AIR UNIVERSITY
review

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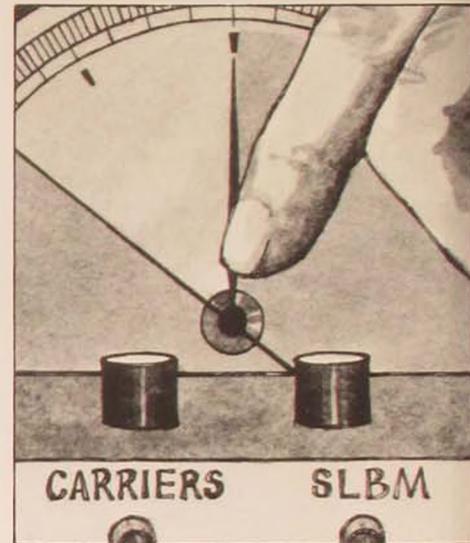
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Attention

Since modern warfare is continuously changing, Air Force leaders must be constantly alert for new ideas that might be the key to the successful application of aerospace power in the future. The *Air University Review* is the professional journal of the United States Air Force and is designed to serve as an open forum for exploratory discussion of professional issues and the presentation of new ideas. As an open forum, the *Review* aims to present new ideas and stimulate innovative thinking on military doctrine, strategy, tactics, professionalism, and related national defense matters. The views and opinions expressed or implied in this journal are those of the individual authors and are not to be construed as carrying the official sanction of the Department of Defense, the Air Force, Air University, or other agencies and departments of the U.S. government. Thoughtful and informed contributions are always welcomed.

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AIR UNIVERSITY review

November-December 1984 Vol. XXXVI No. 1
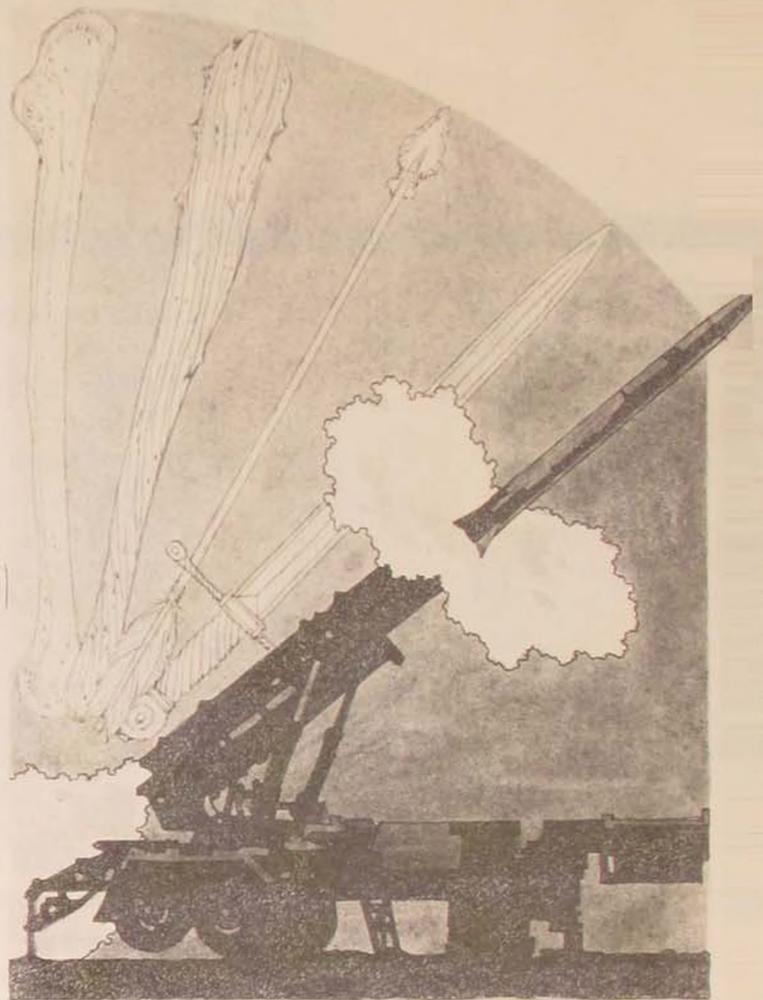
AIR FORCE OFFICER CORPS: QUO VADIS?

We pondered the jargon of experts, each convinced that his peculiar weapon, machine gun, rifle, bayonet, or bomb, was the one designed to bring the war to a satisfactory conclusion. We were inclined to resist their pedantry, suspecting that in truth they knew little more than ourselves; and we—we knew nothing.

Guy Chapman, *A Passionate Prodigality*, p. 15

TECHNOLOGY has been one of the greatest forces for change in human affairs. This is especially true in war. Since prehistoric times, men have sought the advantage offered by a superior weapon that allows a soldier to kill or wound his enemy while he himself remains invulnerable to the effects of his enemy's weapons. In our own century, the quest for superior weaponry continues, now sustained by a technology both enhanced and made more costly by its coupling to science in the research and development process.

As we move toward modern times in military history, we find that the increasing importance and growing number of weapons generated an expanding requirement for technically qualified people who could construct, maintain, and/or operate the weapons and fortifications that were becoming commonplace in warfare. By the late Middle Ages, it became possible to identify a group of men who were responsible for the technical details of war. A member of this group was an *ingeniator*, a Latin word designating one who "built the ingenious fortresses and engines of war" during the era of feudalism. This is, of course, the origin of our word *engineer*, which is not found in the civilian context until the eighteenth century when John Smeaton began to use the term *civil engineer* to describe himself and others interested primarily in civilian enterprises.

Between 1500 and 1900, the need for officers with technical knowledge and skills continued to grow as gunpowder weapons came to dominate European battlefields and logistics was revolutionized through the application of steam and steel to transportation. During this era, technical knowledge and skills became an important entrée to the officer corps for the middle class of Europe and were thus instrumental in breaking the nobility's monopolization of officer ranks. What this meant can be seen by looking at changes in the Prussian officer corps. Before the Napoleonic wars, Prussian officers were almost exclusively from the nobility; by World War I, two out of three German officers were of middle-class background.

In our own country also, technology has had a profound effect on the profession of arms. This impact has been described by Morris Janowitz in his classic work *The Professional Soldier*. According to Janowitz, technology has produced a convergence between civilian and military activities. During the American Civil War, 93 percent of the Army's enlisted personnel were doing uniquely military things, such as firing rifles, manning artillery batteries, or serving in the cavalry. By the

time of the Korean War, this number had dropped to 29 percent and, Janowitz notes, would probably have been lower for the Air Force had the statistical data been available. In 1980, statistics published on the Department of Defense show that only 15 percent of all DOD personnel (13 percent for the Air Force) are doing uniquely military things, while 46 percent are engaged in scientific and technical enterprises.

Statistics such as these have combined with other perceptions of technology's effects to create a climate in which some observers now wonder where the modern quest for superior weapons is taking us. Among this group are some of the most vocal critics of the defense establishment, including Edward Luttwak, Steven Canby, William Lind, and Jeffrey Record, who believe that American officers tend to overemphasize technology to the detriment of other key aspects of war, such as strategy and generalship. Another area where the military response to science and technology has been criticized is officer accession programs. Since such programs determine the makeup of the officer corps, decisions affecting them could have grave consequences for the American military profession and the security of the nation.

In 1976, the U.S. Navy embarked on a program designed to increase the number of technically educated naval officers by requiring 80 percent of entering officers to have technical degrees. As this program began, Captain Edward N. Bouffard raised questions about its wisdom and what it would mean for the quality of the Navy's officer corps.

> By becoming an organization of "technocrats," how does the Navy obtain the line officers it surely needs with backgrounds in such disciplines as business, history, political science, sociology, and education?
>
> "NROTC: Quo Vadis?"
> U.S. Naval Institute *Proceedings*, July 1977, p. 40

An article in the Spring 1984 *Armed Forces and Society* by Professor William P. Snyder indicates that the Air Force is embarked on a program similar to that of the Navy. According to Snyder, the Air Force has moved toward the Navy's model for ROTC since the Vietnam War. Snyder sees the Air Force as "vocationalizing" its ROTC and OTS programs, a process that involves "scientific-technical preparation and the matching of academic programs with specific service career fields." (pp. 408-09) Snyder, himself a West Point graduate and retired Army colonel, sounds this alarm at the end of his article:

The emphasis on scientific-technical education in officer commissioning programs may have more serious implications. New and complex technology dictates that officers at all levels have relevant intellectual skills. But the senior ranks also require officers with broad backgrounds and at least some awareness of social, economic, and political developments. The scientific-technical emphasis addresses problems faced by many officers during their initial service. At the same time, it ignores an important long-term objective: a cadre of well-educated generalists for senior staff and command positions. (p. 422)

More recently, a September 1984 CADRE research report titled *Preserving the Lambent Flame*, by Lieutenant Colonel Richard R. Stokes, Jr., also raises questions about the direction of the USAF officer accessions program. Stokes notes that FY85 plans call for 75 percent of incoming officers to hold technical degrees. And yet, as Stokes points out, there are signs that this emphasis on technical education may be misplaced, for three out of four officers in the class of 1983 at the Air War College held nontechnical degrees. (p. 5) Since selection for the resident AWC course is at least some measure of success in an Air Force career, a nontechnical degree does not seem to have been a hindrance to successful service in the Air Force. Could it be that there is actually a positive correlation between nontechnical degrees and a mind-set that leads to a generalist's ability to lead a large, diverse organization like the Air Force?

With regard to where Air Force accession plans might be taking the officer corps, Stokes expressed concerns that are very similar to those pronounced by Bouffard and Snyder. While noting that we need scientists and engineers, Stokes tells us that "we also need abstract thinkers schooled in the art and history of warfare, the social sciences, and the humanities" to develop the policies that guide the application of weapons produced by our scientists and engineers. (p. 73)

If the concerns expressed by Bouffard, Snyder, and Stokes are justified, what qualities will the future Air Force officer corps possess? Might we possibly wind up with the best qualified company-grade officers in the world and a group of senior leaders without the generalist perspective required to integrate the myriad components of air power into a coherent, effective whole? At some time in the future, could we find ourselves in a situation like that ascribed to the British army by Napoleon? Will we be an Air Force of "lions led by donkeys"? (Basil H. Liddell Hart, *Foch, The Man of Orleans*, p. 453).

D.R.B.

THE IMPACT OF TECHNOLOGY TRANSFER ON THE MILITARY BALANCE

Dr. Sumner Benson

I N NOVEMBER 1983 West German and Swedish customs agents, working with the United States Customs Service, seized thirty tons of advanced U.S. computer equipment being illegally diverted to the Soviet Union. Soviet agents had routed this shipment through a half-dozen Western countries in a well-organized and technically sophisticated operation. The shipment included most components of a VAX 11/782 computer manufactured by Digital Equipment Corporation. That computer far exceeds the capabilities of computers produced
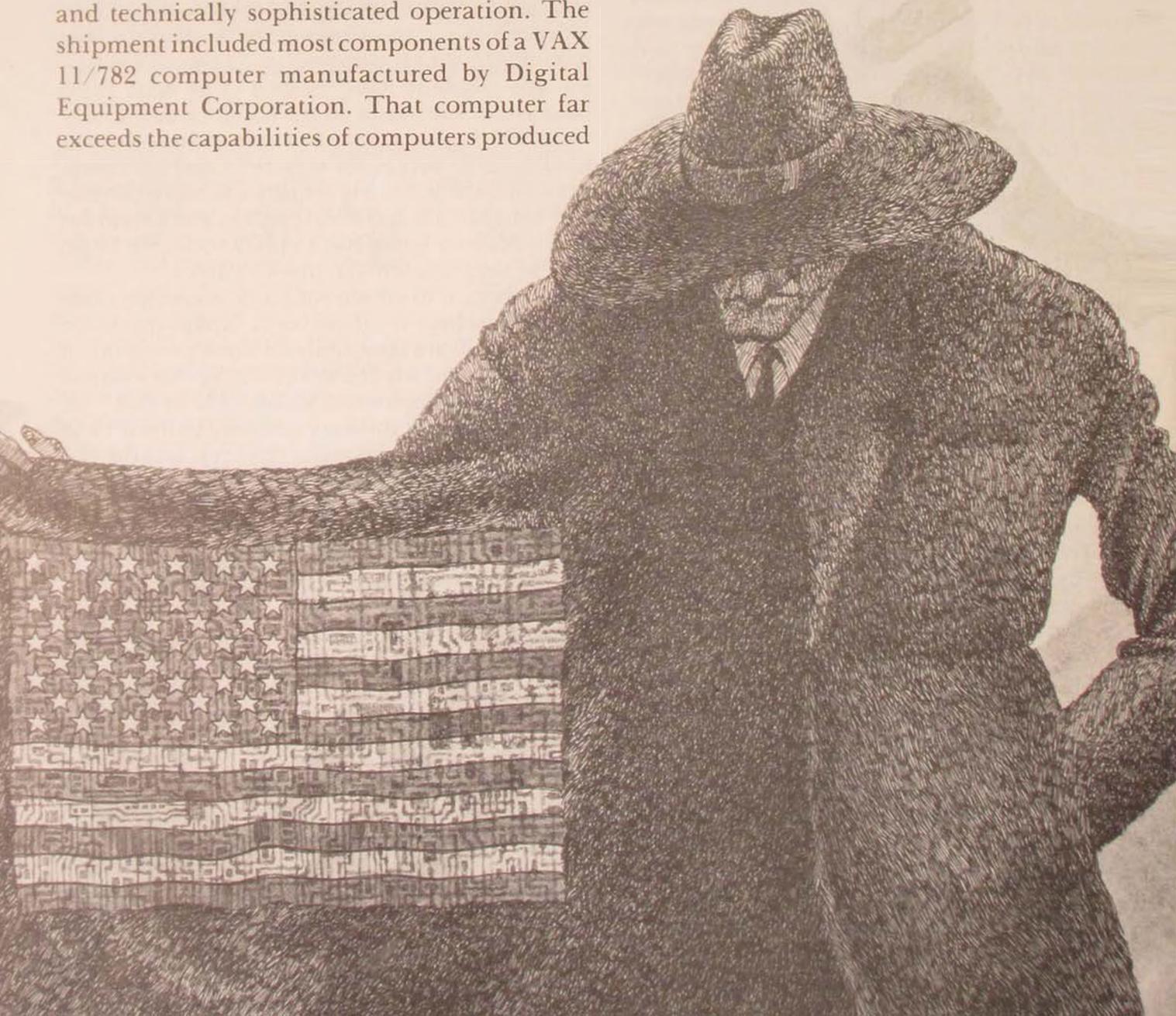
within the Soviet bloc. Its military uses include weapons fire direction, signal processing and analysis, and design and manufacturing of integrated circuits for the most advanced U.S. weapon systems. Several other large containers with similar equipment reached the Soviet Union.[1]

The VAX case dramatizes how the Soviet Union tries to gain Western high technology to strengthen Soviet military power. This Soviet effort poses increasing danger to the West in view of the deterioration of détente and the use of military force in Afghanistan and Poland.

Two specific trends heighten the urgency of tightening up on technology transfer. First, NATO has lost much of the technological edge needed to offset Warsaw Pact superiority in numbers of weapons and troops. The Soviet Union has made such great qualitative improvements in its forces that significant Soviet gains of Western technology could destabilize the military balance. Second, because technologies of commercial origin now provide the Western advantage in many kinds of military equipment and weapons, it is difficult for the free-market Western societies to control the technologies necessary to their national survival.

Russia Turns Westward

The Soviet government consistently has sought Western technology to modernize its national economy and military system. The Soviet Union (like its predecessor, the Russian Empire) has a large population, abundant natural resources, and a highly centralized government committed to rapid economic growth. The Soviets also have heavily emphasized military strength. They have done so to maintain autocratic government within their own country and to project Soviet power in Europe and, more recently, globally. This military focus now blurs the distinction between civilian and military authority and programs.[2]

In contrast, Western nations have had more diversified and productive economies, more rapid technical innovation, and more highly skilled work forces. Because of the greater role of private enterprise and more pluralistic societies, Western governments have tended to separate East-West trade from strategic considerations. They have been less sensitive than the Soviets as to how trade might strengthen a potential enemy.

Several historical examples show how Russian leaders have tried to reduce the Western technology edge. More than two centuries ago, Emperor Peter the Great (1682-1725) used Western experts plus his own personal familiarity with European factories and shipyards to reform the Russian army and to build the first Russian navy. Peter's victory over Sweden at Poltava in 1721 guaranteed Russia's "window on the West" on the Baltic Sea and made Russia a European military power. More recently, Russia's first major drive for industrialization, which began in the 1890s, relied heavily on Western investment and Western construction.

Following the Bolshevik Revolution in 1917, the Soviet government offered large financial incentives to gain advanced Western know-how and equipment. During Stalin's First Five-Year Plan (1928-33), for example, American firms built, or helped to build, the steelworks at Magnitogorsk in the Ural Mountains, the largest steel complex in the world and a replica of the United States Steel plant in Gary, Indiana; the Dnieper River Dam in the Ukraine, the keystone in the development of Soviet hydroelectric power; the automobile plant at Gorki, east of Moscow, modeled after Ford Motor Company's River Rouge plant; and several large chemical plants.

The West helped to arm Soviet Russia as well as to industrialize it. In the case of aviation, the German aircraft manufacturer Junkers modernized a prerevolutionary plant at Fili, near Moscow. At an air base at Lipetsk, south of Moscow, German and Russian engineers collaborated, and German and Russian pilots trained together. During this period between

the two world wars, the Soviet Union also imported military aircraft from Britain, France, Holland, Italy, and Sweden.[3]

Western nations also transferred "dual use" technologies, that is, those with military as well as commercial applications. The Soviet Union used fertilizer plants supplied by the West to produce explosives, machine plants to produce gun barrels, and tractor and automobile factories to produce tanks and armored vehicles. In 1933, the American who served as chief engineer of the Soviet All-Union Construction Trust stated that every tractor plant "is, of course, a tank factory and [every] automobile plant a factory which may at any time produce mobile artillery." Another American engineer reported that in all of the Soviet plants that he visited, at least one department was closed; he noted that he would periodically discover "parts, materials, shells, and acids" with no relation to normal production.[4] According to recent émigrés, the Soviet Union still maintains separate military sections in major manufacturing plants.[5]

Western Policy
on Technology Transfer

Through most of this period, Western governments tolerated or even promoted extensive transfer of technology to Russia. While Western leaders recognized that they were strengthening a state with the population and natural resources to become the dominant military power in Europe, this strategic insight was outweighed by more immediate economic, political, and military calculations. Governments and businesses alike profited from trading Western equipment and technology for Russian raw materials and energy resources. Moreover, the shifting system of alliances associated with balance-of-power politics kept Russia an actual or potential ally of one or more Western states.

Because Europeans assumed that Russia would always lag behind them technologi-

cally, they saw the Russian army as a horde of brave but poorly equipped peasant soldiers rather than as a potentially modern military force. Even after 1917, European governments feared Communist-inspired revolutions more than the Red Army. Such attitudes help explain why most European military observers believed that Germany would defeat Russia after the June 1941 German invasion.

The rapid growth of Soviet military power after World War II shattered Western complacency about the transfer of strategic technology. The United States and its European allies reversed their earlier policies and prohibited the sale of military equipment to the Soviet Union. They also embargoed certain commercial goods and technologies that would strengthen Soviet war-making capabilities. To administer this embargo, they established the Coordinating Committee for Multilateral Export Controls (COCOM), located in Paris and now consisting of most NATO members (all except Iceland and Spain) and Japan.

During the détente of the 1970s, COCOM and individual Western countries loosened controls on dual-use (commercial/military) technologies. U.S. and West European political leaders hoped that an expanding East-West trade would strengthen those groups in Soviet politics associated with consumer goods and foreign trade and, in so doing, weaken the military-heavy industry complex.

These hopes were misplaced. Instead, recent information suggests, increased trade between East and West helped to fortify the position of the Soviet military establishment. The Soviets continued to increase their military spending at an annual rate of 4 percent, while their economic growth declined to 3 percent per year during the second half of the 1970s and, still further, to 1 to 2 percent in the 1980s. Today, high technology goes overwhelmingly to the military and space sectors. This Soviet choice of priorities suggests that strategic and political competition, rather than commercial cooperation, will govern Soviet-Western relations

for at least the rest of the 1980s.[6] Thus, Western nations must exercise caution in releasing advanced Western technology with possible military applications.

Threats to Military Stability

Two specific trends of the past decade strengthen the case for closer control of technology transfer to the East.

First, the Soviet Union has structured and modernized its military forces so that for the first time Soviet acquisition of Western high technology could tilt the military balance in the Soviet favor. During the past fifteen years, the Soviet bloc has improved its military position greatly vis-à-vis the West. The Warsaw Pact now outnumbers NATO by at least a 2:1 ratio in most major categories of tactical ground and air power. The Soviet Union deploys more land-based intercontinental ballistic missiles (ICBMs) than the United States.

More disturbingly, the Soviets have reduced NATO's traditional lead in military technology, in part by outspending the United States on military research, development, test, and evaluation (RDT&E) every year since 1972. Currently, the Soviet Union spends nearly twice as much in this area as the United States. Soviet RDT&E is growing more rapidly than other Soviet military investments.[7] The Soviet Union frees its nine defense-industrial ministries from bottlenecks that can throttle production in other ministries. It also allocates more and better laboratory equipment to military-related than to nonmilitary research.[8]

Soviet investment in military technology is paying off. The Soviets now deploy tanks, artillery, attack helicopters, and ICBMs that equal those of the United States in technological sophistication. They are cutting the U.S. lead in various deployed weapon systems, such as fighter/attack aircraft, precision-guided munitions, antisubmarine warfare, and submarine-launched ballistic missiles (SLBMs). They are superior in strategic surface-to-air

missiles, ballistic missile defense, and antisatellite warfare. They are equal in directed-energy (laser) technology and are spending much more than the United States in this field.[9] According to Department of Defense studies, Warsaw Pact forces in the Central Region of Europe have improved their potential combat effectiveness by more than 90 percent from 1965 to the present, while NATO forces have improved theirs by less than 40 percent.[10]

This technological surge increases Soviet capabilities for a rapid offensive, or preemptive, attack. Improvements in tanks, self-propelled artillery, attack helicopters, and heavy-lift vehicles support a blitzkrieg ground force strategy in Europe. Moreover, the present generation of Soviet tactical aircraft is designed and equipped for offensive operations. While not as capable as the best Western fighters, their numbers and quality invalidate earlier assumptions of automatic NATO air superiority.

At the strategic level, the startling improvement in Soviet ICBM capabilities since the signing of the SALT I agreement in 1972 has made a successful preemptive strike against U.S. Minuteman ICBMs at least theoretically possible. The deployment of SS-18s and SS-19s virtually destroyed the strategic arms control process of the 1970s, which depended on the tenet of mutual assured destruction that neither superpower could develop a first-strike capacity. The increased accuracy of Soviet ICBMs has pushed the United States to plan deployment of the MX ICBM. It also has increased the responsibilities of the other weapons in the U.S. deterrent—penetrating bombers, long-range cruise missiles launched from stand-off aircraft, and SLBMs.

Finally, a Soviet breakthrough in directed-energy weapons could give the Soviets meaningful superiority in strategic defense and military use of space. Such a breakthrough would build on existing Soviet advantages in strategic surface-to-air missiles, ballistic missile defense, and antisatellite warfare.

These trends in theater and strategic weap-

Emperor Peter the Great and Joseph Stalin both turned to the West for technologies needed to foster progress and modernization in Russia.

ons particularly affect Air Force missions. Western air superiority would be necessary to block a Warsaw Pact blitzkrieg attack. NATO's antiarmor doctrine requires the freedom to target air- and ground-launched precision-guided munitions against the first and second echelons of a Pact offensive. Furthermore, the Air Force provides two legs of the Triad of U.S. strategic offensive forces (ICBMs, as well as penetrating bombers and air-launched cruise missiles) and most space and strategic defensive systems.

Changes in Military Technology

The second trend calling for tighter control of Western technology is the rapidly growing military importance of dual-use technologies. Increasingly, commercially focused advances in computers, microelectronics, composite materials, and other high technologies drive military modernization.

The Defense Science Board identified this problem nearly a decade ago. The influential 1976 Bucy Report on export of U.S. technology highlighted the potential military role of commercial computers. According to that report, the "mere presence" of large computer installations "transfers know-how in software" and "develops trained programmers" and other personnel. All of this can be "redirected to strategic applications."[11]

Microelectronics offers the best example of how commercial-origin technology can improve military performance radically. British Air Vice-Marshal Michael Armitage considers solid-state electronics one of four "real break-throughs" in military technology during the past half century (the others being radar, nuclear weapons, and lasers). Air Vice-Marshal Armitage states that solid-state electronics is having a "revolutionary" impact on warfare of an "unusually pervasive and incremental kind." In his view, transistors and integrated circuits will make possible "entirely new efficiencies" in "almost all weapons systems."[12]

Former Under Secretary of Defense (Research and Engineering) William Perry argues that the technologies of microelectronics and computers that were developed "primarily for commercial application" have shifted the focus of military planning from "delivery vehicles and explosive devices" to "improvements in sensors, control, and accuracy."[13] Perry notes that the U.S. semiconductor industry finances nearly all of its research and development from commercial sales, yet it has provided much of the West's lead in computer- and microelectronics-related military systems. Perry cites the microprocessor as "essentially a commercial development," which, nonetheless, plays a "key role in the new generation of precision-guided munitions."[14]

Another example is the strategic cruise missile, now critical to NATO's theater and intercontinental nuclear deterrents. That weapon dates back to the 1950s (Navaho, Snark, and

Regulus) but was too large and inaccurate for major missions until it incorporated guidance and control systems using modern micro-electronics.[15]

This blurring of the commercial/military distinction makes it difficult to protect militarily significant technologies. Often such technologies appear on the civilian market before the government understands their full military implications, let alone how to control them effectively. Moreover, military products have a much longer expected service life than commercial products. Hence, the business community may press for decontrol of technologies that still give the West important military advantages over the Warsaw Pact.

The spread of high technology through the Free World complicates control even further. In the 1950s and 1960s, American supremacy in both commercial and military technology was unchallenged. Now the United States worries that it may lose the supercomputer race to Japan. Moreover, U.S., Japanese, and European firms transfer advanced technologies to newly industrializing countries whose export controls and industrial security are weaker than those in most Western nations.

In 1983, American, Swedish, and West German authorities thwarted Soviet efforts to acquire tons of advanced American computers illegally. The VAX 11/782 (above), manufactured by Digital Equipment Corporation, has sophisticated military applications far exceeding known Soviet capabilities. . . . Below, some of the crates containing the computers that were almost stolen arrive back in the United States at Andrews AFB, Maryland.

What Have the Soviets Gained?

The commercial availability of dual-use technologies having increased military importance offers new tempting and vulnerable targets to the Soviet Union. Predictably, the Soviets have mounted an intensive effort to obtain these technologies legally or illegally. Soviet intelligence services assign several thousand officers to collect Western technology throughout the world; they work under cover titles ranging from diplomat to journalist to trade official. The specialized "foreign trade organizations" within the Ministry of Foreign Trade arrange legal purchases of Western technology and plan for major Western investments in the Soviet Union. They also help the intelligence services carry out illegal diversions of con-

trolled technology, as in the VAX 11/782 case. The State Committee for Science and Technology and the Soviet Academy of Sciences negotiate exchanges with Western governments and maintain contacts between Soviet and Western scientists, universities, and research centers.[16]

The results of this effort have been encouraging to the Soviet Union but disturbing to the West. In 1972, the Soviets legally purchased more than 150 precision grinding machines from an American company. They used these machines to produce large volumes of high-precision bearings for their intercontinental missiles sooner than would have been possible with their own precision grinders. Those bearings helped to improve the missiles' inertial guidance systems, which, in turn, contributed to the major increase in Soviet ICBM accuracy that has threatened Minuteman survivability, undercut strategic arms control negotiations, and added the cost of MX missiles to the U.S. defense budget.[17]

In 1976 and 1977, the Soviet Union illegally obtained more than fifty high-energy laser mirrors from Spawr Optical Research, Inc. The California-based firm had performed laser op-

Table I. *Selected Soviet and East European Legal and Illegal Acquisitions from the West Affecting Key Areas of Soviet Military Technology*

Key Technology Area	Notable Success
Computers	Purchases and acquisitions of complete systems designs, concepts, hardware and software, including a wide variety of Western general-purpose computers and minicomputers, for military applications.
Microelectronics	Complete industrial processes and semiconductor manufacturing equipment capable of meeting all Soviet military requirements, if acquisitions were combined.
Signal Processing Manufacturing	Acquisitions of processing equipment and know-how. Acquisitions of automated and precision manufacturing equipment for electronics, materials, and optical and future laser weapons technology; acquisition of information on manufacturing technology related to weapons, ammunition, and aircraft parts, including turbine blades, computers, and electronic components; acquisition of machine tools for cutting large gears for ship propulsion systems.
Communications	Acquisitions of low-power, low-noise, high-sensitivity receivers.
Lasers	Acquisitions of optical, pulsed power source, and other laser-related components, including special optical mirrors and mirror technology suitable for future laser weapons.
Guidance and Navigation	Acquisitions of marine and other navigation receivers, advanced inertial-guidance components, including miniature and laser gyros; acquisitions of missile guidance subsystems; acquisitions of precision machinery for ball-bearing production for missile and other applications; acquisition of missile test range instrumentation systems and documentation and precision cinetheodolites for collecting data critical to postflight ballistic missile analysis.
Structural Materials	Purchases and acquisitions of Western titanium alloys, welding equipment, and furnaces for producing titanium plate of large size applicable to submarine construction.
Propulsion	Missile technology; some ground propulsion technology (diesels, turbines, and rotaries); purchases and acquisitions of advanced jet engine fabrication technology and jet engine design information.
Acoustical Sensors	Acquisitions of underwater navigation and direction-finding equipment.
Electro-optical Sensors	Acquisition of information on satellite technology, laser rangefinders, and underwater low-light-level television cameras and systems for remote operation.
Radars	Acquisitions and exploitations of air defense radars and antenna designs for missile systems.

Source: U.S. Government, *Soviet Acquisition of Western Technology* (Washington: Central Intelligence Agency, 1982), p. 7.

tics polishing work for such companies as TRW and Rocketdyne and for various government organizations, such as Los Alamos Scientific Laboratory, Redstone Arsenal, and the Naval Weapons Laboratory. Moreover, Spawr had furnished high-energy laser mirrors to the Air Force Weapons Laboratory at Kirtland Air Force Base, New Mexico. When the government rejected Spawr's application to sell the Soviet Union fifty mirrors identical to the Air Force mirrors, the firm shipped the mirrors anyway. Spawr and its German agent falsified export documents to conceal the contents and destination of the shipments. The commander of the Air Force Weapons Laboratory estimated that the mirrors saved the Soviet Union millions of dollars and nearly 100 man-years of research and development (R&D) effort. The mirrors probably have helped the Soviet Union maintain its lead over the United States in ballistic missile defense and antisatellite capabilities.[18]

In a third case, a U.S.-based Polish import-export firm served as the cover for a successful effort to gain technical information on two critical Air Force systems. A Polish intelligence officer paid William H. Bell, a veteran radar project engineer at Hughes Aircraft Company, $110,000 during the late 1970s to photograph classified documents on a wide range of Air Force, Army, and Navy systems. Among these was the look-down, shoot-down radar system of the F-15 fighter. The data that Bell furnished on this radar will help the Soviets develop capabilities to identify and destroy low-flying U.S. cruise missiles. Bell also turned over documents on the radar system for the B-1 and Stealth bombers. This material has helped the Soviet Union plan its defenses against the next generation of U.S. penetrating bombers even before they have been deployed.[19]

The Soviet Union strengthened its oceanic naval capabilities through legal purchases of two huge floating dry docks from Japan and Sweden. Although the Soviets stated that these docks would service merchant vessels only, the docks were soon diverted to military use, one in 1978 to the Soviet Pacific Fleet and the other in 1981 to the Soviet Northern Fleet. They are the only two dry docks in either of the two major Soviet fleet areas capable of servicing Kiev-class vertical/short takeoff and landing (V/STOL) aircraft carriers. These carriers are important to Soviet naval operations against NATO's sea lines of communications and to projection of Soviet power in the Third World.[20]

Finally, the diversion of the VAX 11/782 computer system provides dramatic evidence of a long-term push to acquire computer and microelectronic equipment and technology. Over the past decade, the Soviets have bought or stolen hundreds of pieces of U.S., Japanese, and European microelectronic equipment worth hundreds of millions of dollars. This has made possible a modern microelectronics industry that could meet all Soviet military requirements. The Soviets also have used IBM computers to help them design the Ryad series of computers that are used throughout their military.[21]

The United States Responds

The United States has recognized the historic shift caused by the decline in NATO's technological edge and the growing military importance of commercial-origin technologies. In his first annual report to Congress, Secretary of Defense Caspar W. Weinberger stated that if the Soviet Union continued "to obtain advanced technology from the West," it could later "threaten us with the advanced weaponry" which that technology would help produce. Secretary Weinberger concluded that U.S. trade policies toward the Soviet bloc should not be determined by "private market forces" alone but should take into account "our larger strategic interests."[22]

Top military officers acknowledge that technology transfer can affect the military balance in their areas of responsibility. For example, General James Hartinger, Chief of Air Force

Equipment or Technology	Comments
Process Technology for Microelectronic Wafer Preparation	The Soviets have acquired hundreds of specific pieces of equipment related to wafer preparation, including epitaxial growth furnaces, crystal pullers, rinsers/dryers, slicers, and lapping and polishing units.
Process Technology for Producing Circuit Masks	Many acquisitions in this area include computer-aided design software, pattern generators and compilers, digital plotters, photorepeaters, contact printers, mask comparators, electron-beam generators, and ion million equipment.
Equipment for Device Fabrication	Many hundreds of acquisitions in this area have provided the Soviets with mask aligners, diffusion furnaces, ion implanters, coaters, etchers, and photochemical process lines.
Assembly and Test Equipment	Hundreds of items of Western equipment, including scribers, bonders, probe testers, and final test equipment, have been acquired by the Soviets.

Source: U.S. Government, *Soviet Acquisition of Western Technology* (Washington: Central Intelligence Agency, 1982), p. 9.

Table II. Microelectronic Equipment and Technology Legally and Illegally Acquired by the Soviet Bloc

Space Command, began a recent assessment of the military competition in space by stating that the U.S. technology base "exceeds" the Soviet base. However, General Hartinger also said that the Soviets are outspending the United States, that their space program is "dominated by the military," and that they benefit from the "inherent technology transfer from our open society to theirs."[23]

The Reagan administration has given technology transfer control greater emphasis and broader application than détente-era presidencies had.[24] Tighter procedures for reviewing export license applications now make it much less likely than before that the government will approve the sale of commercial goods with military applications to recipients in the Soviet bloc. The President has extended the Department of Defense's authority to review license applications for exports to Communist nations so that it now includes exports to Free World countries where there is a significant risk of diversion to the Soviet bloc.[25] Such programs as the Customs Service's Operation Exodus have increased substantially the government's ability to stop illegal exports. This new sense of urgency has brought greater cooperation from U.S. exporters. At times, private companies have been more alert than the government to

potential losses of technology.[26]

Abroad, the United States has led in updating the multilateral COCOM control list on dual-use commercial/military items. This updated list now includes computer hardware and software, printed circuit boards, electronic-grade silicon (needed for high-density microelectronic circuits), telephone switching equipment, aeroengines, and floating dry docks. The United States also has encouraged greater international cooperation in enforcing export controls through negotiations in COCOM and with individual allied and nonaligned nations.

The Next Stage

U.S. initiatives have provided a good start in protecting the West's technological edge. Unless the momentum is maintained, however, the two historical trends we have examined still could combine to tilt the military balance toward the Soviets.

We do not know how fully NATO will reverse its decline of the 1970s and reassert its supremacy in military technology. The present U.S. rearmament program will bring on line several major new weapon systems and launch important initiatives in space and strategic defenses. But the United States still cannot devel-

op and deploy advanced military systems expeditiously. Furthermore, some U.S. allies object to the cost of modernizing NATO's conventional defenses with emerging technologies.

Meanwhile, the Soviet Union is unlikely to slacken either its own R&D program or its efforts to acquire Western technology. The Soviets may well believe that they have hit on a winning combination in their military competition with the capitalist world. Possibly they have. A thoughtful American observer asks how long one can count on "superior U.S. innovative capacity" in military technology. He believes that the Soviet "technical establishment" may be on the "threshold of a takeoff" like that which the United States experienced during and after World War II.[27]
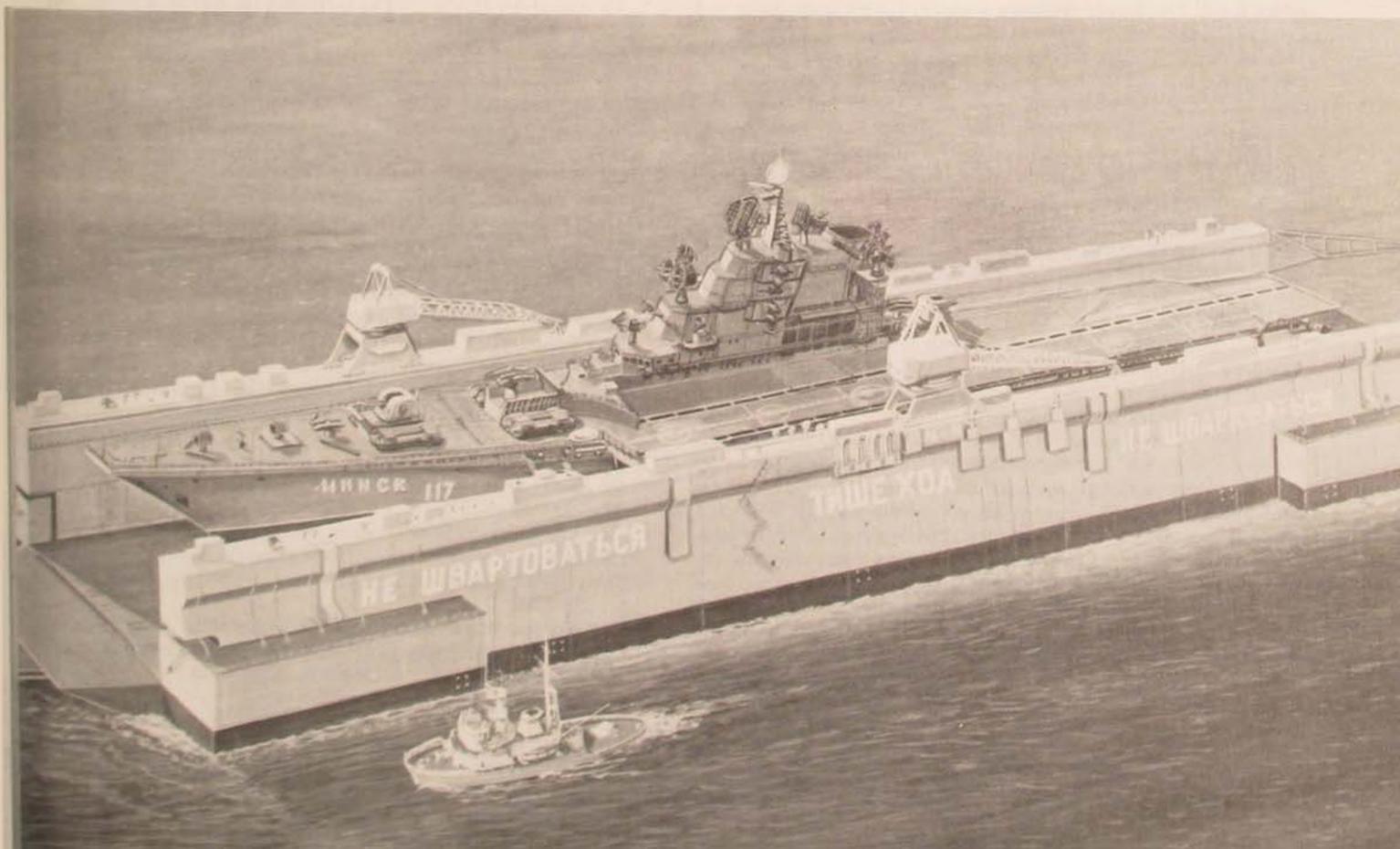
Continuing Soviet technological advances require that the Western nations develop a

In the seventies, the Soviet Union purchased two huge dry docks from Sweden and Japan after promising to use them only for refurbishing merchant and fishing vessels. One of the dry docks is now part of the Soviet Pacific Fleet, while the other serves the Soviet Northern Fleet. These facilities are capable of servicing large naval vessels, such as the V/STOL carrier Minsk shown in the artist's drawing.

long-term strategy for coping with the increasing military importance of commercial-origin technologies. It is not clear how soon these nations will do so. While military officers and national security specialists see the 1970s as a period of Soviet military gains vis-à-vis the West, businessmen and economists look back on it as a decade of expansion in U.S. foreign trade and in world trade. Many of them balk at the prospect of national or COCOM controls that might threaten that expansion in any way. Their arguments carry considerable political weight at a time of large deficits in the U.S. balance of trade. In Europe, persisting economic troubles hamper attempts to modernize export controls.

