC, therefore, is to improve day-to-day deterrence by enhancing productivity.

The approach taken by SAC is to create an environment that keys on people and fosters pride and professionalism. As new weapon systems and upgrades to existing systems meet expanding threats and replace older systems, our challenge remains to improve day-to-day deterrence through the enhanced productivity of professional people working in a professional environment. The following guidelines serve to focus our efforts toward enhancing SAC productivity:

• Provide a wholesome living and working environment for SAC people—an environment that promotes pride, professionalism, and individual dignity.

• Increase the day-to-day readiness of our forces by decentralizing authority and responsibility and by rewarding those who show they can do it better.

• Improve the quality of aircrew and missile crew training.

• Encourage innovation and initiative in finding ways to do our work better and smarter.

The central focus of this guidance is people. SAC believes that an investment in people increases the productivity of those people. These guidelines are more than just words in SAC—they are programs that translate concepts into action.

Management demonstrates its concern for the welfare and worth of its people by investing in improved working environments. This concern pays great dividends in the form of increased productivity, which directly translates to readiness, capability, and finally deterrence. Our approach is to provide facilities that will promote initiative and innovation by involving people directly in the improvement of their own environment. The response is immediate, effective, and lasting.

We start facilities improvements by establishing a five-year plan for each base with annual updates. These plans are drawn up locally with command oversight to integrate locally known priorities into overall programs. This approach sets a long-term growth pattern and establishes a roadmap that all understand and contribute toward. Priorities are publicized and revised annually to ensure the vitality of the plan. There are several methods and several sources of revenue available for implementing the plans in different phases.

Resources available for plan implementation include our military construction program (MILCON), operations and maintenance contracts, and in-house civil engineering skills. MILCON is our capital investment program designed for the long-term. Its first priorities go to new missions and base revitalization projects rather than to the care of current facilities. Contracts using operations and maintenance funds are primarily intended for maintenance and repair. These contracts contribute much toward improvement of facilities and have a shorter lead time than the MILCON programs. In-house civil engineering resources and skills fill in with minor maintenance and repair. These programs reflect our concern for SAC people and result in reciprocated concern for the mission.

In this time of budgetary cutbacks, SAC innovatively leverages funds to support these programs. Two approaches are the commander's emphasis program (CEP) and the self-help program. The CEP allows commanders to generate emphasis funds by finding ways to do other operations and maintenance jobs more efficiently. These funds—a small percentage of total funds—are then available to those same commanders for use as incentives to encourage innovative approaches to improving the work environment and promoting productivity.

Command- and base-financed self-help is

another program that uses the volunteer talents of our people in a different way. The self-help program combines the talent and enthusiasm of unit members with the expertise of civil engineering personnel and results in an effective, responsive, low-cost means to accelerate work and reduce costs. For example, recent legislation prohibited airmen under 21 from drinking alcoholic beverages. This meant that immediate action had to be taken to provide a social outlet for these airmen excluded from the "clubs." The quickest solution was CEP monies for an "under-21 club." The resulting combination of CEP funds, donated labor from enthusiastic and talented people, and civil engineering expertise produced a prompt and cost-effective improvement. This program is self-advertising, self-perpetuating, and a source of great pride to the people.

Self-help projects minimize bureaucratic delays through one-stop processing. They also provide material, tools, and visual displays to supplement the expert advice of volunteer professionals. Such streamlined action guarantees that everything comes together while interest is high. An example of this is provided by the Fuels Management Branch at Beale AFB, California. The people at Beale renovated their ready room through self-help and managed to win the award for best fuels unit in SAC. They were also honored in national competition for the American Petroleum Institute's management award. Examples such as this bear out the contention that eager and enthusiastic professional people produce results. When provided with the opportunity, they will change their environment to fit the professional image they have of themselves.

We have also enhanced productivity through the decentralization of authority and responsibility in the area of logistics. The key concept here is to package authority, responsibility, and resources so that a single supervisor is clearly in charge of a measurable piece of our mission. These logistics initiatives motivate people, eliminate excuses, and make things happen.

The title of this key effort to put the resources and authority in the hands of vital work supervisors is the ready resource program. The goal of this program is to return SAC's aircraft to full mission-capable status in less time. This goal requires a new focus on the mission, which for the maintenance personnel means keeping aircraft in a high state of readiness. It requires a new perspective on scheduling aircraft repair, a change in the way we provide resources, a redelegation of authority, and an improved working environment.

This new focus on readiness mandates well-understood standards and clear measures of performances, and it takes advantage of cross-feed between like units to encourage competition. People will perform when they know where they stand—in other words, what they are measured against, what others are achieving, and what the payoff will be. Rewards in this program include recognition and tangible awards. We also pay a lot of attention to keeping track of programs like this to ensure that we do not forget their record of success.

The repair-scheduling concept changes the emphasis from getting the aircraft ready before the flight to returning the aircraft to ready status immediately after the flight. We accomplish this change in emphasis through a couple of leading actions. The aircrews call in maintenance problems prior to landing, and mobile debriefing teams with the appropriate specialists are dispatched when the aircraft lands to allow time for aircrew and maintenance discussions. These discussions lead to a more thorough understanding of the problems by maintenance personnel as well as to a better quality and longer lasting repair of the malfunction. These procedures also include early identification of spares requirements and the dispatch of specialists to begin repairs shortly after the aircraft lands. The result of

these initiatives is an aircraft available for flight, generation to alert status, or other mission requirements much earlier than before.

We have also revamped the way we make parts available. The centralized supply concept stored inventory items in a large warehouse, and supply people handled everything from aircraft parts to pencils using essentially the same system. Under this supply system, there was a virtual fence separating resources from the people who needed these resources to do their vital job of maintaining the readiness of mission-essential aircraft. The result was that pencils and vital aircraft parts tended to receive the same priority. We clearly needed an approach to supply that made direct and instantaneous support of the maintenance work force the first priority. Accordingly, the new approach puts parts, parts specialists, and aircraft maintenance specialists together on the flightline. Under this new system, base supply still provides inventory oversight. However, to make spare parts more readily available, we took them out of the centralized supply system and made them immediately available on the flightline to the shop specialist or crew chief who needs a part to fix an aircraft.

Together with forward parts and forward specialists placement, we gave the shop chief authority commensurate with his responsibility to keep the airplane in a full mission-capable status. Earlier the authority to direct and prioritize repair of components had also been centralized, a move designed to ensure that the right things were repaired first. However, in reality, it served to diffuse responsibility in the maintenance area so that no one person could direct the work or be held accountable. Now the shop chief is fully responsible, and he stays informed about which components are most needed on the flightline. He is responsible for getting those components repaired and in the hands of the technician who needs them to return an aircraft to full mission-capable status. As a result

of these initiatives, we have more aircraft that are ready to go.

To supplement improvements in the working environment and in the redistribution of authority, responsibility, and resources, SAC is adding a new dimension to aircrew training. The Strategic Training Route Complex (STRC) provides a major step toward a realistic training environment to improve combat capability. To be effective against today's Soviet defenses, our aircraft need to be able to make extended low-level flights, to locate and avoid ground threats, to jam ground and fighter threats that cannot be avoided, and to employ standoff weapons against the most heavily defended targets. The STRC supplies a wide range of low-level training routes that give crews practice in responding to a variety of simulated threat environments, and this increases crew competence and confidence.

Variety is the most descriptive characteristic of the STRC. The new route complex covers a five-state area. This large region offers a wide range of terrain over an area with low population density. Within this wide range of terrain, more realistic threat environments are possible. Longer and lower low-level flights, multiple route entry and exit options, multiple simulated target areas and simulated threat areas, and replication of enemy threat deployment patterns provide a realistic training environment in which crews frequently see new challenges.

The STRC's extensive suite of threat simulators tests and trains defensive system operators and increases crew coordination. The range of training opportunities serves all, from the new crew members to the "old heads" who are experts. To enhance the training productivity of the STRC, a new Strategic Training Center (STC) is being built. The STC provides graphic mission reconstruction. It records ground and aircraft data, expands the currently available measures of aircrew performance, evaluates crew performance, and provides feedback to the crew. The train-

ing is tailored to the needs of specific individual crews, squadrons, and wings.

The productivity realized through well-trained, confident crews is in the crew's familiarity with potential threat environments. These improvements in training increase our capability to penetrate Soviet defenses. Simultaneously, the Soviets' ability to defend against the bomber as well as their confidence in meeting that challenge is decreased. In summary, well-trained, confident crews enhance the investments in equipment, reduce Soviet ability to prevent manned-bomber penetration, and add to the goal of more deterrence for the dollar.

A virtually open-ended approach to innovation and initiative within DOD is the model installation program (MIP), one of DOD's most important programs. The foundation of the model installation program lies in the freedom given unit commanders to use innovative approaches to conducting business and exercising authority commensurate with responsibility. Model installation commanders may request waivers to regulations they think interfere with good management. Support for the MIP has been outstanding at every echelon.

Recently, Deputy Secretary of Defense William H. Taft directed DOD-wide application of the model installation program's management approach. As a result, Headquarters USAF is developing a program that will further the MIP philosophy by doing three things. First, it will give more authority to the "doers" by directing Headquarters USAF's efforts away from restricting and more toward facilitating the work that installation commanders perform. Second, it will give installation commanders freedom to purchase goods and services from sources that provide the best combination of quality, responsiveness, and cost. Finally, it will strengthen the incentive and ability of commanders to save money by allowing them to spend their share of the savings.

SAC is implementing this new program and the MIP philosophy to the fullest possible extent. The purpose is straightforward—to promote excellence in the daily business at our bases. The program engages the bright minds of our people who want to do things better. It removes obstacles to new and innovative ways of doing things by providing rapid waivers. Waivers are quickly and easily approved and are difficult to disapprove. It takes less than 72 hours to gain approval at each level of review. Proposals are disapproved only if they are illegal, immoral, or obviously harmful, not because management judges the proposal to be ineffective. Judgment on the effectiveness of a proposal is left to its originator, the person responsible for getting the work done. The end result is an atmosphere that encourages talented people to find ways to excel in the performance of their jobs.

To show how these effective and common sense approaches can be used to the advantage of the unit, let us review two examples of recent MIP initiatives. In the first example, overspecification was removed as an obstacle to efficiency. While planning to reroof carports at Whiteman AFB, Missouri, a civilian civil engineer found that Air Force standards exceeded local standards. He also found that the Air Force had the same roofing standards worldwide. The climate in Missouri placed less stress on roofing materials than did other more severe climates. A survey of construction materials used in the local area revealed that a commercially available roofing material with a 20-year guarantee satisfied all reasonable requirements. As a result, the authorized use of locally acceptable materials with a substantial guarantee saved $185,000 on the first contract, and, if applied to all the carports at Whiteman, could save $500,000.

The second example involves an airman who discovered that he could reduce the time required for repair of equipment. The airman, a missile electronics technician, found that while technical data and standard proce-

dure required that certain test equipment be repaired at the depot level, both the equipment and the expertise to effect the repair were present at the base level. The airman sought and was granted a waiver to the requirement for depot-level repair. Results were a marked decrease in equipment downtime, fewer man-hours devoted to repair, and a significant saving on shipping costs. Specifically, the payoff from this one initiative reduced downtime from 14 days to two hours and saved $400 per item repaired.

SAC people have submitted 611 proposals such as the two just discussed, with more than 90 percent of those approved. The model installation program is demonstrating its value as a source of good ideas and savings, as well as a means of putting responsibility and authority with the commander, where it belongs. If we openly examine our methods of doing business, the old justification "We've always done it that way" no longer becomes an acceptable reason for using any established procedure. The bright, young, and enthusiastic professionals who feel they can have an impact on the way they work will bring light into dusty old corners by making innovative suggestions to improve effectiveness. The short approval times, high approval rates, and minimum criteria for consideration will cut through the red tape that dampens enthusiasm and stifles innovation. The freedom from old operating procedures, red tape, and bureaucratic resistance inspires initiative and innovation.

The real bottom line to all of the initiatives just discussed is an improved capability to carry out SAC's mission and deter potential aggressors. That improved capability must also be visible to convince a potential opponent that he cannot gain from attacking the United States. And this is actually happening in SAC. For example, one of the ways we measure our day-to-day capability is in bomber readiness. With new standards, enhanced productivity, and better funding support for spare parts, B-52 readiness has gone up from 37 percent to more than 70 percent. For the FB-111, the improvement is similar, progressing from 41 percent to 67 percent.

In summary, everything we do is observed by potential enemies. Our adversaries know that not only are we getting stronger as new systems come on-line but also as the professionalism of our people is improved. That is the bottom-line result. Our deterrent posture is made more visible and credible through these innovative improvements in productivity and will be further strengthened as we add new forces in the future.

Offutt AFB, Nebraska

You've got the stick

STRATEGIC AIR COMMAND'S NEW DIRECTIONS

GEN JOHN T. CHAIN, JR.

The Strategic Air Command (SAC) is an exciting, dynamic command committed to the warrior spirit. We are getting new equipment—and that means new combat capability. Things are happening in all mission areas. B-1Bs and Peacekeepers assumed alert commitments in 1986. We are moving in new conventional warfighting directions by greatly enhancing our support to theater commanders. We have a lot on our plate, which is terrific.

First, and most visibly, we are modernizing, as directed in the President's Strategic Modernization Program. We have a coherent strategy for deterring the Soviet Union, and SAC is implementing that strategy with planning, doctrine, tactics, training, and equipment. We have come a long way in this decade through sensible, effective upgrades to current systems. The command is moving ahead with new systems—B-1Bs, KC-10s, and Peacekeepers are deploying now—and the modernization will continue throughout the 1990s, with Peacekeepers in survivable basing, advanced technology bombers, small ICBMs, and new and upgraded tankers. At the same time, we are developing and acquiring the command, control, communications, and intelligence (C³I) enhancements needed to ensure connectivity and to provide the battle management capabilities that will squeeze even greater combat capability out of our new weapon systems. SAC will become more flexible and better able to adapt to rapidly changing operational situations. By completing the President's Strategic Modernization Program, we will be in a better position to prevent nuclear war or the threat of nuclear war against ourselves or our allies.

Our nuclear mission, though critical, is only half the story. We are taking major steps to expand our conventional capabilities. We are giving our bomber squadrons a dual designed operational capability (DOC) for conventional as well as nuclear responsibilities, and we are improving our conventional training and revamping our tactical doctrine. In the near future, we will acquire new munitions such as standoff missiles. Future plans center on fully realizing our immense potential for supporting theater operations.

Modernizing our forces and supporting conventional initiatives will place a significant demand on both our pool of trained manpower and budgetary resources—and we know that both people and funds will be limited in the foreseeable future. Therefore, we have no choice but to work smarter and be more productive. We are doing that by decentralizing to the maximum extent possible and

encouraging initiative from our people. We remain committed to excellence and to taking care of our people, who have difficult jobs yet do them very well. They deserve the best, and we are committed to providing the best we can for them.

Our preeminent role is deterring war and keeping Americans alive and free. The bottom line for us is combat capability—and with it we will be ready to fight anytime, anywhere, at any level of conflict.

General Chain is the commander in chief, Strategic Air Command, and director, Joint Strategic Target Planning Staff.

Letters

C-5 or C-17—not in competition

Dr William M. Leary's "Strategic Airlift: Past, Present, and Future" in the September-October 1986 issue is shallow at best. Dr Leary is quick to dismiss the C-17 and advocate further production of the C-5B in his University of Georgia backyard.

What is missing is a coherent answer to the challenge of meeting the nation's critical airlift needs in terms of both quantity and quality. Dr Leary's selective presentation of Gen Thomas Ryan's March 1984 statements to the Senate Armed Services Subcommittee on Sea Power and Force Projection failed to mention that General Ryan was accompanied by (then) Lt Gen Fred K. Mahaffey, Army DCS/Operations. General Mahaffey made the US Army's support for the C-17 very clear. The C-5 alone cannot meet Army mobility requirements.

Dr Leary also used an editorial by Gen T. R. Milton, USAF Ret., which advocated increased utilization of the existing fleet as a solution to the airlift shortfall. A little research would reveal some serious limits to achieving higher utilization rates than current plans call for.

Finally, Dr Leary makes the statement that "no one questions the superiority [of the C-5] to the C-17 as an intercontinental transport." Implicit in this statement are the assumptions that the C-5 and C-17 are in competition in the minds of airlift planners and that bigger is better. Neither is true.

Additional C-5s cannot fill the gap the C-17 is designed for. Without the C-17, the US Air Force will have no replacement for the C-141 when it ultimately retires, no near-term augmentation for the C-130 fleet, very limited capability to move outsize cargo in the intratheater environment, and limited opportunity to exploit the advantages of an airlifter that can direct deliver when circumstances call

for it. The time has come for a fresh approach, and the C-17 is the right answer.

Lt Col Michael R. Gallagher, USAF
Travis AFB, California

Dr Leary's article, "Strategic Airlift—Past, Present, and Future," succinctly highlighted our difficulty in obtaining dollars for additional airlift. I wholeheartedly agree with him that MAC's proud record of accomplishments has been achieved because our dedicated men and women have overcome equipment shortages and operational difficulties to deliver vital cargo in support of national objectives. However, I was concerned with his analysis regarding the C-17. Perhaps Dr Leary was overly influenced by the negative press the C-17 received from Jeffrey Record and Kim Holmes.

It is now important to present our side of the story. Our booklet, *The Case for the C-17*, gives some very good reasons why buying more C-5s, KC-10s, and C-130s is not the right solution to the airlift shortfall. In the years ahead, we do not have the manpower or the dollars to operate a C-5 intensive fleet of aircraft. Each C-5 airframe takes significantly more people (45 to be precise) and almost $5 million more per year than the C-17 to achieve an equal training and flying hour program. Besides costs, other solutions lack the operational utility of the C-17. In recent letters to subcommittee chairmen, the chiefs of staff of the Army and Air Force and the commandant of the Marine Corps said:

We have examined the airlift modernization issue from every angle and are convinced that the C-17 is the solution. It is not only the most

cost-effective solution, but gives us the greatest capability—a capability that we must have if we are to meet our country's airlift requirements.

The C-17 has been jointly supported from the ground up and is crucial to the rapid deployment of our combat forces. The key to victory in any future conflict lies in our ability to project our power into the battlefield. The C-17 is vital to projecting this power.

I would also like to change the next chapter in our airlift history. Rather than being reactive and innovative with inadequate resources, we must be farsighted enough to develop an aircraft that will revolutionize airlift and give the nation greater flexibility in meeting the demands of future wars. We believe the C-17 and its direct delivery capability will do just that. Our warfighting CINCs also support that concept and endorse the C-17 as the airplane they need to support their wartime objectives.

More people need to hear our side of the C-17 story: we think it is a compelling one. [To secure a copy of *The Case for the C-17*, write to Hq MAC/PA, Scott AFB, IL. 62225.] In fact, we have gained tremendous support in Congress during the past year—support which has culminated in funding approval for long-lead items and tooling for C-17 production. We believe we have gained this strong program commitment despite tight budget times because of the C-17's operating costs and greater operational utility. With good people and the C-17, we will not have to repeat the problems we have experienced in the past.