Air Force Role

It is obvious that the West will need time to adjust its technology transfer policy fully from the hopes of the 1970s to the realities of the 1980s. In the meantime, the Air Force can help to minimize strategic losses. Among the military services, the Air Force has probably the greatest stake in the outcome of the techno-

logical competition. It receives more than 40 percent of the Department of Defense budget for RDT&E.[28] Moreover, aerospace is a particularly volatile and critical element of the overall U.S.-Soviet military competition. U.S. Air Force officers legitimately can point out that such impressive Soviet advances as Sputnik, the SS-18 and SS-19 ICBMs, and antisatellite systems have challenged U.S. security in a way far transcending one military service or mission.

Because the Soviets are likely to pursue further aerospace capabilities in the years ahead, Air Force personnel have a special responsibility to protect America's lead in military technology. In the case of technology transfer, that responsibility means identifying those areas where loss of Western technology could give the Soviets superiority and alerting the national security establishment to any prospect for such a loss.

Office of the Secretary of Defense
Washington, D.C.

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STRATEGIC FORCE DEVELOPMENT AND ARMS CONTROL SUCCESS

two sides of the same coin

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THE nuclear arms control debate in the United States generally is predicated on two differing theories of how to achieve an agreement. One theory, usually associated with critics of American strategic modernization programs, posits that plans for improving U.S. nuclear forces ruin the basis for arms control. It is argued that U.S. plans to add to its nuclear arsenal motivate the Soviet Union to build up its own forces and perpetuate the arms race. Consequently, strategic modernization programs (such as the B-1B, the MX Peacekeeper, and the Trident D-5 submarine-launched ballistic missile) are regarded as inconsistent with the pursuit of arms control.[1]

The second theory, commonly associated with proponents of American strategic modernization programs, holds that either credible

plans to deploy forces or actual force deployments are necessary to motivate Soviet interest in arms control negotiations. According to this theory, the Soviets are quite unlikely to accept arms control constraints unless they are able to obtain useful constraints placed on U.S. weapons programs that particularly concern them. Consequently, since the Soviet Union has a dynamic strategic buildup in progress, U.S. force modernization is said to provide a necessary basis for successful negotiations.[2]

The implications of these two divergent theories and their respective validity (or lack thereof) are significant. Yet although the theories suggest direct contradictory avenues for success in arms control, there appears to be little historical analysis available to support either of them.

Concentrating on an approach to arms control which follows Winston Churchill's admonition that a country must "arm to parley," one can find that this approach has been effective in several historical instances. These examples do not suggest that weapons deployments (or credible plans for deployment) must *always* precede success in arms control, but they do indicate that such a linkage does have historical precedent. They also indicate that it is not necessarily inconsistent to pursue arms control negotiations and strategic modernization programs simultaneously. Thus, these historical case studies can provide at least a partial answer to those who question the sincerity of those who support both negotiations and modernization.

Post-World War I Naval Agreements

When World War I ended in November 1918, the United States Navy found itself in an unbalanced posture in regard to ship construction. Having acceded to British arguments during the war, the U.S. Navy had concentrated on building antisubmarine craft, such as destroyers, at the expense of deploying a fleet that included significant numbers of new capital ships (battleships and battle cruisers). Britain,

on the other hand, had continued throughout the war to build all types of ships. The result was that by war's end Great Britain's navy was not only distinctly superior to the American navy in capital ships but numerically stronger than the latter in all categories of warships—a situation that senior American naval officers were determined to remedy.

In November 1918, the U.S. Navy Department issued a planning document which concluded that the calculation of American naval requirements should be made relative to the strength of the British fleet. It also set forth three guiding principles for naval preparation:

- Superiority of type (ship for ship).
- Equality in strength in capital ships and cruisers.
- Equality of shore facilities in the essential operating areas.

Congressional approval in 1920 of the Navy's 1916 shipbuilding program, which included funding for significant increases in capital ships, convinced the British government that the United States was determined to achieve parity with the British navy. British leaders were aware that an economically healthy, heavily industrialized United States could afford to expand her naval shipbuilding programs to reach that goal. By this time, however, Great Britain was undergoing increasing economic difficulties. The result was a realization by key British leaders that a U.S.-British naval treaty to prevent an expensive and dangerous naval arms race was vitally important.

Accordingly, at the Washington Naval Conference in 1922, Britain agreed to concede equality to the United States Navy in capital ships. Although she retained overall naval supremacy for the time being, for the first time in the history of the British Empire she had limited herself to numerical equality with another power.

The importance of this early-twentieth-century example of successful arms control is not belied by the fact that in 1919-21 the United

States and Great Britain, recent allies in the "war to end all wars," were peaceful competitors and not strong political antagonists. Britain, recovering slowly from a war that had strained the resources of her empire to the utmost, saw a United States whose industrial and financial might had not only remained unharmed by the war but, in fact, had been increased by it and whose large, modern merchant fleet now threatened to capture an increasing portion of the world trade long dominated by British shipping. The U.S. Navy saw in Britain's continuing alliance with a resurgent Japan the danger of the establishment of a potentially hostile naval superiority in the Pacific. While the level of political enmity (actual or potential) between the two countries was not nearly as high as it has been between the United States and the Soviet Union since 1945, it still was not inconsiderable.

Yet perhaps the most important lesson that can be drawn from events now more than sixty years past is that even negotiations occurring under the auspices of relative political amity required the evidence of a commitment to a strong naval building program to induce the greater naval power to negotiate significant restrictions on the strength of its own fleet. If such an effort was required in an atmosphere where relative political amity existed between the parties, it certainly would appear unlikely that anything less could provide success under present circumstances.

Obviously, there is not a direct analogy between negotiating with such an erstwhile ally as Great Britain during the post-World War I period and negotiating with the Soviet Union during the current period. The level of political enmity is much higher in current U.S.-Soviet relations than in U.S.-British relations following World War I. This fact perhaps underscores an important point. Even in negotiations occurring in the context of relative political amity, the ultimate leverage leading to concessions was a credible and dynamic military modernization program. That such bargain-

ing inducements are helpful in the context of hostile political relations is illustrated in a number of instances in U.S.-Soviet parleying.

SALT I and the U.S. ABM Program

The signing of SALT I (including the ABM Treaty and Interim Agreement) is perhaps the clearest example of the relationship between American nuclear weapons programs and the successful negotiation of arms control agreements. It is quite clear that congressional authorization for deployment of the U.S. Sentinel ballistic missile defense (BMD) program was the primary stimulus behind Soviet agreement to engage in SALT and Soviet accession to both the ABM Treaty and the Interim Agreement.

It is unlikely that Soviet agreement to "an exchange of opinion on arms limitation, including anti-missile systems" (i.e., SALT) on 27 June 1968, only three days after Congress decided to fund Sentinel, was coincidental. The notion of SALT had been first broached to the Soviets in December 1966. During the negotiations, it became clear that the primary Soviet interest was not in limiting offensive force levels but in countering the ongoing U.S. antiballistic missile (ABM) program. During the first round of SALT in Helsinki (November 1969), Moscow indicated its concern in this regard, reversing the Soviet position that Premier Aleksei Kosygin had presented two and a half years earlier at Glassboro. Then, the Soviet leader had indicated that ABM systems obviously were defensive and should not be restricted; during the initial round of SALT, however, the Soviet Union indicated an interest in limiting ABM systems and opposed discussion of limitation on offensive force qualities.

During the third SALT round in Helsinki, the Soviets revealed that they wanted an agreement on antiballistic missiles *only* and no limit on offensive weapons. In contrast, the United States sought limitations on offensive strategic systems and particularly the SS-9 ICBM, which

was viewed as a threat to the survivability of Minuteman ICBM launch control centers. This lack of common objectives could have led to a stalemate. The solution, initiated by the United States, was to link offensive limitations to limitations on ABM systems.

There is little doubt that the ongoing U.S. ABM program (which was renamed Safeguard, as announced by President Nixon on 14 March 1969) was the object of Soviet negotiating interest and was the leverage that the United States exploited to gain Soviet agreement to the offensive limitations achieved at SALT I. The causal linkage between the U.S. Sentinel/Safeguard ABM program and the offensive limitations of SALT I was noted by many who participated directly in the negotiations. It was affirmed by Secretary of State Henry Kissinger, during SALT I congressional hearings.[3] Dr. Kissinger noted: "Our experience has been that an on-going program is no obstacle to an agreement and, on the contrary, may accelerate it. That was certainly the case with respect to Safeguard."[4] John Foster (then Director of Defense, Research, and Engineering) and Gerard Smith (then Director of the Arms Control and Disarmament Agency) noted the same linkage.[5]

The principle that the deployment of weapon systems is helpful leverage in arms control negotiations is reflected also in U.S. anxieties and in Soviet statements. For example, the U.S. quest for strategic arms limitations was essentially a response to the Soviet strategic offensive buildup of the 1960s. By 1969, the primary U.S. SALT goal was to limit the deployment of counterforce-capable ICBMs such as the Soviet SS-9, which was thought to pose a threat to the Minuteman force. (The primary U.S. negotiating objective at SALT and START has continued to be the limitation or reduction of heavy, "destabilizing" ICBMs, such as the SS-9 and its successors, the SS-18 and SS-19). The U.S. perspective at the time of SALT I was that there existed two distinctly different types of potential responses to the Soviet buildup. The United States could emphasize a renewed deployment program of its own; or it could emphasize capping the Soviet buildup through arms control. The United States chose to pursue negotiations and détente. The interesting points are that the United States pursued arms control in response to the Soviet strategic buildup and that U.S. decision makers generally perceived negotiations and modernization programs as distinct and separate alternatives.

Similarly, it is clear that the Soviets believe that it was their own dynamic strategic buildup that "forced" the United States to seek arms control negotiations. As General V. G. Kulikov (then Chief of the Soviet General Staff) observed, the United States was forced to seek the SALT accords after "soberly evaluating" the growth of Soviet military might. This belief reflects the facts of the situation, and perhaps more important, the Soviet perspective concerning what is required for success in the arms control process. As Paul Nitze (now U.S. Representative to the Intermediate-Range Nuclear Forces Talks during the Reagan administration) has noted:

Soviet officials have indicated the view that what they call the "correlation of forces" . . . is moving in their favor and that, even though we may today believe that their proposals are one-sided and inequitable, eventually realism will bring us to accept at least the substance of them.[6]

In short, it is the apparent *Soviet* perspective that dynamic modernization programs are the currency of arms control negotiations. This Soviet view should be a critical factor in U.S. considerations concerning conditions likely to facilitate Soviet agreement in arms control negotiations.

There is little doubt that the Soviet Union required the manifest threat of American ABM deployment before consenting to engage in strategic arms control negotiations, and a quid pro quo in terms of limitations on U.S. weapons programs before agreeing to negotiated restraints on its own forces. This negotiating principle was revealed in the reported response by Soviet academician A. N. Shchukin (member

of the Soviet SALT delegation) to a query concerning what the Soviets would limit in return for President Carter's decision to halt production of the B-1 bomber. Reportedly, Shchukin replied, "You misunderstand us. We are not pacifists nor are we philanthropists."[7]

There is some evidence that the U.S. multiple independently-targetable reentry vehicle (MIRV) program also provided an impetus to the Soviet Union to enter into the SALT I negotiations. In the first half of 1968, U.S. plans to deploy MIRV warheads on Minuteman ICBMs and Poseidon SLBMs were made public. The prospect of facing both an ABM program (which could have provided some potential protection for U.S. ICBMs) and the MIRV program (which increased the threat posed by each ICBM) may have combined as important factors in the Soviet decision to join the United States at the negotiating table. At the time, the Soviet ABM system was beset with technical difficulties, and the Soviet MIRV program was immature as well. Arms control negotiations offered an opportunity for the Soviet Union to curb U.S. advantages derived from these two strategic technologies.

SALT I and the Asymmetrical SSBN/SLBM Sublimits

Another example of the role of active deployment programs in arms control negotiations can be found in the treatment of limitations on SLBMs and SSBNs in the SALT I Interim Agreement. Under the terms of the Interim Agreement, the Soviet Union was allowed a greater number of SSBNs and SLBMs than was the United States. The Soviet Union was permitted 950 SLBMs and 62 "modern" nuclear submarines, while the United States was allowed 710 SLBMs on 44 SSBNs. In addition, older, diesel-powered, nuclear missile-carrying submarines in the Soviet fleet were excluded from the SALT I limits on submarines.

When these numerical discrepancies became known, a number of members of the Congress questioned the equity of an agreement that allowed such quantitative advantages to the Soviet Union. Secretary of State Henry Kissinger admitted that the asymmetrical submarine quotas were not as restrictive as the United States would have liked, but he defended the limits that were achieved on the ground that they constituted the best agreement possible, given the magnitude of the submarine construction program which the Soviets had under way at the time. The Soviets, Kissinger indicated, were building several SSBNs per year, while the United States was building none. As Kissinger explained, this was "not the most brilliant negotiating position" from which to seek Soviet restraint. Without an active U.S. submarine program or at least a near-term deployment schedule for additional forces, the United States had little leverage with which to influence Soviet deployment plans.

The Intermediate-Range Nuclear Forces Negotiations

From the beginning, Soviet cooperation on the issue of theater-range missiles in Europe had been keyed to the level of NATO commitment to theater nuclear force modernization. In March 1979, at a time when the missile deployment issue was first beginning to take hold, Premier Kosygin warned the European members of NATO, particularly West Germany, that if they pursued a "building of military preparations" they would be jeopardizing economic relations with the Soviet Union. By May 1979, the Warsaw Pact Foreign Ministers were calling for the convening of an all-European conference (along with Canada and the United States) to discuss transforming political détente into military détente.

In October 1979, General Secretary Leonid Brezhnev, in a speech in East Berlin, announced the withdrawal of up to 20,000 Soviet troops and 1000 tanks from East Germany and further suggested that the Soviet Union was prepared "to reduce the number of medium-range nu-

clear" weapons deployed in its western area—but only if no additional medium-range systems were deployed in Western Europe. President Carter responded that what Brezhnev was offering, in effect, was "to continue their own rate of modernization as it has been, provided we don't modernize it all."

With time growing shorter before NATO's deployment decision, Brezhnev announced in early November 1979 that the Soviet Union was prepared to begin negotiations on theater missiles "without delay." He added that it was "important that no hasty actions be taken that might complicate the situation or obstruct the attainment of positive results." Several weeks later, Soviet Foreign Minister Gromyko increased the pressure on NATO by announcing that if NATO "should come to such a decision [to deploy new missiles in Europe], if our proposals for immediate negotiations should be rejected, the basis for negotiations would be destroyed." On 12 December 1979, the North Atlantic Council decided in favor of going ahead with the missile deployment. And six months later, the Soviet Union began hinting once again that it was willing to negotiate on the missile issue.

As the time for actually deploying the first Pershing II and ground-launched cruise missiles approached, the Soviet Union showed itself willing to concede some points at the Geneva negotiations. In August 1983, General Secretary Yuri Andropov offered to "liquidate," rather than merely withdraw from western Russia, some SS-20 missiles reduced under an intermediate-range nuclear forces (INF) agreement. Within a few days, Soviet negotiators asserted that the destruction promise applied only to SS-20 launchers, not the missiles themselves. But within a month, Soviet negotiators had agreed to destroy one missile with each launcher.

The Soviet Union had also been saying for many months that because the British and French nuclear forces must be counted in the INF totals, the Soviets could not reduce their deployed SS-20s in the western Soviet Union below the 162 missile total of the British and French forces. Yet as the time for NATO's deployment of its first theater-range missiles approached, Andropov proposed, on 26 October 1983, that this Soviet SS-20 force could be reduced to "about 140." Obviously, the continued demonstration of NATO's resolve to deploy the Pershing IIs and ground-launched cruise missiles (GLCMs) had increased Soviet incentives to negotiate in a last-minute attempt to prevent missile deployment.

However, events were moving beyond the capacity of Moscow's limited, grudging concessions to hold them in check. By the first week of November 1983, Yuri Andropov already was seriously ill (he was to die some three months later), curtailing the Soviet government's negotiating flexibility; with the deployment of the first of the new American missiles only several weeks away, the Soviet government apparently decided to accept the inevitable and began making plans for its threatened walkout of the talks.

In mid-November the Soviet Union floated a last-minute, informal offer to cut its SS-20 force targeted on Western Europe by 572 warheads—to some 120 missiles—in exchange for no deployment of American Pershing IIs and ground-launched cruise missiles. However, this offer was soon revealed as more of an effort at "muddying the waters" than a serious negotiating stance: not only did the Soviets inform U.S. officials that the United States would have to make a formal proposal to the Soviet Union along these lines, but also, when the informal offer was made public, Moscow quickly denounced it. Finally, on 23 November 1983, the Soviets walked out of the INF negotiations in Geneva.

Over the previous months of the negotiations, the Soviets had moved begrudgingly toward concessions on theater-range missiles in Europe, as NATO's determination to deploy the new missiles had been made manifest. Yet, in the end, the pace of Soviet compromise had

proved far too slow. In retrospect, it seems obvious that the Soviets' negotiating effort had been doomed to failure by the nature of their approach to the INF negotiations. Clearly, from the outset of the talks, the Soviet leadership had been pinning its hopes for preventing the NATO missile deployment on persuading key West European parliamentarians, indirectly and directly, that deploying the new NATO missiles would result in unmanageable adverse political and military consequences—consequences that could otherwise be avoided.

Thus the Soviet Union had adopted an extremely hardline negotiating stance from the beginning of the INF talks, predicating its acceptance of limits on its deployed SS-20 missile force on a U.S. commitment to forgo any deployment of new intermediate-range missiles to Europe. Subsequently, over the course of the negotiations, it refused either to move from this unnegotiable demand or to accede to U.S. counterproposals for dismantlement of Soviet European-targeted, theater-range missile force as the price for achieving a U.S. commitment not to deploy Pershing IIs and GLCMs. By the time the Soviet leadership realized that its propaganda campaign had failed to avert the missile deployment, it proved unwilling or unable to compromise with the United States sufficiently at the INF negotiations to accomplish its goal through this means either.

Ultimately, the Soviet Union chose to withdraw from the INF talks rather than to make the necessary concessions on the SS-20 issue. Whether the Soviet "walk-out" will be permanent remains to be seen. Perhaps the Soviet government hopes that its refusal to negotiate will cause doubts within the NATO alliance concerning the wisdom of the "two-track" decision—doubts which might, in turn, undermine the NATO consensus on INF deployments. Yet, if NATO remains steadfast in its support for the Pershing II and cruise missile deployment option, the Soviets may come to realize that only a return to the negotiating table can bring hope of U.S.-Soviet accommo-

dation at lower force levels than would result from an unconstrained arms race. Foreign Minister Gromyko's recent discussions with President Reagan, coming unexpectedly shortly before the 1984 elections, provide grounds for hope that this realization is already taking shape within the Kremlin. Certainly, if the United States halts further INF deployments, the Soviet Union will have no incentive to return to negotiations. The same can be said of the impact that possible cancellation of the Peacekeeper ICBM program would have on Soviet interests in returning to the START negotiations.

SALT II: Experience with "Bargaining Chips"

In SALT II negotiations, a complex agreement limiting forces on both sides was secured. Both sides agreed that during the negotiations "Nothing was agreed until all was agreed upon."

According to Secretary of Defense Harold Brown, the best results of the treaty, those most favorable to the United States were:

• The ceiling that was put on numbers of reentry vehicles (RVs) and warheads allowable on any given type of SLBM and ICBM. This "fractionation" limit allowed no more than ten RVs per ICBM, no more than fourteen RVs per SLBM, and fewer RVs for those types tested with fewer. Soviet SS-18s otherwise had the potential for twenty to thirty warheads.

• The 820 MIRV ICBM ceiling, which constrained the Soviet MIRV ICBM program but fit our own plans more easily.

• The 308 limit on "heavy ICBMs," such as the SS-18. The United States has no plans for such "heavies," whereas the Soviet Union has had an active buildup program.

• The "new types" rule, restricting each side to one new ICBM only. Had this provision of the treaty been observed by the Soviet Union, it would have permitted MX in either a mobile or

fixed basing mode and permitted the Soviet Union one new type only. The Soviets had four new types of ICBMs planned for testing at the time of SALT II.

• Soviet agreement not to interfere with U.S. national technical means required for verification of the treaty nor deliberately to conceal information crucial for verification.[8]

• Freedom for the United States to deploy 120 air-launched cruise missile (ALCM)-equipped bombers beyond the 1200 MIRV sublimit. At the time (1979), the Soviet Union was considered several years behind in ALCM technology; of course, both sides now have long-range ALCMs in deployment.

• U.S.-Soviet agreement to equal aggregates (2250), as well as equal sublimits on MIRV-ALCM bombers (1320), on MIRVs (1200), and on MIRV ICBMs (820). This provision redressed an earlier SALT I disadvantage for the United States, since the Soviet Union deploys more platforms and we had agreed to unequal inferior numbers in SALT I.

The Soviet Union, on the other hand, also gained from the agreement. It secured:

• A ceiling average of no more than twenty-eight ALCMs on each U.S. bomber.

• A protocol with range limits on testing ALCMs, GLCMs, and SLCMs.

• A ceiling on the total numbers of ALCM-equipped bombers.

• No counting of Backfire bombers or SS-20s (with ICBM-range potential) in the aggregates or sublimited totals.

• A unilateral advantage in "heavy" ICBMs (i.e., SS-18s) of 308.

At the 1974 Vladivostok summit, President Gerald R. Ford had agreed to permit the unilateral Soviet advantage in "heavy" ICBMs in return for Soviet agreement to discard the unequal ceilings of SALT I on total strategic nuclear delivery vehicles. Equal numerical limits were agreed to. The Soviet Union agreed not to count U.S., French, or British "forward-based systems" in SALT II totals.

After Vladivostok, Secretary of State Henry Kissinger pushed for an accelerated U.S. strategic cruise missile program in order to increase U.S. bargaining leverage in SALT II. It was this U.S. cruise missile program that the Soviets tried the hardest to block or limit during negotiations. A protocol temporarily limiting ALCM testing was agreed on, but this expired on 31 December 1981 and had no discernible effect on the ALCM testing schedule then planned.

There is little doubt that the package of Soviet concessions that the United States acquired in SALT II negotiations resulted in part because of U.S. concessions on ALCM-equipped bombers whereby such weapons were included in the 1320 sublimit to the treaty.

The United States successfully resisted any restrictions on MX so long as the Soviets refused to cut back on their "heavy" ICBM force of SS-18s. In the negotiations, the Soviet Union proposed banning all new types of ICBMs, all new types of MIRVed ICBMs, and all mobile ICBMs. The United States resisted all such attempts to ban MX.[9]

It was clear in the SALT II negotiations that both sides desired to limit the threat posed by the other and could secure reductions or limits only at the cost of limiting something in their own program. The quid pro quos were complex, not one-for-one exchanges. The United States accepted a package of concessions from the Soviets in return for its own package of concessions. Soviet concessions would not have been made without Soviet concern about the size and character of U.S. strategic offensive forces. In SALT II, the United States gained leverage from its planned improvements, which included MX missiles, Trident I missiles, ALCMs, and other cruise missile programs. These systems gave our SALT II negotiators leverage in securing limits on Soviet programs—although some of those limitations now appear to be rather hollow, given Soviet noncompliance.[10]

Space and ASAT Arms Negotiations: Programs as "Bargaining Chips"

Three rounds of ASAT arms control talks occurred between 1977 and 1980. The Soviet Union was anxious to ban potential U.S. ASATs, just as U.S. negotiators were anxious to ban the operational Soviet ASAT. During the talks, the Soviet delegation attempted to slow, limit, or ban the U.S. Space Transportation System (STS), commonly called the space shuttle, as a potential ASAT. Although the United States could not agree to give up shuttle flights, this example again illustrates how potential U.S. military capabilities and programs can induce the Soviet Union to offer concessions concerning its own.

Another indication of how U.S. ASAT-related programs have produced leverage in informal negotiations was the Soviet unilateral moratorium on additional Soviet ASAT testing, announced in August 1983 and reaffirmed by Konstantin Chernenko. The Soviet Union, of course, insisted that the United States also scrap its test program on F-15 direct-ascent ASATs. The offer was made on the eve of the first scheduled test of the U.S. system. The Soviet Union obviously was attempting to halt the U.S. ASAT program and retain a unilateral ASAT advantage, since the Soviet Union had already tested two types of ASATs in twenty previous tests, while the yet-to-be-tested U.S. system was considered to have superior potential to those of the Soviet Union. Although the Reagan administration rejected the Soviet offer, it is significant that the Soviet Union considered the stopping of the U.S. ASAT program important enough to offer to stop its own ASAT testing.

Since August 1983, the Soviets have not resumed ASAT testing. The U.S. ASAT is being tested but only against coordinates in space, not against actual targets. U.S. congressional legislation has barred U.S. government ASAT testing versus space targets until 1 March 1985 unless the Soviets break their moratorium first. Clearly, the Soviet ASAT moratorium has influenced the thinking of members of Congress just as a potential U.S. antisatellite weapons program had affected the Soviet policymakers' decisions in 1983 to call for a moratorium. Behind the recent flurry of apparent Soviet interest in space arms control probably lies not only Soviet interest in terminating the U.S. ASAT program but also Soviet hopes to undermine or eliminate the U.S. strategic defense initiative (SDI) before it develops momentum. Just as the U.S. ballistic missile defense program of the early 1970s encouraged Soviet willingness to negotiate SALT I, the SDI proposed by President Reagan in March 1983 appears to have motivated great Soviet interest in space arms control. Indeed, even during the U.S. 1984 pre-election period, when the Soviet Union had curtailed any hint of a cooperative Soviet-U.S. atmosphere, the Soviet leadership floated proposals to begin discussions strictly limited to space weapons. Despite claims to the contrary, at this point it appears that the SDI may lead to increased Soviet interest in arms control.

The case studies examined here span sixty-one years and include two sets of negotiating partners of strikingly different character. In each, either the threat of force deployment or actual deployment appears to have been a necessary prelude to progress or success in arms control. This experience does not suggest the weapons programs should be initiated simply as "bargaining chips." It does suggest, however, that needed arms modernization programs should not be opposed on the grounds that they will inevitably result in the failure of arms control and another "spiraling round" in the arms race. In these case studies, U.S. arms modernization programs facilitated success in arms control. U.S. gestures of goodwill or unilateral restraint were not a factor.

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Notes

1. This theory provides much of the basis for opposition to the MX-Peacekeeper. See, for example, Daniel Ford, Henry Kendall, Steven Nandis. The Union of Concerned Scientists, *Beyond the Freeze, the Road to Nuclear Sanity* (Boston: Beacon Press, 1982).

2. See, for example, Colin S. Gray, "Strategic Forces and SALT: A Question of Strategy," *Comparative Strategy*, vol. 2, no. 2 (1980), pp. 113-28.

3. U.S. Senate, Committee on Foreign Relations, *Strategic Arms Limitation Agreements, Hearings*, 92d Cong., 2d sess. (Washington: GPO, 1972), p. 410.

4. Ibid., p. 403.

5. See, respectively, U.S. Senate, Committee on Armed Services, *Military Implications of the Treaty on the Limitations of Anti-Ballistic Missile Systems and the Interim Agreement on Limitation of Strategic Offensive Arms, Hearings*, 92d Cong., 2d sess. (Washington: GPO, 1972), p. 218; and U.S. Senate, Subcommittee of the Committee on Appropriations, *Department of Defense Appropriations for Fiscal Year 1971, Part I, Hearings*, 91st Cong., 2d sess. (Washington: GPO, 1970), p. 247.

6. Quoted in Thomas W. Wolfe, *The Salt Experience* (Cambridge, Massachusetts: Ballinger, 1979), p. 95.

7. See, for example, the discussion in *Congressional Record-Senate*, 6 April 1983, p. S4176.

8. There has been, since that time, considerable encryption of Soviet missile test telemetry beyond reasonable interpretation of the treaty.

9. Ironically, the Soviet Union appears to be testing two or three new ICBMs, MIRVed and potentially mobile, while U.S. domestic political pressure threatens to undermine production of even the reduced number of MX missiles planned by the Reagan administration.

10. For U.S. official presentations of Soviet noncompliance, see the President's "Report on Soviet Noncompliance with Arms Control Agreements," reprinted in *Congressional Record-Senate*, 1 February 1984, pp. S648-49. The General Advisory Committee of the U.S. Arms Control and Disarmament Agency has released an unclassified summary of a detailed, classified study of the Soviet arms control compliance record. This summary cites seventeen acts of Soviet noncompliance. It is reprinted in *Soviet Aerospace*, vol. 41, no. 22 (15 October 1984), pp. 152-59.

U.S. STRATEGIC C³I: A CONCEPTUAL FRAMEWORK

DR. STEPHEN J. CIMBALA

ALTHOUGH strategic command, control, communications, and intelligence (C³I) procedures occur within a bureaucratic milieu and must be responsive to operational requirements, their essential nature is conceptual. Thus, in developing a model for the C³I process, one must first outline a model of the intellectual activities involved, not an operational or bureaucratic model. The five important intellectual functions included in the C³I process are: analysis, optimization, intelligence-gathering, feedback, and synthesis.

Analysis

Analysis is the process of defining precisely what you want to know, who should know it, and when it should be known. It deals with the "output" side rather than the "input" aspects of a problem. Failure to define the *what, who,* and *when* can lead to irrelevant knowledge or
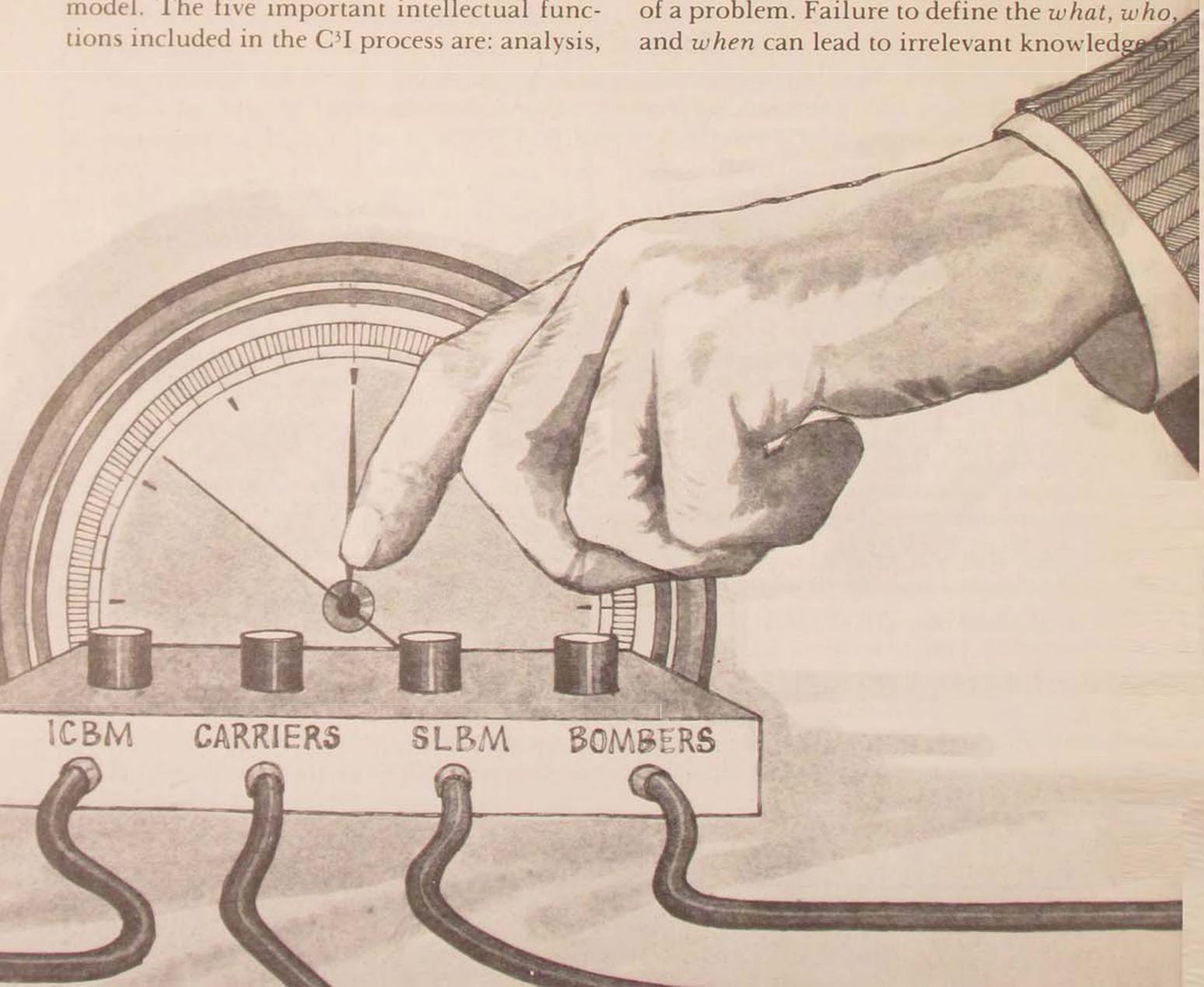
can make relevant knowledge available to the wrong persons at the wrong times.

An illustration of the complexity of this task can be seen in the problem of attack warning and assessment. Presumably, satellites would provide a maximum of thirty minutes' warning to U.S. authorities in the case of a Soviet intercontinental ballistic missile (ICBM) attack. But this initial warning would be too ambiguous to allow the National Command Authority (NCA)—the President, the Secretary of Defense, and their successors—to do more than put forces on alert and otherwise "batten down the hatches." U.S. ICBMs are constantly in a state of immediate readiness for retaliatory launch, and ballistic missile submarines are protected by the oceans from elimination in a surprise first strike. But bombers, air defense systems, and command centers are more vulnerable; they would be alerted.

Perhaps the President and other key political and military leaders would be dispersed from Washington. The selection of an appropriate response to initial satellite warning would await more precise attack characterization by terrestrial sources, since we do not intend to launch ICBMs "on warning." By the time this more detailed attack characterization became available, however, the President's options would be narrowed, and decision time would be shortened.

Decisions about *whether* to respond and *how* would be even more complicated if Soviet ICBM launches were preceded by submarine-launched ballistic missile (SLBM) attacks against our C³I system itself, including the NCA. Even partial decapitation might compromise NCA capabilities to issue orders to the retaliatory forces. Additionally, the disruption of our C³I system due to the by-products of nuclear atmospheric or space explosions cannot be excluded. Thus to await more precise attack characterization is to risk a deterioration in our ability to respond at all, particularly in a controlled fashion. Yet to react too soon is to risk retaliating unnecessarily (if the initial warning is false) or inappropriately (if the character of the opponent's attack is misperceived).

Preprogrammed options in the single integrated operational plan (SIOP) for targeting U.S. strategic weapons do not resolve these dilemmas. It is true that SIOP options have been "fine tuned" as more warheads with improved accuracies have been deployed in American ICBM and SLBM forces. But the uncertainties in choosing partial or full retaliatory responses to imprecise attack characterizations are not due to insufficient numbers of options. More options provide a larger menu but not necessarily a better one, unless the additional options can be linked to survivable C³I, which includes improved attack characterization.

Failures in analyzing attack characterizations adequately are almost always misperceived as due to either insufficient information or analysts' intellectual inability to determine what they need to solve the problem. If organizations cannot define precisely their required outputs, they are doomed to failure. A possible example is provided by the gap between U.S. strategic declaratory policy and employment policy during several past administrations. If the policy guidance to war planners is inexpert or irrelevant to their tools, they will define their own operational objectives. While American declaratory policy statements have been full of aspirations for "victory denial" and "restoring peace on favorable terms," military planners have quite sensibly planned for destruction of the opponent's arsenal and other key targets as quickly as possible.

Optimization

Optimization can be defined as the selection of the most desirable mix of inputs to obtain appropriately defined outputs. Much economic analysis involves the use of optimization models and techniques. Examples of optimization problems include: how many carriers should be forward deployed in the Mediterranean, Pa-

cific, and Indian oceans, and on what schedule? What mix of heavy and lightweight infantry vehicles should be assigned to an Army mechanized division? What combination of reenlistment bonuses, "quality of life" inducements, and educational benefits is appropriate to fulfill Department of Defense manpower requirements?

In strategic C^3I, an example of an important optimization problem is the ratio of ground-to-air or space-based communication links and warning sensors. The number of alternate command posts for NCA and force commanders is another. A third example would be the relative emphasis on fixed versus mobile terminals for processing communications from satellites to military commanders or from commanders to the retaliatory forces.

Perhaps the most difficult optimization problems are those in which the most important variables cannot be quantified easily, if at all. The nonquantifiability of important variables in an optimization problem may lead to the substitution of irrelevant measurements for relevant ones. We all remember the results of using "body count" statistics to estimate tactical successes or failures in Vietnam.

The Reagan administration's program for modernization of strategic C^3I must resolve the question of relative investment in "survivable" versus "enduring" command and control. Some aspects of this trade-off are measurable, but others are strictly qualitative. Survivable C^3I increases the probability of communicating launch orders to retaliatory forces even after they are attacked. Enduring C^3I imposes requirements beyond this necessary minimum. Not only must command, control, and communications survive the first waves of enemy attacks, but they must persevere through the second or "transattack" phase of initial exchanges into a "postattack" phase. In the postattack period, reliable damage assessments must be provided to decision makers. Based on those postattack estimates, the NCA can, in theory, order further attacks on Soviet military targets that have the highest potential to inflict additional damage to U.S. forces and society. In practice, there is no guarantee that the Soviets will oblige us by withholding enough forces from their earlier attacks to provide inviting targets later.