Gen Duane H. Cassidy, USAF
Commander in Chief, Headquarters MAC
Scott AFB, Illinois

on censorship and creative thinking in the Air Force

This is in reference to the article entitled "On Conformity," by Col Alan L. Gropman, USAF Ret., in the September–October 1986 issue of the *Air University Review*. Colonel Gropman referred to an article in the November–December 1984 issue in which William S. Lind criticized Air Force censorship, specifically that of the Air Force policy review process.

Having spoken to Colonel Gropman and reviewed the events since the original Lind article, I am convinced that the problem cited no longer exists insofar as the *Review* is concerned. Prior to 1985 there was indeed a problem in getting *Review* articles cleared through Air Force Security and Policy

Review. In February 1985, however, Lt Gen Thomas C. Richards, then Air University commander, brought the problem to the attention of the Air Force vice chief of staff, who encouraged Air University to handle policy review to the maximum extent possible instead of forwarding it for higher review. Since then we have been following that policy and there has been a dramatic difference in the proportion of articles leaving Air University for review. Of 211 articles requiring review in 1986, only seven were forwarded by Air University for higher review. Almost all of the latter dealt with security rather than policy.

The foregoing does not mean that subtle means of censorship do not remain. Old attitudes die hard. I can say that the chief of staff read the Gropman article and wants Air Force policy set straight: we encourage free and open discussion of all air power subjects.

Lt Gen Truman Spangrud
Commander, Air University
Maxwell AFB, Alabama

I have previously mentioned my regret that the US Air Force does not encourage its members to speak their minds in the *Air University Review* or other publications about policies, procedures, techniques, tactics, doctrine, or whatever. A number of people have quite seriously questioned my loyalty because of those suggestions. In turn, they seem to suggest that expressions counter to company policy are next to treason and must be suppressed. Too bad!

In the thirties, the budding US Army Air Corps published, through its Information Division in the Munitions Building, Washington, a very newsy, often challenging, *Air Corps News Letter*. Recently, I have had the pleasure of reading some of those publications. In one dated 15 August 1935, I came across a very interesting memo from the editor—who was not named in the copy I read.

The first two items in this issue's 22 pages were about navigation processes and navigation training. Both authors expressed some dissatisfaction with what was then being done officially and also some disagreement with each other. In the Editor's Note was the following:

With the importance of aerial navigation steadily mounting, for various reasons, it goes without saying that flying personnel are giving more serious thought to this subject than ever before.

No doubt many of them hold constructive ideas on this all-important subject but, as seems

to be the case at organization meetings where there are discussions on one subject or another, there is a tendency on the part of many present, through modesty or fear that their ideas are not worth expressing, to hesitate to take the floor.

It is gratifying to note that at least two officers have ventured to come out in print and express their views on the present system of navigation and methods of training. These views may not necessarily coincide with those held by the Air Corps, but it shows that they have given serious thought to the proposition.

Now that the ice has been broken and there is in print comments from at least two sources, it is hoped that other Air Corps officers will give the *News Letter* the benefit of their opinions. Let there be an open forum discussion—this is one of the objects of the *News Letter*.

If we are going to have a real Air Corps, we must have constructive criticism, for this is the very life of progress.

I thought that was great, and I submit it to you as a cry from the past for receptivity in the present and future. We need that constructive criticism, and we need the ideas of all—not just those of a few.

Jerry G. Peppers, Jr.
AFIT School of Systems and Logistics

I have followed *Air University Review*'s ongoing dialogue on freedom of expression for nearly two years now. While at once wondering whether the subject has been beaten into a dialectic death, I nonetheless feel compelled to proffer yet another perspective.

Between May 1975 and November 1986, I served as an associate editor and editor of the *Defense Management Journal*, one of the Defense Department's official policy periodicals. I have, as the saying goes, seen it all. A historical article on the Spanish-American War is spiked by security review in 1976 for fear that one of its secondary premises—the American news industry of the era wished to sustain the war to sell newspapers—would offend the Vietnam-era press and worsen already tense relations with the Pentagon. An article on international security is censored for questioning the sanity of selling our first-line military hardware to shaky dictatorships; six months later the Shah of Iran is deposed. A submission on manpower recruitment techniques is sent to the head of the appropriate policy office for comment; the author revises accordingly, we edit the article, security review sends the article back to that office for formal review, and the article is killed by the newly installed office chief whose opinion differed from that of his predecessor.

I have dozens of such word-war stories (and, by the way, they are not specific to any one service or managerial level). As individual instances of institutional paranoia, they are cosmically insignificant; but for what they tell a defense periodicals editor who believes in the value of his or her profession, they are indeed noteworthy. To that editor, they say, "You must be one part Patton, one part Averell Harriman, and one part Br'er Rabbit." I have three suggestions for battling the bogeyman of censorship.

● First, establish a formal article-referee system. Send any submission that survives the initial review by the magazine's staff to as many as six subject matter experts, ideally drawn from as many different institutions as possible. Then notify the security review officials that the article has already been blessed by Professor X, Colonel Y, and Director Z. In my experience, security review officials have invariably been well meaning, intelligent, and ready to work on compromises that satisfy all parties. Naturally, compromises are not always possible, but let's not delude ourselves into thinking censorship doesn't occur in some form or other at General Motors or Harvard or the *New York Times* as well.

● Second, when experience or intuition tells you that an article is a hot potato, find another author with an opposing opinion to write a counterpoint (or challenge the censor to write). Clear them and publish them together. You stand to serve your readers well and make life easier for security review.

● Third, demand that your authors demonstrate rather than assert. In *The Elements of Style*, William Strunk and E. B. White write that "the surest way to arouse and hold the attention of the reader is by being specific, definite, and concrete." To that I might add that it is also the best way to disarm misinformed staff officers and bureaucrats. It is tough to censor facts.

If all else fails, you can always send your censor these words from John Stuart Mill's *On Liberty:*

The peculiar evil of silencing the expression of an opinion is that it is robbing the human race: posterity as well as the existing generation; those who dissent from the opinion, still more than those who hold it. If the opinion is right, they are deprived of the opportunity of exchanging error for truth; if wrong, they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth produced by its collision with error.

Larry J. Wilson
Defense Logistics Agency
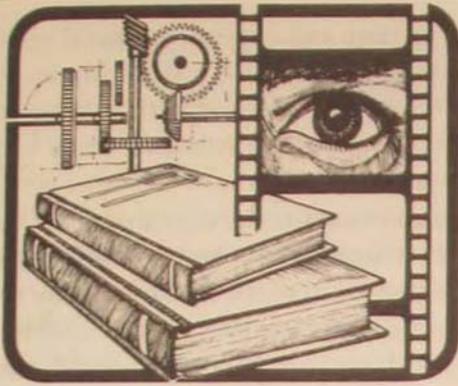
MILITARY REFORM:
AN IDEA WHOSE TIME HAS COME

Lt Col. Donald R. Baucom

Military reform is always a political matter.

Anthony John Trythall
"Boney" Fuller

I n October 1986, Senators Barry M. Gold-water (R-California) and Sam Nunn (D-Georgia) released a 645-page staff study detailing problems with the current Department of Defense (DOD) and proposing fundamental changes in that organization.[1] Benjamin Schemmer, editor of *Armed Forces Journal International*, considered the appearance of this report and the joint statement by the two senators sufficiently significant to issue a special edition of his journal, only the third such edition in its 122-year history. Schemmer stated in an opening editorial that his staff considered the Senate study to be "the single most important body of work on national security matters done so far this century."[2] In April 1986, the President's Blue Ribbon Commission on Defense Management (Packard Commission) issued its recommendations for the reform of the defense acquisition system.[3] On

7 May 1986, the Senate voted unanimously to pass what the *Washington Post* referred to as "the most sweeping revision of the nation's military since 1947." On 5 August 1986, a far-reaching reform bill in the form of an amendment to the 1987 defense authorization bill "whizzed" through the House of Representatives on a vote of 406 to 4.[4] In the midst of this ferment, Sen Gary Hart (D-Colorado), a leading contender for the Democratic presidential nomination, and William S. Lind have coauthored *America Can Win*,[5] a book that bids well to make military reform a key issue in the next presidential election.

Military reform would seem to be an idea whose time has come. If so, it would be to the advantage of the military professional to understand the reform movement and its ideas.[6] Until recently, this would have been difficult to do, for the rather extensive literature of the

reform movement consisted mostly of articles and briefings, which means that information about the ideas of the movement was scattered and more or less inaccessible to most officers. Fortunately, within the past two years, several major books have appeared that make it considerably easier to get at the issues raised by the reform movement. In addition to the Hart and Lind volume, two others are particularly noteworthy: Lind's *Maneuver Warfare Handbook* and Richard Gabriel's *Military Incompetence.*[7] In general, the reform movement argues that America's defense system does not work and has produced an incompetent military. There are four basic problems: the officer corps of the military establishment is too large and is mired in a bureaucracy of its own making; the Joint Chiefs of Staff (JCS) fails to integrate our military services into effective unified military forces and gives inadequate military advice to civilian leaders; our defense establishment develops and procures the wrong kinds of weapons; and our military doctrine is flawed. We shall look at each of these points in turn, but first let us begin by looking at why the reformers believe the military is incompetent.

Military Incompetence

According to the reformers, clear evidence of problems in our military establishment is found in the poor operational performance of US military forces since the Korean War. Thus, Hart and Lind begin their book with a standard reform theme: America has not won a "brilliant victory since Inchon."[8] The most elaborate statement of this operational indictment appears in Gabriel's *Military Incompetence.*

Gabriel has long held the view that something is seriously wrong with the US military. In 1978, he and Paul Savage coauthored *Crisis in Command,* a book that severely criticizes the performance of Army leadership in the Vietnam War. In this work, the authors argue that

during the Vietnam era entrepreneurial mentality came to dominate officer thinking as officers became more concerned with managing their careers to ensure promotions than with serving the nation.[9]

Gabriel again presents the concept of an entrepreneurial officer corps in his 1985 book, *Military Incompetence,* a work that begins by defining military incompetence as the "inability of military leaders and forces to avoid mistakes which, in the normal course of things, should and could be avoided." A competent officer corps is capable of minimizing "foreseeable risks, thereby increasing the probabilities of success."[10] Having defined military incompetence, Gabriel devotes most of the remainder of the book to discussions of military operations in which our armed forces have either failed outright or performed poorly in the presence of minimal opposition. This portion of the book contains five chapters, each one dealing with a US military operation beginning with the Sontay raid in November 1970. Other chapters deal with the *Mayaguez* operation, the Iranian rescue attempt, the Beirut attack that killed 240 Marines, and the invasion of Grenada. While there is little new in Gabriel's discussion of these operations, his volume does provide the interested reader with good, readable accounts of these undertakings.

Hart and Lind cite essentially the same examples used by Gabriel in arguing that America's defense establishment is ineffective. They tell us that after the Korean War, the United States fought an unsuccessful 10-year war. They also remind us that we lost 41 Marines rescuing 40 seamen in the *Mayaguez* operation. To them, the effort to rescue the Iranian hostages was an "ignominious failure." In short, our military record since Korea led Hart and Lind to conclude that "our conventional forces are not effective enough to defend us. Unless we make them effective, in every crisis we will risk a choice between national humiliation and nuclear war."[11]

Problems and Solutions:
The Officer Corps

The reformers generally believe that the basic causes of incompetence in the US military are to be found in an overly large bureaucratic officer corps. This means that the size of the officer corps must be reduced and its composition altered so that we shall have "a military that is run by educated warriors, not trained managers."[12]

Gabriel considers the officer corps of the Army twice as large as it has to be and those of the Air Force and Navy one-third too large. Strangely enough, he believes that the excessive number of officers is both an indication of a decline in quality of the officers and a cause of the decline. "Standards have deteriorated," he tells us, "because there is an inflated officer pool, inflated staffs, and excessive school assignments."[13]

Where the composition of the officer corps is concerned, the reformers cite several problems. Hart and Lind believe that the current military promotion system rewards the wrong kind of behavior, that the up-or-out promotion requirement puts undesirable strain on career officers, and that professional military education programs (with notable exceptions) need improvement. They also criticize our nation's service academies for producing officers who are ideally suited for the military bureaucracy but ill-prepared to serve as warriors and military leaders.[14] Gabriel chides the military for having too many short assignments. The large number of short assignments leads to "amateurism" because officers do not have time to master their duties before they are reassigned. Gabriel also criticizes modern professional officers for careerist tendencies that are bred by a personnel system that overemphasizes promotion.[15]

Given the strong views expressed about an excess of officers in today's military, it comes as no surprise that one major change favored by the reformers is a substantial reduction in the number of officers. Gabriel would achieve his reductions as a by-product of several other changes he proposes. He would begin by establishing a firm ethical code to shift the values of officers away from careerism back toward a view of officership that emphasizes the special calling of the officer.[16] He would stabilize the assignment system so that people remain in positions longer, learn their duties better, and become more effective. At the same time, he would make a 30-year career the norm, rather than the current 20-year term. An officer corps in which the people are better versed in their current duties and whose officers remain on duty 30 years would reduce amateurism and make the officer corps more efficient so that it would be possible to reduce the number of officers by one-fifth to one-third. In this smaller officer corps, Gabriel believes that officers would assume more responsibilities and the corps itself would be more likely to develop into a professional brotherhood in which officers know each other and are aware of each other's strengths and weaknesses. But, alas, even cutting Air Force officer strength by 50 percent would leave more than 40,000 officers, still far too large a group to develop into anything like Adm Horatio Nelson's small band of brothers.[17]

Reduction by 50 percent of the officers above the grade of 03 is part of the solution Hart and Lind propose for the woes of the officer corps. They would accomplish this by retiring officers early, even if they do not have the 20 years now required for retirement. The decision of who would retire and who would remain on duty would be made by warriors and not by the "milicrats" who presently dominate the officer corps. Such a reduction of officers would force the military to divest itself of many of the jobs it is now doing. Furthermore, officers would have much more responsibility and would be forced to delegate more of the tasks remaining to subordinate officers and noncommissioned officers.[18]

Congress has already shown itself disposed to agree with the reformers where the size of the officer corps is concerned. Bills being considered by the House and Senate would reduce the number of officers during the next three to four years by as many as 25,000.[19]

In addition to this major point about reducing the number of officers, the reformers offer several other suggestions for improvement in the officer corps. Among these are eliminating the up-or-out feature of the promotion system to "reduce the current fixation on promotion and the resultant careerism"[20] and reforming the military educational system.[21]

Problems and Solutions: The JCS System

One place where the reformers see the bureaucracy of the officer corps clearly manifested is in the Joint Chiefs of Staff system. In Richard Gabriel's view, the JCS is a "bloated and overburdened bureaucracy," the decisions of which "represent the least common denominator among competing bureaucracies."[22]

The JCS also receives a scourging at the hands of Hart and Lind, who claim that the advice given by the JCS is "notoriously poor." They claim, for example, that the JCS opposed the Inchon landing for two months prior to finally approving the operation a week before it began. They bolster their criticism of the JCS with quotations from important national leaders like Sen Barry Goldwater and Gen David C. Jones, former Air Force chief of staff and chairman of the JCS. Here is General Jones' comment: "The corporate advice provided by the Joint Chiefs of Staff is not crisp, timely, very useful, or very influential. . . . Individual service interests too often dominate JCS recommendations and actions at the expense of broader defense interests."[23]

America Can Win argues that the problem with the JCS is "systemic" and has little to do with the people involved. The JCS is a committee that must conduct its business on the basis of consensus. Business is conducted through the famous "flimsy, buff, green" decision-making process. Each of these terms refers to an issue paper in its different stages of coordination. Since JCS decisions require the concurrence of all the services, the coordination process produces decisions that represent the "lowest common denominator."[24]

Hart and Lind recommend several changes in the JCS to make it effective. They would replace the current JCS with a National Defense Staff of about 500 officers. Selection to the staff would be based on a competitive examination and would come while the officer is serving in the grade of major/lieutenant commander. Once selected, an officer would complete a rigorous three-year school program and remain a member of the staff for the remainder of his or her career. Also, staff officers would be assigned periodically to duties with units in the field, returning to the staff after completion of such assignments. The National Defense Staff would consciously work to cultivate an atmosphere in which all officers, regardless of rank, are encouraged to speak their minds; there would be no penalty for disagreeing with a senior officer—such disagreements would be expected of junior officers. Finally, once the National Service Staff is established, the service chiefs would be forbidden expressly to interfere with the combat employment of America's military forces; guiding these forces would be the responsibility of the staff.[25]

Problems and Solutions: Weaponry

Another area in which reformers believe the defense establishment has serious problems is weapons development and acquisition. Arguments between the defense establishment and the reformers in this area all too frequently wind up with the two sides badly polarized.[26] In fact, according to Hart and

Lind, there is much more common ground than one might suppose. The reformers do not favor low-technology weapons, but rather weapons with characteristics that ensure effective performance in combat. This means that weapons should be designed with combat in mind. They must be rugged and easy to maintain, small and thus difficult to spot, and simple so that they can be operated effectively by troops under the stress of combat. Since numbers are still important in warfare, our weapons should also be inexpensive so that sufficient numbers of them can be purchased.

America Can Win presents several examples of what the reformers consider poorly designed weapons. The M1 tank is criticized for having machine guns that are poorly mounted, for being too heavy, for drinking fuel, and for having parts that are very expensive. Large aircraft carriers are criticized for

being too expensive and too vulnerable for the amount of combat power they provide. Indeed, much of the Navy force structure and most of the aircraft on the carriers exist to defend the carriers themselves. American fighter designs are criticized for stressing the wrong qualities (range and speed) rather than performance factors like turning rate.[28]

While Hart and Lind offer suggestions for improving the equipment of all the services, some of their more interesting views on military technology would affect the Navy's force structure. Hart and Lind argue that the Navy, with its reliance on the large carrier as the backbone of its force structure, is behind the times. To begin with, the carrier is no longer the capital ship, that role having been assumed by the submarine. According to the authors, the Navy should undertake a submarine building program that would give the United States 300 attack submarines by 2015. In addition to relying on the submarine as the new capital ship, the Navy should begin to develop and use high adaptability surface combatant (HASC) ships. These would have a basic generic-type hull that is essentially like a small aircraft carrier with features such as a flat deck and an island structure. This basic hull could be modified through the addition of modularized weapons and electronics packages to become a cruiser, a minesweeper, a frigate, or a destroyer. However, most of the HASC would be fitted with vertical and/or short takeoff and landing (VSTOL) aircraft, fighters, or antisubmarine aircraft and serve as carriers. In other words, we would replace our small number of large carriers with a large number of small carriers. A substantial number of hulls would be built and be configured as merchantmen in peacetime. In war, they could be converted quickly to warships.[29]

One other significant aspect of Hart and Lind's discussion of hardware issues is their excellent summary of Franklin "Chuck" Spinney's analysis of defense planning. Spinney argues that the planning for weapons acqui-

sition is guided by overly optimistic assumptions about funding and weapons costs. When these optimistic conditions fail to materialize, a budget crisis occurs that causes funds for operations and maintenance to be squeezed, resulting in detrimental effects on readiness. Those who do not have time to read Spinney's *Defense Facts of Life*[30] will find a clear exposition of his plans and reality mismatch in *America Can Win.*[31]

Problems and Solutions: The American Approach to War

The final area of defense we are to view through the ideas of the reformers is the American approach to war, our operational doctrine. According to Hart and Lind, the US approach is basically one of firepower/attrition. Here the objective is to drown the enemy in fire, killing his troops and smashing his equipment with overwhelming firepower. This approach to war leads to attrition battles, such as Verdun, in which masses of troops on both sides die in battle with very little that is meaningful being accomplished. On the other hand, in maneuver warfare, one aims to disrupt, to confuse, to disorganize one's enemy so that the enemy's command structure becomes disoriented and his forces fall apart.[32]

An excellent, more detailed discussion of maneuver warfare is contained in Lind's *Maneuver Warfare Handbook* (1985). Although this book is "addressed primarily to Marines," it is the single best source for anyone interested in understanding the elements of maneuver warfare.