The postattack assessments must be complemented by "real-time" targeting information from space-based sensors, such as the integrated operational nuclear detection system (IONDS) aboard U.S. satellites. Soviet pre-, trans-, and postattack attempts to cripple these sensors can be presumed. The satellites themselves are vulnerable targets compared to terrestrial strategic forces and command posts. Enduring postattack systems will be expensive. The need for them must be estimated, based on some assumptions about how long strategic nuclear forces could continue exchanges into the postattack period. These assumptions involve value and fact distinctions. How long we can continue to fight a nuclear war calls for both political and technical judgments. Is it worthwhile to invest in systems that can endure for a few additional hours at the expense of investments in other systems that are more survivable against the initial attack but not necessarily enduring?[1]

The danger in this optimization between survivable and enduring command and control is that the technical capability to increase endurance may lead to false confidence in our ability to fight a protracted nuclear war. Actually, more enduring systems may inhibit, rather than promote, controlled nuclear warfighting and war termination, raising expectations that fail to materialize. Thus, resolving the survivability-endurance dilemma to achieve optimization may be not merely a crucial task but a difficult one.

Intelligence-Gathering

The kinds of intelligence needed to deter or to fight nuclear war are of two kinds: intelligence about the opponent's capabilities and

intelligence about his intentions. Worst-case scenarios can lead us to self-delusion, particularly if we infer our enemy's intentions from his capabilities alone, and this, in turn, can weaken rather than strengthen our deterrence posture.

A case in point is the much-discussed problem of "ICBM vulnerability" of U.S. land-based missiles to a surgical Soviet first strike against those forces.[2] In this scenario, Soviet attackers disarm the U.S. ICBM force while holding in reserve additional strategic forces for subsequent attacks against other American forces, C³I systems, or cities. Concern about this scenario has led several administrations to search for basing modes that will make American ICBMs invulnerable to such an attack.

Simultaneously, the focus of much of our intelligence collection on Soviet strategic forces has been on such characteristics as the numbers of warheads mounted on missiles, throw weights, accuracies, alert status, and reload capabilities. These emphases are not to be disparaged; they are things that our planners need to know. But there should be equal interest in the less measurable aspects of possible scenarios: the intentions of current Soviet leaders, Soviet military doctrine, and the Soviets' historical record in regard to risk-taking. Significant analysis of the vulnerability problem for U.S. ICBMs cannot be based on physical or technical evidence alone. Knowledge of Soviet actions and reactions in previous wars and contemporary crises, temperaments and motivations of Soviet leaders, and other intangibles are as important as are the "harder" kinds of knowledge. Indeed, they may even be more important. Even if the Soviets revealed a clear-cut capability to execute successfully a selective first strike against American ICBMs, that fact, by itself, would not guarantee that they would choose to launch such an attack.

While our technology-driven estimates of Soviet capabilities have improved in ways that can be measured, our estimates from human sources about Soviet intentions and psychology are still mostly guesswork. Unfortunately, if we guess incorrectly during a crisis, we could start a war that neither side intended to start. On the other hand, we could be the victim of surprise if our assumptions about their intentions are too optimistic. American intelligence experts have noted our overreliance on the collection of technical data and our underutilization of human sources.[3]

One consequence of excessively technological estimates (in the case of ICBM vulnerability scenarios) has been the vain search for survivable basing modes for American ICBMs against improbable Soviet counterforce threats, given Soviet doctrine and historical crisis behavior. Soviet doctrine provides little reassurance that the Soviets would confine their attack to a limited nuclear strike against ICBMs alone if they were to attack U.S. strategic forces.[4] Furthermore, as the Scowcroft Commission noted, the issue of ICBM survivability cannot be assessed properly without considering the survivability of other components of the strategic Triad.[5] Certainly, the Soviets would have to take into account the necessity of attacking other American forces and C³I systems for an even partially successful attack, even if their criteria for a "credible first strike" differed from our own.[6]

Feedback

Feedback refers to the process by which decision makers acquire information about the effects of their decisions. In strategic command and control, this feedback to NCA from force commanders may spell the difference between victory and defeat.

Feedback will be compromised if the NCA cannot be identified by force commanders or if communications in the transattack phase are disrupted. In these instances, force commanders on submarines and in aircraft will assume by default the responsibilities of political leaders. But this emergency improvisation of command responsibility becomes irrelevant if the status of surviving forces cannot be ascertained.

C³I feedback can be disrupted in at least two ways. First, the C³I systems themselves can be interrupted or physically destroyed. Fixed ground command posts and communications links probably would be early casualties of the first nuclear strikes against the continental United States, and airborne emergency command posts could be disrupted.[7]

Another type of disruption in American C³I could occur as a result of the death or incapacitation of NCA and force commanders. Both the National Military Command Center in the Pentagon and the Alternative NMCC are vulnerable to direct hits by Soviet weapons, which have already demonstrated the requisite accuracies for such hits.[8] The President's National Emergency Airborne Command Post (NEACP) must be moved from Indiana to Washington or to some other location where the President can meet it under conditions of extreme duress. Even if the President survives the initial attack and gets airborne, he can remain in that status for only a limited period of time.[9] All airborne command posts eventually would run out of flight time or favorable landing sites if a nuclear war continued beyond the first limited exchanges of strategic weapons.[10]

Nor are these the only problems related to feedback. The most important kind of feedback is information about Soviet capabilities and intentions to continue or terminate warfighting once a war has begun. How would our adversaries define "victory" or "defeat" under the extreme conditions of nuclear warfare? Could we communicate with them in ways that would be perceived as credible and authoritative? Soviet doctrine provides little reassurance that, once a nuclear war had begun, such feedback would be high among their priorities. Their doctrinal pronouncements have emphasized instead the improbability of ending the war on terms other than total defeat for their adversaries.[11] Should such doctrine guide their transattack and postattack decisionmaking, war termination short of global catastrophe would be difficult.

Synthesis

Synthesis is the process of combining analysis, optimization, intelligence-gathering, and feedback into a coherent whole. C³I problems cannot be resolved individually in isolation from one another. Furthermore, if it is to be other than haphazard, synthesis must proceed from a systematic framework of assumptions about our and their capabilities and intentions before, during, and after the first exchange of strategic weapons. This conceptual framework must emphasize priorities among C³I requirements, based on policymakers' needs for attack assessment, retaliatory options, and capacity to control the war in the transattack and postattack phases.

Before the Reagan administration took office, our strategic priorities emphasized retaliation over war survival in nuclear conflict. Attempting to improve active and passive defenses against nuclear attack, with the attendant command and control requirements for those forces, was regarded by many experts as "destabilizing" for both the nuclear balance and crisis management. President Reagan's 23 March 1983 speech indicated a change in position on this matter, and subsequent studies have argued that missile defense systems are within the realm of possibility near the end of this century or the beginning of the next. Should these projected missile defense systems and other defensive measures prove feasible, changes in our C³I systems might be required to make these advances work to our political and military advantage.

The kinds of C³I systems that are best suited for damage limitations may not be appropriate if defense against ballistic missile attack is considered infeasible. Furthermore, presuming that civil defense is regarded as an adjunct to deterrence, credible protection for the American population begins with the ability to communicate with that population under wartime conditions. Thus, if part of the U.S. passive defense program includes improved civil defense, C³I

planners must consider hardening communications systems beyond those intended for military and diplomatic uses.[12] Present systems offer little capacity of the sort needed.

IN this rough outline of the important processes in strategic C³I, a number of unresolved dilemmas have been mentioned. To recognize the "probabilistic" and conceptual character of these problems is not to fault previous efforts to address them in other frames of reference. Improvements in C³I technology have been apparent since the 1950s.[13] However, during the decades ahead, advances in understanding the unquantifiable issues associated with nuclear force systems will be equally important.

Several practical implications of the ideas presented here have immediate policy relevance. First, declaratory policies should provide consistent objectives to war planners. To the extent that they are designed simply for public relations rather than internal consumption by strategists and planners, they will be irrelevant, misleading, or predestined for failure. Second, approaches to strategic C³I should not be technically driven but only technologically sensitive. Third, the most important things we need to know include the intentions of probable opponents, which may require our paying more attention to "tradecraft" than to hardware.

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Notes

1. Congress of the United States, Congressional Budget Office, *Strategic Command, Control and Communications: Alternative Approaches to Modernization* (Washington: U.S. Government Printing Office, October 1981). Some experts doubt whether U.S. strategic forces can be fully alerted safely. See Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven: Yale University Press, 1983), pp. 54-73.

2. For some calculations pertinent to this scenario, see Matthew Bunn and Kosta Tsipis, "The Uncertainties of a Preemptive Nuclear Attack," *Scientific American*, November 1983, pp. 38-47.

3. For a discussion of our overreliance on technical data in the context of a possible U.S.-Soviet strategic conflict, see Angelo Codevilla, "Wartime Collection Requirements," *Intelligence Requirements for the 1980s: Clandestine Collection*, edited by Roy Godson (New Brunswick, New Jersey: Transaction Books/National Strategy Information Center, 1983), pp. 127-47. On the possibility of U.S. forces and C³ being subject to strategic surprise, see Zbigniew Brzezinski, "From Arms Control to Controlled Security," *Wall Street Journal*, 10 July 1984, and John Steinbruner, "Launch under Attack," *Scientific American*, January 1984, pp. 37-47.

4. For a more comprehensive view of Soviet doctrine for nuclear war, see Fritz W. Ermath, "Contrasts in American and Soviet Strategic Thought," in *Soviet Military Thinking*, edited by Derek Leebaert (London: Allen and Unwin, 1981), pp. 50-69; Joseph D. Douglass, Jr., and Amoretta M. Hoeber, *Soviet Strategy for Nuclear War* (Stanford, California: Hoover Institution Press, 1979); and Benjamin S. Lambeth, "How to Think about Soviet Military Doctrine," in *The Defense Policies of Nations*, edited by Douglas J. Murray and Paul R. Viotti (Baltimore: Johns Hopkins University Press, 1982), pp. 146-53.

5. President's Commission on Strategic Forces, *Report*, April 1983.

6. Lambeth (in "How to Think about Soviet Military Doctrine") expresses doubt that U.S. and Soviet concepts of a successful first strike are the same.

7. John Steinbruner, "Nuclear Decapitation," *Foreign Policy*, Winter 1981-82, pp. 16-28. As Colin S. Gray has noted, "a strategic doctrine that emphasizes endurance and real-time responsiveness to possibly novel strike demands is a doctrine that stresses prospective technical accomplishments precisely where it is least convincing—with regard to C³I." See Gray, *Nuclear Strategy and Strategic Planning* (Philadelphia: Foreign Policy Research Institute, 1984), p. 26.

8. Desmond Ball, *Can Nuclear War Be Controlled?* Adelphi Papers, No. 169 (London: International Institute for Strategic Studies, Autumn 1981), p. 14.

9. See the comments by Lieutenant General Brent Scowcroft in *Strategic Nuclear Policies, Weapons, and the C³ Connection* (paper published by Electronic Systems Division/MITRE Corporation, National Security Issues Symposium, October 1981), pp. 93-95.

10. Ball, p. 17.

11. *Marxism-Leninism and War and Army (A Soviet View)*, translated and published under the auspices of the United States Air Force (Washington: U.S. Government Printing Office, 1973), pp. 28-30. The Soviet authors suggest that the relationship between war and politics is not severed by nuclear war, but they do acknowledge that the "essence" of nuclear combat is somewhat different from other kinds of conflict.

12. For a discussion of the elements required for survival and reconstitution of the federal government, the government's role in societal recovery, and other postattack considerations, see William M. Brown, *On the Postattack Viability of American Institutions* (Santa Monica, California: Rand Corporation, 1970). For an assessment of the U.S. telecommunications structure and its implications for strategic C³I, see Lee M. Paschall, "C³I Damaged, Intercepted, or Blinked," in *The U.S. Defense Mobilization Infrastructure: Problems and Priorities*, edited by Robert L. Pfaltzgraff, Jr., and Uri Ra'anan (Medford, Massachusetts: Archon Books, 1983), pp. 204-15.

13. Ball, pp. 3-8. See also Thomas Powers, "Choosing a Strategy for World War III," *Atlantic Monthly*, November 1983, pp. 82-110.
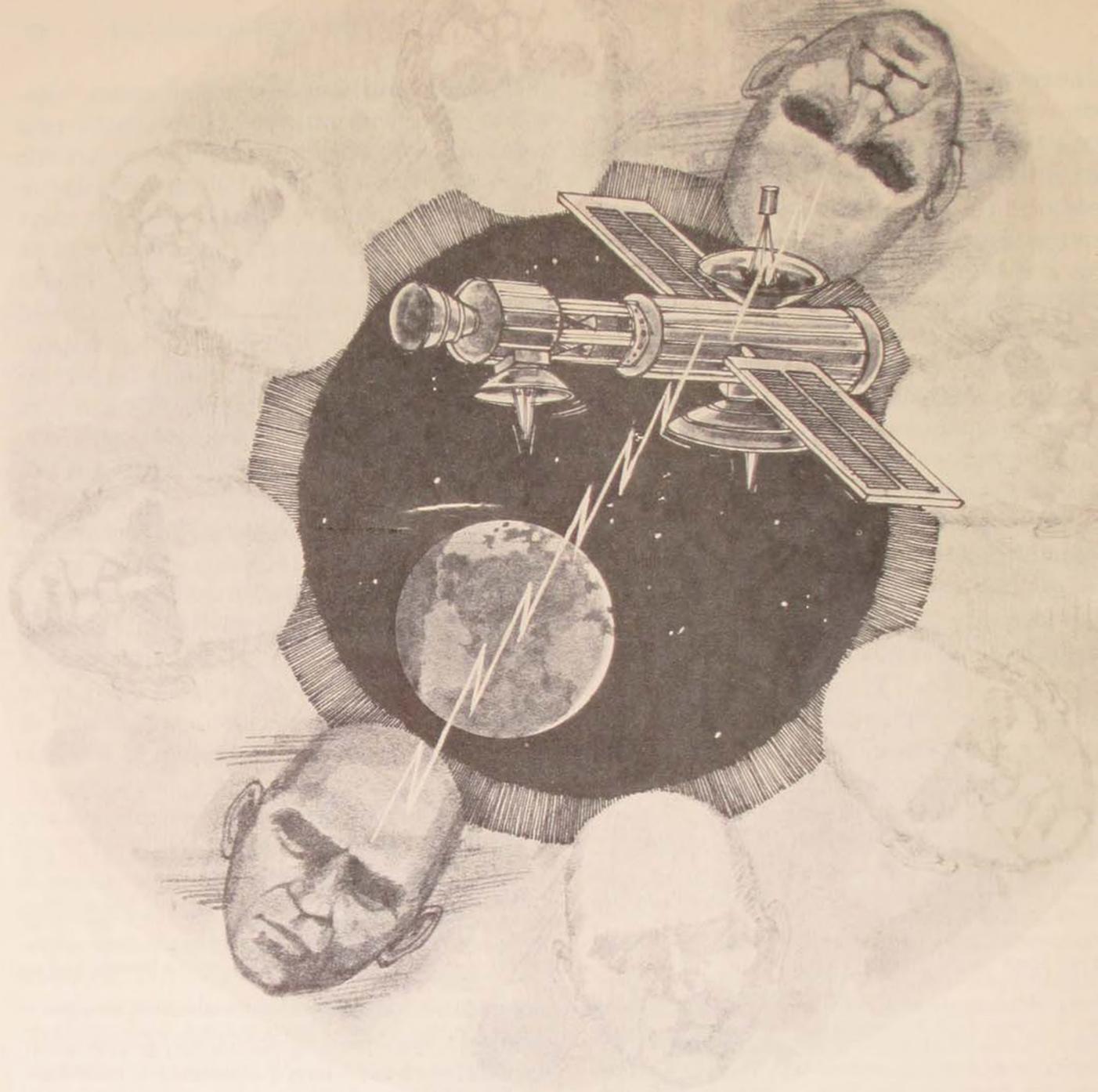
BEYOND DETERRENCE:
THE STRATEGIC DEFENSE OPTION

LIEUTENANT COLONEL JOHN E. LAWYER, USAFR (RET)

FOR the first time in more than thirty years, U.S. officials at the highest levels are giving serious consideration to a new strategic concept, one that would carry us far beyond the idea of deterrence by the end of this century. As President Reagan expressed in an address to the nation on 23 March 1983, "What if a free people could live secure in the knowledge that their security did not rest upon the threat of instant U.S. retaliation to deter a So-

viet attack, that we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our Allies?" While acknowledging the formidable technical tasks involved, he concluded by announcing a long-range research effort toward making that security goal a reality. Soon after, a high-level Pentagon executive committee was set up to oversee administration efforts, headed by Deputy Secretary of Defense Paul Thayer.[1]

Predictably, the reactions to the President's announcement were mixed. The address itself was quickly dubbed his "star wars" speech. One editorial cartoonist portrayed Mr. Reagan with Artoo Detoo and E.T. at his side, saying ". . . and we've assembled a crack team of experts to advise on the project." Another commentator claimed that the President had "alarmed our foes, baffled our allies, and bewildered our friends," while political opponents suggested that the proposal was the child of expediency, intended to rescue a beleaguered defense budget, regain momentum in Congress for the MX, preempt nuclear freeze efforts, or cover for the lack of results in the strategic arms reduction talks (START) and intermediate-range nuclear force (INF) negotiations.[2]

Other observers have suggested that more is involved. Reportedly, the President has a deep personal commitment to the full exploitation of our growing capabilities in space.[3] To him and others, the proposal for a space-based ballistic missile defense represents an attempt to break out of the "balance of terror" philosophy that has overshadowed public life for more than thirty years. "Mutual assured survival" has a powerful psychological appeal; it strikes the imagination at the same time that it allays our fears. A former State Department official was quoted as observing, "A president ought to see the national interest in broad perspective and set positive goals. If he correctly senses the national need, the experts can be put back to work solving the technical problems."[4]

Currently, the U.S. political and military community is not committing the nation to anything beyond a serious look at the options. Strategic deterrence, as it has been generally understood, will remain recognizably the same organizing concept around which U.S. forces and planning will be designed for the rest of the 1980s. But what about the end of the century, the specific timeframe mentioned in the President's speech?

Two deep-seated historical imperatives converge in the answer to that question. The first is the age-old oscillation between offense and defense as the dominant military characteristic of a given strategic era. No weapon, from the crossbow to the battleship, has ever enjoyed more than a brief period of tactical hegemony; and strategies too tightly wedded to such systems risk rapid obsolescence themselves if not adapted to changing conditions. The second imperative is the inveterate if regrettable tendency of humankind to carry its conflicts wherever it goes. With the launching of Sputnik, the world stepped over the threshold into outer-space. Predictably, military theorists and strategists began to look to space for military purposes, including combat.

Both tendencies find concrete expression in the President's idea of a space-based defense against ballistic missiles, or DABM, as it has come to be known in Pentagon shorthand. Thus it is not too early to consider in greater detail some of the implications of this departure from the models and assumptions that have shaped U.S. defense policies since the end of World War II.

The Short-Run Issues: Treaties and Mind-Sets

The first questions that planners must consider when contemplating a shift in any strategy concern its impact on the status quo. Thus one of the early issues raised about DABM was whether the President's proposal ran afoul of current U.S. treaty obligations. Specifically, critics have voiced concern that a space-based

antimissile defense would violate the 1967 Outer Space Treaty and the 1972 ABM Treaty (SALT I).[5]

Charges that DABM research constitutes a breach of U.S. international obligations appear on closer examination to lack foundation. The only limit that the Outer Space Treaty places on orbiting stations of terrestrial origin is that they cannot carry weapons of mass destruction, a term which does not extend to lasers, particle-beam or directed-energy systems, or high explosives.[6] Similarly, the ABM Treaty was never intended to straitjacket either side into an unrealistic strategic situation. The primary purpose of SALT I was to provide a breathing space and create a better negotiating climate for continuing discussions on strategic offensive weapons limits. Indeed, in a formal statement printed with the treaty, the head of the U.S. delegation declared that a failure to achieve such an agreement within five years would in itself constitute a basis for withdrawal from the agreement.[7] To the extent that the ABM Treaty has succeeded in maintaining some degree of stability for the past ten years, the treaty deserves high regard. But the real worth of that accomplishment depends on what the signatories do with the time purchased. If continuing strategic developments render it obsolete in another five or ten years, and if it cannot be modified in ways satisfactory to the two signatories, it could then be decently laid to rest without great regret. From the beginning, it was seen by its drafters as simply one step in a long process. It was never intended to bind for all time.

If, for the present, DABM does not offend against our treaty obligations, what about its clash with the rationale underlying the status quo? Certainly, in terms of the orthodoxy of deterrence, DABM is clearly heretical.

This second issue can be most succinctly described as a variant on the old problem that "No man puts new wine in old wineskins, lest they burst and split asunder." Our imaging of the unknown future is always conditioned by the known present. This gap means that we have many wrong ideas about the military role of space—or, rather, ideas that were valid in the old context but are less so in the new.

Since a changed future plays havoc with an established present, the peddlers of new wine are often viewed with suspicion by those with a significant investment in old wineskins. In the 1920s, General William "Billy" Mitchell first perceived the impact of air power on naval war, much as Major Charles de Gaulle came to appreciate the importance of tank forces in changing the conduct of future land war in the 1930s. Both became virtual pariahs within their respective defense establishments on account of these correct but heterodox views.

It is tempting to dramatize the conflict in terms of meanspirited but well-entrenched villains versus farseeing heroes, but doing so would be less than just to both sets of players. The problem is that the advocates of a new advance, the full outlines of which can be but dimly perceived, are necessarily tentative (or near-hysterical) in articulating how it will make sense in terms of the old matrix; for it is precisely the change in context that enables the new ideas to come into their own. The defenders of this status quo, on the other hand, may well be persons of vision and liberal spirit, but in a given military establishment it is they who must bear the responsibility for maintaining the nation's present security until that broadly beaming future comes.[8]

In other words, new wine is seldom worth it from the context of those currently holding the old wineskins. Even when possible payoffs can be suggested, they are more easily refuted or dismissed than accepted. Embracing the revolutionary innovation requires a good deal of faith on the part of its backers, even when they are correct—and they are not always correct.

Herein lies the problem for the present set of managers, and it is difficult not to sympathize with their apparent obduracy. At the same time, it could be perilous to let that mind-set prevail.

The Midrange: Politics and Issues

The midrange period (1985-95) is likely to be most influenced by political considerations if the DABM concept takes hold, as publics and governments become widely aware that a major new development is at hand. We shall need to pay particular attention to the reactions of the Soviets, of our allies, and of American domestic opinion.

Of the three, the Soviets will be the least surprised. Highly active in the military applications of space themselves, they are fully aware of the unfolding reality of a U.S. space effort and the possibilities of the medium in general. Their main reaction may be bewilderment about why it has taken the United States so long to grasp the obvious military implications of a long-standing but largely civilian space effort.

The Soviets took the success of the Apollo moon landing program much more to heart than did the American public. They saw our space feats as evidence of what a far wealthier and technologically more advanced United States can do, once it puts its mind to it. But the Soviets also believe that U.S. strategic thinking, lacking the scientific basis of Marxism-Leninism, is hopelessly muddled and self-contradictory, in contrast to the rigorously objective quality of their own military and political doctrine. The American government, they believe, while powerful, is hardly able to follow consistent, long-term policies—a result of the inevitable contradictions that doom capitalist society to eventual failure in the competition with socialism.

Thus a "turtle and hare" model of American decision making tends to color Soviet thinking. The military potential of the West is not underestimated, nor are its economic and technological strengths; like the rabbit in the fable, it can run faster. But the West is also more scatterbrained and, unless prodded, will not be able to pull itself together to make a serious

national effort to save itself. The best strategy for the turtle, then, is to keep plodding away, at the same time doing as little as possible to stimulate the competition to more strenuous effort.

If this interpretation of the Soviet view is accurate, then we may expect them to try to do as much as they can to head off a full-blown U.S. space defense effort. Soon after the Reagan speech, Soviet Foreign Minister Andrei Gromyko approached the U.S. government to suggest discussions on DABM but indicated that the Soviets wanted to focus on the dangerous aspects of a new "arms race in space."[9] While escalating their anti-U.S. propaganda effort, particularly in Europe, the Soviets will try at the same time to allay U.S. fears. To this end, they could prove quite willing to explore or even demand space arms control negotiations.

The Soviets will no doubt reappraise their own considerable military space program as we move into that arena, and we may well see some increase in their effort. It is reasonable to expect that they would give particular attention to the elaboration of new strategic offensive systems in an effort to stay ahead of any defenses we might deploy and that they will also give high priority to increasing their antisatellite (ASAT) and related capabilities. These areas already command a substantial investment of Soviet resources; they will probably not mount a sudden surge effort or crash program. On the other hand, at the highest levels of Soviet leadership there will certainly be both a keen appreciation of the importance of these programs and a corresponding desire to exploit fully the gains that result.[10]

This whole relatively nonthreatening "business as usual" scenario might suddenly grow much more ominous, however, if the Soviets came to believe that they had a commanding lead over U.S. space efforts. At that point, the Soviets might consider imposing a unilateral space disarmament regime on the United States, by force if necessary, particularly if it appeared that they were in danger of being overtaken.

Already the buildup of Soviet "killer satellites," combined with an increase in international tension, leaves our space capability quasi-dependent on the goodwill of a hostile adversary. The diplomatic consequences or risk of strategic retaliation from what would amount to an undeclared war in space would be much more manageable for the Soviets than would the consequences of any interference with U.S. ground installations or forces, particularly if no American lives were lost. Indubitably, the Soviets would try to rally world opinion behind them by claiming to be acting in the interests of global peace.

It is less easy to generalize about the reactions of our allies to DABM. European leaders were caught off balance by the President's 23 March speech but generally interpreted his announcement as a setback to hopes for stabilizing the arms race. Some worried that DABM would be ineffective against Soviet tactical nuclear weapons, while others feared that a Soviet counterpart would work only too well, canceling out British and French retaliatory capabilities. In either case, Europe would be left exposed, reinforcing the perennial anxiety as to how far the United States would go on behalf of its European allies.[11] The continuing furor over cruise missile and Pershing II deployments in Europe adds to the unsettled state of intra-alliance relations.

We should not expect DABM to counter the long-term drift toward greater European independence, which is essentially a generational phenomenon. While it could be argued that a system which protects the United States would make Washington more willing to stand up for alliance interests, Europeans tend to feel that the only reliable guarantee of U.S. backing is a continued partnership in risk, in which we see Europe's vulnerability as an extension of our own. In addition, Europeans would be concerned about the commercial implications of a new U.S. space effort, given their own growing interest in commercial exploitation of space.

European governments will face a multitude of choices within three broad options: they can support the United States in this effort, in exchange for a share in the benefits but at an unwelcome political cost; they can pursue space enterprises on their own, possibly more along civilian/commercial lines than military application, as a component of a "Europe first" policy; or they can decide to do without space endeavors, thereby avoiding the political and economic costs associated with either of the first two options.

The actual choices within those three broad patterns will, one suspects, often be at cross-purposes within and among governments. We can thus expect that specific reactions to DABM will vary widely from country to country and over a span of time. Whatever the eventual outcome, DABM will represent another fertile source of European exasperation with the United States in the meantime.

Japan may wish to go shares with the United States, participating in a partnership to which Japanese technology, resources, and geography would have much to contribute. Japanese industry would benefit in having access to the resulting know-how, particularly where it might have commercial applications. Conversely, Tokyo could decide that a realistic missile defense is not possible, given Japan's proximity to the national territory of the Soviet Union and China, its two most likely adversaries, and so remain uninvolved.[12]

As with allied reactions, it would be foolhardy to predict the mood of the American public five to ten years hence. Despite the current stridency of the peace lobby, the inward-looking, antimilitary attitude of the 1970s has begun to change. The year-long drama of the embassy hostages in Iran drove home the wisdom of Machiavelli's precept that it is better to be feared than loved. If the Soviet leadership carries through with the late Premier Andropov's threat to station Soviet missiles close to U.S. borders if no agreement can be reached on intermediate-range nuclear forces, American opinion could shift quite rapidly and

dramatically in favor of DABM. Spectacular Soviet achievements in space, particularly if their military implications are clear, and attempts by the Soviet government to capitalize politically on that potential would also spur public support for a comparable U.S. effort.

On the other side, the realignment of force structures associated with a shift from deterrence to strategic defense will be tremendously expensive, perhaps the most costly single undertaking the United States has ever attempted.[13] Current estimates for a space-based defense run from $50 billion total, which most observers see as unrealistically low, to upward of $500 billion, over the life of the program.[14] Those who are opposed to increased government spending in general, or defense spending in particular, will be quick to mobilize forces in opposition to DABM.

How the matter is handled among the military services will also affect the potential for public and congressional support. The dispute need not follow strict service lines. Within the traditional military services, those who feel DABM will come out of their hides will oppose it, while those who see it as enlarging their turf will support it. If a significant group of dissenting military leaders should emerge, their voices would add important legitimacy to the antistrategic defense case.[15]

The creation of a unified command for space, on the other hand, would give DABM supporters a much needed institutional and conceptual coherence. According to unofficial reports, the Joint Chiefs of Staff have already sent such a recommendation to the President, but only after the Navy obtained a two-year delay in implementation in order to give their own newly established space command time to develop. As the *Washington Post* reported, "A unified command would represent a victory for the Air Force, which would probably take the lead in its formation. Air Force officials have argued that a unified command could lobby more successfully for funds in Congress and would clearly establish space as a significant arena for military research and operations."[16]

Above all, much will depend on how our top political leadership conceives and articulates the place of DABM in the sweep of current history. Two days after his initial speech on the subject, President Reagan gave some indication of the potential strength of his position in a news conference, in which he commented:

> The quicker we start the better. But it is inconceivable to me that we can go on thinking down the future—not only for ourselves in our lifetime but for other generations—that the great nations of the world will sit here like people facing themselves across a table each with a cocked gun, and no one knowing whether someone might tighten the finger on the trigger.[17]

The Long-Range Outlook: Strategy and Vision

To think through the strategic concepts according to which we might evaluate DABM's technical possibilities is also necessary, or else, once again, technology will drive strategy—which has been a recurring major problem in U.S. defense policy. Two issues here are paramount: the impact of "assured survival" on strategic stability and the possible contribution of DABM to the emerging international order and security of the twenty-first century.

The conventional wisdom for the last decade and a half has held that strategic stability rests on the ability of either superpower to guarantee that, no matter what the other side did, it would be able to strike back. As long as both parties possessed this capability, the resultant potential for mutual assured destruction (MAD) would stay the hands of both.

When an effective ICBM defense is introduced into the calculus, it can be argued that MAD would no longer be viable or, more precisely, that the threat of destruction would no longer be mutual: the side with the shield could strike with impunity.

In this kind of strategic environment, the effect of strategic defense depends on what targets are protected and the symmetry of the

two opponents' defensive capabilities. If the defense system protects only the country's strategic offensive forces while both sides have roughly comparable offensive and defensive capabilities, we are in effect back to MAD, though at a more sophisticated level of hardware. However, if we are talking about a more comprehensive antiballistic missile defense in depth—one that protects population centers as well as strategic targets (presumably any system that has the former capability can also perform the latter job)—the situation is different if both sides have it. Then we have moved to a far safer situation than MAD. The balance is stable, and, more important, the threat of ICBM attack is lessened.

The circumstance provoking serious problems is that in which one side develops an effective ICBM defense earlier than the other side does. To begin with, the technological lead would be highly precarious, for whichever side lacked such a defense would give high priority to catching up. Yet to argue that DABM will lead to an arms race in space assumes that the Soviets are not already concentrating significant efforts in this area. In reality, a stepped-up U.S. effort will not "force" the Soviets to do much more than they are already doing. If the United States were in the dominant strategic position, we could expect the Soviets to compensate in other areas, such as increasing their conventional forces as they did in the post-World War II years or in deploying missile-carrying submarines off U.S. coasts.

This situation also suggests the possibility of striking a bargain, in which we would share some of our expertise in exchange for some degree of negotiated limits or timetables controlling deployment on both sides.[18] The incentive for the Soviets to join such a phased agreement would be access to more advanced U.S. technology, on a selective basis, and the assurance that the United States would not get ahead of them; the quid pro quo would be an agreed schedule of space defense development and deployment, subject to verification, designed to ensure that each side proceeds more or less in parallel with the other. One advantage of space arms control measures is that verification should be relatively easy, in that objects in near space are difficult to conceal for long, and on-site inspection by probes or astronauts of either side is increasingly feasible.

The danger of this negotiated approach is that we might become too reliant on its political component as a cheap way out of building as much hardware as we really need. Thus we should make sure that any arms limitation agreements we enter to stabilize the transition period are strictly limited to the DABM deployment phases. Were we to place permanent reliance on paper limits to contain Soviet efforts, we would lay ourselves open to nasty surprises in the case of Soviet breakout. Once deployed, DABM must be able to perform the job on its own, apart from any negotiated limitations.

The matter of deployment brings us back to the question of whether DABM is technically feasible.[19] Although no one can say for certain how effective it would be, few today believe that we can develop a totally impermeable defense. But even a partial DABM capability would offer several strategic advantages. Even if not leakproof, DABM could vastly complicate a potential attacker's calculations. He might be sure that, say, half of his warheads would get through; but which half, in what sequence, on what targets? The increased uncertainty would itself discourage risk-taking; it would also raise the level of forces needed before an attack could even be contemplated. Furthermore, if an attack were launched, a defense would blunt the blow; the converse of the argument that even a partially successful attack could cost millions of lives is that even a partially effective defense could save millions of lives. More important, DABM would widen the nuclear firebreak. If it could successfully intercept anything less than an all-out saturation attack, a space-based defense would limit possibilities of graduated escalation from tactical-level nuclear engage-

ments or local crises peripheral to the vital interests of the two superpowers.

The argument between the proponents of MAD (or some updated version thereof) and those proposing a space-based missile defense is analogous to the debate occasioned in Great Britain by German rearmament in the 1930s. British planners, including most of the Royal Air Force, were especially concerned about the Luftwaffe. As Churchill described the situation in 1935, "Ministers had to imagine the most frightful scenes of ruin and slaughter in London if we quarrelled with the German Dictator." They were no less aware that the ports, dockyards, and technical installations on which the fleet depended were equally vulnerable from the air. The Air Ministry's position was that there could really be no defense; the well-entrenched official view held that "the bomber will always get through."[20]

The government's response was to meet the threat of the "unstoppable" German air weapon by building as many British offensive fighters and bombers as possible. Against this trend, Churchill led the drive to base Britain's defense on beam warfare, or radar as it came to be known, even though the technology and the strategy for putting it to use were both unproved at that point.

The lesson of the outcome was not that one party was right and the other wrong, but that both were right: victory in the ensuing Battle of Britain would not have been possible without both sufficient fighters and radar. The parallels with our own situation are obvious. Neither MAD alone nor DABM alone can do the whole job, but a mix of modernized strategic offensive systems and new defensive capabilities offers the best guarantee of continued U.S. security.

The possibility of a global security system, developed within a context of shared technology and negotiated international agreement, gives rise to a further set of considerations. While the United States may decide to press on with an antimissile defense of its own, the global system we need might, with more profit, reflect and nurture global cooperation. Though its realization would require a substantial political evolution, the idea is basically the same concept as that institutionalized in the United Nations Charter in 1945. In the Security Council, the great powers were to assume a special responsibility for the military security of the world, unencumbered by the voice of the multitude in the General Assembly. Even the players are similar: the United States, the Soviet Union, China, Britain, and France; only the addition of Japan and perhaps Germany is necessary to complete a current list of potential DABM participants. The substantial degree of U.S.-European cooperation in the recent Spacelab mission provides a good precedent from which to expand.[21]

As in the case of the European Coal and Steel Community negotiated in the 1950s, such a cooperative international regime would use national enmities, not assume them away. The idea of a U.S.-Soviet joint venture in space (or linked, parallel ventures) has much to commend it in terms of starkest national interest. First, it would help solve each government's main security problem, increasing the protection afforded to each society against the other's ICBMs. Second, it would provide a meaningful vehicle for integrating China constructively into a stable world order, a primary Soviet goal and only slightly less important to the United States. Third, it could help discourage *n*-country nuclear proliferation, which appears likely to be a serious problem by the end of the century if unchecked. Security Council members would have means to limit Third World strike capabilities. Fourth, a cooperative DABM would neatly end-run the will-o'-the-wisp of strategic disarmament, which we have pursued with little success for over a generation. If the antimissile system worked as expected and was protected against independent veto or sabotage by one of the partners, nations could at least afford a considerable reduction from present levels of strategic offensive forces without feeling that they were jeopardizing their security.

Finally, and perhaps most important, the system could provide a new global vision—one that would harness technology, strategy, and politics to the cause of world survival and harmony.

The chief objection to this pleasing prospect is that it would require an almost unforeseeable transformation in the Soviet outlook. Though the scheme would offer the Soviets numerous benefits, including access to the West's more advanced technologies, a solution to the China problem, and worldwide prestige as a guarantor of the peace of the planet, the idea of partnership with the West on a basis of long-run equality, as we have noted, runs against the central thrust of Marxist-Leninist thinking.

A shock could provide the impetus for cooperative efforts. The whole rationale in support of DABM is that somehow, somewhere, nuclear weapons will once again be used. If that grim eventuality were to occur on a small scale (probably in a Third World conflict) and if the superpowers could manage to avoid being drawn into the abyss of destructiveness, the trauma of the experience might be sufficient to make an unlikely idea of partnership seem suddenly plausible. In any event, we should start laying the groundwork now. If great

power cooperation proves feasible, so much the better; and if a climate of hostility persists, DABM will be all that more necessary.

Can we succeed? There is of course no way to tell. But let the last word again be Churchill's. Summing up the British experience with strategic defense in the early days of World War II, he noted:

> The Germans would not have been surprised to hear our radar pulses, for they had developed a technically efficient radar system which was in some respects ahead of our own. What would have surprised them, however, was the extent to which we had turned our discoveries to a practical effect, and woven all into our general air defence system. In this we led the world, and it was operational efficiency rather than novelty of equipment that was the British achievement.[22]

Strategic security can be achieved by the United States in the 1980s and 1990s, not simply in the narrow terms of systems engineering, the integration of technical components into an operationally effective anti-ICBM defense, but in the larger, political realm also: integration of that system into an emerging political order could well offer increased security for all nations of the world.

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Notes

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A capacity and taste for reading gives access to whatever has been discovered by others. It is the key, or one of the keys, to the already solved problems. And not only so; it gives a relish and facility for successfully pursuing the unsolved ones.