Here we can learn that the ideas underlying this approach to war come from Col John Boyd, a retired Air Force fighter pilot. Boyd used experience he gained in flying F-86s against MiG-15s in Korea as the foundation for a concept of warfare that stresses rapid decision and maneuver. Boyd holds that warfare involves a universal pattern in which a combatant must observe the situation, orient him-

self to the situation, decide on a course of action, and act. This is the famous Boyd cycle, or OODA (observing-orienting-deciding-acting) loop, which represents the kind of universal generalization found in military classics such as Carl von Clausewitz's *On War* and Sun Tzu's *Art of War*. The one with the shorter cycle will be constantly ahead of his enemy. As a result, the enemy's action becomes a reaction that is further and further behind his opponent's action and that is increasingly ineffective.

> Maneuver means Boyd cycling the enemy, being consistently faster through however many OODA Loops it takes until the enemy loses his cohesion—until he can no longer fight as an effective, organized force.[33]

Normally, Lind writes, "God is on the side of the bigger battalions—unless the smaller battalions have a better idea." In his view, maneuver warfare is a better idea of how to fight—it is "military judo." In this form of warfare, the principal function of firepower is to screen movement, not kill people and break things. Firepower may indeed be destructive, but its destructiveness is incidental to its main function of covering movement.[34]

A key element of maneuver warfare is the idea that battle presents a free-wheeling, unpredictable environment that requires a decentralized command system if an army is to respond quickly to fleeting opportunities. In this type of warfare, it is vital that subordinate commanders understand the broad objects of their superior. This information is communicated through mission orders that specify what units are to accomplish, but leaves the "how" to subordinate commanders. The mission order should specify the *Schwerpunct*, the unit located where the commander thinks he can "achieve a decision." The *Schwerpunct* determines the focus of the parent unit's objective, for the unit so designated receives maximum support from artillery and sister units. The location of the *Schwerpunct*, then, is flexible—it is where the *Schwerpunct* unit

pushes and this location is determined by "reconnaissance pull." Reconnaissance forces search for gaps or weak spots in the enemy line, and when they find such weaknesses or gaps, they draw the attacking units to this point or these points. This, it seems, is another way of expressing the expanding torrent concept of Sir Basil H. Liddell Hart, the idea that attacks should be carried out like water flowing over a surface. Since water seeks the path of least resistance, most water flows through the place where resistance is weakest. In short, you reinforce units that are successful in their attacks, not the units that are halted by stubborn resistance.[35]

Interestingly, two recent studies of command support this view of decentralized command in combat operations. The first of these studies, *Combat Operations C³I: Fundamentals and Interactions*, was written by Maj George Orr while a research associate in the Air University Center for Aerospace Doctrine, Research, and Education (AUCADRE). In it, he argues that combat operations are stochastic in nature. Therefore, a decentralized command system that emphasizes autonomous operations at all levels is best.[36]

In the second study, *Command in War*, Martin Van Creveld describes command as essentially the effort to ensure certainty about a number of factors that must be coordinated to achieve victory. He argues that we are no closer to achieving this goal today than Napoleon was because war involves unpredictable, uncontrollable factors like people, emotions, irrationality, and human efforts to deceive and confuse. This makes uncertainty "the central fact that all command systems have to cope with." The best way to deal with the uncertainty of battlefield conditions is through a decentralized command system with freedom of action at the lowest possible level.[37]

Reform of the officer corps, restructuring of the JCS system, changing the weapons we procure, and implementing a new general

combat doctrine—these are the major goals of the reform movement. Ten years ago, when the reform movement was building up its initial head of steam, few people were even talking about these issues and fewer still agreed that the reformers were describing real problems in need of solution. Through their public writings and briefings and discussions with national leaders, especially congressmen, the reformers have succeeded in building a constituency for military reform.

All of this is not to say that there are no problems with what the reformers propose and that there is no resistance to changes the reformers advocate. The idea of maneuver warfare as a panacea for operational deficiencies in our Army has been challenged by one of the Army's brightest officers, who has pointed out that successful military operations will involve elements of both maneuver and firepower/attrition warfare.[38] There

would also seem to be a valid concern about what will happen to the motivation and energy of the officer corps if the up-or-out feature of the promotion system is eliminated. Senior officers know that the current promotion system was introduced in response to a pre-World War II officer corps that contained far too much deadwood. There are other specific questions such as how Hart and Lind would see to it that warriors (as opposed to milicrats) would oversee the officer reduction in force (RIF) they propose in reducing the size of the officer corps. Furthermore, there appears to be strong resistance to at least some of the changes pending in proposed legislation.

Nevertheless, thanks to forces set in motion by the reformers, fundamental changes in the way the military does business are already in progress. Military reform has become a political idea whose time has come.

Bolling AFB, D.C.

Notes

1. Senate, Committee on Armed Services, *Defense Organization: The Need for Change*, staff report, 99th Cong., 1st sess., 16 October 1985. S. Prt. 99-86, 645.

2. Benjamin F. Schemmer, "The Foundation Needs Fixing and the System Needs Rewiring," *Armed Forces Journal International*, special edition, October 1985, 3.

3. President's Blue Ribbon Commission on Defense Management, *A Formula for Action: A Report to the President on Defense Acquisition*, April 1986. The commission also published *An Interim Report to the President*, 28 February 1986. Both reports are available through the Government Printing Office, the April report for $4.25 and the February report for $1.75.

4. George C. Wilson, "Mr. Reliable Becomes Mr. Fix-It," *Washington Post*, 7 August 1986, A21.

5. Gary Hart and William S. Lind, *America Can Win: The Case for Military Reform* (Bethesda, Md.: Adler and Adler, 1986).

6. For an excellent discussion of the origins and evolution of the reform movement, see Hart and Lind, 1–28. Hart and Lind tell us that the reform movement's goal is "to make all our defense policies and practices—from the infantry squad through the Office of the Secretary of Defense and the Congress—serve the purpose of winning in combat."

7. William S. Lind, *Maneuver Warfare Handbook* (Boulder, Colo.: Westview Press, 1985); and Richard A. Gabriel, *Military Incompetence: Why the American Military Doesn't Win* (New York: Hill and Wang, 1985). Edward N. Luttwak's *The Pentagon and the Art of War: The Question of Military Reform* (New York: Simon and Schuster, 1984) is another important reform work that was reviewed in the May–June 1985 edition of this journal, 97–100.

8. Hart and Lind, 1.

9. Richard A. Gabriel and Paul L. Savage, *Crisis in Command: Mismanagement in the Army* (New York: Hill and Wang, 1978).

10. Gabriel, *Military Incompetence*, 6, 13–14.

11. Hart and Lind, 1–3, 25.

12. Hart and Lind, 189, 238–40; and Gabriel, *Military Incompetence*, 8-9.

13. Gabriel, *Military Incompetence*, 8–9.

14. Hart and Lind, 165–88. Where PME schools are concerned, the Air Force's Squadron Officer School, the Army's Command and General Staff College, and the Naval War College are singled out for special praise.

15. Gabriel, *Military Incompetence*, 9–15.

16. For a more elaborate discussion of Gabriel's views on a military code of ethics, see his *To Serve with Honor: A Treatise on Military Ethics and the Way of the Soldier* (Westport, Conn.: Greenwood Press, 1982).

17. Gabriel, *Military Incompetence*, 7–9, 191–93.

18. Hart and Lind, 163–64.

19. P. J. Budahn, "Pressure by Congress May Spur Officer Cuts," *Air Force Times*, 21 July 1986, 1, 10. Authorization bills in both houses for FY 1987 call for reductions in the number of officers. The Senate version would reduce officers by 18,285 over three years, whereas the House bill calls for the elimination of 25,957 officers over four years. Luttwak's *Pentagon and the Art of War* is credited with triggering this interest in officer reductions.

20. Hart and Lind, 185.

21. Ibid., 165–81; Gabriel, *Military Incompetence*, 194–96; Luttwak, 198-99.

22. Gabriel, *Military Incompetence*, 16–20.

23. Hart and Lind, 212–13. For more on General Jones' view

of the JCS, see his "What's Wrong with the Defense Establishment," in Asa A. Clark et al., eds., *The Defense Reform Debate: Issues and Analysis* (Baltimore and London: Johns Hopkins University Press, 1984), 272–86.

24. Hart and Lind, 214–15. For a detailed discussion of the JCS and its problems from the perspective of the Senate staff study, see S. Prt. 99-86, *Defense Organization*, 139–274.

25. Hart and Lind, 216–18. For a similar set of recommendations, see Luttwak, 272–76.

26. For example, see the exchanges between Col Alan L. Gropman and William S. Lind in the *Air University Review*, September–October 1983, 86–91, and January–February 1984, 92–95.

27. Hart and Lind, 13–14, and chapter 6 passim. For an interesting example of the relationship between complexity, combat stress, and effectiveness as illustrated by the use of the Norden bombsight, see Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 2, *Europe: TORCH to POINTBLANK, August 1942 to December 1943* (Chicago: University of Chicago Press, 1949; New Imprint by Office of Air Force History, Washington, D.C., 1983), 270.

28. Hart and Lind, 13–4, 40–53, 83–98, 192, and chapter 3 passim; Luttwak, 98–111, 215–27; and Pierre Sprey, "The Case for Better and Cheaper Weapons," 193–208, in Clark et al., *Defense Reform Debate*. Those especially interested in the debate over US aircraft design might wish to check these sources also: the exchanges cited earlier between Lind and Gropman in the *Air University Review* and a series of articles in *Armed Forces Journal International* started by Marconi von Spangenberg, "USAF's 'Fighter Mafia' Needs a New Aircraft Design Philosophy," in the March 1986 issue of that journal, 64, 66, 68.

29. Hart and Lind, 98–99, 101–5.

30. Franklin C. Spinney, *Defense Facts of Life: The Plans/Reality Mismatch*, edited and with commentary by James Clay Thompson (Boulder, Colo.: Westview Press, 1985).

31. Hart and Lind, 149–57, 219–25.

32. Ibid., 30.

33. Lind, *Maneuver Warfare Handbook*, 4–6.

34. Ibid., 2, 6, 19.

35. Ibid., 9, 13–19.

36. Maj George E. Orr, *Combat Operations C³I: Fundamentals and Interactions*, CADRE Research Report no. AU-ARI-82-5 (Maxwell AFB, Ala.: Air University Press, 1983), 87–90.

37. Martin Van Creveld, *Command in War* (Cambridge, Mass.: Harvard University Press, 1985), 261–74.

38. Huba Wass de Czege, "Army Doctrinal Reform" in Clark et al., *Defense Reform Debate*, 102–5.

Short Bursts

Korea: The First War We Lost by Bevin Alexander. New York: Hippocrene Books, 1986, 557 pages, $24.95.

Long the neglected war in the classroom and lightly treated in scholarship in comparison to World War II and Vietnam, the Korean conflict is now experiencing a rebirth of interest and scholarship. As government sources for the period have opened, we have witnessed several significant books by authors such as Bruce Cummings, Charles M. Dobbs, William W. Stueck, Joseph C. Goulden, and Burton I. Kaufman. Most of these treat the war in larger context.

Bevin Alexander, journalist and former combat historian in Korea, offers a traditional straightforward political-military history. Although he has done some archival work, his sources are mainly secondary ones. Chiefly, he relies on the fine US Army and Air Force official histories of the war and key memoirs. He virtually ignores the best secondary scholarship on Korea, including David Rees' classic *Korea: The Limited War* (1964) and the recent works of the authors noted above. Thus it is not surprising that Alexander fails to address the most recent questions about the war.

Although well-written and interesting, the book is little more than an update of Rees. *Korea: The First War We Lost* offers little, if anything, that is new; and the author's attempts at analysis are not profound. It is hardly earth shattering to conclude that the United States won one war (against North Korea) but lost the other (against the People's Republic of China); that the United States overlooked signals that might have prevented war with China; or that the war was unduly prolonged, and this worked against us.

Alexander's book will be of interest to the novice who wishes a solid introduction to the war; but more serious students should return to the old standards by Rees, John Spanier, S. S. Cho, and Alan Whiting, or consult one of the more recent contributions of the authors previously mentioned.

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An International History of the Vietnam War (2 volumes) by R. B. Smith. New York: St. Martin's Press, volume 1, 1984, 261 pages, and volume 2, 1985, 429 pages, $25.00 each.

R. B. Smith, an Englishman, has undertaken a tremendous task in writing his *International History of the Vietnam War*. The work will comprise four volumes when completed, and the first two are described here. Volume 1 is *Revolution versus Containment, 1955-61*, and volume 2 is *The Kennedy Strategy*.

Smith seeks to explore the high-level decision-making process of the principal nations involved, which is something new. Most histories have been written from the perspective of one nation. The problem is even more acute than the sheer size and complexity of the task because most European archives are protected by a "30-year rule," the US archives are also sheltered for varying periods of time, and the Communist archival material is inaccessible to Western scholars.

As the author rightly asserts, the period of the mid-to-late 1950s is a sort of barren wilderness, "a desert to be traversed as rapidly as possible." But these were important developmental years for both primary contestants in this fight to the finish, and Smith's research helps us to think about those formative years and the decisions that led to (among other things) the formation of the National Liberation Front in the South and the escalation of the military efforts there by both sides.

Volume 2, titled *The Kennedy Strategy*, covers the period from 1961, the glory days of "counterinsurgency" and creeping American involvement in Vietnam, to full-blown military intervention in 1965 under Lyndon B. Johnson. As Smith states, this study (like volume 1) "looks at both sides of the conflict simultaneously; and it places events in Indochina into the wider international picture." He asserts that the historian must look far afield to discover how one of many such areas of tension went in four years from being a trouble spot to a place where the bulk of the US armed forces were committed. One nice touch in the book is the use of a series of tables, which appear from time to time, showing important events that happened in several nations involved in the main part of the story at hand.

This may well be the most difficult, if not the most ambitious, undertaking to date regarding the writing of the Vietnam War. Volume 3 has been finished, and the author hopes to complete volume

4 next year. *An International History of the Vietnam War* has been well researched and will prove to be an important addition to the literature of the period.

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Nationalism and Federalism in Yugoslavia, 1963-1983 by Pedro Ramet. Bloomington: Indiana University Press, 1984, 336 pages, $27.50.

Pedro Ramet uses insights drawn from studies of international relations, comparative politics, and ethnic studies to discuss post-World War II political developments in Yugoslavia in his book. The primary argument in *Nationalism and Federalism in Yugoslavia*, which is supplemented by numerous specific hypotheses, is that the Yugoslav political system after 1965 has many of the characteristics of a balance-of-power system in the international arena. After setting out the theoretical underpinnings of his study, Ramet discusses the background and development of Yugoslavia's nationalities policies, the institutional context of politics and regulation of ethnic conflict in Yugoslavia, and numerous specific crises and decisions characterized by ethnic conflict in the period between 1963 and 1983. The focus throughout is on the way in which Yugoslavia's ethnic composition and political structure have affected each other.

Nationalism and Federalism in Yugoslavia is an ambitious book with many strengths. The attempt by Ramet to apply balance-of-power concepts to the internal functioning of a political system is innovative and illuminates several aspects of Yugoslav politics, including the tendency of political actors to unite to oppose threats to their autonomy or the stability of the system and the shifting composition of the ethnic-republic coalitions that have formed over different issues. The framework chosen by the author is also useful in that it leads him to make explicit many of the patterns of behavior other accounts of ethnic relations and crises in Yugoslavia take for granted.

The real value of the book, however, lies less in its foray into international relations theory than in its solid analysis of the origins, resolution, and implications of the various ethnically based crises that the Yugoslav system has endured. Drawing on a wide variety of sources that range from statistical materials to official speeches and documents, Ramet provides a wealth of information concerning the roots of ethnic conflict in socialist Yugoslavia,

the impact of modernization on the behavior of ethnic group members, and the aftermath of various crises for the ethnic groups most affected and for the federal structure in Yugoslavia. The author also documents the way in which economic issues have intersected with traditional ethnic divisions in Yugoslavia and makes a good case for his claim that Yugoslavia's particular form of federalism has been fairly successful in moderating ethnic conflict in that country. Ramet's observations concerning the forces that serve to perpetuate the main features of the current system of conflict resolution—particularly the decentralization of political and economic decision making and the unanimous approval required for federal decisions—also provide a useful background for understanding current debates in Yugoslavia about the role of federal and republic authorities and the proper form of the political system. For these reasons, *Nationalism and Federalism in Yugoslavia* remains a welcome addition to the literature on ethnicity and politics in Yugoslavia.

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The CIA and the U.S. Intelligence System by Scott D. Breckinridge. Boulder, Colorado: Westview Press, 1986, 364 pages, $30.00.

A longtime employee of the Central Intelligence Agency (CIA) who retired as deputy inspector general, Scott D. Breckinridge brings a wealth of experience to *The CIA and the U.S. Intelligence System*, which is a study of the structure and function of the national intelligence system. Intelligence activities, he emphasizes in the preface, "are not unauthorized independent adventures but, rather, constitute part of a national policy decided at the highest levels of government." (p. xiv) Every president since Harry S. Truman has used intelligence agencies in conducting foreign policy and, given the nature of the international environment, will continue to do so.

Breckinridge is optimistic about the current state of the intelligence community. A complex system, it functions without major problems and offers the president "the best-considered programs possible." (p. 21) Arrangements within the executive branch for direction and control of intelligence "are about as complete as reasonably can be expected," while machinery for congressional oversight is firmly in place. (p. 67) The national intelligence system, he

concludes, "has been put together remarkably well and functions with great effectiveness." (p. 324)

Unfortunately, the intelligence community has not always been properly understood or appreciated, especially by Congress. A battle-scarred veteran of the investigations of the mid-1970s, Breckinridge believes that the CIA was treated unfairly. "There is something really wrong," he contends, "in attacking a government organization that has carried out an approved government policy as though that policy did not have that approval." (p. 77) And he remains concerned about the ability of Congress to keep secrets, noting a tendency to use intelligence for purposes of partisan politics.