Abraham Lincoln
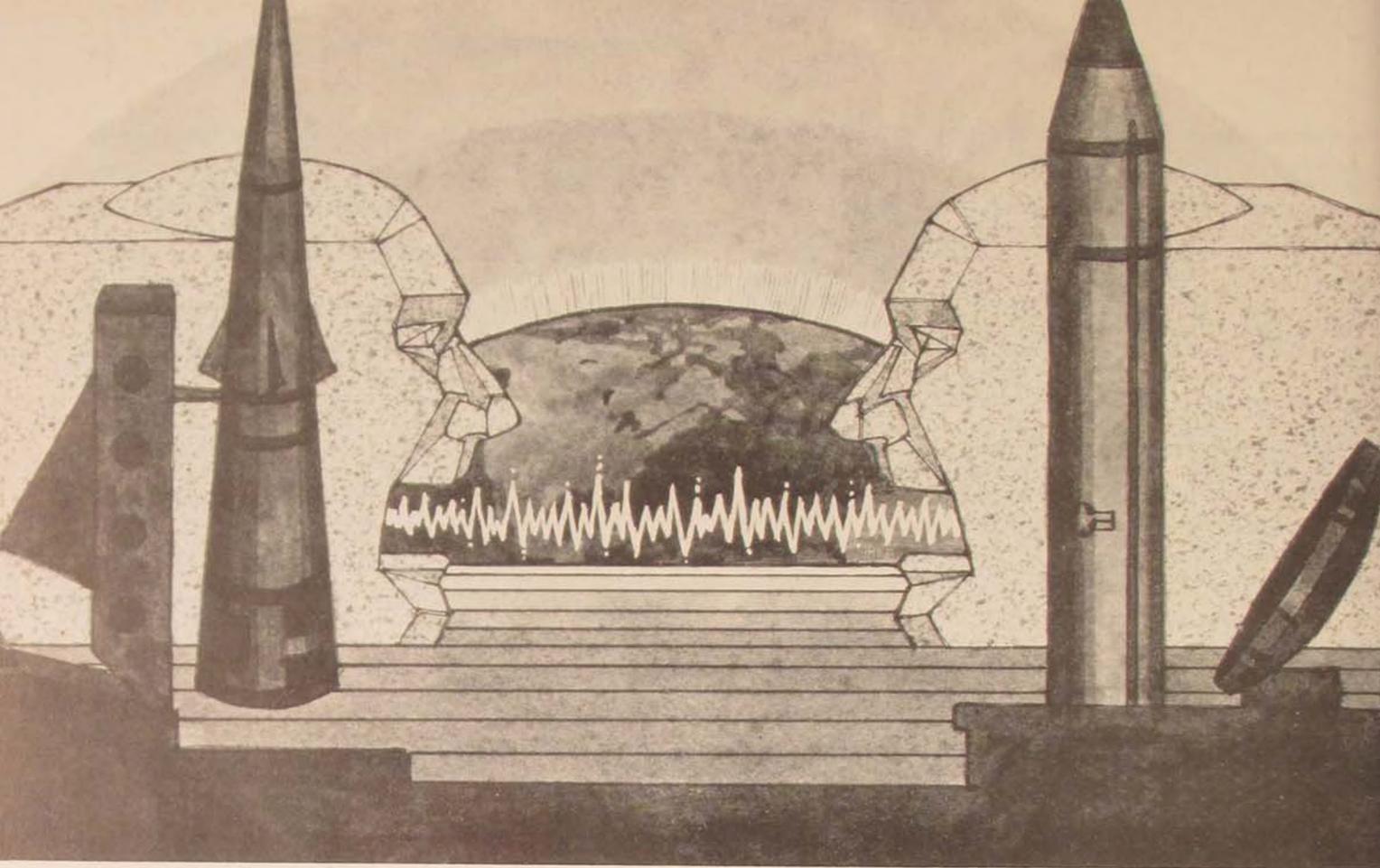
THE EMERGING BMD DEBATE: DÉJÀ VU OR NOT?

LIEUTENANT COLONEL JAMES F. BRYDEN

THE American people are on the verge of another debate on ballistic missile defense (BMD). There are several possible explanations for renewed interest in BMD, but the underlying reason seems to stem from the perceived change in context since the question of Safeguard deployment was argued in the late sixties. Because it is possible, if not probable, that the same major issues that dominated the first debate will also provide the framework for the emerging one, defense analysts must decide at the outset whether the change in context is perceptual or real. Would a new debate on ballistic missile defense be déjà vu, or are there indeed sufficient contextual changes to make renewed arguing meaningful and fruitful?

On Thursday, 6 March 1969, the Senate Sub-committee on International Organization and Disarmament Affairs of the Committee on Foreign Relations began to hear testimony on the implications of deploying the Safeguard system. Selected for deployment by the Nixon administration, the system represented more than thirteen years of research and development and proposals for deployment.

A BMD program had been first presented to Congress in 1955, and by 1958 the Nike-Zeus system was in full-scale development. Nike-Zeus was a high-altitude interceptor equipped with a nuclear warhead and controlled by ground-based mechanically steered radars. During 1959 and 1960, considerable sentiment favoring deployment grew in Congress, but the Eisenhower administration rejected deployment

in favor of more research and development. Finally, in 1963, the Nike-Zeus system was abandoned because it could not cope with the Soviet threat envisioned for the late sixties.

After the demise of Nike-Zeus, a new and improved system, dubbed Nike-X, was entered into research and development. Unlike Nike-Zeus, which employed only a high-altitude interceptor, Nike-X represented an attempt to develop a BMD system that could provide defense-in-depth for population. Nike-X would use two interceptors. The long-range Spartan's mission would be nationwide area defense. The short-range, high-speed Sprint, on the other hand, would be deployed for terminal defense of major cities. Both interceptors would be controlled by new phased-array radars reflecting a significant technological advance beyond the mechanically steered radars of Nike-Zeus.

President Johnson's announcement to Congress on 24 January 1967 may have been the turning point in the path the United States seemed to be following. The President had decided to continue intense research and development but not to deploy a BMD system. The historically more significant announcement, however, was the initiation of arms control discussions with the Soviet Union. Of course, the administration left open the option to reconsider BMD deployment if these fledgling discussions should fail to bear fruit.[1]

In a speech before a group of United Press International editors in San Francisco later that year, then-Secretary of Defense Robert S. McNamara promulgated a doctrinal pronouncement that has guided and constrained the nuclear deterrent strategy of the United States even to the present. McNamara's main purpose may have been to announce the administration's decision to deploy a thin Chinese-oriented BMD system. But when questioned about the Soviet threat, his remarks also reflected a major doctrinal shift.

Many analysts of nuclear strategy accepted McNamara's remarks during that speech as the official pronouncement of the nuclear deterrent doctrine known as mutual assured destruction or MAD. (Actually, the genesis of MAD occurred much earlier. MAD as a concept was presented in writings of Bernard Brodie as early as 1946.) Specifically, McNamara claimed that "assured destruction" was the "very essence of the . . . deterrence concept." Furthermore, he believed that the strategic nuclear capabilities of the two superpowers had grown to the point that the United States and the Soviet Union could deter each other (thus, mutual assured destruction).[2]

When questioned about arms control negotiations, McNamara asserted that, as a result of what he called an "action-reaction phenomenon," both sides had force levels exceeding requirements of a credible second-strike capability. He viewed this action-reaction phenomenon as the "intrinsic dynamics of the arms race" observable in the way U.S. planning had influenced Soviet planning and vice versa. His conclusion was that an arms limitation accord was preferable to an unceasing arms race because such an accord would arrest the dynamism of the arms race.[3]

McNamara hoped that BMD deployments could be limited under the provisions of the Strategic Arms Limitations Talks. But if SALT success failed to materialize, he believed the proper U.S. response to massive BMD deployments by the Soviets was to increase offensive capability rather than trying to match the Soviets defensively. McNamara argued against a thick Soviet-oriented BMD system on two grounds: first, that such a system would be technically imperfect and penetrable, and second, that the Soviets would probably respond with more offensive deployments (the action-reaction phenomenon).[4]

In view of McNamara's description of the action-reaction phenomenon and his arguments against deployment of a thick BMD system in response to the Soviet threat, one must wonder why the Johnson administration opted for a thin system against a nonexistent Chinese

threat. The Chinese-oriented Sentinel system was essentially a fallback position. The administration surmised that should BMD deployment be forced upon it eventually by circumstances, this deployment would reflect at least some degree of prescience and prudence. In addition, a thin defensive system, coincidentally providing some very limited defense of the Minuteman force, would fulfill at least a common part of the various deployment schemes advanced by ballistic missile defense proponents. The primary objectives of the administration were to prevent large-scale BMD deployment that could be construed as provocative by the Soviets and, at the same time, to provide a hedge against defeat of continued funding for research and development in lieu of production and deployment.

The Sentinel system was the product of the Nike-X research and development efforts. Sentinel would have applied both area-defense and terminal-defense concepts. Area defense, using the long-range Spartan missile with a multimegaton nuclear warhead, would have involved midcourse detection and tracking of incoming objects and interception exoatmospherically. Terminal defense would have taken place endoatmospherically when, after sorting from chaff and decoys, sprint missiles would intercept reentry vehicles (RVs) and kill them either by the air blast or by penetrating neutrons emitted by Sprint's nuclear kill mechanism. Target acquisition, initial tracking, and trajectory prediction would have been the functions of perimeter acquisition radars (PARs), while missile site radars (MSRs) would have provided shorter-range tracking and interceptor guidance.

The Chinese-oriented Sentinel system would have included seventeen sites—fifteen in the continental United States (CONUS) and one each in Alaska and Hawaii. Each site would have had its own MSR, and six PARs would have been deployed along the northern tier of the CONUS. Sprint missiles were to be deployed to the Hawaii site and each PAR for terminal defense of the radar itself. All other sites were to be equipped with the Spartan interceptor.

The year 1968 saw continuation of the Johnson administration's effort to stimulate SALT negotiations for both offensive and defensive weapon systems. On the domestic front, the administration struggled to evade competing pressures regarding BMD deployment. From one end of the continuum came pressure to move beyond the limited Sentinel deployment to a full-scale, Soviet-oriented system; the other end was represented by an emerging congressional movement to cut BMD funding.

Nixon's victory in the fall of 1968 set the stage for review of Johnson's positions on foreign affairs and defense issues. On 14 March 1969, President Nixon identified several perceived deficiencies in the Sentinel system and announced a replacement system, Safeguard. Perhaps the most significant criticism levied by Nixon against Sentinel was that it was too heavily Chinese-oriented. Three specific examples were offered to support his position. First, the north-facing perimeter acquisition radars provided no coverage of sea-launched ballistic missile (SLBM) trajectories. Second, many missile site radars lacked terminal defense. Third, no Sprints were provided specifically for defense of Minuteman.[5] To place Nixon's criticism in perspective, one should recall that during this period the perceived Soviet threat to land-based U.S. forces was growing more rapidly than forecast, while the converse was true for the Chinese threat.

The Nixon administration also criticized deployment of ten of the fifteen CONUS sites in or near major metropolitan areas. For one thing, there were indications that Spartan's multimegaton nuclear warhead had generated some public alarm. Additionally and probably more important, the administration believed that the Soviets could perceive deployment in or near cities as a threat to *their* deterrent. This belief was based on the MAD premise that maintenance of a stable deterrent balance re-

quired each side to offer its industrial and population centers as "hostage" to the assured destruction threat. Finally, Sentinel's fixed, predetermined deployment schedule disturbed the administration because it lacked the flexibility for periodic reassessment of the need to continue a step-by-step deployment.

President Nixon concluded that the concepts on which Sentinel had been based should be modified substantially, that the United States should proceed with a new system (Safeguard) in a carefully phased program, and that the new program should be reviewed annually in view of new technology, the threat, and SALT developments. Nixon believed that it was impossible to protect population from a determined Soviet attack (even with a thick system that could be unnecessarily provocative) but that a thin, expandable system could strengthen the U.S. deterrent without threatening the Soviet deterrent if it were deployed in defense of nuclear retaliatory forces rather than cities.

Safeguard's objectives were threefold. First, Safeguard would be deployed to protect land-based retaliatory forces, particularly the Minuteman force, against direct Soviet attack. This was the overriding objective. Second, the new system would defend population centers against the anticipated Chinese threat. And, third, Safeguard would protect the country from an accidental attack from any source.

Safeguard was to be deployed at twelve sites. Seven perimeter acquisition radars with eleven faces were planned. Six of these faces would be seaward to cover the SLBM threat to bomber bases. Although somewhat fewer Spartan interceptors were planned, twice as many Sprints would be deployed, primarily for terminal defense of Minuteman. All Safeguard components would be located away from major cities but still would provide sufficient area defense capability to deal with the Chinese threat. Finally, deployment would be implemented in phases and related to actual threat development. Phase 1, for example, would include only the sites near Grand Forks AFB, North

Dakota, and Malmstrom AFB, Montana.

This, then, was the immediate background of the congressional debates in 1969. The U.S. nuclear strategy of assured destruction required secure second-strike-capable forces. Stability of the condition of mutual deterrence was seen as desirable. And, finally, an asymmetry in need of redressing jeopardized both of these goals. Déjà vu? An answer to that question requires a much closer look at the arguments presented to Congress by BMD proponents and opponents. Their testimony concentrated on four issues: system effectiveness, effects on the U.S.-Soviet strategic balance, effects on arms control negotiations, and the impact on deterrence.

One particularly articulate witness before Congress rather bluntly summarized his opposition to Safeguard when he labeled it "a prime example of a weapon system that will at best do very little good; most likely accelerate the arms race; and, either way, waste large sums of money." His opposition was based on his judgment that Safeguard could not be made to function reliably, that it could be easily overwhelmed, that it was not needed to protect deterrent forces, and that it would ultimately reduce U.S. security, complicate the arms race, and make arms control more difficult.[6]

President Nixon's announcement of his decision to deploy Safeguard perhaps best summarizes the pro position. Proponents agreed with Nixon's assertion that active defense of U.S. retaliatory forces was needed to protect against the projected Soviet ICBM and SLBM threat. They perceived that an increase in U.S. offensive forces would threaten the Soviets and thus stimulate a more intense offense-offense arms race. Safeguard, they argued, would merely secure the U.S. deterrent and would not affect the Soviets' deterrent. Furthermore, BMD deployment would not impede but might actually help the SALT talks for two reasons: it would restore the mutuality of deterrence, and phased deployment would permit agreements limiting the potential for an accelerated offense-defense arms race.[7]

Obviously, proponents of Safeguard believed that the system would be capable of performing its assigned missions, but opponents were not convinced. Many saw a mismatch of mission and capability. They argued that Safeguard had been designed more for thin area defense than for terminal defense of Minuteman. The radars were vulnerable to direct attack. The system would be easy to overwhelm because of its limited radar-tracking capacity, the limited data-handling capacity of computers, and the relatively small finite number of interceptors. The Soviets could penetrate Safeguard easily with penetration aids and eventually with multiple independently-targetable reentry vehicles (MIRVs). Additionally, opponents were concerned that a high-altitude nuclear detonation (perhaps even by U.S. Spartans) could degrade the system by creating a radar "black out."

Although there were two opposing schools of thought on the implications of Safeguard deployment for the strategic balance (or arms race), there was substantial agreement in the late sixties about the state of that strategic balance. By the middle of the decade, U.S. observers generally believed that a tenuous stability had emerged. The arms race had evolved into a strategic balance or plateau. That arms race had been characterized as repeated and reciprocal new deployments by both sides—an action-reaction cycle—as each side sought to achieve temporary advantage, to redress a vulnerability, or to blunt an anticipated escalatory move by the other side. The strategic balance perceived by the United States was not a symmetry of deliverable warheads or megatonnage; it was the existence of a secure deterrent (i.e., second-strike capability) by both sides.

There were indications, however, that the broad stability of mutual deterrence was about to end. Continuing Soviet missile deployments, for example, were perceived as threatening to U.S. retaliatory forces. These deployments included the SS-9 ICBM, an expanding force of SLBMs, and fractional orbital bombardment systems. On the horizon was the possibility of Soviet deployment of MIRV-equipped missiles. Compounding the perception of threat (based largely on faulty intelligence) were Soviet BMD deployments.

One group of U.S. analysts believed that phased deployment of a BMD system would redress the perceived vulnerability of land-based retaliatory forces and thus ensure the stability of mutual deterrence. Such a phased deployment could correspond to the Soviet threat as it developed. Moreover, the advocates of this school of thought denied that BMD deployment would elicit a Soviet response. Terminal defense of retaliatory forces, they argued, would not threaten the Soviet deterrent (provided, of course, the Soviets embraced the MAD premise that cities and industry were indeed the assured destruction hostage).

Those who belonged to the opposing school of thought were convinced that deployment of the Safeguard BMD system would accelerate the arms race and exacerbate instability in the strategic balance. They denounced the argument that BMD deployment by the United States would restore stable mutual deterrence, calling it an errant belief based on the "fallacy of the last move."[8] While attributing the dynamics of the arms race to an action-reaction phenomenon, these analysts blamed the United States for setting the pace. The effect of Safeguard would be a continued upward spiral of U.S. and Soviet efforts into further technological advances that were becoming available: accuracy, range, and yield improvements; MIRV technology; and military use of space and the ocean floor. Participating in this spiral, they argued, would be both costly and destabilizing.

To its opponents, then, Safeguard was a symbol of the arms race. It could lead to a new round of penetration aid development, an increase in numbers of offensive systems, and almost certainly to Soviet MIRV deployment. The result would be a period of uncertainty and instability during a new offense-defense arms race, followed eventually by restoration of a stable strategic balance at a new, higher, and

more dangerous plateau. Thus, overall national security would actually be lessened by BMD deployment, not enhanced as the BMD advocates proclaimed.

Closely related to the strategic balance issue was the arms control issue. On the arms control issue, however, there were three (rather than two) schools of thought. One group believed that Safeguard deployment would interfere with success of the SALT negotiations. These analysts saw in SALT a less expensive and longer lasting solution to the projected instability in the strategic balance. At the same time, they theorized that U.S. deployment of BMD in tandem with MIRV deployment might lead to Soviet perception that the United States was giving them a "double whammy."[9]

A second group of analysts disagreed substantially with the first group. By emphasizing different potential implications of BMD deployment, these analysts argued that Safeguard would enhance the possibility of successful SALT negotiations. Deployment away from cities would show the Soviets that the United States had no first-strike intent but that any effort on *their* part to attain first-strike capability would be fruitless. Thus, BMD would serve as an incentive to negotiate by depriving the Soviets of any first-strike capability without threatening their second-strike deterrent.

A third group of analysts believed that BMD deployment would do more than serve merely as an incentive to negotiate. Rather, they asserted that Safeguard would strengthen the U.S. hand in SALT. Phased deployment of a BMD system would provide not only flexibility but also a hedge against failure of the talks. That is, if SALT negotiations failed, the United States would be in position to move beyond the first phase of Safeguard deployment to protect the U.S. deterrent.

Since the fundamental objective of U.S. national security policy is deterrence of general nuclear war, it is not surprising that the impact of BMD deployment on the U.S. deterrent posture would arise as the fourth key issue in the

Safeguard debates. Nor is it surprising that there were several (some diametrically opposed) positions on that issue. It is perhaps ironic, however, that most analysts shared a common doctrinal belief (i.e., MAD) and that their arguments seemed to be different interpretations of the constraints that doctrine placed on military strategy. Those who argued against Safeguard in the name of MAD may have shared beliefs rooted in the past when cities were the assured destruction hostage by default because early offensive systems were not sufficiently accurate or responsive to threaten retaliatory forces credibly. Safeguard proponents who adhered to MAD doctrine, on the other hand, may have been more future-oriented. Perhaps they recognized the potential impact of large numbers of accurate Soviet missiles on the ability of the United States to maintain a credible second-strike deterrent force.

Many opponents of Safeguard reasoned that deterrence and defense were incompatible. These MAD adherents tended to assume that the Soviets "mirror-imaged" U.S. dogma about nuclear deterrence and strategic stability. According to these analysts, the concept of mutual deterrence was the central organizing principle of each side's nuclear strategy. Moreover, static long-term strategic stability was attainable if each side had confidence that its second-strike forces could inflict unacceptable damage on the population and industry of the other side. Such mutual vulnerability was the most effective deterrent because it made the idea of nuclear war unthinkable. Any form of defense was undesirable, these analysts argued, because it suggested belief in the possibility of a preemptive first-strike. Deploying BMD systems (whether accomplished simultaneously by both superpowers or phased in gradually by one of them) would lead to instability, providing both sides with incentives to initiate a preemptive nuclear strike.

In contrast, MAD advocates who favored deployment of the Safeguard system contended that BMD was neither incompatible with MAD

logic nor potentially destabilizing. Indeed, these analysts believed that defending one's second-strike forces (rather than cities) was totally consistent, if not laudable, under mutual assured destruction doctrine because such a defense would strengthen the security of second-strike forces without threatening the other side's deterrent (i.e., without eliminating one's own societal vulnerability). Safeguard, therefore, would maintain the basis of stable mutual deterrence.

Irrespective of their doctrinal beliefs, some analysts opposed Safeguard on the grounds that deployment was unnecessary. These strategists maintained that Minuteman was not really vulnerable and that the Chinese threat was not credible. Furthermore, the other legs of the Triad were more than adequate to carry out the assured destruction threat.

A small minority of strategists believed that MAD itself represented errant thinking. They considered the American belief that the Soviets had been tutored in "correct thinking" about nuclear war as arrogant, ethnocentric, and false. The incompatibility of deterrence and defense was valid, they argued, only if the American doctrine of short war (i.e., mutual assured destruction) was accepted by both sides. According to these critics, however, the Soviets espoused a long-war doctrine of deterrence based on maintenance of a war-fighting capability, not a doctrine that envisioned a spasmodic and massive retaliatory strike designed to inflict "unacceptable damage." If their appraisal of Soviet strategic thinking was correct, there were important implications to consider. First, there would be no incompatibility between deterrence and defense. Rather, defense could enhance war-fighting capability by limiting damage to one's own offensive forces while attriting enemy offensive forces. Second, strategic balance could not be a static phenomenon. Instead, it would fluctuate with changes in the "correlation of forces." Finally, if nuclear war were viewed as possible rather than unthinkable, nuclear weapons could have po-

litical utility beyond simply deterrence of aggressive attack.

When the issue of deploying Phase 1 of the Safeguard system finally came to a vote on the Senate floor, the senators were as divided as the many defense analysts who had testified before the committee. Funding for initial deployment was approved in a fifty-fifty tie vote with the vice-president casting the tie-breaking vote in favor of the administration's position. Funding was approved again in 1970 by only a fifty-two to forty-seven margin. On 26 May 1972, however, the United States and the Soviet Union signed a treaty limiting deployment of BMD systems. A 1974 revision further constrained BMD, and a year later, only months after its construction, the United States dismantled its only Safeguard site near Grand Forks, North Dakota.

B MD may be making a comeback. What's changed? Will the renewed interest in BMD prove to be déjà vu? Although probably the same four issues will dominate a new debate on BMD deployment, many analysts argue that the context has changed enough that substantially different positions on these issues may be presented.

The effectiveness of Safeguard was questioned on four grounds: penetrability, radar vulnerability, data-handling capability, and the nature of its nuclear kill mechanism. Proponents of a new BMD system claim that all of these have changed. They envision a layered defense system that would be effective against large numbers of reentry vehicles. Using a variety of sensors (including optical and infrared types), the exoatmospheric interceptors would be guided internally to points in space along the path of Soviet vehicles. These interceptors would use such nonnuclear mechanisms as debris and other barriers to destroy target vehicles. The endoatmospheric interceptors (Sprint counterparts) would employ new technology and sensors. The need for a network of large,

vulnerable, high-powered radars would be negated by terminal guidance systems on board the interceptors. And, finally, contemporary high-speed computers could provide requisite data-handling capacity.

Many analysts believe the strategic balance issue, like the effectiveness issue, must be reviewed in light of some significant contextual developments. One widely held perception is that the United States gave up Safeguard and agreed to BMD limitations in hope that the Soviet Union would limit MIRV deployments and increases in the number of offensive launchers. However, the Soviets have proceeded with deployment of so many accurate warheads that the United States now perceives a serious first-strike threat potential against its ICBMs.

Although belief that U.S. land-based ICBMs are vulnerable to direct attack (or that they soon will be so) is widespread, it is by no means universal. Some skeptics remind analysts of the vulnerability school about what "circular error probable" calculations really mean. Others cite the problems of unpredictable meteorological influences (e.g., jet streams, thunderstorms, winds, solar flares, barometric pressure variations, and other conditions) and a yet untested theoretical north-south trajectory bias that would degrade RV accuracy. Still others, rather than attacking the validity of the vulnerability argument, discount the implications of ICBM vulnerability by espousing the adequacy of the air-breathing and sea-launched legs of the strategic Triad to deter the Soviets.

Whereas BMD was perceived by many to be *destabilizing* in 1969, it may appear to be *restabilizing* today in the minds of the believers in ICBM vulnerability. By altering Soviet perception of gain achieved by deploying more offense, an effective U.S. ballistic missile defense system might discourage continuation of the course the Soviets have followed throughout the last decade. At the very least, BMD could reduce potential gain by offsetting any Soviet advantage in hard-target kill capability.

However, as many BMD opponents point out, deployment of an effective U.S. system could stimulate a renewed arms race. Such an arms race might be a reciprocal defensive systems race, but it could include more offensive deployments, particularly by the Soviets. Why might such an outcome occur?

Many analysts now believe that the Soviets view strategic balance differently from Americans. Balance to the Soviets is determined not only by a static equivalence of offensive inventories but also by what would remain after initial counterforce attacks. An effective U.S. ballistic missile defense system could create significant uncertainty in Soviet calculations. To restore confidence and gain a more favorable correlation of forces, the Soviets could feel compelled to counter the U.S. system with more offense or with their own ballistic missile defense system. Even more ominous to the Soviets would be U.S. deployment of a counterforce-capable ICBM (e.g., MX) in tandem with BMD. From a Soviet perspective, such a move by the United States might appear to be a "double whammy" in the equation.

American acceptance of the reality that the Soviets view the nuclear world differently has taken an ironic twist. Under pure MAD, the United States tried unsuccessfully to tutor the Soviets on "correct thinking" about the best way to deter nuclear war and to maintain a stable strategic balance. Today, however, the United States pursues a declaratory strategy (albeit based ultimately on an assured destruction doctrine in an environment of mutuality) that prescribes counterforce capability and strategic force endurance—essentially deterrence based ultimately on the assured destruction threat and enhanced by fully flexible response options (which the United States may not yet have). Some analysts call this "deterrence plus." The irony is that whereas the United States once tried to coax the Soviets into adopting *its* view of the nuclear world, it now seems to be espousing declaratory strategy using language and concepts more akin to long-held Soviet beliefs.

In addition to the implications of BMD deployment for the arms race, there are also some arms control implications that would be unavoidable in any new debate on active defense against missiles. Most obvious, of course, is the ABM Treaty. The original treaty, signed in 1972, allowed each side to maintain two BMD sites with no more than 100 launchers each. The 1974 protocol agreement reduced the authorization to one site per side. With a view to the future, the treaty also prohibited development, testing, or deployment of space-based BMD systems or components. Any BMD deployments beyond the treaty limitations would necessitate renegotiation or abrogation of the treaty.

Some analysts have no compunction about abrogating the treaty, if necessary. They tend to view as patently unsuccessful U.S. attempts to use restraint and arms control as the preferred means of maintaining strategic stability. Their common perception is that arms control agreements opened opportunities for the Soviets, which the Soviets used advantageously to deploy offensive systems capable of credibly threatening U.S. ICBMs. The ABM Treaty aggravated the situation by denying to the United States what may have been the best remedy for this growing vulnerability.

That SALT II has been essentially rejected by U.S. decision makers attests to the extent of the perception that SALT agreements have hurt more than helped. What about the future then? Although most Americans appear to support the resumption of the Strategic Arms Reduction Talks (START) initiated by the Reagan administration, some defense analysts are skeptical about the potential advantage of such talks for the United States. These analysts would prefer some sort of hedge against failure of new arms control negotiations. Many see redressing real or perceived asymmetries as just such a hedge against a future made uncertain by the murky outlook for arms control and the thrust of the recent buildup of Soviet offensive forces. BMD is only one of many alternatives

that they suggest. A few analysts see ballistic missile defense as more than a hedge, however. As in 1969, some see BMD as a stimulus to negotiation.[10] Déjà vu?

To answer that question now would be premature without considering the contemporary context relevant to the fourth major issue of the BMD debate—deterrence. In conjunction with their reassessment of Soviet nuclear war doctrine, U.S. strategists and decision makers have been reevaluating how to best deter the Soviets from initiating a nuclear attack against the United States. Perhaps the most obvious result was the Carter administration's countervailing strategy and Presidential Directive-59. Both seemed to reinforce the need for a secure, second-strike-capable ICBM. At issue has been what is the best way to ensure ICBM survivability. Some analysts advocate novel basing schemes for missiles; others, BMD. Still others support a combination of both. Overall, a significant number of analysts see in BMD a cost-effective way of maintaining the credibility of the ICBM leg of the U.S. strategic nuclear Triad.[11]

Colin Gray, when he was Director of National Security Studies at the Hudson Institute, provided a succinct summary of the arguments in favor of reopening the debate on BMD deployment:

> ... BMD technologies which the United States ... could deploy in the 1980s and 1990s have little in common with the Safeguard ABM technology that was debated in 1969-70. Moreover, our knowledge of Soviet "strategic culture," and of Soviet strategic "style" in arms competition, had undermined the plausibility of a good many of the anti-ABM arguments popular ten years ago; and the disadvantageous evolution of the multi-level military balance in the 1970s, in an era characterized by intensive arms negotiations, has cast significant doubts upon the value of a Western concept of strategic stability born in an era of US strategic superiority. In short, BMD technology has changed, Western understanding of the Soviet Union has changed, and Western appreciation of what is, and is not, an adequate strategic concept, has changed.[12]

Further:

> . . . there are more than sufficient grounds for reopening a policy debate not only about BMD's possible merit for stabilizing the Soviet-American strategic balance . . ., but also about the fundamental wisdom of the offence-dominance which has characterized US strategic doctrine and posture for the better part of fifteen years.[13]

There are many reasons why a new debate on BMD deployment would be more than simply déjà vu. The contextual changes identified in this discussion make reopening debate both necessary and potentially fruitful. On the horizon, the implications of weapons in space—such as directed-energy weapons for BMD—strengthen this imperative. Thus, it might be wise for potential participants in such a debate to adopt a comprehensive analytical framework for considering the merits of any proposed BMD deployment.

Such a framework demands consideration of a rather wide range of issues and concern. Ideally, military strategy should guide decisions on force development, force deployment, and force employment. However, military strategy is constrained by several outside influences, some of which seem particularly relevant to the BMD question. What, for example, does current military doctrine say about BMD? How do "pure MAD" advocates and "deterrence plus" advocates differ in their views? What about the economic factors? What, for instance, is the marginal utility of an additional dollar's worth of offense versus defense?

How significant is the current Soviet threat? Is Minuteman really vulnerable? Can future ICBMs be deployed in a survivable basing mode without BMD? And what of the national culture? Will the public accept a defense of forces but not of people? Finally, is BMD technology sufficiently advanced to permit deployment of an effective system?

Beyond these concerns are other matters to consider. Certainly, any BMD deployment holds the potential for affecting the arms control process. Would it enhance the prospects for meaningful arms control or complicate the process? Ballistic missile defense also has implications relating to the strategic balance. Would an American BMD deployment *resta*bilize the balance or *de*stabilize it? Is the action-reaction phenomenon real? Would deployment start a new arms race? If so, would it be a defense-defense race or an offense-defense race? Is either preferable to an offense-offense race?

IT should be apparent that the question of whether to deploy a BMD system is indeed complex. The potential for clear answers to critically important questions is probably very low. Decisions perhaps must be based on the so-called bottom line. What is the bottom line? Hopefully, it is this: What would be the contribution of BMD to the national objective of deterring nuclear war? Or stated more broadly, what is the best way to deter? That is *the* fundamental question.

Kirtland AFB, New Mexico

Notes

1. U.S. Congress, House of Representatives, Committee on Appropriations, *Safeguard Antiballistic Missile System, Hearings before subcommittees for the Committee on Appropriations,* 91st Cong., 1969, p. 19. Hereafter referred to as *Safeguard System.*

2. Ernest J. Yanarella, *The Missile Defense Controversy: Strategy, Technology and Politics, 1955-1972* (Lexington: University Press of Kentucky, 1977), p. 120.

3. Ibid., p. 121.

4. Ibid.

5. *Safeguard System,* p. 24.

6. U.S. Congress, Senate Committee on Foreign Relations, *Strategic and Foreign Policy Implications of ABM Systems, Hearings before the Subcommittee on International Organization and Disarmament Affairs of the Committee on Foreign Relations,* Part II, 91st Cong., 1969, p. 408. Hereafter referred to as *Implications of ABM Systems.*

7. Yanarella, pp. 1-7.

8. *Implications of ABM Systems,* Part I, p. 78.

9. Ibid., p. 319.

10. See, for example, arguments by Jack Kemp, "U.S. Strategic Force Modernization: A New Role for Ballistic Missile Defense," *Strategic Review,* Summer 1980, pp. 11-17; and Raymond L. Garthoff's views in "ABM Revisited: Promise or Peril?" *Washington Quarterly,* Autumn 1981, pp. 53-85.

11. See, for example, arguments by Raymond L. Garthoff and William R. Van Cleave in "ABM Revisited: Promise or Peril?" loc. cit. For one analyst's description of the Reagan administration's position on BMD for ICBMs, see Clarence A. Robinson, Jr., "Administration Pushes ICBM Defense," *Aviation Week and Space Technology,* 11 October 1982, pp. 113-18.

12. Colin S. Gray, "A New Debate on Ballistic Missile Defence," *Survival,* March-April 1981, p. 60.

13. Ibid.

ECONOMIC IMPACT OF PEACEKEEPER IN MINUTEMAN SILOS

Brigadier General Gordon E. Fornell
Lieutenant Colonel Glenn H. Vogel

THE Peacekeeper system development program being conducted during the Reagan administration is intended to modernize the U.S. intercontinental ballistic missile (ICBM) system and, in so doing, revitalize U.S. strategic deterrent capabilities threatened by Soviet advances in weaponry. The program, including the deployment of Peacekeepers in existing Minuteman silos, calls for an expenditure of $16.6 billion over the 1983-90 period.

(All dollar figures are expressed in constant 1982 dollars, and all years refer to fiscal years.) This expenditure will provide for missile research, development, test, and evaluation (RDT&E); missile procurement; and system
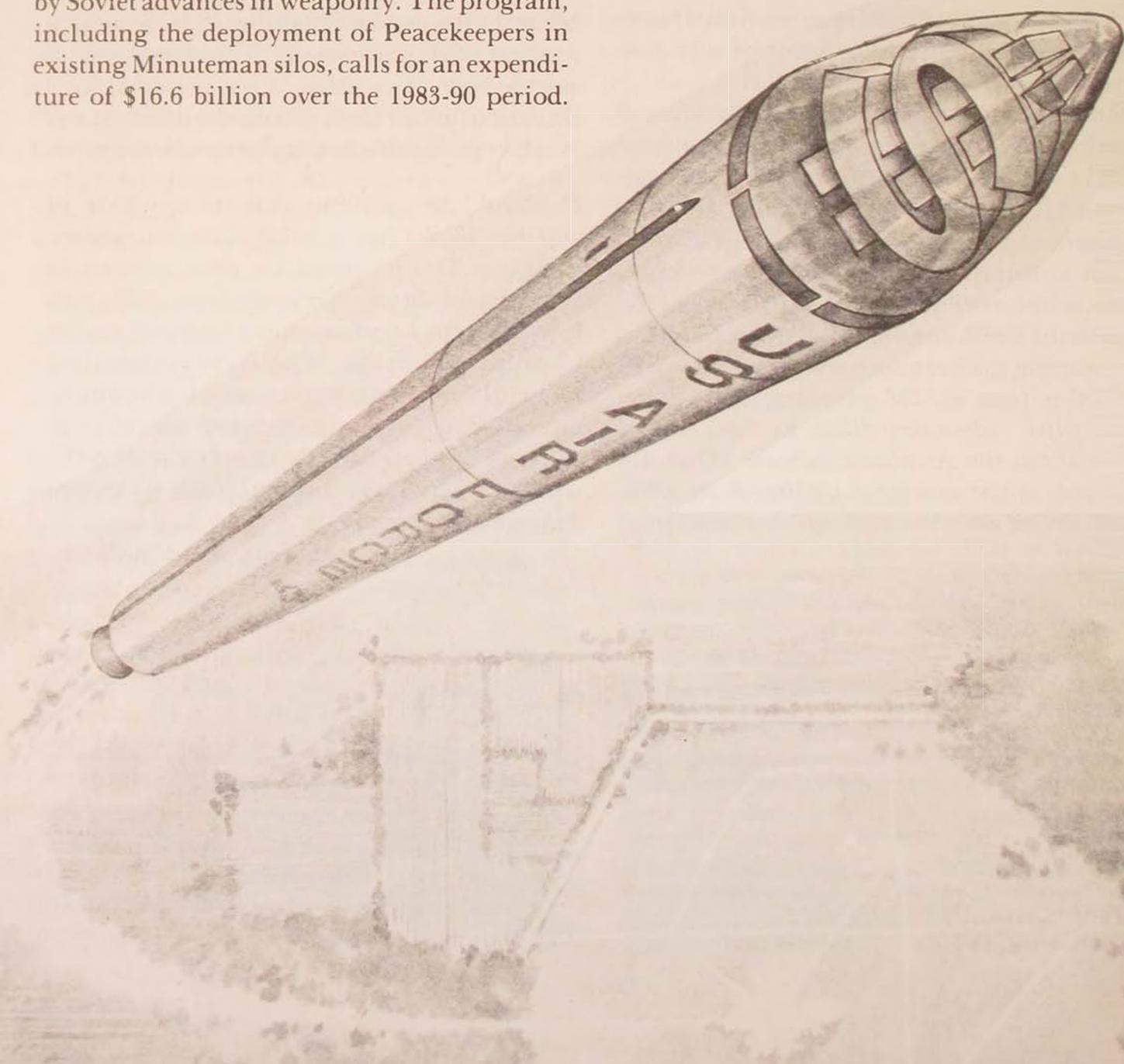
construction improvements to existing Minuteman silos. In addition to strengthening our strategic forces, production and deployment of the Peacekeeper will have significant national and regional economic effects on the demand for industrial output, employment, skilled labor, and critical materials.

The Peacekeeper missile has been designed as an ICBM capable of delivering ten reentry vehicles (RVs), or warheads, to independent targets at ranges greater than 5000 miles. In comparison with other ICBM systems currently in the U.S. inventory, the missile has greater resistance to nuclear effects, the ability to carry more warheads, and greater range and targeting flexibility. Peacekeepers are to be deployed in existing Minuteman silos in Wyoming and

Nebraska supported by Frances E. Warren Air Force Base. The Peacekeeper program schedule calls for the initial operational capability of 10 missiles by late 1986, with the full operational capability of 100 missiles expected by late 1989.