Intended as a textbook for courses in intelligence, *The CIA and the U.S. Intelligence System* contains enough useful information to guide undergraduates through the system's thicket of agencies and acronyms. Many instructors, however, most likely will reject the author's admiring interpretation of events, label the book a portrait of a smoothly functioning bureaucracy by a loyal former bureaucrat, and refer students to Adm Stansfield Turner's memoirs for a somewhat different view of the intelligence community and its problems.

Dr William M. Leary
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Strategic Defense: "Star Wars" in Perspective by Keith B. Payne. Lanham, Maryland: Hamilton Press, 1986, 250 pages, $9.95, paper, $20.00, cloth.

Dr Keith Payne is executive vice-president of the National Institute for Public Policy. This organization under the leadership of Dr Colin Gray has produced a series of easy-to-read books about nuclear strategy and doctrine. *Strategic Defense* is an excellent addition to that series.

Payne's arguments focus on strategy and show how active defenses could support the national security objectives of both superpowers. He presents very little discussion on whether or not missile defenses will prove to be technically feasible. Instead, he tells his readers how strategic doctrine is changing and why more and more such defenses are being seen as desirable. He addresses at length the traditional US view that stability can be achieved through mutual vulnerability and shows how the Soviet preference for a counterforce strategy has made that view untenable and forced us to search

for other options. This perceived need for a change, combined with advances in technology that cast doubt on another traditional view, that active ballistic missile defenses (BMD) are impossible, has rekindled the strategic defense debate.

His introductory chapter contains a crisis scenario that slowly escalates until deterrence fails and a strategic nuclear exchange occurs. Payne uses this scenario to point out the need for achieving security in ways that lessen our present dependence on offensive nuclear forces.

In chapter 2, "The SDI: Is It 'Star Wars'?" Payne describes the genesis of President Reagan's "Star Wars" speech as "a profound dissatisfaction with the continuing nuclear threat." Payne defines the Strategic Defense Initiative (SDI) as a "research program to assess and demonstrate the technological feasibility of intercepting attacking nuclear missiles." According to Payne, if the SDI achieves its research objectives, mankind may have the option of deploying ballistic missile defenses that are so effective that offensive nuclear forces and the fears they engender can be largely discarded. The purpose of the SDI is not to find "just another method of protecting missile silos." Its ultimate purpose is to find ways to destroy missiles, not protect them and, thus, make a defense-dominant world possible. As presented by Payne, the SDI is shown to be only a research program to see if BMD is technically and economically feasible. He stresses that the SDI is not a deployment program and also points out that the SDI has been a catalyst for a major rethinking about how we provide for our national security. In his view, the first doctrinal precept to be a casualty of this rethinking was the conventional wisdom that "mutual vulnerability is an unavoidable but useful condition."

Strategic Defense contains several chapters on the various dimensions of SDI (stability, technical feasibility, nuclear winter, morality, and allied concerns) but the two devoted to Soviet doctrine and arms control were the most enlightening to me.

Dr Payne makes strong and convincing arguments as to how BMD can be viewed as consistent with Soviet security requirements and doctrine. Much of the controversy surrounding the SDI stems from the idea that the Soviets will be forced to take desperate, destabilizing measures if we attempt to deploy active defenses. Dr Payne's arguments convince me that there is good reason to believe that the Soviets will end up endorsing and at least tacitly cooperating in a move to a defense-dominant world if the SDI or their own BMD research efforts make such an option available. He argues rather effectively that such a policy decision

would be consistent with their traditional approach to security.

Dr Payne completes his argument in a later chapter on arms control. In it he shows how the pursuit of BMD and offensive force reductions complement each other and are in the best interests of both superpowers. According to Payne, the Soviets' current strategy is to employ counterforce in order to limit damage to themselves if a nuclear war occurs. He argues that if mature BMD technology becomes available, the Soviets will be both forced to abandon counterforce as a method of achieving their damage limitation objective and forced to recognize the potential of BMD as an alternative and safer way of achieving the same objective. Since smaller offensive arsenals make BMD systems more feasible and affordable and with the not-too-unreasonable assumption that both superpowers are more interested in limiting damage to themselves as opposed to inflicting damage on their opponent, Payne concludes that BMD and arms reductions are mutually supporting. This argument is well made and understanding the logic behind it is the key to supporting President Reagan's vision of making nuclear missiles obsolete and transitioning to a defense-dominant world.

Both SDI skeptics and those who think BMD is a magic answer to the nuclear dilemma should study *Strategic Defense* carefully. Payne has treated a very difficult topic, analyzed its many dimensions, and provided much food for thought. SDI skeptics who think BMD makes no sense even if it can be built will probably find Payne's treatment of stability to be oversimplified and unfair in its discussion of the stability arguments that led to the ABM Treaty. This aside, Payne's arguments do show how BMD can result in greatly increased stability. This conclusion, of course, depends on the reader's perception of how stable the present situation is. For those who see BMD as a magic answer, Payne also recognizes the difficulties in achieving the levels of superpower cooperation that would seem to be necessary for a safe transition to a defense-dominant world.

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Virtue under Fire: How World War II Changed Our Social and Sexual Attitudes by John Costello. New York: Little, Brown and Company, 1986, 309 pages, $17.95.

Virtue under Fire purports to be a book about how World War II loosened sexual mores and changed the role of women in American and British society. What it is, in fact, is a monotonous compilation of wartime general disease statistics and lurid descriptions of brothels from London to Cairo. Its main theme—that the urge to kill and the urge to procreate are closely related in the male psyche—is as worn out as a World War II combat boot.

There are three variations on the theme: how men satisfy their sexual cravings with the most readily available females at any given time and place; how men satisfy their sexual cravings with other men when women are temporarily unavailable; and how women meet their needs for love and security under the stress of wartime separations. The primary focus is not on women's virtue under fire, but on men and their needs.

The only bright spot in the book is that it dispels the tenacious but erroneous image of women in uniform as being promiscuous. Statistics reveal that both illegitimacy and VD rates were substantially lower among British and American servicewomen than for their civilian counterparts.

Virtue under Fire would have been much more interesting if Costello had speculated on how the socialization of men and women of the 1970s and 1980s will affect relationships between the sexes in the next war, when the ratio of men to women in uniform will be much closer to equal. Many interviews in the book seem to indicate that what both sexes were really looking for was the companionship and comfort of the opposite sex, despite the generally accepted Freudian idea that making love is like making war—just an expression of man's need to dominate (particularly women). One might ask how "comrades in arms" will meet their sexual and emotional needs in the 1990s when the women have a more equal role in killing the enemy?

Judith M. Galloway
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Gatchina Days: Reminiscences of a Russian Pilot by Alexander Riaboff and edited by Von Hardesty. Washington, D.C.: Smithsonian Institution Press, 1986, 181 pages, $19.95.

The engineering and strategic aspects of the development of Russian and Soviet aviation are gradually becoming known to Western readers through the valuable works of Higham, Kipp, Jones, Kilmarx, and Hardesty; some Russian works have also been translated. However, there have been few first-person accounts, certainly nothing to match the wealth of material about aviation on the West-

ern Front during the First World War. This carefully produced work, *Gatchina Days*, by a Russian pilot who flew in the Imperial, the Red, and the White air forces is therefore welcome.

Alexander Riaboff, an engineering student in Moscow when the First World War started, enrolled in the Moscow School of Theoretical Aviation in 1916. Following a three-month technical course, he had three months of flight instruction at the Gatchina Military Flying School just outside Petrograd. He was commissioned in the Imperial Russian Air Force and flew various French planes then in use. Nieuports were particularly popular. Riaboff never flew against German or Austrian pilots, but his planes were frequently serviced by volunteer POW aviation mechanics. In the spring of 1917, following the first revolution, Riaboff was sent to Odessa on the Black Sea coast for advanced flight training; after the Bolshevik seizure of power that fall, he continued flying in the Red Air Fleet. However, his accounts of political harassment, disrespect to officers, food shortages, and general disruption of everyday as well as military life all foreshadow his going over to the opposing White forces in August 1918. His escape was simple: he merely kept flying past the area he was reconnoitering to the White airfield at Kazan.

For the next couple of years, Riaboff flew for the Whites, taking part in their initial small successes in the area east of Moscow, and then in the retreat across Siberia. The author paints a discouraging picture of feuding, drinking, lack of materiel—the existing planes had to be carefully tended, and aviation fuel was in short supply. Above all, there was little support from the local populations, probably as a consequence of the lack of political leadership among the various White forces. The Red and White pilots, while occasionally making bombing runs, mostly flew reconnaissance missions. Riaboff describes several occasions when enemy pilots did not choose to take advantage of a crippled opponent and cites them as among the few instances of sanity in the civil war. There was a great deal of waiting around, which frustrated the men; after all, as Riaboff noted, "Pilots without airplanes feel as useless as Cossacks without horses." Eventually, the discouragement led Riaboff and his wife Sonya, a nurse whom he had met in Siberia, to leave Russia, this time by train into China.

After a couple of years in the émigré community in Harbin, Alexander and Sonya Riaboff emigrated to the United States, where he gave up flying and developed a new career as a lawyer. His return to visit relatives in Russia in 1960—and the discovery of his aviation photographs which they

had saved—inspired him to write these memoirs, based on his contemporary diary. Riaboff died in 1984.

For those unfamiliar with Russia's government and military activities during this period, Hardesty's introduction and comments at the beginning of each chapter provide a helpful framework and reference; there is also a useful bibliography. The maps are clear, though they do not include all the locations mentioned in the text, and they are essential to follow the action in Siberia and to appreciate the distances and terrain involved; however, it would have been helpful to have a listing of all the maps.