Based on the latest program schedule and cost data provided by the U.S. Air Force and the application of input-output models developed by Data Resources, Incorporated, and the Bureau of Labor Statistics, a preliminary economic impact analysis of the Peacekeeper program was conducted for the fiscal year 1984 Five-Year Defense Plan, covering the fiscal year 1984-88 period. The general approach used to assess the effects of Peacekeeper development on industrial output and employment was a five-step procedure. (See Figure 1.) The objec-

Figure 1. Economic Impact Assessment Methodology
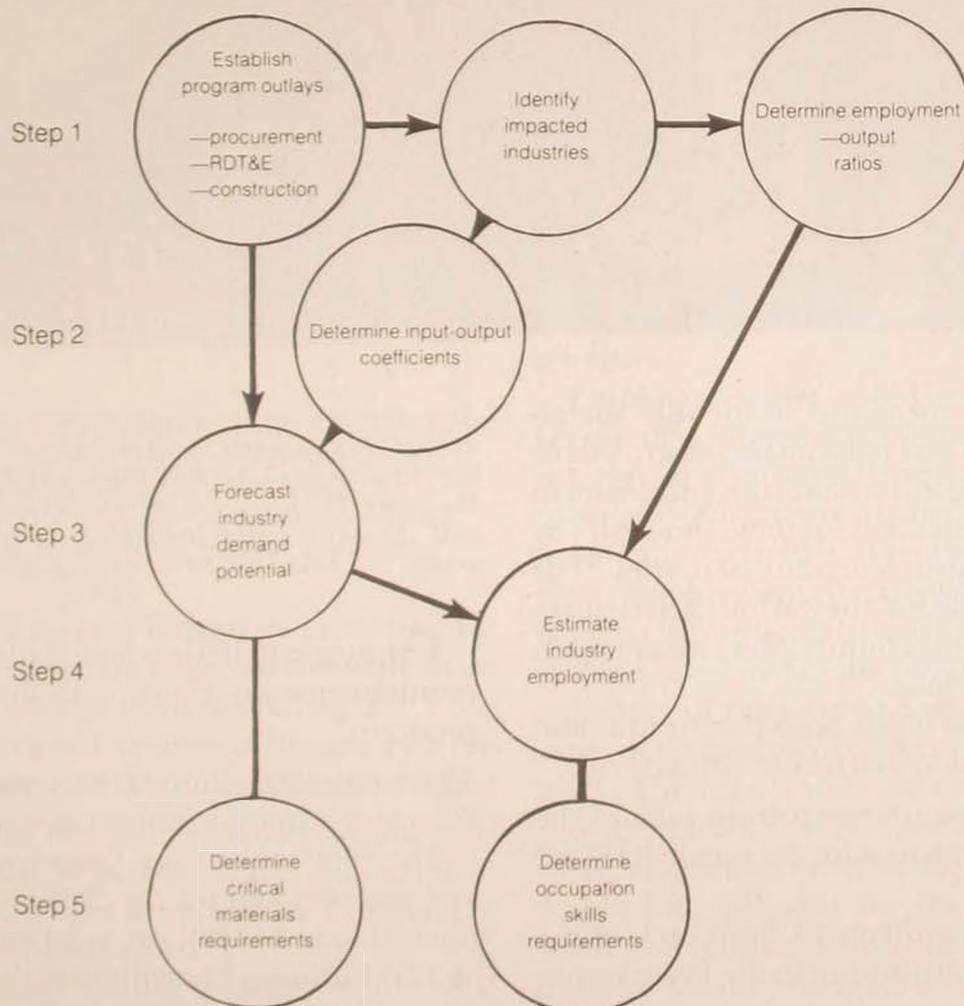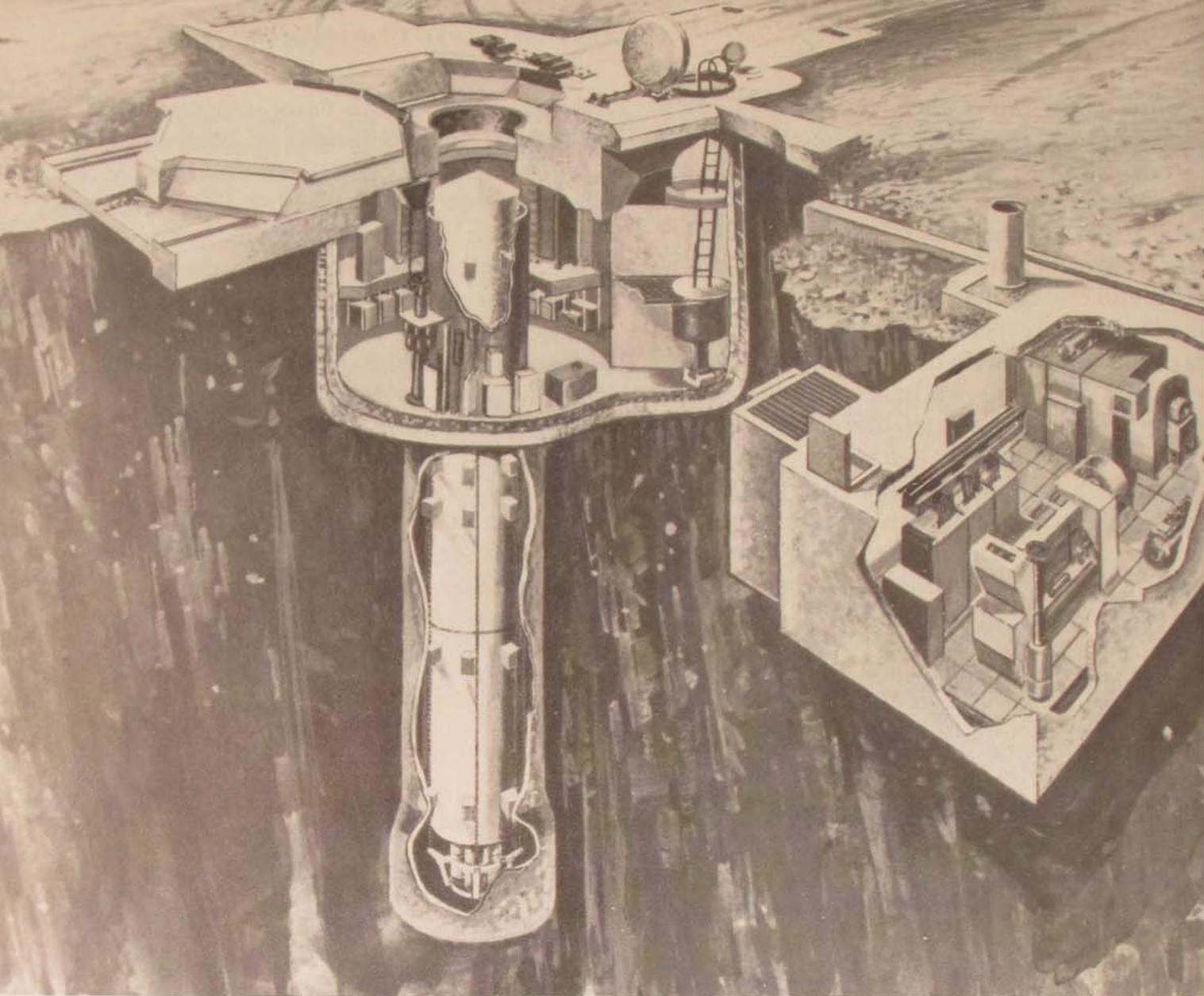
tive of the assessment was to identify the affected industries and to estimate the growth or sales (output) potential and the employment opportunities generated for these industries by Peacekeeper-related economic activities. The growth potentials for the various affected industries, and for the country, were measured in both dollars and jobs.

Specifically, the input-output technique and models were used to determine estimates of:

• The input requirements from each of the 400 supplying industries for the system RDT&E and acquisition.

• The input requirements from each of the 156 industries contributing to the Peacekeeper silo construction/improvement.

According to current program projections, MX missiles, dubbed "Peacekeepers," will be deployed in already existing Minuteman silos at F. E. Warren AFB near Cheyenne, Wyoming. Installation of the missiles will begin in 1986, with the whole system projected to be fully operational when 100 missiles have been deployed in 1989.

• Strategic materials and skilled manpower requirements associated with the Peacekeeper program.

These estimates, in turn, were used to develop summary economic impact assessments.

The total outlay for Peacekeeper RDT&E and procurement for the 1984-88 period is estimated to be $12 billion, at an annual average of $2.4 billion. (These figures do not include silo modifications.) The production activities

The Peacekeeper has a greater throw weight than the Minuteman system that it will supplement. It can carry more warheads farther and with greater accuracy while better withstanding the effects of electromagnetic pulses produced by nuclear explosions.

from the 400 various industries providing input to the system are expected to result in an increase in sales or services totaling $21.5 billion, or an annual average of almost $4.3 billion. An analysis of these projections indicates:

• Thirty of the 400 industries would contribute almost 90 percent of the total value of production or sales generated by Peacekeeper RDT&E and procurement activity.

• The missile industry's share in the total value of production would be the largest; its

sales would increase by $12.2 billion over the period under consideration, at an annual sales value of $2.4 billion.

• Other major sectors benefiting from Peacekeeper RDT&E and procurement outlays would include aircraft ($1.28 billion), radio and television communication equipment ($830 million), semiconductors ($960 million), and electronic components ($565 million).

The estimated outlay for silo construction/improvement activities is $232 million over the five-year period, at an annual average outlay of $46.4 million. An analysis of the data on the economic impact of silo modification activities shows:

• The total value of production or sales for industries involved in silo modification activities would increase by $432 million over the five-year period, at an annual average value of $86.4 million.

• Major industries needed for Peacekeeper silo modification activities would be suppliers of fabricated metal products, professional services, cement and concrete products, and wholesale trade.

• Thirty industries would contribute more than 87 percent of the increase in output or sales resulting from Peacekeeper deployment activities.

Employment that would be created by Peacekeeper development is of three types: direct, indirect, and induced. Direct and indirect employment effects are related to Peacekeeper production activities. The induced (or multiplier) employment effects are expected to result from consumption activities stimulated by the income generated in the production process. A summary of the estimates of each of the three types of employment effects is provided in Table I. The results indicate that the direct employment from Peacekeeper RDT&E, procurement, and deployment would amount to about 33,115 jobs per year for the 1984-88 period, while the indirect employment in related industries would average 14,545 jobs annually. The employment creation due to the multi-

55

Table I. Estimates of National Aggregate
Employment Changes* Due to
Peacekeeper Program Development
for 1984–88

(annual average number of jobs)

Peacekeeper development category	outlays† in 1982$ millions/ year	direct employment in the missile industry	indirect employment in Peacekeeper-related industries	induced employment in all other industries	aggregate employment
RDT&E	982.3	13,125	5,805	18,930	37,860
Procurement	1,422.8	19,005	8,465	27,470	54,940
Military Construction	46.4	985	275	1,260	2,520
Total	2,451.5	33,115	14,545	47,660	95,320

*Changes refer to the additions to the current level of jobs in the missile industry.
†Outlays do not include expenses due to operation, maintenance, and support activities.

plier or induced effect would be an additional 47,660 jobs annually. Overall, the Peacekeeper program could be expected to provide an annual average of 95,320 jobs during the 1984-88 period.

Although the employment and output effects associated with the Peacekeeper activities would be spread throughout the nation, they would not be uniformly distributed. The largest share of the employment and income benefits from Peacekeeper RDT&E and production activities would be concentrated in a few states (e.g., California, Colorado, Florida, Massachusetts, New York, Pennsylvania, and Utah) where specialized firms in missile technology and aerospace support industries, such as communications, propulsion, and transportation equipment, are located.

Preliminary analysis indicates that a few large prime contractors, located in a few states, employed 75 percent of the total workers directly engaged in Peacekeeper production in 1982. The remaining 25 percent of employment was provided by subcontractors' activities spread throughout the nation. Further, a significant share of the prime contractors' employment and production activities was concentrated in the western states. The employment and income activity related to the silo modification for the deployment of Peacekeepers would be concentrated in parts of southeastern Wyoming and western Nebraska.

Approximately 163 labor skills related to Peacekeeper missile production were identified. The results show that the greatest demand for high-skill labor would occur for engineers (particularly aeroastronautic, electrical, and mechanical), engineering and science technicians, scientists, and computer specialists.

In regard to material requirements, seventy-two strategic materials are needed for the Peacekeeper production. The demand is great-

PEACEKEEPER IN EXISTING SILOS: F. E. WARREN DEPLOYMENT—100

KEY:
● MINUTEMAN
◉ PEACEKEEPER
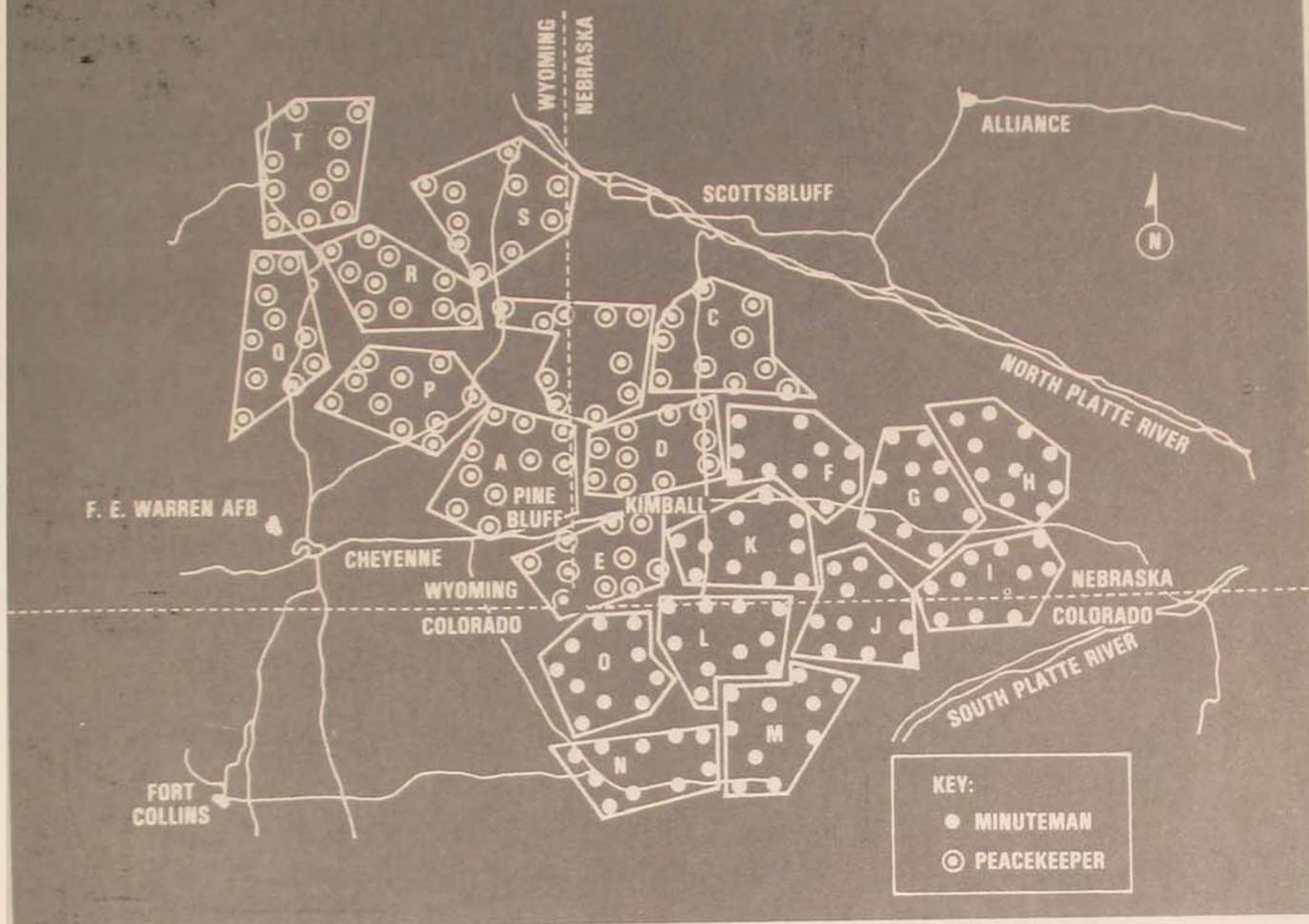
The deployment of Peacekeepers in existing silos at F. E. Warren AFB will have a significant, positive impact on the economy of Wyoming and several other western states. Putting new missiles in old Minuteman silos avoids negative ecological phenomena that might result from building entirely new installations elsewhere.

est for aluminum, chromium, copper, manganese, and primary nickel.

PRELIMINARY findings indicate that the planned development, procurement, and deployment of Peacekeeper in Minuteman silos with actual expenditures of approximately $12.3 billion during the fiscal year 1984-88 period would have significant economic effects throughout the nation. Industrial output and employment would grow considerably in aerospace-related industries, as industrial sales of approximately $23 billion would be generated by the program over the five-year period. The program-related output could be expected to create an annual average increase of 47,660 jobs over the 1984-88 period, with a peak-year (1986) employment of 56,150 jobs. When the induced-consumption effects of the economic stimulus provided by missile production activity are taken into consideration, a total annual average of 95,320 jobs would be created.

Hq USAF

G. E. F. and G. H. V.

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"Christian Morality and Nuclear Deterrence"
  by Captain Charles H. Nicholls, 328 BMS (DOE), 93 BMW (SAC),
  Castle AFB, California

"Military Leadership in the 1980s: Where's the Beef?"
  by Major Charles J. Dunlap, 97th Combat Support Group, Staff
  Judge Advocate, Blytheville AFB, Arkansas

"Communist Shadow: The Red in the Red, White, and Blue"
  by Second Lieutenant Leokadia B. Galka, Headquarters Armament
  Division/YNT, Eglin AFB, Florida

"The Imaginary Stranger: The Military Member in the
 Nuclear Age"
  by Captain Peter H. Liotta, 906th Air Refueling Squadron/CCE,
  Minot AFB, North Dakota

"Reflections on the Concept of Duty"
  by Captain John C. Orndorff, 18th Combat Support Group, Kadena
  AB, Okinawa, Japan

"Cowboy Philosophy"
  by First Lieutenant David A. Moore, 356 Tactical Fighter Squadron,
  Myrtle Beach AFB, South Carolina

MINOT/GRAND FORKS NOTEBOOK

Dr. Charles C. Moskos

IN THE spring of 1983, I was privileged to spend several days with Strategic Air Command (SAC) units at Minot and Grand Forks Air Force Bases in North Dakota. During that time, in the company of a small group of U.S. Air Force officers from manpower and personnel headquarters, I conducted "focused interviews" with small groups of enlisted members. The average interview session lasted about one hour and typically consisted of four to six participants. These groups of enlisted personnel were homogeneous in terms of Air Force specialty code (AFSC) and rank. In this manner, we talked with lower-ranking airmen and both junior and senior noncommissioned officers (NCOs) in various SAC assignments (i.e., bomber, tanker, missile squadrons, and general support services).

The reception these Air Force men and women accorded their visitors was characterized by candor and often by good fellowship as

well. The people assigned to the Strategic Air Command bases at Minot and Grand Forks are truly impressive. The SAC mission is being carried out by people of high quality and dedication.

Although I have conducted research on the armed forces for many years, this trip provided me with an opportunity to become acquainted with a part of the Air Force with which I had had little previous direct knowledge. My purpose was not to focus on issues specific to Minot or Grand Forks but to form some ideas and tentative conclusions that had more general applicability to Air Force personnel issues. This article is an informal account of some of the personnel issues as I saw them.

Quality Emphasis

The renewed emphasis to improve the quality of the enlisted force within the Air Force is an effort to produce or strengthen the "whole airman." No longer is off-duty behavior considered irrelevant to the airman's role. In the longer view of things, emphasizing the total person and life-style is clearly a step to reinvigorate the professional or institutional aspects of Air Force and to reverse the trend toward occupationalism or an "eight-to-five" mentality. These goals can be pursued largely because recruitment and retention have taken a considerable upturn in the early 1980s.

From the viewpoint of some lower-ranking airmen, however, such quality emphasis is sometimes seen as capricious or heavy-handed. Some individuals are surprised to learn that one can be discharged from the Air Force for such behavior patterns as off-duty drug use, driving while intoxicated, writing bad checks, and even repeatedly missing appointments. Likewise, some middle-level supervisors find the new role of melding job performance and off-duty behavior unsettling. None of these reactions should be surprising.

On no account, however, should the Air Force retreat from a quality force. But it may be advisable to consider ways to give lower-ranking airmen a bigger picture or context. Precisely because higher standards are expected of airmen than of civilians, the point should be made that the Air Force is a way of life, more honorable and distinctive than that followed by most of their civilian counterparts. Airmen might also be reminded of the low-quality performers who were removed, and whose departure has made for better work and living environments. The mechanisms for imparting this information and attitude might be first sergeants' initiatives, commander's calls, printed media, and possibly peer communications.

Similarly, there is a widespread view that promotion time for junior airmen has been lengthened substantially. Some of this thinking reflects a confusion between time-in-grade and time-in-service requirements. Few airmen perceive delayed promotions as the inevitable outcome of improved retention rates. Again, factual and contextual information must be transmitted to the airmen. We, in our own small way as interviewing visitors, were able to defuse some of the concerns about slow promotion.

Reference Groups

In light of the proposed pay freeze at the time of the interviews, we expected to find some resentment about pay. We found less than we had anticipated. Perhaps the slowing of inflation rate, the sense of security offered by the Air Force, and the absolute amount of compensation combined to reduce concern over the proposed pay freeze. Significantly, fewer airmen compared their pay with that of civilian counterparts than I had expected. Indeed, when comparisons were made with civilian friends, they were usually to the advantage of the Air Force. A striking fact that emerged during the interview sessions, however, was that most airmen did not see themselves performing work that had a civilian counterpart. When comparisons were made, they were much more

often with federal employees than with private-sector workers.

By far the most frequent contrasts made by Air Force members were in regard to other Air Force members. In particular, there was some resentment expressed by those who were subjected to irregular shifts or alert cycles as opposed to those who had "less demanding" jobs with regular hours. In this aspect, the Air Force "institutionalists" seemed to be reacting against the "occupationalists."

I recommend that the Air Force reexamine how support facilities can adjust to those who work at the center of Air Force functions, rather than the other way around. One illustration of how helpful scheduling can be accomplished is the way some on-base college courses have classes that are repeated several times during the week. Perhaps this kind of flexibility is needed in other support services.

Differential Career Incentives

It appears that career incentives and motives vary, depending on where one is located in the Air Force career structure. Of course, there are individual exceptions, but the following generalizations seem warranted.

recruits

People join the Air Force out of a combination of reasons: patriotism, a desire for skill training, a chance to do something different, and the state of economy. These factors affect recruitment propensity in other services also. I would argue, however, that the model Air Force recruit is someone who sees the Air Force as a means of upward mobility, a way to acquire a position unavailable in civilian life and responsible and secure to a degree not found in the other services. Such recruits, in time, become the backbone of the technical branches and the NCO cadres. Therefore, postservice education benefits (such as the GI Bill of Rights) are not as important to Air Force recruits as in-service education and skill training.

first-term reenlistees

For the person who has been in the Air Force four to six years and is considering reenlistment, the variables are different from those of the recruit. Job satisfaction, career development, and a reenlistment bonus, if available, become paramount. Geographical assignment also becomes a factor (although this aspect may be more pressing for those stationed in the northern tier). If family considerations are present, base facilities and medical benefits for family members also assume importance.

career reenlistees

For the person who has been in the Air Force ten years or so, yet another set of considerations becomes salient. The Air Force as a "way of life" becomes ingrained, and "in-kind" compensation takes on added importance. Retirement benefits loom extremely important. The continual talk of changing the retirement system has become a kind of running sore in career commitment; it also causes senior NCOs to transmit negative vibrations to junior airmen. Settling the retirement issue should be a top priority in the military personnel community.

Bringing midlevel technicians into career enlistments is the crucial issue. If there must be a primary focus on any enlisted group, it should be on technicians in the second enlistment. In-service education, perhaps including a "sabbatical" for engineering training, would be more appealing than the GI Bill with transferability provisions for dependents.

Among this older group too is the widespread view that the level of technical experience is dropping, that the younger technicians of today are less broadly trained than in times past, and that general technical expertise is giving way to more narrow, if not rote, mechanical skills. Thus, advanced technical training may not only serve to strengthen commitment in an important segment of the enlisted career force but also enhance operational readiness significantly.

Security Guards

The Air Force is undergoing a transformation in one significant way that is perhaps not fully recognized. Security personnel now make up the third largest Air Force specialty—8 percent of all enlisted personnel—and, it is reported, upward of 20 percent of personnel at major SAC bases. In all likelihood, the security function will continue to be a growing one. Nuclear weapons, in particular, require stringent security precautions. The Air Force is moving into a situation where there is an interface between highly technical and labor-intensive skills. The implications of this phenomenon are yet to be recognized, much less assessed.

The crux of the issue for the security force is that security duty is tedious and boring. At the same time, security personnel must be capable of reacting quickly and appropriately in the event of security violations. Viewing this situation, I would advance the hypothesis that post-entry disillusionment is higher in the security force than in just about any other enlisted specialty. One of the central manpower concerns of the Air Force in the years to come may well be the maintenance of morale and alertness in the security force.

Sex Roles

The role of women in the Air Force seems to be approaching some sort of balance. I project slightly increasing numbers of women in the Air Force, with, at the same time, proportionately fewer assigned to hard-core, "nontraditional" work. I see trends toward some kind of formal movement on the part of Air Force women toward a form of distinctive consideration. Already, certain junior female officers are designated "resident consultants for women" to advise enlisted females. There is a National Military Women's Pilots Association, which apparently is in the process of changing its name and constituency to National Military Women's Association. Informal "networking"

among women in the Air Force will in all likelihood become more pronounced.

The issues of fraternization and joint-service marriages will continue to cause command concern and administrative headaches. Official policy will be to discourage fraternization strongly, perhaps by establishing and enforcing specific guidelines, and to make fewer accommodations to joint-service couples. Simultaneously, the incidence of both fraternization and joint-service marriages is likely to continue to grow. I would estimate that currently about one-fourth of all Air Force women have military spouses.

Future trends in the role of civilian spouses of Air Force personnel are not easy to predict. I do not see a renaissance or widely based return of wives in the volunteer activities that underlay so much of the military community in the past. What may occur, however, is that the individual wife may take part in base activities with different intensities during different assignments. Such participation will be inversely related to job opportunities in the base area.

Organizational Trends

An increasing proportion of officers in the security field will probably have prior enlisted service. The same pattern seems to be true for missile officers. Thus many officers in security and missile assignments will be retiring after only fourteen or so years of commissioned service. The implications of this trend need to be taken into account in the long-range manning of the officer corps. There is also the anomaly that progression from the enlisted ranks into the officer corps is more characteristic of enlisted members from relatively soft skills than from those with technical skills.

The growing public debate on national strategy and nuclear deterrence will have impacts on definitions of Air Force professionalism. We can expect that the debate will lead to more self-reflection within the Air Force on the role of the Air Force. Some individual Air Force

members may dissent from national policy publicly and cause some organizational embarrassment. The heightened interest in national security issues, however, will dovetail with efforts to emphasize the calling aspect of Air Force life. Ultimately, public debate will foster an internal consensus on the Air Force role and contribute to a more professional definition of Air Force service.

In general, there can be little question that organizational trends within the Air Force are positive. The Air Force is going through a period of transition and is moving toward a modern form of military professionalism and institutional commitment. The trend toward "oc-cupationalism" seems to have crested. A new equilibrium in the service is being struck in many ways. The quality emphasis within the enlisted force, for example, can be interpreted as making the Air Force role more inclusive than it has been in the immediate past. Pay-by-skill formulas will be proposed and perhaps even partially adopted, but the long-term trend will be toward a greater appreciation of nonsalary forms of compensation. Air Force leaders must continue to show vigilance in counteracting persistent external pressures to move the armed services toward an occupational model.

Northwestern University
Evanston, Illinois

The requirement imposed on serving officers that they secure written approval from their superiors before publishing may not be regarded as censorship by those in command, but it would be difficult to deny that this stipulation has tended to inhibit full free discussion of at least some controversial military ideas.

I. B. Holley, Jr., "The Doctrinal Process: Some Suggested Steps,"
Military Review, April 1979

IRA C. EAKER ESSAY COMPETITION

Air University is pleased to announce the fifth annual Ira C. Eaker Essay Competition. The objectives of this competition are to encourage the development and open discussion of innovative air power ideas and concepts in a dynamic and interactive forum, much as General Eaker and his colleagues approached the challenges in developing air power in the '30s and '40s. *Air University Review* is proud to be a part of this very significant competition honoring the achievements of General Ira C. Eaker and to memorialize the indomitable martial spirit of General Eaker and his colleagues.

Topic areas for the essay competition are military strategy and tactics, doctrine, professionalism, ethics and values, esprit de corps, or any combination thereof.

ENTRY RULES

—Essays must be *original* and *specifically* written for the competition. Only one entry per person may be submitted.

—Entries must be a minimum of 2000 words and a maximum of 4000 words.

—Essays must be typewritten, double-spaced, and on standard-size paper.

—The competition is open to active-duty members of the regular Air Force, Air Force Reserve, and Air National Guard; Air Force Academy and AFROTC cadets; and Civil Air Patrol members. Competition judges, *Air University Review* staff members, and cash-award winners of the last annual competition are ineligible for cash awards.

—A separate coversheet should include the essay title, author's name, rank, duty/home addresses and duty/home phone numbers. The author's name must not appear on the essay itself. The title should be repeated at the head of the first page of the essay.

—Send entries to: Editor, *Air University Review*, Building 1211, Maxwell AFB AL 36112-5511. All essays must be received or postmarked not later than 1 June 1985.

—Essays are submitted with the understanding that first-publication rights belong to the *Air University Review*.

ENTRIES NOT IN COMPLIANCE WITH RULES WILL BE DISQUALIFIED.

First-, second-, and third-prize medallions will be awarded, as well as $2000, $1000, and $500 United States Savings Bonds, repectively. Distinguished Honorable Mention and Honorable Mention certificates will also be awarded. Winning essays will be published in the *Review*.

The Ira C. Eaker Essay Competition is funded by a permanent grant from the Arthur G. B. Metcalf Foundation through the United States Strategic Institute, Washington, D.C.

R in my opinion
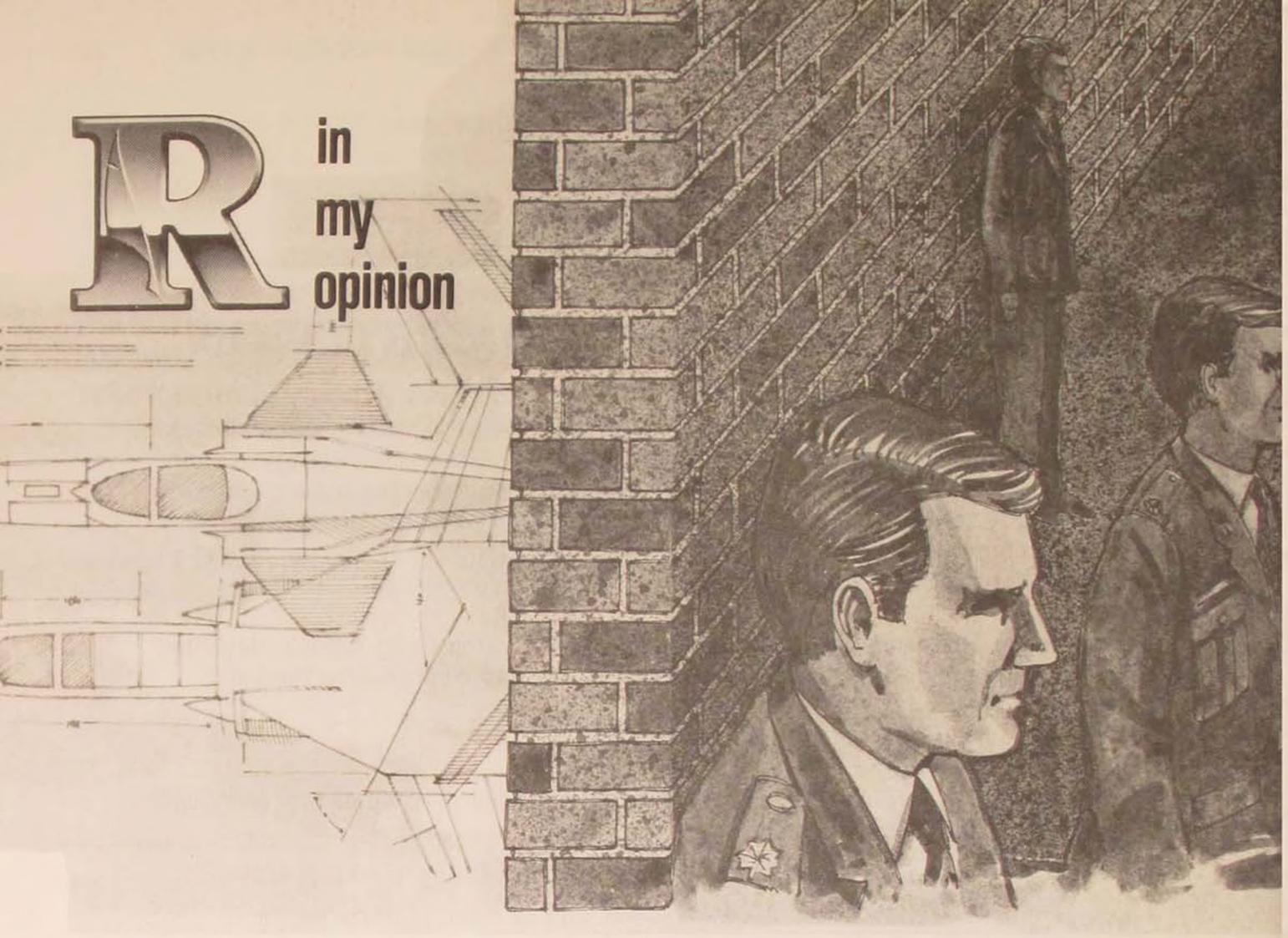
READING, WRITING, AND POLICY REVIEW

the Air Force's unilateral disarmament in the war of ideas

WILLIAM S. LIND

DURING the second year of the American Revolutionary War, a Hessian jaeger captain offered an interesting comment on both his enemy and his own army. He wrote in his diary:

During these two years the Americans have trained a great many excellent officers, who very often shame and excel our experienced officers, who consider it sinful to read a book or to think of learning anything during the war. For the love of justice and in praise of this nation, I must admit that when we examined a haversack of the enemy, which contained only two shirts, we also found the most excellent military books translated into their language. For example, Turpin, Jenny, Grandmaison, La Croix, Tielke's *Field Engineer*, and the *Instructions* of the great Frederick to his generals I have found more than one hundred times. Moreover, several among their officers had designed excellent small handbooks and distributed them in the army. Upon finding these books, I have exhorted our gentlemen many

times to read and emulate these people, who only two years before were hunters, lawyers, physicians, clergymen, tradesmen, inn-keepers, shoe-makers, and tailors.[1]

Captain Johannes Ewald went on to add a "von" to his name and to attain the rank of lieutenant general in the Danish service. He also acquired a deserved reputation for being a military intellectual of the first order and the premier authority in Europe on insurgency and counterinsurgency during the Napoleonic period. His personal and professional achievements spoke strongly for one of his most deeply held beliefs: that ideas are important in war.

It is not surprising that an eighteenth-century gentleman would have held such a view. That century saw such an intellectual flowering that there have been few fundamentally new ideas since. It was a time when to be educated meant to be interested in ideas, to read extensively and seriously, and often to write and publish as well. Literary and other types of journals, the ancestors of *Air University Review*, first appeared in the eighteenth century, and a high percentage of the literate public read them. *Salons* were formed in which educated men and women met regularly to discuss what they read and what the leading thinkers of the day were saying.

Especially in the Germanys, the century saw a great revival of interest in the classical civilizations and in history generally. Both classical and modern history may have helped form Ewald's belief in the importance of ideas in war. Certainly, both argued strongly for such a view. Ideas such as the oblique attack that gave Thebes victory over Sparta at Leuctra in 371 B.C. and the double envelopment Hannibal used to crush the Romans at Cannae stood out prominently in classical history. Modern history offered not only battles where one side had decisively outthought the other but explicit records of the thoughts of great commanders, such as the *Reveries* of Marshal Maurice de Saxe and the *Instructions* of Frederick the Great. Military professionals joined their colleagues in other fields in endeavoring to define new questions and issues and to think about them logically and comprehensively.

While the specific military issues themselves have changed in the last 200 years, the existence of vital issues—issues which must be thought through carefully and correctly if combat is to result in victory—is still very much a fact. The Air Force faces a large number of them today. To offer just one example, which school of fighter design is correct?

Currently, three schools of fighter design are contending with one another: the "current-approach" school, the "missileer" school, and the "lightweight-fighter" school. Each has a very different approach to fighter design. Which one is best? Our decision on which one to adopt will have significant influence on our chances for success in future aerial conflicts.

The "current-approach" school is the easiest to understand because it is exemplified by most of the fighters the United States now buys, including the F-14, F-18, and F-15 (less so, the F-16). In general, American current-design fighters have the following characteristics:

• They are large and heavy by world standards. The F-14 and F-15 are among the largest fighter aircraft in the world. The F-18 is twice the weight of a MiG-21. Their large size makes these aircraft relatively easy to see in air-to-air combat.

• They are designed for a high, supersonic top speed but cruise subsonically. Time at supersonic speeds is restricted to a few minutes by afterburner fuel limitations. Maneuverability (including energy maneuverability and transient characteristics) ranges from marginal (F-14) to fairly good (F-15).

• They incorporate large amounts of complex electronics and depend heavily on these electronics, especially radar, in combat. They are designed to emit electronic energy essentially all the time when tactical.

• Weapons include radar-guided air-to-air missiles, infrared missiles, and cannon.

• They are designed in the expectation that

some, but not all, combat will be "beyond visual range" (BVR).

- They have all-weather and night capability.
- They are twin-engined.
- They are expensive—$30 million or more each.

One of the conceptual alternatives to these fighters is often called the "missileer," a name given to an aircraft of this type proposed in the 1950s. The missileer is not a fighter at all, as a "fighter" is currently defined. It is merely a platform that launches air-to-air missiles. The theory behind the missileer is that high performance can be put into the weapon instead of the aircraft. Modern radar-guided air-to-air missiles are so effective, missileer proponents argue, that even the hottest fighter has little chance to evade them, so aircraft performance is irrelevant. All that will be needed in future air combat is something to carry these missiles aloft and launch them toward radar contacts. A variant on the missileer argument is that the missiles themselves can be carried by ships or land-based; the aircraft is needed only to carry the radar.

General characteristics of a missileer would include:

- A large, heavy aircraft, perhaps along the lines of an A-6. Large payload and long loiter time are the most important performance characteristics. Logically, a Boeing 747 or a blimp could serve adequately as a missileer-type fighter.
- No supersonic speed; no combat maneuverability.
- Heavy electronics suites, including powerful radars and heavy ECM/ECCM.
- Main (possibly sole) armament consisting of radar-guided air-to-air missiles; possibly some infrared missiles for last-ditch self-defense (as with the AIM-9s carried by Royal Air Force Nimrods in the Falklands/Malvinas conflict).
- Design based on the presumption that all combat will be BVR.
- All-weather and night capability.

- Multiengined.
- Very expensive—at least as costly as an A6-E Prowler ($67 million per aircraft in FY 1984).

The second alternative to current-design fighters is the so-called lightweight fighter. The F-16 reflects some, though by no means all, lightweight-fighter concepts, as does the F-5. The basic idea behind the lightweight fighter is that most air-to-air combat is dogfighting. Proponents argue that BVR rules of engagement are seldom feasible because of identification, friend, or foe problems, and even if BVR were allowed, radar-guided air-to-air missiles have such a low P_K that few kills would be achieved before the "fur ball" stage is reached. Characteristics of an ideal lightweight fighter would include:

- Small size—smaller than an F-5—for minimum visual signature. Correspondingly low weight, perhaps around 10,000 pounds. Excellent combat maneuverability, especially transient characteristics.
- Comparatively low top speed, perhaps around mach 1.8. Supersonic cruise capability. High fuel fraction for long range and ability to outlast an opponent in a dogfight.
- Mostly passive electronics to locate, identify, and count enemy aircraft through their own emissions. Radio and radar silence presumed for most tactical flying. "Short-squirt" radar for brief "looks" in the direction indicated by the passive radar warning electronics. Very good outward visibility (replacing most electronics) for dogfights.
- No radar-guided air-to-air missiles. Infrared missiles and guns for armament, plus passive radar-homing air-to-air missiles to force (radar-dependent) enemy to shut down his radars.
- Presumption of no BVR combat, except possibly with passive radar-homing missiles.
- Visual weather/day capability emphasized, based on the presumption that enemy attack aircraft have poor accuracy in bad weather and at night. The fighter would inherently have a good clear night capability since infrared works

better at night than during day and enemy night bombers would have to use their radar.