For many readers the photographs will undoubtedly be a major attraction of *Gatchina Days: Reminiscences of a Russian Pilot*. Most of the planes used in this period are shown, including the great bomber, the Ilya Muromets, designed by Igor Sikorsky. There are fascinating aerial views of Petrograd, but the shots of pilots, planes, and mishaps vividly convey the hazards inherent in fragile, frequently repaired planes, makeshift landing zones, and warfare.

Riaboff's memoirs—and the accompanying translated excerpts from his diary—are an enjoyable and valuable addition to the literature on Russian aviation and the civil war.

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The Red Army Order of Battle in the Great Patriotic War by Albert Z. Conner and Robert G. Poirier. Novato, California: Presidio, 1985. 408 pages, $22.50.

This very specialized reference work—*The Red Army Order of Battle in the Great Patriotic War*—bears the subtitle *Including Data from 1919 to Postwar Years*. What kind of data?

Albert Conner and Robert Poirier list seven kinds of data in the introduction: American, British, and German World War II secret material now declassified; unclassified and low-classification Soviet military publications; and both Western and Soviet historical works. This listing, alas, does not go into detail. A future edition, tentatively promised in the introduction, should at least cite the historical literature used. The pseudonymous "Suvorov" of the present is given as the source for front assignments of two armies in a future war. (pp. 54, 57) That may be interesting speculation, but does it belong in a work of historical reference?

Where the work is historical, one would like to

have more detail. The authors refer to German sources (FHO) but do not clarify whether this includes material about the early Red Army from the files of the Polish general staff, captured during the German-Russian invasion of Poland in September 1939.

In short, we have here many layers of data, accumulating more than half a century or more, gathered and interpreted by and for very different organizations. Were all these layers represented with respect not only to unit histories but to strategy and policy, the reader might well drown in cross-currents of perspective and interpretation. So Conner and Poirier were wise to restrict themselves, essentially, to the barest bones of an order of battle. They list each army, corps, and division in numerical order and tell us where it was and when it was there. They also give a unit's origin or earliest known activity, unit honors, key commanders, and subordinate formations.

There are some minor blemishes. Blagoveshchensk is misspelled. (p. 296) Is Oranienbaum (pp. 266, 337) not Oranienburg? Leaving such detail aside, the work does fill a gap on the reference shelf. In one fascinating respect, it does much more. For the nonspecialist reader, *The Red Army Order of Battle in the Great Patriotic War* conveys something of the flavor of the military mysteries of the Soviet Union. We learn of many corps that they "probably existed" or are "known to have existed." (pp. 166–71) For them, such are the only entries. It is hard to imagine any other country in which a whole army corps—let alone several—like a subatomic particle, barely leaves a trace.

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Spy-Tech by Graham Yost. New York: Facts on File, 1985, 288 pages. $17.95.

Spy novels and movies are full of incredible high-tech gadgets to make agents' jobs easier, but the real-life tools of the espionage trade are even more fascinating. Author Graham Yost has written an in-depth study of the kinds of equipment used in intelligence gathering by combining information available from a variety of published sources with interviews of members of the intelligence community.

Spy-Tech is divided into two sections, of which part 1, "Spying from Above," is the longest. In this section, Yost traces the history of aerial surveillance from the hot-air balloons of the eighteenth century to the latest satellites used by the Central Intelligence Agency (CIA) and Department of Defense. Yost details the development of the U-2 and SR-71 spy planes and then shows the history and current uses of spy satellites, including the latest types such as the CIA's KH-11. The detailed discussion of US satellite reconnaissance is followed by a brief overview of the Soviet space program's intelligence gathering.

Part 2, "The Secret Agent's Tools," comes closer to the world of spy novels and movies, for it describes the techniques and tools used for bugging and debugging rooms and phones, breaking into computer files, photographing documents clandestinely, writing secret messages, and breaking codes. Yost also includes a chapter on the more violent side of espionage, including burglary, sabotage, and weaponry.

Overall, this book provides a useful summary of the technology used in espionage. *Spy-Tech* is strongest in its coverage of aerial surveillance, because Yost provides considerable background material and gives up-to-date details in nontechnical language on the important topic of satellite reconnaissance. The section on the tools of the secret agent is less useful because it covers too many topics without enough detail. Readers hoping to find fascinating stories about wristwatch cameras or exploding cigars will be disappointed. The primary usefulness of *Spy-Tech* is thus to provide military and academic readers with an up-to-date, unclassified survey of intelligence technology, particularly in the area of high-altitude and satellite reconnaissance.

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The Myth of Soviet Military Supremacy by Tom Gervasi. New York: Harper and Row, 1986, 545 pages, $24.95.

The Myth of Soviet Military Supremacy is an impassioned book written in the manner of Emile Zola's *J'accuse* and directed against the advocates of the current US military buildup. Tom Gervasi's premise is that the current defense effort is the result of a propaganda campaign that oversold the Soviet threat. Gervasi, a journalist and director of the Center for Military Research and Analysis in New York, presents a vast amount of data regarding the relative military postures of the two superpowers and their respective alliance systems during the last decade. These materials, compiled into eight appendices covering 200 pages, are intended to call into question the Reagan administration's claims

regarding Soviet military power. Much of the data are contradictory; estimates, provided by various sources in and out of government, conflict. As John Prados has pointed out in *The Soviet Estimate* (1982), bureaucratic politics affect the nature of the assessments offered by intelligence agencies. While men of goodwill have disagreed and continue to disagree regarding the nature of such assessments, the author can find no place for such honest conflict. Instead, he depicts this conflicting testimony regarding Soviet military capabilities as either proof that a massive disinformation campaign is under way or that the Reagan administration has been unsuccessful in its efforts to suppress the real evidence.

This work begins with two disclaimers: first, Gervasi states that he is for a strong defense and, second, that "America has had a strong defense throughout its history." (p. 3) The author does not explain what he means by a strong defense, and in failing to do so leaves unanswered the crucial issues of the current defense-foreign policy debate: What do we defend, how, and at what price? Surely it is clear six years into this administration that the crucial questions are about "extended deterrence," global responsibilities, and the relationship between third world instability and Soviet activities. The figures, which so much concern Gervasi, only take on a political, strategic, and military significance within the context of a national grand strategy. In democratic politics, grand strategies become the subject of partisan debate.

Gervasi would have been well served by recalling the repartee to number mongers attributed to Disraeli: "There are three kinds of lies: lies, damned lies, and statistics." There are legitimate questions to be asked regarding the public presentation of aspects of the military balance between the United States and the Soviet Union. Instead of critically analyzing the presentation of such data, Gervasi attempts his own encyclopedic presentation of the facts. Gervasi's case stands or falls on the accuracy of his own numbers. These figures are taken to be the chief indices of the relative military, geostrategic positions of the United States and the USSR—regardless of the asymmetries that affect their postures. These figures are at best incomplete estimates, already dated when they appeared and, regarding Soviet forces, only Western assessments in lieu of Soviet data.

In such a massive compilation, errors will appear, giving critics more than enough ammunition. A few examples will suffice to demonstrate the problem. The FB-111 did not go into service in 1956 (p. 312); the first prototype flew in 1967 (N. Krivinyi, ed., *World Military Aviation* [New York: Arco Publishing, 1973], 172). The 7th Marine Amphibious Brigade hardly has 15,000 combat troops. (p. 451) And the rate of fire on a T-72, according to a recent Soviet work (V. S. Kniaz'kov, *Boevaia tekhnika* [Moscow: Voenizdat, 1986], 34) is eight rounds per minute using the automatic loader and not the two rounds per minute cited by Gervasi. (p. 476)

Gervasi is critical of other analysts for their use of sources, while at the same time being very uncritical and lax in his exploitation of his own sources. Thus, Gervasi criticizes Leon Gouré and Michael Deane for their interpretation of Maj Gen V. G. Reznichenko's writings on nuclear warfighting, suggesting their misuse of materials contained in the restricted journal *Voennaia mysl'*. However, Gervasi does not cite and he seems unaware of Reznichenko's major writings on tactics over the last two decades. To question the use of Soviet writings without making every effort to study those writings raises serious issues regarding research methodology. This concern is reinforced by the manner in which he employs his own sources. Gervasi attributes to David Isby the information that the Soviet 28th Corps has headquarters in the Grodno region of the Belorussian military district. (p. 476) In fact, Isby refers to the 28th Army.

While Soviet military supremacy is a myth, Soviet military power is not. To understand its significance within the context of the ongoing political and ideological competition between the United States and the Soviet Union requires a certain hardheaded realism regarding the severe limitations affecting the utility of military power in the nuclear era. Gervasi's book does not provide the context for such an assessment.

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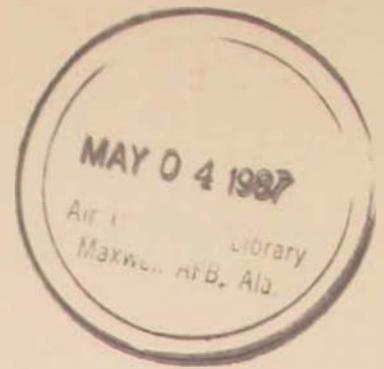
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The *Air University Review* Awards Committee has selected "The Soviet Union: Crisis, Stability, or Renewal?" by Dr Ralph S. Clem and "Train Hard, Fight Easy: The Legacy of A. V. Suvorov and His 'Art of Victory'" by Dr Bruce W. Menning as the outstanding articles in the November–December 1986 issue of the *Review*.

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