• Single-engine turbojets. Turbojets are much better than fans for supersonic cruising, and singles have less supersonic drag.

• Inexpensive. The F-16 costs only half as much as an F-15; lightweight-fighter proponents estimate that a true lightweight supercruiser would cost about half as much as an F-16.

Which of the contending schools is correct? Much depends on finding the answer and following it in future fighter-development programs. The Soviet Union is today following the "current-design" school; new Soviet aircraft are conceptually similar to our own. If either of the other schools is correct, we have a great opportunity. If, for example, future aerial combat is dominated by dogfighting, the Soviets' current-design fighters would be at a severe disadvantage if faced with lightweight fighters (as Soviet-built MiG-23s have been when confronted by Israeli-flown F-16s). The side that is first to adopt the best approach (if the current-design school is not best) will threaten its opponents with massive and rapid obsolescence.

How is the Air Force dealing with this and similar issues today? Do we see the sort of widespread reading, writing, talking, and thinking about them that their importance demands? Hardly. Ideas, apart from those relating to the "how to do it" aspects of narrow, specific jobs, play little or no part in the life of today's average Air Force officer. The average officer appears to read little if at all about warfare, writes less, and in general leaves the issues that will largely determine whether he wins or loses in combat to some nameless "they" in some remote headquarters. Intellectually, the Air Force officer corps appears not merely sluggish but moribund.

In a recent discussion with one former editor of *Air University Review*, I asked how many copies of the *Review* he thought were actually read. He replied that he had once discussed this question at some length with his colleagues and that they subsequently attempted an informal survey on the matter. The result? They concluded that of the 28,000 copies of each issue sent out, probably about 500 were thoroughly read.

Last year, I engaged in a series of exchanges with an Air Force colonel in the pages of the *Review*. Our arguments were on an important and difficult issue—the problem of defining what constitutes quality in military equipment—and they were somewhat sharp in tone, even contentious. Later, I asked the current *Review* staff how many letters the exchange had generated. The reply: two.

Intellectual activity naturally generates a demand for the raw material of thought, books. Where is the professional bookstore on your air base?

The situation is particularly bad in terms of writing. The entire U.S. Air Force officer corps of 105,000 people has just one combat-oriented military journal that deals with issues above the level of tactical technique—*Air University Review*. Imaginative articles written by Air Force officers on controversial subjects seldom appear in its pages. It does not compare very well in this respect with other military journals, such as the *Marine Corps Gazette*, the Army War College's *Parameters*, and the U.S. Naval Institute *Proceedings*.

Several years ago, a since-retired officer then on the *Review*'s staff wrote to me, "We have just completed the Ira C. Eaker Essay Competition. There were around seventy entries from across the Air Force. The quality of most of the essays is poor. The level of thinking is rather lower than the sophistication in writing. If there is a renaissance in military thinking, it is confined to a few individuals. The Air Force is such a difficult place to surface new ideas with a great deal of opposition to the discussion of any issue that is controversial or which may run counter to current policy and doctrine."

Why do so few Air Force officers read or write

about issues vital to their own future? As always, there is no single cause. Military professionals, like all Americans today, are products of a society that wants recipes and formulas, a modernistic milieu that teaches people what to do, not how to think. They have little time for consideration of issues that lie beyond the boundaries of their daily jobs. There is little if any obvious reward in the service for reading or writing. But there is one factor that is particularly marked because it is unique to the Air Force. It is censorship.

My discussions with officers from all the departments indicate that the Air Force officer faces tighter restrictions on publication than officers from other military services. If an Army, Navy, or Marine Corps officer wants to write and publish a controversial article, he can. But if his Air Force counterpart writes a similar piece, he faces a severe hurdle: the policy review process. While the other services either do not require policy review or permit the individual officer to say what he wants to with a disclaimer that his views do not represent official policy, the Air Force routinely denies permission to publish articles that conflict with established policy.

The effect is crippling. An article that cannot be published might as well not be written, and since the rigidity of Air Force policy review is well known among Air Force thinkers, most of them see little point in writing. The intellectual quality of published material is poor because only articles that are essentially irrelevant to significant issues or that support established policies are allowed to see the light of day. The result is that critical thinking is left to outside civilians, and the officer corps—the group that will be most directly affected by policy—is rendered mute.

The lessons of history here are only too obvious. Time and again, military services that have ossified, that have perpetuated incorrect or outdated views and policies, have paid a heavy price in blood and failure. Unless a service has a vibrant internal intellectual life, all the budget allocations which the nation can afford and more are not likely to make that service successful in combat. Ideas are as important to us today as they were to our ancestors in the Revolution. What would those ancestors who, according to Captain Ewald, wore rags so that they might buy books about their profession, think of a policy of suppressing innovative ideas that could lead to success in war?

The success of the Air Force in any future combat is too important, and critical thinking is too necessary for success, to allow the current Air Force policy review process to be perpetuated. The Air Force must allow its officers at least as much latitude to publish controversial materials as is given to their counterparts in other services. Few actions would pay greater dividends than ending the Air Force's unilateral disarmament in the war of ideas.

Alexandria, Virginia

Note
1. Captain Johannes Ewald, Field Jaeger Corps, *Diary of the American War; A Hessian Journal*, translated and edited by Joseph P. Tustin (New Haven: Yale University Press, 1979), p. 108.

MISSION CRITICAL: THE JUNIOR OFFICER-SENIOR NONCOMMISSIONED OFFICER RELATIONSHIP

MAJOR RICHARD H. ESTES

MANY officers assigned to the rated supplement after the Vietnam drawdown came face to face with a completely unfamiliar figure—the senior noncommissioned officer. As fighter pilots, bomber navigators, and others fanned out into various support fields, they were unprepared to cope with new challenges in leadership and management posed by their relationship with senior enlisted people. These sergeants had been leaders and managers for twenty years and were fifteen or more years older than the officers. Pilots and navigators who had worked with crews that included enlisted members began to realize that clear lines of command observed on large aircraft were a bit more hazy in the field. Rated people who had not worked with large crews had virtually no relevant experience. Today, young lieutenants, fresh from the Air Force Academy, Officer Training School, and Reserve Officer Training Corps, face an even tougher challenge when they take over sections without the benefit of experience or the credibility that comes from having served as a flight crew member.

With few exceptions, the junior officer-senior noncommissioned officer relationship is fundamental to the effective performance of Air Force units. In many activities—maintenance, supply, security police, finance, or any other support function—if these two people do not function effectively together, leadership and management of the unit, as well as the mission, suffer. Yet in many cases, the relationship does not work well.

Because of the disparity in age and experience, young officers and older superintendents are less likely to work well together than individuals of about the same age and with similar backgrounds. Certainly, it is not surprising that an NCO with twenty years of service might view with jaundiced eye a new boss almost young enough to be a son or daughter. Thus, the system of assigning two mismatched individuals to work together may itself be a root cause of the problem.

The difficulties arising from the age-experience gap are further intensified when the newly commissioned lieutenant is inadequately prepared to assume a position of leadership. This lack of preparedness seems to stem from three sources: poorly timed training in leadership and management, little or no experience in the work area, and inadequate involvement of officer supervisors or commanders.

Two surveys conducted from October to December 1983, plus interviews conducted by management specialists at the Leadership and Management Development Center during the same period, point to these three areas as difficulties. One survey, administered at three separate U.S. Air Force bases, was addressed to lieutenants who had master sergeants or higher working directly for them as noncommissioned officers in charge (NCOICs). The other survey, administered at the Senior NCO Academy, sought information from noncommissioned officers who either worked for lieutenants in their current jobs or had worked for lieutenants at some point since they attained the rank of master sergeant.

How does the Air Force train lieutenants to assume these positions that are so critical to mission accomplishment? What roles do typical lieutenants and senior noncommissioned

officers perceive as proper for each other in the officer-NCO management team? Answers to these and other questions were at least in part revealed by the surveys and the interviews. The specific results themselves are interesting, but the more important general message that emerges is that these mission-critical teams walk a fine line between success and failure. The question is, how do we broaden that line?

Officer Preparedness

Young officers without prior civilian work experience have five avenues for professional preparation prior to taking charge of units or sections: commissioning sources (Reserve Officer Training Corps, U.S. Air Force Academy, and Officer Training School); technical schools; professional military education; prior enlisted service; and direct advice from immediate supervisors or commanders. The first three sources present formal programs that offer varying degrees of preparation. Their major drawback is the period between the officer's exposure to training and his or her initial assumption of a position of responsibility. Regarding the latter two sources of preparation, direct advice from immediate officer supervisors and commanders offers considerable potential for helping the new lieutenant, while prior enlisted experience has some positive value but also some drawbacks.

commissioning sources

All three sources of commissions offer leadership and management training in different formats, but they share common problems of timing. First, the officer candidate is relatively immature when he or she receives the training. Second, too much time elapses between the receipt of the training and his or her first duty assignment. Curricula vary from program to program, but the basic content is similar in the sense that it includes case studies of management situations in the field, some exposure to

experienced enlisted supervisors, and generalized leadership training.

A major disadvantage of the ROTC program is that it is administered in hundreds of colleges and universities in courses of varying length. Although the program provides a standardized curriculum and the instructor corps includes officers as well as enlisted personnel who may provide excellent insights, the course materials are subject to as many interpretations as there are schools and instructors.

The Air Force Academy and the Officer Training School do not have a problem of standardization, but they have other unique problems in the area of leadership and management training. The academy has initiated a reinforced leadership program that emphasizes practical application within the cadet wing, but the military environment is somewhat artificial in the sense that future officers have only limited contacts with enlisted personnel, particularly in a supervisory relationship. The somewhat harsh leadership techniques used in dealing with underclassmen who are essentially the same age may have a negative effect if new lieutenants attempt to transpose them directly to the field where older subordinates may tend to be somewhat less subservient.

Officer Training School offers two advantages over its two counterparts: the training is compressed into a period immediately preceding commissioning, and "ninety-day wonders" are normally exposed during training to prior enlisted people who are being commissioned. However, the condensed curriculum and the attendant "fire hose" approach to instruction works against the program.

In the final analysis, commissioning programs are sound in their approach to leadership and management development, but they should be viewed only as orientation programs in this area.

technical schools

Prior to assuming supervisory responsibilities in any operational unit, most young officers

are required to attend some sort of specialized training at one of several training centers or other locations. These centers emphasize technical aspects of the various career fields—operating procedures, pertinent regulations, and exposure to relevant equipment. But they provide only limited exposure to leadership and management training.

From the standpoint of the lieutenant's performance vis-à-vis the senior NCO, the primary advantage of technical schools is the fact that officers normally attend them immediately prior to assuming duties as section chiefs. At present, providing effective leadership and management training is not a primary goal of technical schools. Nevertheless, the timing of this training makes these schools a logical place for further preparation of young officers to assume their leadership roles. On the other hand, since lieutenants have not yet operated in a unit environment and do not understand the practical aspects of their jobs, training efforts based on abstract leadership principles may be of doubtful value.

leadership and management training

Squadron Officer School and the Lieutenants Professional Development Program of the Leadership and Management Development Center (LMDC) are essentially the only sources of leadership and management training available to junior company grade officers. Most other professional development courses are designed as supplementary programs and assume some degree of practical experience prior to attendance.

Squadron Officer School offers excellent instruction in a seminar format taught by people who specialize in leadership and management, and the curriculum includes lessons on relations with NCOs that are taught by noncommissioned officers from the Senior NCO Academy. This training is valuable as officers move through their careers, but it comes too late to help the new lieutenant who is becoming a section chief, since most officers do not attend Squadron Officer School until they have at least two years of commissioned service. Although Squadron Officer School offers an excellent correspondence program that is almost immediately available, many educators agree that correspondence programs are not as effective as resident programs.

The Lieutenants Professional Development Program, offered by LMDC since mid-1979, provides tailored instruction in the areas of officership, leadership, and management to lieutenants with less than two years of commissioned service. LMDC consultants employ a combination of lectures, seminars, and question-and-answer periods aimed at translating leadership and management theory to real-life situations. Although this course aims to fill the vacuum left by other programs, at least in focus and content, its effects on Air Force lieutenants are somewhat limited, as it is currently offered by an LMDC traveling team only when requested by an installation commander. Thus, the program may be offered at some installations only every few years and at other installations never at all. LMDC is not currently manned to offer the program on a regular basis either in the field or as a resident program at Air University, but LMDC consultants agree that proper application of the program could reduce the difficulties faced by young, inexperienced officers in the early phases of their first assignments.

prior enlisted service

Complete figures are not available for prior-enlisted members commissioned and serving in officer-in-charge (OIC) positions, but the limited survey results show that approximately half of all lieutenants mentioned in either survey who supervise senior enlisted people have spent some time as enlisted members. If this high percentage of prior-enlisted lieutenants represents an Air Force-wide trend, the officer force in the support fields may be assuming a new complexion. Officers who have enlisted experience in their officer specialty will have

an advantage over their peers where technical expertise is concerned. Most prior-enlisted officers will also have an age advantage over nonprior-service officers, and their greater age should give them an advantage in their relations with enlisted superintendents. But even though they may enter the officer corps with a certain built-in credibility, enlisted experience at the working level does not necessarily make them better leaders and managers.

Management specialists at LMDC state that officers with enlisted experience are more likely to be effective in OIC positions if they had advanced to the supervisory level prior to commissioning. Otherwise, younger prior-enlisted officers may identify with enlisted members of the same age and may be unable to maintain appropriate separation from young enlisted personnel on the job or during off-duty hours. This situation, of course, complicates relations with senior noncommissioned officers. Others, regardless of the length of their prior service, may assume that they now know everything about the job and are insufferable.

In spite of these potential problems, many officers with prior enlisted time serve effectively in leadership positions initially too difficult for less-experienced officers. However, there will never be enough prior-enlisted officers to fill all of the demanding positions; and, even if there were sufficient numbers of these officers, manning the support fields in this manner would create difficulties in the force structure.

on-the-job guidance by supervisors

Seventy-three percent of all lieutenants responding to the survey indicated that they receive little or no advice from their immediate supervisors or commanders concerning relations with their enlisted superintendents. Lieutenants responded far more negatively in this area than about the adequacy of their leadership and management training prior to assuming their current positions. Thus, one may conclude that although supervisors' or commanders' assistance to young officers assuming critical positions in their units could be a major contributing factor in leadership development, the Air Force has achieved relatively few leadership benefits from this source.

Management consultants at LMDC support this premise. Most of them suggest that senior NCOs are responsible for a certain amount of the training of their young OICs, but that higher-ranking officers in the unit must provide the basis for this on-the-job training. These officers usually have more experience, perhaps in similar situations, and could offer a great deal of practical advice to their new lieutenants.

Commanders and officer supervisors who do not properly guide their lieutenants may create problems in several ways. Supervisors concerned only with results may not care how sections are run, so long as the mission is accomplished. Some may ignore their lieutenants and deal directly with their more experienced noncommissioned officers in charge, thereby undermining the chain of command and the authority of the lieutenant. Still others may *direct* their young officers to stay in the shadows and allow enlisted supervisors to run the sections.

Experienced officer supervisors who take the time and effort can do much to enhance leadership qualities in younger Air Force officers and to promote effective organizational relationships. They can prevent or solve numerous problems if they help these young officers get started on the right foot, monitor their progress, and nudge them in the right direction as the need arises.

Leadership and Management Environment on the Job

What leadership and management styles are available to newly commissioned lieutenants as they enter their first job? What are the perceptions of senior noncommissioned officers concerning the proper role for these young officers?

While the critical relationship between a junior officer in charge and his or her senior enlisted superintendent may be less than optimal in part because of the officer's lack of preparation, many senior sergeants appear to reject the efforts of young OICs subconsciously—this, despite the fact that outwardly they seem to go to great lengths to train and help these officers. Almost 70 percent of those who completed the NCO survey gave a strong, positive response when asked whether they could run their sections just as well without their officers in charge. These NCOs were probably still very helpful and supportive of the officers. More than 90 percent of the lieutenants who were surveyed indicated that noncommissioned officers in charge were helpful in introducing them to their first jobs. Such apparently incongruous statistics should not be surprising: mature and experienced supervisors are expected to overcome resentment, or at least not to display it, and to give the benefit of their experience to their units. On the other hand, experienced supervisors often harbor some inner resentment against people at higher levels with less experience. This difficult backdrop of emotions is the typical environment facing young lieutenants as they attempt to establish their positions.

Most lieutenants, at least initially, adopt one of two management styles. Some, recognizing inadequacies in their managerial skills and technical knowledge, approach the job with attitudes of timidity. Others assume, or attempt to assume, more authority than their knowledge warrants. Obviously, the ideal style lies somewhere between these extremes; but finding this happy medium is an achievement beyond the capabilities of many young officers.

I encountered an example of each extreme upon entering my new career field under the rated supplement program. Both individuals were male second lieutenants; both arrived on station at approximately the same time; both had essentially the same levels and types of jobs; and both had chief master sergeants working for them as their superintendents. One individual had a weak personality and could command little or no respect; the other was a young, intelligent, hard-charging officer with considerable leadership potential and an infectious manner. Both were utter failures. The officer with the weak personality was doomed from the start; the other showed possibilities but brought on his own failure. Most lieutenants, of course, do not exhibit such personality extremes, but these two examples illustrate management styles at the two ends of the management spectrum.

The timid lieutenant subjugated himself to the chief and abdicated control of the section to him. He made no real effort to resolve the problems of the unit, and he kept shorter hours than anyone else. He even allowed the chief to move his desk to the center of the office—the obvious position of power—and pushed his own desk against the wall near the door as if he were a receptionist. The lieutenant quickly became the laughing stock of the office. The chief, who initially supported the lieutenant in the face of disrespect from enlisted personnel, soon withdrew the support and began to mock the lieutenant along with the other enlisted men. Once the chief withdrew his support from the lieutenant, the lieutenant's fate was sealed; he could not overcome enlisted perceptions of him as a person lacking leadership abilities.

The other lieutenant considered himself so effective in working with people that he depended solely on his human relations skills and disregarded the requirement for technical competence. After assuming control, he let it be known almost immediately that he, not the chief, was the decision maker and that he was not concerned with a team effort. He assigned the performance of menial tasks to the chief, attended meetings alone, committed his unit to unreasonable or impossible actions, and made technical decisions based on insufficient information. The unit, from the chief on down, dropped any residual support for the lieutenant. Productivity in the section declined.

Many young officers in charge should and do cast themselves intentionally more in the role of the timid lieutenant, but they follow a more balanced approach. They recognize, at least initially, that they lack experience and that their leadership and management skills are untried. If such officers later assume the role of principal decision maker for their sections, this status should be based on proven ability and not on ex officio power.

Lieutenants responding to the survey were divided in describing their management styles. More than half (56 percent) indicated that they take broad views of mission requirements and leave technical operation of their units to noncommissioned officers. Twenty-six percent stated that they allow their superintendents to direct day-to-day operations but they expect to be kept informed. Only a small percentage (7.4 percent) stated that they make all of the decisions. Other responses were mixed.

Interestingly enough, enlisted responses to essentially the same question were almost exactly the opposite. Fifty-five percent of the sergeants stated that they direct day-to-day operations, and only 26 percent reported a partnership of equals. But contrasting perceptions are not necessarily indicative of a problem. Perceptions of leadership and management are the same as reality, at least to the individual concerned. Thus, if individuals are satisfied with their perceived roles, they will act out those roles, and, in many cases, their perceptions become reality. But this line of reasoning can be faulty if an individual's perception is based on insensitivity to his or her surroundings, as was the case with the hard-charging authoritarian lieutenant.

Regardless of a lieutenant's position or perceived position in the continuum from minimum involvement to autocratic control, the officer *must* be in charge and *must* have some measure of authority in the section. Management experts vary in their opinions concerning initial efforts by officers to establish themselves as the heads of their sections. But they agree without exception that enlisted superintendents must be the primary trainers for officers in charge, particularly if the officers are not prepared for their jobs.

Most experts agree that a solution to problems in the lieutenant-NCO relationship begins with thorough coaching of new officers by other officers in the unit. These veteran officers should explain to new lieutenants such things as potential pitfalls and areas of major concern. They should also present their impressions of the personalities of the people whom a new officer will supervise—especially the NCOIC. New officers in charge should then be candid with the NCO superintendent about their experience and expertise (or the lack of these), asking for cooperative help. At the same time, new officers should insist on an organizational role in which their responsibility increases as they acquire additional knowledge of operations. These officers should then work to master the details of operations as quickly as possible, taking care to preserve their officer status and to avoid becoming tied slavishly to the NCO's superior technical knowledge.

On the other hand, enlisted superintendents can overtrain officers to the point that the officers develop the styles and attitudes of enlisted individuals. Although many sergeants are outstanding managers, there should be subtle differences in the management styles of officers and noncommissioned officers. Officers should be concerned with fitting the production of their section into the mission plans of their parent units. Noncommissioned officers should have similar goals, but they should perhaps be more concerned with the production process itself. This is the essence of the relationship between officers and their enlisted superintendents.

This issue of mission orientation was addressed in the surveys; the results on this question are interesting. When asked whether they would take courses of action that would have the most benefit for their sections or for parent organizations if they were given a choice on

specific issues, enlisted members indicated over-whelmingly that they would act in favor of their parent organizations (i.e., they were mis-sion-oriented). The lieutenants, however, tended to have the opposite perception of ser-geants' reactions: they stated that superintend-ents would usually act more parochially and be less concerned with the mission. What these data seem to indicate is that both the commis-sioned officer and the NCO would act in favor of the mission if he or she were running the section alone. But where both individuals are present, the officer may feel that the OIC is the one who must adjudicate between mission de-mands made by higher-level supervisors and demands related to section welfare that are rep-resented by the NCOIC. Depending on how the NCOIC presents the section needs, the lieuten-ant may or may not feel that the NCOIC is supporting the lieutenant's efforts to meet mis-sion requirements. Whether or not the officer's perceptions are accurate, the responsibility for a distasteful decision—placing mission above section—should fall on the officer.

One final hazard for developing officers is the pitfall of relying on social contacts or close friendships with superintendents as a route to success in the leadership and management bus-iness. Effective NCOs neither expect nor really want the team to operate in such a manner. Officers limit their options severely if they take this route; a sound relationship on the job should be built on appropriate mutual respect.

Some lieutenants find it difficult to navigate this maze of emotions, perceptions, and train-ing; and many of these are driven off course to the detriment of their units. Management ex-perts agree that production is almost always better when the members of an OIC-NCOIC team work together. Perceptions from the sur-vey confirm this fact, but specific correlations are difficult to quantify. Nevertheless, most sources agree that a single manager is probably better than a two-member management team hindered by the ineptitude of one member.

Should the Air Force make major changes in its traditional policy of assigning young offi-cers with senior noncommissioned officers? Some senior enlisted members (based on survey re-sults and interviews) actually would prefer more situations in which noncommissioned officers are single managers much like warrant officers in the former Air Force management system. But this approach would hinder the development of officers for future management positions. As mentioned earlier, raising the percentage of prior-enlisted officers in the sup-port fields would help to solve the problem of inexperienced lieutenants, but it would also undermine Air Force efforts to develop each officer generation so that its members have twenty to thirty years of potential service. Furthermore, the effectiveness of prior-enlisted officers is questionable in some circumstances.

Consultants at the Leadership and Man-agement Development Center suggest varied approaches in establishing training programs for newly commissioned lieutenants. One ap-proach involves assigning them to sections as OICs or as their assistants for periods of six months to learn the business. On completion of this initial assignment, they would be reas-signed to other sections, where they could begin anew without the stigma that frequently is as-sociated with lieutenants because of their lack of experience and job knowledge. Another ap-proach would take the form of a civilian man-agement training program in which they be-come immersed in the technical aspects of their jobs and perform all appropriate tasks prior to assuming any supervisory or management po-sition. Both of the suggested programs would put officers for some period of time in some-what untenable positions within units, partic-ularly if they encounter difficulties during training periods.

If one assumes that no major changes can be made in the system of assigning junior officers with senior noncommissioned officers, what avenues of improvement are available within the system? The simplest approach—more di-rect supervisory mentoring—will not require a

change in policy. Lieutenants included in the survey are eager for such assistance, and they currently have no other method of obtaining the timely advice needed for supervising particular sections and personalities. Senior officer supervisors could even go so far as to schedule formal training sessions or programs and draw on the experience of other senior officers in the unit. In addition to providing direct assistance to younger officers, officer supervisors and commanders with an appreciation for lieutenants' problems are likely to experience growth in their own management philosophy and style, thereby achieving a sound basis for more consistent, ongoing support of all of their subordinate sections.

A more far-reaching proposal is to establish the Lieutenants Professional Development Seminar as a one-week resident course offered at frequent intervals. New lieutenants could be required to attend the training immediately before assuming their first supervisory positions. This course, as currently presented, offers valuable training but lacks timely application. A resident program of this sort should be administered by LMDC, where the expertise lies, but its implementation would require additional facilities and manning.

The problem of poor officer-enlisted relations is not new, but it has been overshadowed in many quarters recently by discussions of leadership versus management that tend to focus almost exclusively on the officer corps. To the extent that these discussions apply to the roles of officers in an increasingly bureaucratic (and less combat-oriented) Air Force, they may have some value. However, today's Air Force still needs a focused effort on ensuring that officer-enlisted teams are equal to the challenges before them. The mission of the Air Force requires that an aircraft maintenance unit be able to produce sorties for the next Grenada and that a security police flight be able to protect critical nuclear assets. These sections and others must be able to accomplish their missions not six months from now but all of the time. There is very little room for mismatched teams of officers and noncommissioned officers ill-prepared for carrying out their jobs. More timely training may help to resolve some potential problems, but senior officers must recognize their professional obligations to act as mentors to their younger officers both before and after these new team leaders assume their jobs. The mission depends on properly functioning units, not units that spend valuable time simply analyzing and debating leadership theory.

Air Command and Staff College
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ON TECHNOLOGICAL WAR

CAPTAIN NEAL I. FOX

A HYPOTHETICAL SCENARIO: 25 December 1996, The White House, Washington, D.C., 0205 hours

"Wake up, Mr. President . . . Mr. President, it's the Hotline."

"What? Oh, yes . . . on my way!"

"Yes, What is it, Premier Chebrikov? It is two in the morning here, you know."

"Mr. President, we have a rather serious matter to discuss. . . . You undoubtedly know by now that we have successfully demonstrated our operational capability to destroy ballistic missiles in flight with our satellite-based ABM system. You monitored our test, yes?"

"So?"

"Mr. President, by now you realize that your ICBM and SLBM forces are effectively useless. True, you still have cruise missiles and some bombers, but what are these in relation to our forces?"

"Premier Chebrikov, just what is the point of your calling me at this hour?"

"The point is that my tanks will begin rolling into West Germany thirty minutes from now. But what is this to you? The forces you have there will last but a few days. The whole matter will be settled in less than two weeks. All we want is West Germany. We do not wish to bring you into this."

"Do you know what you are risking? You're talking war!"

"I think not, Mr. President. Your conventional forces are inadequate, and your nuclear forces are useless. If you strike, we can destroy your ICBMs and SLBMs. We can handle the rest and deal you a crushing blow that will leave you in ashes. You have no choice but to stay out of this."
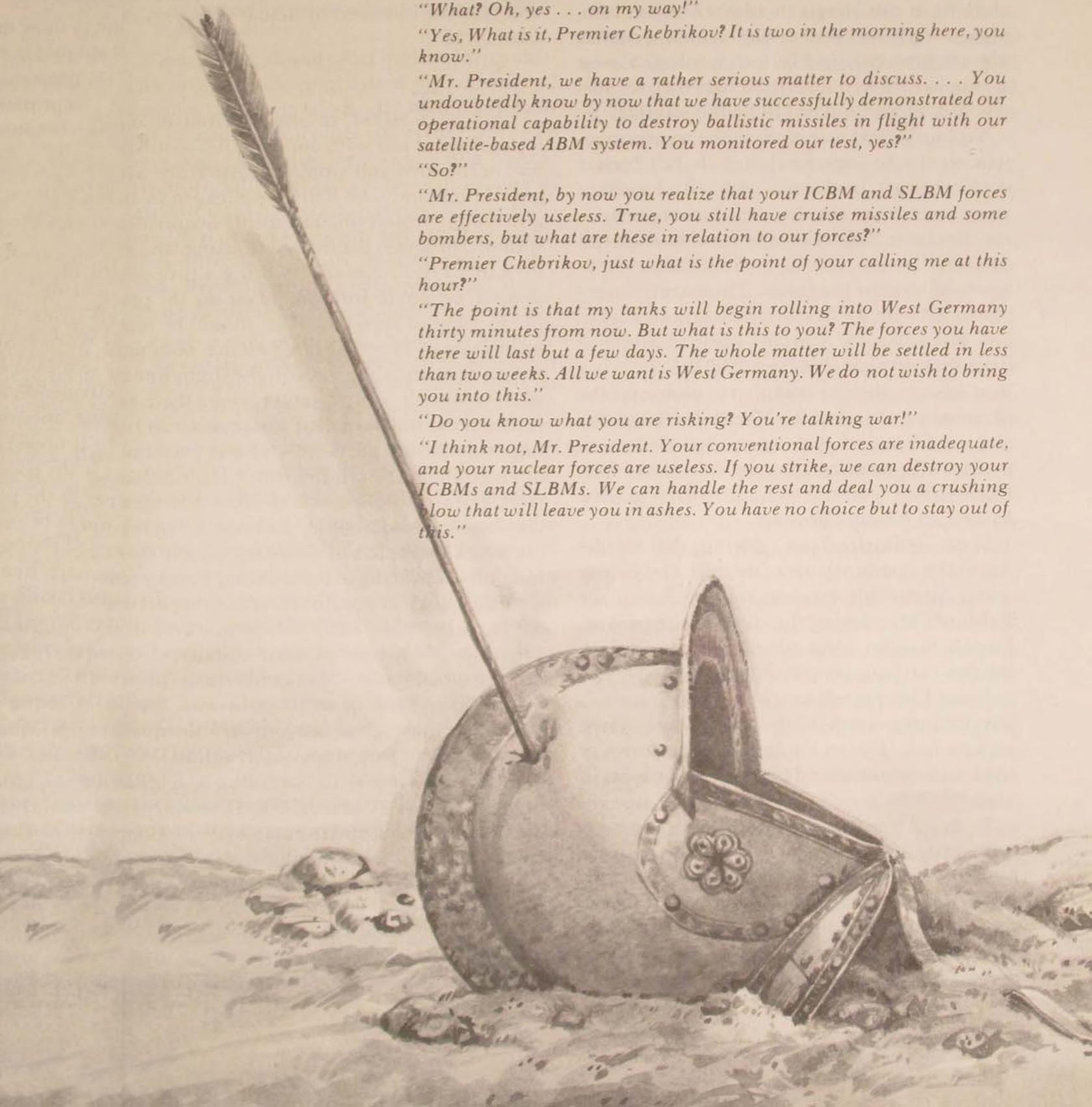
TECHNOLOGICAL surprise. It has all the ingredients of a nightmare. Nations have vanished practically overnight because they could not or did not have the will to prevent their enemies from gaining overwhelming technological superiority. And it will happen again, perhaps even to the United States, if we are not vigilant in our efforts to advance the technological sophistication of our weapon systems. We are now engaged in a technological war whose battles will determine whether we survive as a free nation or fall by the wayside.

Technological war is not a phenomenon restricted to the Industrial Age. It has been a decisive factor in the rise and fall of nations since time began. In the twelfth century B.C., the Mycenaean Greeks were at the height of their civilization, having a well-developed culture and written language. Their armies were equipped with the best bronze weapons available. But when the Dorians invaded Mycenae from the northwest in about 1200 B.C. carrying iron swords, they so completely destroyed the Mycenaeans that even the Mycenaean language arts were lost and the vanquished Greeks remained illiterate for the next 500 years.[1] The Dorians had won the technological war, and battlefield victory followed.

Many centuries later, during the Middle Ages, the combination of knight and armor was a formidable weapon system. But in the Battle of Crécy during the Hundred Years War, French knights were pitted against English archers carrying powerful longbows. The result was 1500 French knights and their attendant infantry dead, with only a few dozen archers lost. The technological superiority of the longbow put an end to the age of knights in armor.[2]

In much the same way, the musket overwhelmed the bow when it was brought into battle in Europe in the late 1660s. Its main advantage was that the musket could be mastered more easily than the bow, enabling more accurate fire to be directed against the enemy by larger numbers of trained soldiers. The techno-logically superior weapon made the difference between victory and defeat in many European battles and later in the New World.[3]

These few examples are enough to show that technology has played a significant role in the defeat of those who have not kept pace in the technological competition. Technological defeat is often followed by actual defeat on the battlefield.

THOSE in the forefront of our technological war with our potential adversaries are the men and women of Air Force Systems Command who daily are engaged in engineering, project management, acquisition support, program control, contracting, and all the other tasks necessary to bring a proposed weapon system to fruition. These are the people to whom Project Warrior should be most meaningful. They do not practice bombing targets or spend their days on the flight line or sit in a launch control center where there are constant reminders of their true mission and its importance. Instead, these Air Force personnel often go about their duties with a businesslike, managerial mind-set, which does not mean they lack professionalism; far from it. But they often lack reminders of the importance of their mission in ensuring that the United States wins the technological war. In this sense, they are on the front lines of a battle whose outcome will determine the future of their country, determining whether the nation will remain strong militarily and free or whether, instead, it will lose the technological war and the subsequent actual war that would inevitably follow.

In an interview with *Air Force Magazine*, General Robert T. Marsh, USAF, recently retired Commander of Air Force Systems Command, outlined his thoughts on the need to emphasize technological superiority. General Marsh declared:

> There's been a disturbing trend downward in exploratory and basic research funding over a number of years. That must be reversed. We're on

the verge of losing our technological leadership in the world, and the Air Force must play its part in this role and reinforce its commitment to basic and exploratory research and advanced development. We must keep the technology moving forward so we have the options available to continue to build superior new Air Force systems. You can neglect that area only so long, and then you will have cast the die permanently in terms of technological superiority.[4]

General Marsh and other high-ranking military officers have emphasized the necessity of keeping pace technologically with our potential adversaries. But other voices in recent years have been clamoring for a switch to a "quantity, not quality" approach to weapon systems acquisition. They would have us sacrifice technological progress in order to field large quantities of technologically inferior weapon systems. Regarding this quantity-versus-quality debate, General Marsh has said:

> I feel, as most of the leadership in the Air Force does today, that the very first and fundamental prerequisite is that everything has to focus on superiority. If you can't win, if you can't defeat the enemy with a given system, no matter how simple it is or how easy it is to operate or maintain, it's not worth building.[5]

General Robert C. Mathis, USAF (Ret), former Vice Chief of Staff of the Air Force, has also addressed the quantity-quality question. He echoed General Marsh's sentiments when he wrote that some "equate technology with complexity and high cost and draw the erroneous conclusion that we would be better off by returning to the combat-proven weapons of the past. . . . This thesis is simply fallacious."[6] General Mathis further pointed out that the aircraft we are fielding today represent the most significant increase in operational capability since the jet airplane was first introduced. They are not only more effective but also more maintainable, reliable, and easier to operate and employ than the aircraft we were using in Vietnam. This fact was recently confirmed during the Israeli-Syrian air battles in which the kill ratio was heavily one-sided in favor of the U.S.-made F-15s and F-16s.[7]

Keith Jackson, writing on quantity versus quality, pointed out that at the bombing of the ball-bearing plant at Schweinfurt, Germany, during World War II, the Eighth Air Force used 291 B-17s plus fighter escort. Of these, 228 B-17s made it to the target area; and of all the bombs dropped during the raid, only 13 percent fell within the target area, due to the smoke and haze that clouded the sky. In order to get that number of bombs on target, 3000 people took part in the raid and more than 600 of them lost their lives. In comparison, this same amount of damage could be accomplished today by eight F-16s and eight people.[8]

Those who would have us neglect technological advance and instead acquire large quantities of inferior weapons would cause us to lose the technological war, with all its attendant consequences.

ONE of the Soviet Union's most effective means of achieving gains in the technological war during the past twenty years has been the theft of technology, both by espionage and by illegal purchases through exporters who violate U.S. laws. A 1982 government report outlines the effectiveness of the Soviet attempts to gain technological advance by theft and mirroring, a practice that involves copying components for use exactly as made in the United States. The report shows that the Soviets are concentrating on the industrial aspect of the military acquisition process—probably the most vulnerable segment of the acquisition cycle to Soviet efforts to acquire technology by theft.[9]

Reportedly, the Soviet Union has a special coordinated directorate with a staff of about 20,000 tasked to acquire Western technology through espionage, theft, and direct or indirect purchasing. These sources say that at least 150 Soviet weapon systems depend on Western technology. U.S. experts have found components in captured Soviet weapons and equipment that are direct copies of Western parts,

many of which were produced on Western machines obtained by the Soviets.[10]

While the espionage cases get most of the publicity, it is the piecemeal technology transfer through illegal sales which gives the Soviets the bulk of the high technology that they obtain from the United States. They obtain some chips here, an automated test set there, precision equipment from somewhere else, and soon they have the keys to advancing their technology without the high cost and long lead time of an R&D effort. This flow of technology to the Soviets is an ongoing battle in the technological war in which the West has already suffered significant tactical losses.

The Soviets realize the importance of winning the technological war in order that they might exert their influence around the world. For the past twenty years, they have been engaged in an unrelenting effort to surpass the United States in every area of military capability. Until the 1970s, the Soviets could boast a numerical superiority in many areas of conventional weaponry; but their technology was seriously lacking when compared with that of the United States. During the past decade, however, the Soviets have closed the technological gap rapidly and have threatened to surpass the technology of the United States in some very important areas. In 1979, then-Under Secretary of Defense for Research and Engineering Dr. William J. Perry testified before Congress that "the Soviet Union is investing twice as much as we are in its military technology base program, leading to a real risk of technological surprise."[11] Dr. Perry stated that the Soviets are concentrating on several unconventional technologies, such as "high-energy lasers, charged-particle beams, and surface effects vehicles. . . . In the high-energy laser field, they may be beginning the development of specific weapon systems."[12]

The imbalance in research and development has led some experts, including retired Major General George J. Keegan, former head of U.S. Air Force intelligence activities, to warn of a possibly imminent breakthrough by the Soviets on new technology weapons, such as charged-particle-beam weapons capable of destroying missiles and satellites.[13] A Library of Congress report observed of the current Soviet efforts that "for a system that flaunts its atheism, there is a certain element of secular religion in the official attitude that Soviet man through his mastery of science and technology can control his destiny for the good of his system of society and government . . . and the investment in support of these ends is substantial, and probably in real terms is in excess of the U.S. program at its previous peak.[14]

The Soviets are also expanding their technology base much faster than the United States. According to the pamphlet *Soviet Military Power*, published by the Department of Defense, the Soviet arms industry is proceeding with an accelerated expansion program to broaden the base of their technology. The basis of this expansion is an increased emphasis on scientifically and technically trained manpower. Intelligence sources have put the total number of scientists and engineers working in Soviet research and development at 900,000—the world's largest technical manpower pool. Comparatively, the United States has about 600,000 technically trained people working in research and development. As the DOD publication indicates, the expansion of the Soviet technology base has paid great dividends. For example, "in the latter half of this decade, it is possible that the Soviets could demonstrate laser weapons in a wide variety of ground, ship, and aerospace applications," and the Soviet directed-energy weapons program is proceeding at "three to five times the U.S. level of effort."[15] The authors of the publication concluded that the results of the Soviet R&D efforts are sobering. "During the 1970s the Soviets have dramatically reduced the U.S. lead in virtually every basic technology. The United States is losing its lead in key technologies, including electro-optical sensors, guidance and navigation, hydroacoustics, optics, and propulsion."[16]

If the Soviet technological threat is indeed credible, as reliable sources have pointed out, a technological surprise could lead to other—more menacing—surprises. Such a consequence may seem unimaginable, but it is no longer impossible.

THE United States no longer can afford the luxury of waiting for Sputnik-type events for motivation to begin new programs. Technological advances come much too rapidly today, and it takes an average of fifteen years from the conceptual phase to production of a new weapon system, such as the B-1 or MX. Technological surprise is an ominous possibility,

and it is technological surprise which defines when a nation has lost the technological war.

The technological war in which we are now engaged is a struggle for our survival. We cannot afford for our technological warriors to fall into a business-managerial mind-set: the consequence is unthinkable, although definitely not impossible. As Air Marshal Giulio Douhet stated more than forty years ago, "Victory smiles on those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur."[17] In technological war, winning is everything.

Joint Cruise Missiles Project Office
Washington, D.C.

Notes

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2. Major General J. F. C. Fuller, *The Age of Valor* (New York: Scribner's Sons, 1945), pp. 25-30.
3. Eugene Fubini, "Down-to-Earth Research," *Ordnance*, March-April 1964, vol. 48, pp. 522-28.
4. General Robert T. Marsh, "Developing the Future," *Air Force Magazine*, January 1982, p. 94.
5. Ibid., p. 88.
6. General Robert C. Mathis, USAF (Ret), "Defense Myths—And Facts," *Air Force Magazine*, June 1982, p. 16.
7. Ibid.
8. Keith Jackson, "Quality-Quantity and Technology—A Perspective on Fighter Development," SAE Technical Paper Series, Aerospace Congress and Exposition, Anaheim, California, 5-8 October 1981.

9. CIA Report, "Soviet Acquisition of Military Technology," pp. 1-35.
10. "U.S., Allies Seek to Halt Technology Leaks," *Los Angeles Times*, 6 October 1982, Part I, p. 14.
11. Edgar Ulsamer, "Defense Technology: Moving into Space," *Air Force Magazine*, June 1979, p. 46.
12. Ibid.
13. Clarence Robinson, "Soviets Push for Beam Weapons," *Aviation Week and Space Technology*, 2 May 1977.
14. Edgar Ulsamer, "Will the Soviets Wage War in Space?" *Air Force Magazine*, December 1976, p. 35.
15. *Soviet Military Power* (Washington: U.S. Government Printing Office, 1981), p. 76.
16. Ibid., p. 71.
17. Giulio Douhet, *The Command of the Air* (New York: Coward-McCann, 1942), p. 175.

THE SEVEN-PERCENT SOLUTION FOR U.S. DEFENSE

Major Jeffery R. Barnett

FROM a political perspective, our current approach for presenting military budgets to the general public is seriously flawed. We continually make the mistake of expressing our budget requests solely in terms of the threat and the cost of specific systems needed to counter this threat. However, our country is deeply divided as to the magnitude and immediacy of any threat—a divisiveness that results in a weak base of support for the defense budget in general. When this weakened base of support is combined with a budget process that continually pits individual defense programs against individual domestic social issues, the Department of Defense finds itself repeatedly in an inherent and unwinnable domestic conflict. From day one of our budget submission to Congress, we are on the defensive, trying to hold our budget losses to a minimum against repeated attacks by groups with differing perceptions of either the threat itself or the relative merit of specific defense programs compared with domestic social programs. We are neglecting the need, and the opportunity, to form a national consensus behind defense spending based on what the nation as a whole can afford. Such a consensus would go a long way toward alleviating the irritants built into our present budget process while allowing for more accurate fiscal planning.

The Threat

The country is divided over the actual threat posed to us by the Soviet Union, and it is important for military professionals to recognize the existence and depth of this division. A recent survey conducted by the Chicago Council on Foreign Relations, a moderate and reputable organization, illustrates this division well. It showed 35 percent of the American public oppose sending U.S. troops if the Soviets invade Western Europe, and 49 percent of the people polled oppose sending troops if the Soviets invade Japan.[1] Taken to its logical conclusion, that portion (more than one-third) of the American public which opposes the use of U.S. forces overseas during wartime would probably also oppose the heavy funding of these same forces during peacetime.

What are the reasons for this opposition? While opinions vary concerning the correct use of U.S. forces overseas, the following three ideas seem to have wide support. First, based on our recent experiences in Vietnam, Lebanon, and El Salvador, any military involvement overseas would prove costly and futile. Second, Americans have shouldered the defense burdens of the free world for too long; the West Europeans and the Japanese with their robust (and competitive) economies should provide for their own defense. Third, the foreign policy goals and methods of the two superpowers are essentially the same, with both nations in competition and conflict about interests beyond the control and concern of the average American.

Regardless of whether you or I agree with any or all of these attitudes, we must face facts: given the widespread acceptance of one or more of these opinions, a defense budget request for hundreds of billions of dollars based solely on threat will meet with divided political support.

The Budget Process

Similarly, we are leading with our chin when we phrase defense budget requests solely

in terms of hundreds of billions of dollars or percentages of real growth. Such phrasing allows for direct comparisons of DOD programs with other federal programs competing for the same federal dollars. Initiatives whose payoffs appear far in the future, nonessential, or even potentially life-threatening to many constituents must compete for funding with social programs in which the impact is both immediate and politically popular. And the competition for federal dollars is intensifying. People are starting to realize that no amount of "economic recovery" will eradicate $200 billion deficits in the federal budget. Taxes will be raised, but first, cuts are going to be made. Since 80 percent of the federal budget goes for pensions, health care, interest on the debt, and defense, guess what is likely to bear the brunt of the cuts? Defense will; except in times of national crisis, it has the weakest constituency of the four. And don't bother looking at the other 20 percent of the budget. Some of this funding is deemed essential to the nation (e.g., that needed to run such departments and agencies as the FBI, IRS, State Department, etc.); and in regard to the rest, the conservative Reagan administration with an election mandate to cut federal spending could only make a small dent in the face of committed and entrenched special interests. A January 1983 Gallup poll illustrates the political difficulties: 45 percent of the American people thought the "Pentagon" is getting too much money; only 15 percent held the same view one year earlier.[2]

Our present budget process exacerbates these attitudes and inhibits DOD budgetary success. The plethora of continuing resolutions, appropriation bills, authorization bills, committees, subcommittees, ad hoc committees, presidential advisory panels, congressional caucuses, etc. has made the defense budget into a year-round issue and a year-round political sore. People are bombarded continually with stories of multibillion-dollar defense programs being started while social programs are being cut. As a result, the defense budget is vulnerable to all kinds of political maneuvering, which, in turn, provokes popular distaste for the entire process, popular distrust of the Congress and the military, and an understandable unwillingness to pay for it all.

The Solution

The question is: "What can we, as military professionals, do?" One answer is to start stressing the defense budget as a percentage of gross national product (GNP). If we could frame the public debate in terms of allocating a specific portion of national wealth to defense, we could lessen the target-rich environment of complex defense issues now provided defense critics and proponents of other programs. We would also be providing a simple framework for people to see just how large the defense budget actually is and what it has been in the past.

The figures given in Table I are the key for understanding the "7 percent solution." When dealing with the general public, we should

Table I. Defense Outlays as a Percentage of Gross National Product

FY55	FY60	FY65	FY70	FY75	FY79	FY80	FY81	FY82	FY83	FY84	FY85
9.2	8.3	7.0	8.0	5.7	4.9	5.2	5.4	6.0	6.3	6.5*	7.0*

Percentages for 1955 through 1984 are based on gross national product and actual budget outlays as reported in the Secretary of Defense's *Annual Report to the Congress, Fiscal Year 1985* (Washington, D.C.: Department of Defense, 1984), p. 280, Table 3. The 1985 estimate was extracted from the *Air Force Budget Fiscal Year 1985* (Washington, D.C.: Department of the Air Force, 1984), p. A-4, Table 3.

*Estimated

stress our budget requests not just in terms of threat or hundreds of billions of dollars but also as 7 percent of the GNP.[3] Such a percentage of national wealth should satisfy our defense needs in the long run while being an amount that the country as a whole should support.

Why would using a percentage of GNP be helpful? First, it allows us to reasonably compare this year's defense budget with that approved by previous administrations and paid for by previous generations of taxpayers. As the table reveals, in the context of defense spending during the past three decades, a defense budget on the order of 7 percent of GNP is not excessive. In fact, since 1960 the U.S. defense budget has averaged 6.9 percent of GNP.[4] Second, expressing the defense budget by percentage of GNP decreases the opportunities for outlandish budget predictions based on "best-guess" inflation rates. All defense budgets would be based primarily on what the country agreed it could afford. Inflation would be reflected in a larger GNP, which, in turn, would drive a larger defense budget. Third, a consensus behind such a program would allow more accurate fiscal planning; high-ticket systems would not have to be moved to the out-years to make the budget politically palatable. The hazards of doing the latter were recognized in the *USAF Strategy and Policy Assessment, FY 1986-1999:*

> Any tendency toward optimistic fiscal guidance results in a temptation to be overly ambitious about what is achievable in the out-years. This is a problem facing us in the years immediately ahead; the available data indicate that we may have committed ourselves to numerous programs which we cannot afford in the long-term.[5]

Once we had achieved a consensus on the percentage of GNP to allocate for defense, the debate would center on priorities within the defense budget. We would be forced to discipline ourselves to an even greater extent over intra-DOD priorities. For example, to keep the defense budget within the 7 percent of GNP limit, a new carrier battle group might be funded instead of a pay raise (or vice versa). Our present process of asking the Congress for both the pay raise and the battle group while the funds involved are still being fought for by nondefense interests is a major irritant built into our current budget process.

One note of caution. Launching a massive pro-military propaganda program to ensure DOD budgetary success, for very correct moral and political reasons, would backfire quickly. What we need is simply a change in emphasis in our public pronouncements. While the concept of tying the defense budget to a percentage of GNP is not entirely new, it should be made a coequal partner with threat assessment as a means of obtaining public and legislative approval for defense spending.

Of course, some people think that once the economy improves and the memories of Vietnam fade, Americans will revert to their historical support for the military and a strong national defense. Such projections may be wishful thinking with little substance. With the exception of the immediate post-World War II years, the military has never been a very popular peacetime institution in the United States. In addition, draft exemptions, the unpopularity of military service, and the end of the draft itself have resulted in a rising generation of national leaders who have had only limited exposure to military institutions. For example, less than half of the newly elected members of the U.S. House of Representatives in 1983 had any kind of military experience.[6] Thus, while time may dim the sharp memories of our failures in Vietnam, it will also decrease the numbers of national leaders familiar with military service.

As long as social programs and defense requirements are forced to compete for the same dollars day in and day out, we are going to fall far short of unifying the country behind the enormously costly programs associated with a strong defense. As Senator Gary

Hart (D-Colo) stated several years ago:

> Whatever the number and effectiveness of weapons we amass, they will not secure our Republic unless we have the national will to defend our values and our interests. . . . We cannot expect the old factionalism to disappear unless we muster new ideas around which people can unite.[7]

Currently, we are continually on the defensive in securing the funds that we need. If a real economic crunch comes, as many expect, our present base of popular support is too small to avoid massive cuts in the defense budget. Before that happens, we must minimize the irritants built into our budget process, arrive at a national consensus behind our defense effort, and stake out a "piece-of-the-budget-pie" for defense. Our present reactive policy for defending the DOD budget will not stop the coming challenges; perhaps using the concept of "7 percent of GNP for defense" as the bedrock of our existing public relation effort will do so.

Hq Pacific Air Forces

Notes

1. J. Reilly, editor, *American Public Opinion and U.S. Foreign Policy 1983* (Chicago: Chicago Council on Foreign Relations, 1983), p. 31.

2. "Defense-Deficit Dilemma," *Nation's Business*, April 1983, p. 38.

3. As comparisons, during 1981 the Soviets spent 15 percent of their GNP on the military; the Japanese, 1 percent; the West Germans, 4½ percent; the East Germans, 7½ percent; the South Koreans, 7 percent; the North Koreans, 9 percent; the British, 5½ percent; the French, 4 percent; and the Cubans, 8½ percent. (*Air Force Magazine*, December 1982, p. 151).

4. *Air Force Report to the 98th Congress, Fiscal Year 1984* (Washington, D.C.: Department of the Air Force, 1984), p. v, Figure 1.

During the 1950s, defense outlays were even higher, averaging 10 percent of GNP. See *Armed Forces Journal International*, May 1983, p. 105, Table 5.

5. *USAF Strategy and Policy Assessment FY 1986-1993* (Washington, D.C.: Directorate of Plans, Headquarters USAF, 1983), p. 7, para 2D (3).

6. As reported in the biographical sketches in the *1983 Congressional Directory* (Washington, D.C.: U.S. Government Printing Office, 1983). Of the eighty-one freshmen in the 98th Congress, thirty-nine have previous military experience. Of these thirty-nine, only three served more than five years in an active unit.

7. Gary Hart, "Toward a Consensus on Defense," *Strategic Review*, Fall 1980, pp. 13-14.

WHY AM I HERE? MILITARY HISTORY AND THE PROFESSIONAL OFFICER

CADET KEVIN SHANNAHAN

AN officer's job is to lead subordinates into battle. A support or administrative officer and a commander of a Ranger battalion have this responsibility in common. A maintenance squadron will probably never see the enemy, but their planes will; and the fate of our country potentially rides with every combat mission. No military assignment is a nine-to-five job. The mission has to be fulfilled first and foremost, and every link in the chain has to be strong. The qualities needed in a support officer are therefore only superficially different from those needed in a combat officer. Our country's security demands excellence from all officers, regardless of rank or role.

What are the qualities of character that an officer should have? Among the most important ones are moral courage, dedication, intelligence, and acceptance of responsibility. These qualities are essential for successful leadership in war, which is the bottom line of our profession. Moral courage provides the strength to choose the "harder right over the easier wrong." Without it, physical courage is useless. Dedication enables the officer to keep trying in the face of defeat. The defenders of Bastogne (Belgium), the staunch troops at Khe Sanh (Vietnam), and the air and support crews of the Berlin Airlift are good examples of what this quality can accomplish. Intelligence helps us to pursue the mission with minimal costs in materiel and blood, to know when and how to engage the enemy, and to anticipate future requirements. Accepting responsibility for correct decisions and successful action is easily done; accepting responsibility for our and our command's mistakes squarely and without equivocation is perhaps one of the most difficult officer qualities to acquire.

Officers must strive to be special people and to set a good example. They should get up earlier, go to bed later, and work harder than anyone else in their command. They must see to their subordinates' comfort before their own and do without if necessary. They must keep in mind that officers are scrutinized by the people of their command. They must change the whole outlook of their thinking from "I" to "them" and set the mission and the unit over their own convenience or welfare.

How to develop a potential officer's thinking from "I" and "me" to "them" should be the central focus of an officer's education. The current emphasis on management as opposed to leadership in the AFROTC curriculum needs to be changed. The Air Force is not IBM. While most of our jobs are technical, rather than strictly military, the *reason* that these jobs exist is military. Unlike a corporation, we cannot have "poor-performance quarters." Our bottom line is our nation's safety and freedom. The fact that an airman works with a wrench instead of a rifle does not change the fundamental purpose of his or her job and the need for quality performance.

The management text used in the Aerospace Studies 300 course is totally civilian-oriented. It discusses profit and loss and rising to the top of the business world. It does not encourage self-sacrifice and public service, nor does it speak of courage in the face of obstacles, of committed people in the service of a worthy cause, of the camaraderie that is one of the most lasting benefits of military life. My objection to the text lies in the difference in outlook between the officer and the businessman. An officer, dedicated to public service, should not hold the "get ahead" values of the business

world to the degree that a businessman should. Peace is a job well done, though rarely credited to our efforts. Our balance sheet should be subtler. A war prevented is harder to point at but infinitely preferable to a war fought.

Instead of hiding our military nature in our recruiting and training, we should celebrate it. The United States Air Force may not be as old as the other services, but we have fought our country's battles with courage and skill. That fact needs to be reiterated to each successive generation of officers and airmen. Our predecessors won the most medals of honor ever awarded in a single engagement in a raid on a Romanian oil refinery. People (unfortunately, many of them in the Air Force) who insist that the Air Force is somehow different from the other services insult the memory of many brave men. We are most definitely *not* "civilians in uniform"!

There are many ways in which the Air Force could go about correcting this misconception. The one that I believe would have the most lasting effect would be an emphasis on military history. I do not mean the watered-down textbook used in Aerospace Studies 200 but a vigorous investigation of the philosophical and historical roots of our profession. Spending class time delving into John Keegan's *The Face of Battle* or Grant's *Memoirs* would be a great opportunity to lay down an intellectual base that would last an officer all his life. I see no reason why the Durants, Churchill, J. Glenn Gray, Mahan, and Clausewitz should not be an integral part of every officer's education. With our current emphasis on management and buzz-words, we stand in danger of producing a generation of intellectually shallow officers or, worse yet, officers unsure of their vocation, who think of the Air Force as a "job." The Air Force officer of today is a world removed from the Roman centurion in terms of the techno-

logical world he inhabits, but the difference is superficial. The reason that he or she wears the uniform is the same. The "barbarians" still are a threat.

Shakespeare wrote that there is "nothing new under the sun." Nowhere is this truth more applicable than in the military. Liddell Hart's analysis of Genghis Khan's cavalry tactics for adaptation by the British Tank Corps in World War II is an excellent illustration. And there was more to General George Smith Patton, Jr., than a crusty image: he spoke several languages and was an expert historian, particularly in military history. He was familiar with all the previous battles of the Romans, Napoleon, and others who had fought for control of the same areas earlier.

THE study of military history deserves more attention than it is currently getting in the education of junior officers. While it may not instill character where none exists, a knowledge of military history will act as a support in hard times. More important, it will give the officer the intellectual breadth to realize who he is, how he got there, and why his role is important. This realization will shore up his resolve in the face of not only the enemy but those in our society who do not see the value of our profession. It will combat doubt and provide support in adversity. Finally, it is a measure of our professionalism. Blackstone and English common law no longer play a role directly in our jurisprudence, yet there is no law student who is not familiar with them. Current law evolved from and is related to them. One cannot understand or appreciate today's law fully without awareness of its historical roots. The military is no different.

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ON SEEKING A FORUM FOR THE MITCHELLS

LIEUTENANT COLONEL TIMOTHY E. KLINE

HOW wonderful to see Major Denny Nelson wielding the cudgel for open debate within the officer corps.* His call for a forum was superb. Mitchell would be pleased.

After spending some time with the U.S. Marine Corps, I'm beginning to appreciate the problem of fully airing views on any controversial subject. Those 209 years of splendid tradition are weighty arguments indeed. They hedge the arena of debate with very formidable obstacles. Nonetheless, I am convinced that there is more pure freedom of debate in the *Marine Corps Gazette* than *Air University Review* (lately).

What has happened to the Air Force is not hard to describe. Quite simply, a kind of mental ossification has settled in. There is such an atmosphere of institutional self-satisfaction afoot that nothing short of a shooting war will jolt us sufficiently to return clear thinking to its former place of honor. Meanwhile the hollow ring of efficiency continues to prevail over the far sweeter melody of military effectiveness. The present disorder will make more difficult the shakeout of the numb, byzantine institutionalists once the next hot war begins. Hopefully, the Major Nelsons (and the *Review*) will survive to reorient us for combat when we return to the "wild blue yonder!"

Quantico, Virginia

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*Major Denny R. Nelson, "Seeking a Forum for the Mitchells," *Air University Review,* July-August 1984, pp. 85-86.

Colonel Kline is Senior Air Force Representative at the Marine Corps Development and Education Command.

R books, images, and ideas

ON MOVING INTO SPACE

LIEUTENANT COLONEL JAMES P. MOORE

S HE sails brilliantly white against the stark black of space. Below, a dappled blue-green earth floats, emphasizing the significance of her aerial display. She is Challenger, second in the United States' fleet of reusable space shuttles, representing the nation's hopes for its space program and signifying both renewed national interest and the latest evolution in man's dream to move through the heavens.

Spaceflight began as an idea in Western literature. Jules Verne is recognized as a pioneer for his epic work on an imaginary trip to earth's nearest neighbor, the moon, although, even earlier, the historic figure Cyrano de Bergerac penned a poem about travel into space that he titled "Voyage to the Moon." The genre of literature for such works came to be known later as science fiction.

Science and technology have advanced so substantially that now there is a blur between the speculative fiction of such writers as Robert Heinlein, Arthur Clarke, and Isaac Asimov and the reality of modern science. Man has traveled to the moon and returned safely, conducted experiments and run manufacturing processes in the nearly perfect vacuum and microgravity of space, and magnified the effects of earth-bound enterprises through spaceborne systems of communication, navigation, and earth resource analysis.

Today, science fiction-like developments in space are a focus of American attention. This interest has resulted in part from the dramatic
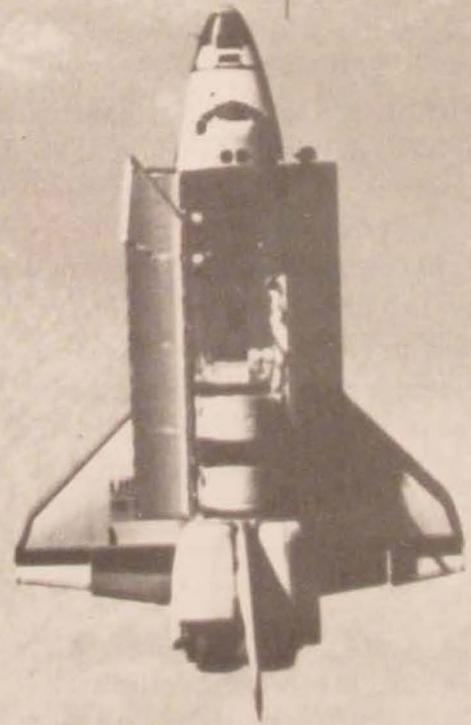
successes of the space shuttle program. It also is tied to the greater political debate over such issues as budget allocations between the National Aeronautics and Space Administration (NASA) and defense space programs. This intense interest, in turn, has resulted in a flood of new books that address various aspects of the space experience, ranging from future possibilities to understanding our pragmatic response to Soviet space initiatives. Five volumes in particular give a cross section of recent trends.

BEN BOVA is a dreamer. He comes from the science fiction tradition, having served as executive editor for *Omni* science fiction/science fact magazine. He sees space as *The High Road* leading to the potential solution of many social problems on earth.† Space, for instance, through the application of solar power technology, could help eliminate our current dependence on fossil fuels, a finite resource. New manufacturing techniques in space promise new products of greater strength and purity than is possible on earth. Bova further posits space as a partial solution to aging, envisioning older citizens among the first permanent residents in the low-stress environment of space.

Within this dream of social benefits, Bova recognizes that one of the social applications of space is national defense and security. He notes that most Americans "believe instinctively" that space should be reserved for peaceful purposes, but he recognizes that in reality this approach has been impossible since 1957 when the Soviets launched Sputnik. (p. 198)

Translating the dreams and promise of space into reality will depend on applied technology and a greater involvement of private resources in space exploration and exploitation. This is the thesis of Dr. Jerry Grey in *Beachheads in Space*, which the author touts as a "blueprint for the future" of man's presence in space.†† Grey, publisher of *Aerospace America* (formerly *Astronautics and Aeronautics*) and vice-president of the American Institute of Aeronautics and Astronautics, suggests that the advance of space development was not helped by American political indecision and reduced budgets in the 1970s. In fact, unilateral U.S. reductions threatened joint efforts with the European Space Agency to develop the Spacelab flying laboratory.

Grey would like to see demonstrated technology turned into productive processes for the benefit of all society. He notes that several practical techniques have already been demonstrated in recent space shuttle flights:

• The production of alloys and metals purer and stronger than anything produced on earth.

• Electrophoresis—a process to separate substances from liquids in the generation of pharmaceuticals to treat conditions like anemia.

• Semiautomatic construction to build large structures for astronomical observatories, solar energy devices, and intermediate stages toward a large, manned space station.

To exploit these capabilities fully will take private-sector involvement, building on the base already generated by government-funded activities, including national security programs.

The allocation of money for space-based defense is a natural outgrowth of military interest in advanced technology weapons, James W. Canan records. Writing in *War in Space*, Canan describes how defense spending in space

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†Ben Bova, *The High Road* (Boston: Houghton Mifflin Company, 1981, $11. 95 cloth, 289 pages; New York: Pocket Books, 1983, $3.95 paperback).

††Jerry Grey, *Beachheads in Space: A Blueprint for the Future* (New York: Macmillan, 1983, $14.95), 274 pages.

moved from the early technology of guided missiles, through the precision-guided ("smart") munitions of the Vietnam War, to today's reliance on sophisticated spaceborne systems to augment land, sea, and air capabilities.† His exposition also treats the emerging areas of antisatellite, laser, and particle-beam weaponry. Canan, in an opinion shared with Bova, observes that defense spending in space grew to fill a vacuum created by political and public indifference during the late 1960s and 1970s.

Canan also examines the impact of high-technology systems on defense planning. The cruise missile, for example, reflects an interdependence of high technology in near-earth systems and spaceborne capabilities. The cruise missile is an attractive weapon system because it can fly long, complicated, low-altitude routes to evade and penetrate enemy air defenses and deliver a warhead on target. This ability depends on an accurate on-board terrain guidance tracking system, which, in turn, depends on accurate digital mapping data. Digital map data are derived today from spaceborne systems.

In response to critics who fear introduction of defense systems into space, Canan quotes the congressional testimony of General George S. Brown, former Chairman of the Joint Chiefs of Staff:

> Unless all possible antagonists in this dangerous world agree, with ironclad guarantees, to halt military technology in its tracks, none of them can safely do so. It then becomes a question of which one is most successful in his pursuit of science and technology. . . . That, really, is what the technological race is all about—the true meaning of the impact of science and technology

on strategy. The fundamental point is the question of *whose* science and technology impacts on whose strategy. . . . (p. 80, emphasis in original.)

Modern defense technology in space has evolved to include command, control, and communications (C^3), reconnaissance and surveillance, and navigation and meteorology as force multipliers. Thomas Karas sees this evolution as a natural outgrowth of military views of space as *The New High Ground* that promises important benefits for military management and command decision making.†† Among the benefits detailed by Karas are such things as better battlefield management resulting from space's "high ground" vantage, improved preconflict information, and a global communication capability, regardless of locale or extent of the conflict. Nevertheless, warns Karas, we must recognize that while space is useful to the military, "space power is not going to provide us with a military superiority that will solve our problems—any more than air power did before it." (p. 15)

In spite of what Karas says about the evolution of space technology, at times it seems that developments in the U.S. space program are reactions to developments in the Soviet space program. Some evidence of this pattern of response appears in *The Shape of Wars to Come.*††† Here David Baker traces the sometimes parallel, sometimes divergent course in U.S. and Soviet space developments, including the latest explorations of advanced-beam technology. Antisatellite technology, in particular, reveals the pattern of initiative and response. Soviet developments in antisatellite technology and techniques prompted U.S. planners to

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†James W. Canan, *War in Space* (New York: Harper and Row, 1982, $13.95), 186 pages.

††Thomas Karas, *The New High Ground—Strategies and Weapons of Space-Age War* (New York: Simon and Schuster, 1983, $14.95), 224 pages.

†††David Baker, *The Shape of Wars to Come* (New York: Stein and Day, 1982, $19.95), 304 pages.

investigate an answering antisatellite system and explore self-defense techniques for passive orbiting systems. This "space weapon race" extends into the 1980s the so-called missile race born in the early 1960s out of U.S. perceptions of Soviet capabilities in intercontinental missile technologies.

THE five books mentioned here do more than simply reflect increased public awareness of and interest in the space program. They also contribute substantially to the public debate over the shape and direction of that program. None presents independently an adequate overview of the experience and overall thrust of the U.S. space program. Canan describes the political and social evolution that took America into the defense space program. Karas and Baker provide information on military space programs and the military potential of space. Grey and Bovas describe where space developments may lead. While individually none of these books provides a complete picture of space endeavors, taken together, they serve as a reasonably comprehensive introduction to present and future space issues, especially in the sphere of national security.

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TV'S "CALL TO GLORY": THE MILITARY'S HOLLYWOOD COMEBACK?

Dr. Lawrence H. Suid

PATRIOTISM has returned to the United States. People lined the roads to cheer on the Olympic torch last summer, and the games produced an outpouring of national pride. This renewed love of country has helped the rehabilitation of the United States Armed Forces. ROTC courses are again popular on college campuses. Men in uniform now appear in television commercials. And movies that portray America's fighting men in positive terms are now appearing with greater regularity both in theaters and on television.

At virtually every commercial break during its Olympic coverage, ABC promoted the premiere episode of its new series "Call to Glory" as a "major television event" about "families of honor," a "man of honor," and "heroes no one knew." Not since the mid-1960s, when the Vietnam War ended the commercial appeal of the military film genre, have movie or TV producers used such phrases in describing their portrayals of the United States Armed Forces. More important as far as the Pentagon is concerned, "Call to Glory" completes the rehabilitation of the savaged American military image that resulted from the television news reporting of the war in Southeast Asia and the cycle of Vietnam films in the late 1970s.

The Vietnam War had brought to an end the symbiotic relationship between Hollywood and the military which had its origins before World War I and produced a seemingly endless stream of stories about American fighting men. The controversies surrounding the war in Southeast Asia convinced filmmakers that military subjects no longer had box office appeal and except for a few "safe" movies about U.S. successes in World War II, such as *Patton, Mid-*

way, and *MacArthur*, Hollywood avoided military subjects during most of the 1970s.

Only gradually during the last two or three years have filmmakers again begun to portray the United States Armed Forces in a positive manner on the theater and television screens with such films as *Private Benjamin, An Officer and a Gentlemen, The Great Santini, Uncommon Valor*, and *Tank*. While not the gung ho, flag-waving, John Wayne-type movies or the simplistic Dean Martin/Jerry Lewis military comedies of the 1950s, these movies show the U.S. fighting person as a "good guy," trying to do a necessary job, in contrast to the dark portrayals in such Vietnam stories as *Boys in Company C, Coming Home, The Deer Hunter*, and *Apocalypse Now*. ABC's "Call to Glory" completes the circle, returning to the positive images of Air Force men doing their jobs in a professional manner in much the same way as the classic SAC films *Strategic Air Command* (1954), *Bombers B-52* (1957), and *Gathering of Eagles* (1963) conveyed them.

The "Call to Glory" project began as a two-hour pilot program about Air Force fliers and their families during the period from the Cuban missile crisis to the assassination of President John F. Kennedy. It had its origins three years ago when Lieutenant Colonel Duncan Wilmore, in his capacity as chief of the Air Force's Public Affairs Office in Los Angeles, discussed with producers Jonathan Avnet and Steve Tisch the idea of creating a television series featuring the Air Force.

Neither Avnet nor Tisch had any military background. But coming at a time when Tom Wolfe's *The Right Stuff* had become a hot property and *The Great Santini* was becoming a hit in its second release, Wilmore's suggestion struck the producers as both a commercially attractive enterprise and, according to Tisch, "an opportunity to be exposed to the military life style."

CBS television turned down the idea of the project, but Jordan Kerner, head of dramatic development at ABC, became excited about the concept and gave the producers the go-ahead. Avnet and Tisch chose to focus the story on the period of the Cuban missile crisis, which not only offered the advantage of being "an interesting, difficult, and exciting" time in American history but gave the producers an opportunity to return to the formative period of their lives.

In making his formal pitch for military assistance on his production in December 1982, producer Jonathan Avnet wrote the Air Force's Los Angeles Public Affairs Office:

> We have a wonderful script which can become an equally wonderful movie describing the courage and professionalism which led members of our armed service to successfully help the President of our country with a most serious threat to our security. We place great emphasis on the role of his family in making him a superior serviceman.

No longer fearing the antipathy of U.S. audiences to military subjects, Avnet believed that by exploiting values that are rarely experienced on television, "namely—patriotism, sacrifice, and service for one's country," he could make a show that would be "quite unique and very commercially successful."

Recognizing that the Department of Defense provides assistance only when a project in some way benefits the armed forces or seems in their best interest, Avnet suggested that this production, originally titled "Air Force" and intended as a TV pilot, would "be of enormous benefit to the Department of Defense by creating an image of the Air Force that is both positive and one worthy of emulation." Avnet acknowledged the long eclipse of military subjects by reminding the Air Force that "a show of this kind is quite visibly lacking from the primetime network arena and has been for a number of years. This show is therefore a most unique opportunity for us both."

Vietnam had offered no glorifying stories of the Air Force in combat, and Paramount's miniseries *Enola Gay*, the story of Colonel Paul W. Tibbets, Jr., and the dropping of the atomic bombs on Japan, did little to promote the ser-

vice, coming as it did during the rise of the nuclear freeze movement. Likewise, last year's smash hit *Wargames* suggested that the Air Force could not control its weapons of destruction. Although the *Wargames* screenwriters did tour NORAD's facilities, ultimately they produced a script that had little relationship with the reality of Air Force operations. Of course, if they had portrayed NORAD and Strategic Air Command procedures accurately, they would have had no film. And given the implausibility of the story, the Air Force Public Affairs Office in Los Angeles had no choice but to reject any overtures from *Wargames* filmmakers for assistance.

Ironically, Colonel Wilmore, who had retired from the Air Force after getting "Call to Glory" started, signed on as technical advisor on *Wargames*. He readily acknowledges that the film is a fantasy and bears no resemblance to Air Force procedures. However, he points out that if one accepts the opening premise of *Wargames* that 20 percent of officers in missile silos would not turn their keys if ordered to launch nuclear rockets, the replacing of human control of ICBMs with a computer might be legitimate. As a result, he could suspend his disbelief and work on the production even with his Air Force training and public affairs orientation. Nevertheless, he admits that the original premise has little resemblance to what would happen in the event the United States were attacked, namely, that Air Force officers would, in fact, turn the keys.

In any event, the Air Force Public Affairs Office in Los Angeles was quick to recognize the advantages that "Call to Glory" offered the service. Lieutenant Colonel Donald Gilleland, Wilmore's replacement as chief of the office, worked with Avnet and his writers to help mold the concept and the script in order to avoid technical problems. According to Gilleland, his office has no great interest in making movies: "We want to only make certain Air Force people are depicted as accurately as possible carrying out their professional assign-

ments in the manner that officers and men actually perform. We have a public trust to defend the nation and if filmmakers are going to depict us in that role, we want to be shown as accurately as possible."

In forwarding the script to Brigadier General Richard F. Abel, the Air Force Director of Public Affairs in Washington, Gilleland wrote that the project

> offers the best opportunity we have ever had to showcase the Air Force way of life before millions of American viewers every week. It is a family-oriented show, depicting Air Force people as dedicated professionals who love their work and their families. It has the lure of flying, with a sense of doing something patriotic that is also personally rewarding and emotionally satisfying to the airman and his family.

Noting that producer Avnet had "agreed to make whatever reasonable script or location modifications are necessary to accommodate Air Force operational considerations," Gilleland urged the Air Force and the Pentagon to "approve Air Force support to this excellent film effort."

Because of the manner in which the Air Force worked with the producers, the completed script had no problem meeting the Defense Department's criteria of plausibility, accurate portrayal of procedures, and positive image. Only a few minor technical errors needed correction. The service noted that it has "commanders," not "commanding officers," which is the Army term. It also pointed out that a jet uses a good grade of kerosene, not high-octane fuel as the screenplay had indicated.

The script reviewers in Washington did have a few more substantive technical objections. Perhaps the most significant question was about the opening sequence in the teleplay, which had a visiting three-star general being escorted to an air base by a tight formation of jets, a display that would be taboo. Nevertheless, "Call to Glory" opens with the aerial greeting, which Colonel Gilleland justifies as legitimate dramatic license.

The only concern that Donald Baruch, Chief

of Defense Department's Audiovisual Division, had about the project was for the Air Force to avoid getting "involved in a soap opera." In approving assistance, Baruch's office advised the Air Force that cooperation with the project was to be "at no cost to the government." Personnel who performed specifically for the camera would do so "on a voluntary basis and in most cases on their own time."

In the Air Force Public Affairs Office, Master Sergeant Rick Racquer, who served as a liaison with the production, felt that the "Call to Glory" reflected

> the current attitude of Americans toward the military that began to shift in a more positive direction following the Iranian hostage rescue attempt which showed to the American people the armed forces working in unison making a concerted effort to help fellow citizens.

According to Racquer, the actions of the Marines in Lebanon and the Grenada rescue mission reinforced the image of the U.S. Armed Forces trying to aid their fellow Americans.

To Mr. Baruch, the completed movie "lived up to the promises which Avnet had made to produce a positive, interesting, and exciting television feature which would give the public a better understanding of the Air Force in action during a significant period in United States history." After screening the two-hour opening program, Baruch and other Pentagon officials had hopes that "Call to Glory" could gain a popular acceptance without resorting to the melodrama of other recent military series, such as "For Love and Honor" and "Emerald Point."

Gilleland found the product of his two year's of work with the producers "satisfying," be-lieving it "one of the best depictions of the Air Force audiences have seen in many years and, in particular, the best portrayal of an Air Force wing commander and his family that has ever been done." Confirming that Avnet succeeded in his efforts to show the role of a military family, Gilleland's wife said "Call to Glory" was the "only film she has seen that has presented an accurate view of an Air Force wife's perspective."

On his part, producer Steve Tisch feels that the completed feature was a "great example of working in harmony with the government." Of the production itself, Tisch said, "I'm going to use the word *patriotism*. People are going to respond to this series the way they responded to the Olympics. They'll be entertained, and they'll be proud."

Whether the producer was correct, when ABC personnel screened the pilot (which the network had originally scheduled for broadcast last February), they liked "Call to Glory" so much that the network made a commitment immediately to develop thirteen additional stories, Subsequently, the network moved the initial two-hour film to the night after the Olympics closed, promoted the series at every opportunity during the Olympics, and began broadcasting additional episodes the week after the original film was shown.

Hollywood is not waiting to see whether "Call to Glory" will attract viewers to a military story. Producers are working on several similar projects already, including stories set during the Vietnam War. It appears that the military film genre is making a genuine comeback.

Washington, D.C.

POTPOURRI

Air Power in the Nuclear Age by M. J. Armitage and R. A. Mason. Champaign: University of Illinois Press, 1983, 296 pages, $24.95.

M. J. Armitage, Director of Service Intelligence in Great Britain's Ministry of Defence, and R. A. Mason, Director of Ground Personnel for the Royal Air Force, agree with Lord Tedder that military planners must not look back to the past for its own sake but rather must look to the future from the perspective of past events. Tedder's utilitarian approach to history is obvious in this richly textured volume that combines a balanced and dispassionate survey of air power since World War II with a thoughtful treatment of the present and future.

Taking the lessons of World War II as a point of departure, the authors note the dominant influence of the United States on postwar strategic thought. As General H. H. "Hap" Arnold wrote to the Secretary of War in November 1945: "It must be apparent to a potential aggressor that an attack on the United States would be immediately followed by an immensely devastating air atomic attack on him." (p. 17) This doctrine of massive nuclear retaliation took firm root in the United States; it would remain at the center of American—and later, NATO—air strategy until the 1960s.

But no sooner had the lessons of the past been incorporated into national strategy than the Korean War called into question the idea that strategic air bombardment by manned bombers would bring total victory. High-ranking airmen must have shuddered as B-29s, flying at 10,000 feet, were used to attack tanks, trucks, and other targets of opportunity; they were quick to agree with Secretary of the Air Force Thomas K. Finletter that Korea was "a special case," (p. 44) lacking useful lessons for the future.

Korea, however, proved to be anything but special. After surveying the role of air power in Indochina, Malaya, Algeria, Kenya, and other colonial struggles of the 1950s (where air power was always useful but never decisive), Armitage and Mason subject America's war in Southeast Asia to critical analysis. Their conclusions should come as no surprise. While strategic and tactical air transport played a vital role in Vietnam, direct air support in ground fighting rarely decided the outcome of battles, interdiction failed, and the strategic use of air power (to apply pressure on the North) did not work until the end of the war, when the Linebacker campaigns induced the enemy to conclude negotiations in Paris.

Vietnam, Korea, and the colonial wars tended to be one-sided affairs as far as air power was concerned, and the lessons derived from these conflicts had limited value for a major war in Europe. On the other hand, the Arab-Israeli wars could be seen as more characteristic of a confrontation between the great powers. Air power did prove decisive in the deserts of the Middle East. Facing a coalition of enemies, Israel took advantage of its superb air force to wage war with considerable success on several fronts. With all sides employing advanced electronics, the struggle called attention to "the intrinsic relationship between air power

and technolgy" (p. 138) and the superiority of Western weaponry.

In the book's longest chapter, Armitage and Mason trace the rise of modern Soviet air power from its post-World War II origins (when the Soviets used Western technology to great advantage), through an emphasis on defensive strategy and reliance on missiles during the Khrushchev era, to the priority given to offensive air operations since 1967. By 1980, the authors point out, "Soviet air power had reached formidable proportions and its growth showed no signs of slackening." (p. 177)

While the Soviets were emphasizing offensive operations, NATO strategic doctrine was evolving from massive retaliation to "flexible and appropriate response." Unable to match Soviet numerical superiority, the West relied on technological excellence as a counterbalance. The authors believe that NATO air forces can fulfill their responsibilities at the present time, but they warn that the size of Warsaw Pact air forces, together with improving technology, presents a growing danger for the West.

Following a brief account of the Falklands/Malvinas conflict (which suffers from the demands for instant analysis), Armitage and Mason turn to the future. They foresee a continuation of the trend toward small wars with increasing intervention by external powers. Air power, with its unmatched flexibility and speed, will play a major role in the future as it has in the past. However, to be effective, air power must deal with the problems of sophisticated antiaircraft defenses, rapidly escalating costs, and unnecessary political restraints (arising from proper humanitarian concern for noncombatants, danger of reprisals, a wish to contain the conflict, and fear that air operations will produce adverse results). The answer to all three can be found in aircraft that can stay beyond the enemy's effective defenses and launch highly accurate weapons. "A change from the past emphasis on platform performance and on to weapon performance," they argue, "therefore seems not only inevitable but imperative." (p. 257)

Air Power in the Nuclear Age is an intelligent and rewarding book, and it is not possible to do justice to its many facets in a short review. It should be read by all serious students—and practitioners—of air power in the nuclear age.

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U.S. Cruise Missile Programs: Development, Deployment and Implications for Arms Control by Charles A. Sorrels. New York: McGraw-Hill, 1983, 250 pages, $60.00.

As a new weapon in the U.S. arsenal, the cruise missile has understandably and correctly received much attention. Thus, the cruise missile has been featured in numerous newspaper and magazine articles, as well as in a few books. The first two books were published in 1981: Ronald Huisken's historical study, *The Origin of the Strategic*

Cruise Missile and Richard Betts's *Cruise Missiles: Technology, Strategy, Politics.* Last year, two more appeared. One was *The Joint Cruise Missile Project: An Acquisition History*, an analysis of the management of the program; joint-authored by Edmund Conrow, G. K. Smith, and A. A. Barbour, it is the most detailed and best study of the cruise missile thus far in print. The other, Charles Sorrels's large, expensive, and impressive-looking volume is the subject of this review.

Sorrels covers most of the aspects of the current cruise missile in great detail. After a brief introduction, he follows with chapters on the missile's strategic, tactical, conventional, and naval applications, concluding his study with a discussion of the weapon in terms of arms control. The author marshals considerable data from secondary materials, especially congressional sources. He also employs extensive documentation, 55 pages in small type (compared with 179 pages of text), 665 endnotes in all.

Besides its size and expense, the most obvious characteristics of this book are its faults. Although the author touches most topics, he does so with questionable balance. Sorrels's longest chapter (almost one-third of the text and notes) discusses nuclear theater forces, while his chapter on strategic applications receives only about half that space, about the same as that devoted to arms control. In addition to this problem, Sorrels frequently loses the cruise missile in his treatment of other topics. For example, his chapter on strategic issues is more about bombers and air defenses than about cruise missiles; similarly, his monster, sixty-page chapter on theater issues does not deal with the cruise missile for thirty-six pages. These imbalances and digressions may lead some readers to question the title of this book. Furthermore, important issues are left unclear. Sorrels's topical organization, focusing on function, obscures crucial points, for example, that cruise missile technology evolved into a related, albeit varied, family of weapons. Likewise, the role of the Joint Cruise Missiles Project Office, which managed that technology, is largely missing. Sorrels provides no genuine conclusion to his study; he simply ends abruptly with a summary of the last chapter. Overall, his text cries out for editing: the uneven treatment of topics and the mass of data provided will probably overwhelm and confuse the average reader.

Viewed positively, *U.S. Cruise Missile Programs* contains some good chapters (e.g., those on conventional and naval applications as well as the one on arms control), is a useful compilation of secondary materials, and attempts to put the weapon into context. On the negative side, it is an overpriced, underedited rehash of secondary sources, terribly out of balance. Both views are accurate. Potential readers must decide which view is more relevant to their needs. General readers will find the textual content difficult and of less use than will some specialists.

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Conventional Deterrence by John J. Mearsheimer. Ithaca, New York: Cornell University Press, 1983, 296 pages, $29.50.

Attacking a question of fundamental importance, *Conventional Deterrence* produces less insight than its author promises. Typical of other books produced in this age of academic overthink, John Mearsheimer's book is a passable doctoral dissertation reinforced by two worthwhile articles on NATO defense and on the role of technology in conventional warfare in the 1980s. As a coherent development of a single idea—that the outbreak of war is related to the operational doctrine of the attacker—there is less to this book than meets the eye.

Largely on the basis of his analysis of the differences between Allied and German strategies in 1939 and 1940, Mearsheimer argues that the prospect of attrition will inhibit an attacker but that the expectation of blitzkrieg will prove irresistible. He acknowledges that the attacking armed force must have the military capability to make blitzkrieg work, but he argues that the evaluation of risk ultimately rests more on political factors than short-term net assessments. Although Mearsheimer protests that his theory is based on his study of "all the principal large-scale conventional wars of the past fifty years," he finds many reasons to narrow his sample to the Western Front of World War II and three Arab-Israeli wars. Crudely put, if the war doesn't involve large numbers of tanks, it isn't a war—a definition that reveals Mearsheimer's real interest, namely, the likelihood of a NATO-Warsaw Pact conventional war on the inner German border. His conclusions on this hypothetical war, which largely follow General Sir John Hackett's *The Third World War: August 1985* (1980), are supportable, but they produce the heavy-handed rummaging into the past that one might expect of a political science graduate student tutored by unrestrained advisors.

There are flaws aplenty in Mearsheimer's research model, historical examples, and general theory. He virtually ignores the calculations that occurred in assessing air control over the battlefield. He mixes his categories by confusing strategic ends and means; he argues, for example, that attrition and blitzkreig exist as forms of "total war" as opposed to a strategy of limited war for the conquest of territory. Attrition and blitzkreig, assuming that they can really be precisely differentiated, are optional ways to break an enemy's will by reducing his military capability. They are dependent variables driven by war aims that may be either total or limited, depending on the degree of revolutionizing damage one yearns to do to the opposing state. The author does have a pertinent point to make: that a decision for war really depends on the role of one or two hardy souls who are willing to accept risks that their general staffs find unacceptable. Bureaucratic politics, not strategic theory, is the firmest foundation for conventional deterrence, which is largely a function not of one's fears of the enemy but, rather, of self-deterring awareness of one's own weaknesses. In sum, one can share Mearsheimer's optimism for deterrence in Europe but arrive at that conclusion by a different reading of his historical evidence.

What is truly distressing is that Mearsheimer's already published articles (which appear as revised chapters in the book) suggested that the author would produce an original, thoughtful investigation of the dynamics of nonnuclear land warfare in the twentieth century. Given the book's crude methodology and pretentious theorizing,

however, *Conventional Deterrence* appeared well before its time and carries with it all the dissatisfactions of raw wine. Perhaps the author will study the work of Richard K. Betts, Barry Blechman, Stephen S. Kaplan, Alexander George, and Klaus Knorr to first get his research model right. Then he may truly make the annihilating intellectual breakthrough his panzers of the mind do not deliver in this book.

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Ballistic Missile Defense edited by Ashton B. Carter and David N. Schwartz. Washington: Brookings Institution, 1984, 455 pages, $32.95 cloth, $12.95 paper.

Since the early Cold War years, American military strategy has depended on some variation of deterrence, which essentially has meant discouraging the Soviet Union from attacking the United States by convincing her leaders that any such aggression would bring overwhelming retaliation from America's nuclear ICBMs, bombers, and submarines. In a deterrence strategy, national security ultimately is upheld by offensive, rather than defensive, weapons. Near the end of a 23 March 1983 speech on military spending, President Ronald Reagan questioned this long-standing strategy. "Wouldn't it be better to save lives," the President asked, "than to avenge them?"

The President's speech, together with the publication in 1982 of *High Frontier: A New National Strategy* by Lieutenant General Daniel O. Graham, USA (Ret), raised an issue largely ignored since the Safeguard controversy of the late 1960s: the possibility of a national defense against ballistic missiles and other strategic weapons. The resulting ballistic missile defense (BMD) debate of the 1980s has revived such questions as whether an effective BMD could be built, how it would affect military and diplomatic policy, what it would cost, and whether it would fuel a defensive arms race.

Ballistic Missile Defense is a collection of essays intended not to answer these questions and thereby resolve the BMD issue but, rather, to serve as an introduction and guide to this complicated subject. Two chapters, for example, will be helpful to readers who want a basic explanation of the technical intricacies of BMD: Stephen Weiner's discussion of "Systems and Technology" and Ashton Carter's of "BMD Applications: Performance and Limitations." Although *Ballistic Missile Defense* represents many points of view and has no single thesis, its chapters leave the collective impression that a ballistic missile defense would improve national security but must overcome enormous technical challenges.

The collection also considers the future of the Anti-Ballistic Missile (ABM) Treaty of 1972, a corollary issue to the BMD debate. President Richard Nixon claimed that the ABM Treaty "stopped what inevitably would have become a defensive arms race, with untold billions of dollars being spent on each side for more and more ABM coverage." In contrast, President Reagan has never expressed such enthusiasm for the treaty. Although he said in his 23 March speech that any United States efforts in BMD development

would be "consistent with our obligations under the ABM Treaty," the reality is that a viable BMD program runs counter to the premises of the treaty. It is therefore likely that the treaty will draw increasing criticism within the Reagan administration if the President's strategic defense initiative continues its momentum. Most analysts agree that a vigorous BMD effort is impossible under the ABM Treaty; the issue to be argued is whether the United States should be content with the agreement, seek modifications of it, or abrogate it. The last chapter of *Ballistic Missile Defense* offers a spectrum of opinion on the treaty, ranging from the view expressed by Spurgeon M. Keeny, Jr., that the end of the ABM agreement would "be a high price to pay for a technological will-o'-the-wisp" to the contention of William A. Davis, Jr., that the Soviet Union welcomed the treaty as a "generous offer to freeze ABM deployment while it had an opportunity to catch up in ABM technology."

The chief weakness of *Ballistic Missile Defense* is its documentation. The book is intended as an introduction to a controversial issue, and the editors should have included a bibliographical essay, directing readers to sources and perspectives beyond those offered within. Some of the chapters are well documented by footnotes; others are not. A bibliographical essay might have organized, by topic, both the works cited in the footnotes and other recommended sources.

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American Military Space Policy: Information Systems, Weapon Systems and Arms Control by Colin S. Gray. Cambridge, Massachusetts: Abt Books, 1982, 128 pages, $28.00.

Colin Gray's book is a clarion call for immediate U.S. action to enhance its national security through development and deployment of space-based antisatellite (ASAT) and defensive satellite (DSAT) weapons. *American Military Space Policy* is dedicated to help clarify the issues and to end the misperceptions surrounding the national debate over strategic defense policy. Underlying the entire effort is Gray's assertion that prior to President Reagan's now famous "Star Wars" speech of 23 March 1983, the United States lacked any policy of strategic defense. The President's speech focused the debate and provided a much needed "strategic vision," which offers a point of departure for a policy pull rather than a technology push for weapons development. Further, Gray believes, the speech offered new hope that the United States can escape the potentially deadly doctrine of mutual assured destruction (MAD) and begin to pursue a plan of national survival by putting defense back into the nation's defense posture.

The author argues that the United States must move quickly to develop the capability to defend itself against attack. Such a system, because it elevates the uncertainties surrounding a nuclear exchange, would enhance the doctrine of deterrence. He asserts that the national strategy of MAD is no longer valid—if it ever was—and that should

deterrence fail, it would "fail deadly." Without a capability and strategy for defense, the United States would suffer incalculable losses in the event of nuclear war. The Soviets have only grudgingly adhered to the notion of MAD; they have worked steadily to develop a warfighting nuclear arsenal and strategy. As a result, Gray believes, we may once again be entering a period where the defense could prove to be a stronger form of warfare than the offense.

Simultaneously, Gray points out, technological break-throughs have given the United States the ability to construct a viable ASAT and DSAT capability. Although Gray discusses ballistic missile defense briefly, the thrust of the book is clearly with ASATs and DSATs. He asserts that to delay building such a system while awaiting a more technologically sophisticated capability would be a grave error. Gray says that we can "what if" ourselves into a continuing paralysis of indecision and inaction as we dream about future technologies. He argues that space is not a sanctuary. The militarization of space has been ongoing almost since the outset of the space age, and the arms race in space is now in full swing. Both the United States and the Soviets rely on space-based military assets that perform a variety of missions. Some of these assets are today vulnerable to attack. The Soviets have had an operational earth-based ASAT capability since 1971, and the United States is currently engaged in initial tests of its newly developed ASAT system. For both the United States and the Soviet Union, the loss or severe degradation of certain space-based assets could have serious implications for the outcome of any conflict between them. Because of our heavy reliance on space systems, we must take measures now to ensure that we can defend those assets and take out Soviet space systems if war should occur. We must not permit the Soviets an unchallenged access to space. Gray says that "military conflict in space is not a matter for U.S. policy choice today— the choice has already been made."

American Military Space Policy is short, concise, and easily read. It is a must for anyone who is serious about following the current and upcoming national debate on strategic defense and the weaponization of space. It is a serious effort to address the deadly important subject of national defense in the space age. Gray emphasizes the need for developing a clear sense of policy direction and guidance. As a nation, he asserts, we must develop an unequivocal sense of the threat and then devise a policy to guide technology development. He argues that "notwithstanding a quarter century of space experience, the U.S. today remains confused as to what its space policy should be, how it should think about the military uses of space, and how military space activity may affect national military policy as a whole."

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Arsenal: Understanding Weapons in the Nuclear Age by Kosta Tsipis. New York: Simon and Schuster, 1983, 342 pages, $16.95.

This book is described on its dust jacket as being written for the "interested nontechnical reader." Its author, Kosta Tsipis, clearly intends to provide such a reader with an introduction to the science and technology behind modern strategic weapon systems. He discusses the principles of nuclear physics, the effects of nuclear weapons, missiles and guidance systems, theories of nuclear strategy, cruise missiles, ballistic missile defense, antisubmarine warfare, and verification of arms control pacts. In a generally readable style, *Arsenal* provides useful data for current debates.

The author is a scientist and serves on the Board of Directors of SANE. It is worthwhile to note the level at which the book is actually written. A reader who has delved into virtually no science since freshman physics in college can follow the main text with little trouble. The footnotes contain additional material that generally will defeat the same reader, while some of the appendixes are thoroughly daunting. Thus, given a certain basic knowledge, one has a choice of levels to select when reading.

It is fortunate that Tsipis makes few attempts to deal with history. The account of the political events leading to the development of the atomic bomb is barely adequate. The cavalier dismissal of strategic bombing in World War II is unhistorical.

When he comes to the discussion of the weapon systems themselves, the author's skepticism about space weapons for ballistic missile defense does not seem to extrapolate the technology very far. His discussion of missile guidance and the question of accuracy is likely to provoke dispute. But the environmental impact statement for a nuclear war deserves credit for its balance and for its avoidance of overblown statements.

Most Air Force officers are likely to know much about the technology of these weapon systems or at least a fair amount about some of them. Nevertheless, for an educated general reader, *Arsenal* can be recommended.

One final point: the dust jacket proclaims that Tsipis did not get a security clearance so as to avoid submitting his text to the process of security review. The harried intelligence officer can take consolation in knowing that this book will not tell a Soviet scientist anything which he does not already know.

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Last Aid: The Medical Dimensions of Nuclear War by the International Physicians for the Prevention of Nuclear War and edited by Dr. Eric Chivian et al. San Francisco: W. H. Freeman, 1982, 338 pages, $19.95.

Seventy-two top physicians from twelve nations collaborated to create this book, which has received considerable attention on American campuses and is used as a supplemental text in nuclear medicine at Harvard, City College of New York, Mount Sinai, and Army War College. In the estimation of these physicians, nuclear war is the most serious present threat to human life.

Last Aid details the effects that a nuclear war would have

on the world. These would include not only many deaths, many severe injuries, and much property destruction but also such long-range aftereffects as the degradation of the stratospheric ozone layer, changes in climate, contamination of the food chains, insect population increases, and crop failures. Humans who escaped initial injury would probably experience such other misfortunes as increases in all communicable diseases, grave complications for fetuses exposed to radiation, and a variety of psychic injuries. The very young and the elderly would be most vulnerable to residual radioactivity that would remain for a long time. These and other human problems would be complicated greatly by the destruction of many medical facilities and by casualties among medical personnel.

In personal conversation with Dr. Eric Chivian, I learned that this book has been printed in Italian and Japanese and is likely to appear soon in German, French, and Spanish. So far, it has not been printed in Russian, although its basic message has been discussed on Soviet television. The physicians who contributed their assessments concentrated on thermal, blast, and psychic injuries in a nearly uninhabitable postnuclear world; their conclusions and the underlying theme of *Last Aid* echo President Reagan's April 1982 statement: "A nuclear war cannot be won and must never be fought."

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Nuclear Weapons and the American Churches: Ethical Positions on Modern Warfare by Donald L. Davidson, Chaplain (Major), USA. Boulder, Colorado: Westview Press, 1983, 208 pages, $20.00.

For centuries, the Christian churches have wrestled with the letter and the spirit of the biblical injunction attributed to Jesus: "You have heard that it hath been said: An eye for an eye, and a tooth for a tooth. But I say to you not to resist evil, but if one strike thee on thy right cheek, turn to him also the other." (Matthew 5:38-39) In a world so often at war, how literally did Jesus' admonition (from the Sermon on the Mount) have to be applied? Did that imperative concern just individuals, or did it apply as much to nation-states?

Through the ages, various Christian churches have responded differently to the challenge of that and similar biblical texts. Indeed, the Christian tradition accommodates historical pacifism and the crusades. Those interested in searching the scriptures and in exploring the records of Christian international conduct will discover some astonishingly divergent traditions and beliefs.

Chaplain Donald Davidson does not seek in *Nuclear Weapons and the American Churches* finally to resolve the question of whether the Christian can serve as soldier. Rather, Dr. Davidson explores the positions taken by the major Christian churches on the basic issues raised in and by the nuclear weapons debate. He examines such issues as nuclear disarmament and reductions, the nuclear freeze proposal, deterrence considerations, first-strike possibilities, and unilateral disarmament. An instructor on the

faculty of the U.S. Army War College, Dr. Davidson's own position is that the Christian churches' "... current crusade against nuclear weapons is not wholly realistic, and at times it appears that they would sacrifice justice and security for peace." (p. 194)

Much of this book is based on the churches' response to a letter sent to their main offices by Chaplain Davidson. His discussions offer little new in the way of biblical exegesis or theoretical understanding, but doing so is not the author's purpose. Rather, his book is a compilation of the churches' attitudes toward nuclear issues. Chaplain Davidson contends that "the most serious deficiency in church positions is the lack of correlation with the international political-military context. Most of the denominations renounce U.S. nuclear weapons as if they were an abstraction. The churches refer only briefly, if at all, to Soviet weapons or the balance of forces in Europe. There is little or no discussion of the Soviet 'gulag' or of Soviet actions in East Germany, Hungary, Czechoslovakia, Afghanistan, or Poland." (pp. 182-83)

Chaplain Davidson indicates that the Catholic Church seems to have studied the nuclear issue in remarkable detail, evidenced by the American Catholic Bishops' recent pastoral letter. But even among American Catholic intellectuals, such as William J. O'Brien, Gordon Zahn, Michael Novak, Archbishop Raymond Hunthausen, William F. Buckley, Bishop John O'Connor, and many others, there is widespread disagreement. Similar quarrels beset the faithful in other churches, most of which have yet to examine the nuclear issue in great detail. Except for the established peace churches (e.g., the Quakers), all Christian churches—and Jewish bodies as well—seem unclear and uncertain about the desperately troublesome issues raised by nuclear weapons.

This is a useful book, offering a good bibliography and helpful charts of the churches' positions. The brief historical discussion of the just-war doctrine is succinct and sound. There are odd stylistic errors, such as misspellings of fairly common words, inconsistent typesetting, flawed English usage, and abnormal punctuating. However, these do not detract from what is a well-done compilation of church positions. Those interested in the ethical issues of nuclear weaponry will find *Nuclear Weapons and the American Churches* a helpful source.

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Soviet Decisionmaking for National Security edited by Jiri Valenta and William Potter. London: George Allen and Unwin, 1984, 319 pages, $40.00 cloth, $18.50 paper.

This volume is the finest work to appear on the Soviet military since the appearance of Derek Leebaert's edited work, *Soviet Military Thinking*, in 1981. Unlike many edited works, which are often idiosyncratic collections of diverse and tangentially related works, Jiri Valenta and William Potter's volume is a well-conceived and integrated discussion of a single topic, systematically and signifi-

cantly enriching our understanding of the vital subject of Soviet defense decisionmaking.

A number of the chapters are especially worthy of mention. Arthur Alexander provides a useful model of the flow of the decisionmaking process, with especially interesting emphasis on the different processes at work at different levels of decisionmaking. Vernon V. Aspaturian develops a sophisticated and detailed analysis of the nature of the Stalinist system as it evolved through five distinctive stages. The tremendous influence of Stalin on the process emerges clearly from his analysis. Dimitrii Simes stresses the development of "controlled pluralism" in the Soviet Union, while Jerry F. Hough maintains, contrary to Aspaturian, that Stalin created an elaborate defense process with broad participation in decisionmaking. Ellen Jones argues that the policy goals of the top leaders drive military research and development. Raymond L. Garthoff argues, as elsewhere, that the Soviet military played an important role in SALT negotiations and that SALT, in turn, has had a major impact on Soviet military decisionmaking. Jiri Valenta demonstrates, convincingly in the case of Czechoslovakia and less clearly in the case of Afghanistan (partly through a lack of data), the relevance of the bureaucratic policy model to decisionmaking. Galia Golan provides an interesting analysis of the 1973 Yom Kippur War with emphasis on the key role of détente and the dilemmas facing the Soviet leadership. Dennis Ross demonstrates quite impressively the potential applications of pluralism to the Soviet process. Perhaps the best single essay, by Stephen Meyer, includes an excellent review of applicable models and trenchant critique of the shortcomings of the existing literature. William Potter concludes the volume with a stress on the nature of policy sequences.

Overall, *Soviet Decisionmaking for National Security* adds considerably to the current state of the art. It highlights the problems, as stressed by Meyer, of too much descriptive work and too little analysis that has testable conclusions and comparative features. While the problems with data and analysis remain considerable, this collection of insightful readings advances the level of discussion of the Soviet decisionmaking process.

Dr. Jonathan R. Adelman
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The Soviet Union Today: An Interpretive Guide edited by James Cracraft. Chicago: Bulletin of the Atomic Scientists, 1983, 348 pages, $9.95.

The Soviet Union Today: An Interpretive Guide is a most unusual book. It is not quite a reference manual, not quite a handbook. It is a very brief but rather multifaceted introduction to the vast complexity and enigma that is the contemporary Soviet Union. It consists of twenty-six chapters, most of them by recognized authorities in their fields, on history, politics, the armed forces, geography, the economy, science and technology, the cultural scene, and society. In the main, the quality of the work is very good, and the book is enormously useful in that it brings together in one short volume a variety of subjects and expertise not

easily found in so convenient a form. The chapters themselves are both remarkably brief and astonishingly informative. As no specialist in the Soviet Union can be qualified in all that is addressed here, the volume is likely to be as useful to specialists as to others, perhaps more so.

I found David Jones's chapter on the Soviet military and Loren Graham's chapter on science and technology to be especially informative and interesting. Mikhail Tsypkin presents a fascinating account of the life of the conscript in the Soviet armed forces. Vladimir Kresin writes in a rare fashion of his own experiences inside the Soviet scientific establishment. However, Irwin Weil's sprightly description of the cultural scene is misleading: Soviet cultural life is simply not so lively as he presents it, at least not the official part of it, which is the part that he describes. One of the most interesting chapters is that by Geoffrey Hosking on "village prose" (the *derevenshchiki*) and the politics of publishing. He concentrates on the editorial lines of two journals in particular, *Nash sovremennik (Our Contemporaries)* and *Druzhba narodov (Friendship of Peoples)* which might be described briefly without much exaggeration as Russian nationalist and Soviet chauvinist, respectively. James Cracraft summarizes imperial Russian history chiefly through presenting the conflicting views of Richard Pipes and Alexander Solzhenitsyn, as good a device as any for covering ten centuries in ten pages. The nationalities crisis, one of the most complex and provocative Soviet problems today, is summarized effectively by Ralph Clem. Nina Tumarkin describes the Lenin cult; and Stephen Cohen deals with the Stalin question. Also included is a description of the KGB (anonymous author).

Some chapters of *The Soviet Union Today* are disappointing, but most are not; and it will be a rare reader who does not find something of value in this volume.

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Caviar and Commissars: The Experiences of a U.S. Naval Officer in Stalin's Russia by Kemp Tolley. Annapolis, Maryland: Naval Institute Press, 1983, 289 pages, $21.95.

Caviar and Commissars is a truly pleasant surprise. Since it is advertised as the memoirs of a U.S. naval officer who served as assistant naval attaché to the Soviet Union from 1935 to 1944, one might expect a tome filled with endless passages on various embassy functions set in a superficial history of the Soviet Union in World War II. Happily, this is not the case. Instead, the book is an exciting, educational, and insightful work by an extremely intelligent, perceptive, and sensitive man. As a result, it is of great value to both the historian and the general reader.

The scope of this account is extremely ambitious, dealing with the wartime Soviet Union. The book's greatest asset to the historian is that it is based almost totally on Kemp Tolley's experiences and is supplemented at times with vignettes from his contemporaries. Fortunately, Tolley is a man who knows good history, realizing that he should relate and analyze only what he saw. His major contribution, then, is that he provides not only the views of the U.S. Embassy during the period but also insights on the

personalities of various key figures. Some of these perceptions are truly unique and valuable. For example, Tolley's impression of W. Averell Harriman was that the Ambassador was more hawkish toward the Soviet Union than most accounts report. Likewise, the author reports candidly on the mood of Americans in Moscow. The White House was thought of as "Kremlin West," reflecting the frustration of those administrators of the lend-lease program who felt that the United States was too conciliatory toward the Soviets. Some vignettes are extremely valuable. For example, Tolley so skillfully relates an incident in which Stalin insulted Churchill at a banquet in August 1942 that the reader is made to realize all the nuances and results of the occurrence. Similarly insightful are his discussions about the rivalries and feuding among embassy personnel, as well as about the embassy's views of occurrences in the Soviet Union. Among these observations, some are particularly noteworthy. For example, Tolley indicates that embassy personnel had uncovered information that a key motive behind the Soviet Union's intention to support the creation of Israel was to alienate Great Britain and the United States from the Arab world.

Tolley is equally masterful in his vignettes on the Russians. He begins by noting that Americans have been going to Russia for two centuries; most have returned "disillusioned, sometimes bitter, even if belatedly wiser." With a Russian wife and years of experience in traveling throughout the Soviet Union, Tolley is excellently prepared to discuss his subject. He notes that, "The Soviet Union and its people should be approached warily, subjectively, keeping in mind that a white skin sometimes conceals a Mongol or Tartar or trans-Caucasus mentality that does not function in the Kansas fashion." While Tolley often talks in generalities (and generalities can be misleading), his perception and vast experience produce some significant insights on Russian attitudes ("they are infuriatingly overbearing to inferiors and cringingly servile to supposed superiors"), on military life ("along with being decoration-conscious, the Russian is also extremely rank-conscious"), on prejudice (the fact that the ex-serfs are still looked down on leads to their "fear of authority, subservience to seniors, suspicion of the unusual and of outsiders"), and on a host of other aspects of the Soviet Union. The accounts of his impressions of Murmansk, Archangel, Moscow, Baku, Komsomolsk, and other Soviet cities in wartime are masterful and of great historical significance.

A final value of the book pertains to the author himself, who obviously loves life and people. Quick, perceptive, and shrewd, Tolley is a writer who can assess the human condition accurately. His views on the Soviet Union, on the Russians, on women, and on diplomats are as educational as they are entertaining. Those in the highly managed U.S. Armed Forces of today may well look with envy on the great freedom Tolley enjoyed, the significant events he witnessed, and the masterful way that he conveys it all to the reader. In sum, *Caviar and Commissars* is both serious historical material and entertaining reading.

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Communist Nations' Military Assistance edited by John F. Cooper and Daniel S. Papp. Boulder, Colorado: Westview Press, 1983, 201 pages, $20.00.

This very useful and timely book fills a major gap in a key area. In fact, given the intensity of the debate which has raged in this country in recent years over the extent and goals of Soviet/communist involvement in the Third World, it is indeed surprising that "military assistance programs of the communist bloc countries have not been systematically studied." (p. xi) *Communist Nations' Military Assistance* is aimed at filling this gap and does so to a notable degree. It should be in the library of any serious student of communist affairs and will be of particular interest to those specializing in Soviet policy toward the Third World.

As might be expected in any edited work, the quality of the seven contributed articles varies, although an introduction and a conclusion by the editors help to pull the strands of thought together. Daniel Papp's article on "Soviet Military Assistance to Eastern Europe," while of general interest to anyone working on Eastern Europe, is of peripheral value for this book. Trond Gilberg's article on Eastern European military assistance, on the other hand, provides a wealth of information. Despite its superficiality, this account should convince those who see the Warsaw Pact as a monolithic organization that important differences exist between Moscow and some of its allies in the area of military assistance, as in so many others. John Cooper's piece on Chinese military assistance serves not only to underline the limited scope of China's program but also to draw attention to the key role that the Sino-Soviet dispute plays in this area. Likewise, W. Raymond Duncan provides a useful overview of Cuban involvement in the Third World. Finally, Douglas Pike's piece on Vietnam and Nack and Rose Ans's article on North Korea provide the first analyses of the role of these countries in such programs. Unfortunately, the latter article is far too short and passes over a number of key questions.

The most important article in the collection is Roger Kanet's piece on the role of Soviet military assistance in the Third World. Kanet argues that Moscow's foreign military assistance has four primary goals: to undermine the West, to increase the Soviet political/military presence in the Third World, to provide support for its allies, and to earn hard currency. The last factor is often overlooked in the West. In addition, Kanet shows how Moscow's policy on military assistance has gone through a number of stages and what its potential influence might be on future political/military events in the Third World.

The major weakness of the Kanet article—indeed, of the book as a whole—is that it tells the reader little about the dynamics of communist aid programs. It is one thing to note that Moscow has had a number of successes and failures; it is another to describe or analyze the dynamics of the process. For example, Moscow has provided fairly extensive amounts of aid to Peru in recent years, often providing weapons at bargain prices. However, the Soviets also have tried to use this relationship to their own advantage by threatening to cut off the supply of spare parts when it appeared that Peru might perform "unfriendly" acts. Sim-

ilarly, in another sphere, Kanet acknowledges the impact of military assistance on Soviet domestic politics, but he does not really provide any insight into the process itself.

Nevertheless, at least to a certain degree, these criticisms may be unjustified. The editors do not claim to have written the authoritative work on the subject, and it is clearly impossible to deal with all of the details of Soviet military assistance in one book, let alone in a single article. Hopefully, future works will provide in-depth analyses of the dynamics of military assistance programs in the Soviet Union and other communist nations. Such studies will be more difficult and time-consuming, but building on the foundations laid in *Communist Nations' Military Assistance*, they should significantly enhance our understanding of this vitally important but neglected component of Soviet/communist foreign policies.

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Beating the Fascists? The German Communists and Political Violence, 1929-1933 by Eve Rosenhaft. New York: Cambridge University Press, 1983, 273 pages, $39.50.

The Communist party of Weimar Germany has a long-sustained image as a monolith: an organization constrained in behavior and policies by a rigid orthodoxy imposed from Moscow and, at best, marginally relevant to German conditions. Eve Rosenhaft's revisionist work, by stressing German communism's susceptibility to grass roots initiatives, not only critiques this stereotype but is a significant challenge to the currently dominant manipulative model of German history. Rosenhaft argues that elites on the left, as well as the right—Communist leaders, as well as Junkers, bureaucrats, and officers—could find themselves trailing in the wake of rank-and-file initiatives.

Rosenhaft presents German Communists' initial acceptance of political violence in the 1920s as, in large part, reactive, illustrated by their desire to extend the party's influence vis-à-vis the Social Democrats in those Berlin working-class neighborhoods where violence was already an endemic response to hard times and Nazi penetration. At the same time, Communist theoreticians asserted the role of organized mass violence as a means of smashing the Weimar system and inaugurating the revolution. However, by encouraging "mass terror," the Communists achieved something significantly different. The battle for Berlin's streets and taverns was waged in neighborhoods: social communities whose structures and attitudes antedated Communist interest in them. The warriors were not committed revolutionaries. Neither ideologues nor *Lumpenproletariat*, they were by and large outsiders: men who consistently expressed a sense of grievance, of having been unjustly brought low by the economic hardships of the interwar years. Many held physical jobs whose performance required group cohesion: construction or transportation work. Others, adolescents or young adults, belonged to street gangs and youth clubs on the margins of the law. They emerge as virtual mirror images of the SA men described in Conan Fischer's *Stormtroopers*—a 1983 work that should be read in conjunction with this volume.

The politicization of such groups and individuals was, at best, shaky. The Communist party might have encouraged a paramilitary mood and an enhanced technical efficiency. However, the campaigns that it organized against the National Socialists tended to become struggles for turf instead of preludes to revolution. They were localized actions that depended essentially on personal and small-group initiatives: "individual terror," defensive in nature, with no more than short-term prospects for success. In this context, Rosenhaft's critique of Communist policies for bringing militant workers into an ongoing, hopeless conflict with Weimar's police and courts seems misplaced. The absence of violent resistance to the Nazi takeover reflected less the proletariat's premature exhaustion than its limited will to pursue positive revolutionary action—a limitation that Rosenhaft in *Beating the Fascists?* refuses to concede but cannot explain away.

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War in the Modern Great Power System, 1495-1975 by Jack S. Levy. Lexington: University Press of Kentucky, 1983, 215 pages, $24.00.

War in the Modern Great Power System, 1495-1975 is an admirable effort to lay a foundation for the quantitative study of the frequency, duration, extent, magnitude, severity, and concentration of wars. Jack S. Levy, an assistant professor of government at the University of Texas at Austin, intends to build similar quantitative studies on it and hopes that other scholars will do the same. Military personnel and military historians not inclined toward the quantitative approach will nevertheless find much value in this study because it assembles a wealth of information about the nature of warfare and offers many sound judgments about that information.

Levy's sound judgments begin with his emphasis on the importance of the great powers in understanding the causes and nature of war. Previous statistical studies of war, particularly those of J. David Singer and Melvin Small as set forth in *The Wages of War, 1816-1965: A Statistical Handbook* (1972), have usually surveyed war in general without differentiating the role of the great powers from that of the other states of the international system. Levy believes that the role of the great powers demands special attention.

Not the least of the book's values to all students of war is its consequent definition of what constitutes a great power and its list of the states that are or have been great powers at various times since 1495. While necessarily emphasizing the plentiful resources and especially the military capabilities possessed by states deserving to be ranked as great powers, Levy pays special attention to the criterion that a state must be able to threaten others or to influence security affairs in the international system as a whole to be a great power. It is not enough that the state cannot be conquered by others. It is for this reason that the United States through most of the nineteenth century is not usually considered, and is not counted by Levy, as one of the great powers,

notwithstanding the economic resources of the country and the military strength that it mobilized in the Civil War.

Having carefully defined what constitutes a great power, Levy takes similar pains to develop an accurate list of wars throughout the extended time span of his coverage, to indicate which were great-power wars and to define and measure each of the characteristics of warfare listed in the first sentence of this review. The data that he compiles will challenge several familiar generalizations. For example, the eighteenth century before the French Revolution has often been described as an era of frequent but limited wars. Levy's evidence indicates that it was a time of relatively infrequent war in contrast to the sixteenth and seventeenth centuries, but that its wars tended to be more serious in their effects than those of the two preceding centuries, especially in terms of the number of battle-connected deaths of military personnel.

It comes as less of a jolt to prevailing interpretations that the nineteenth century was the most peaceful of Levy's five centuries in terms of the frequency of wars and by and large in terms of other criteria as well. While the twentieth century has witnessed a rise in the frequency of wars, our century has still not returned to the frequency level of the eighteenth century, let alone that of the warlike sixteenth and seventeenth centuries. But in regard to severity and similar criteria of the seriousness of wars, the twentieth century, not surprisingly, exhibits disconcerting tendencies.

Levy's ultimate purpose is to help counter those disconcerting tendencies. More immediately, he hopes to move on to apply his findings about wars among the the great powers to balance-of-power theory, which focuses on the great powers, to enhance understanding of both the causes and the nature of war. Such larger and ongoing aims aside, Levy offers a useful book for all who would better understand modern war.

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Surprise Attack: Lessons for Defense Planning by Richard K. Betts. Washington, D.C.: Brookings Institution, 1982, 318 pages, $24.95.

Half a loaf is better than none. However, it is sad when the whole loaf is not delivered, particularly when the oven is hot, the ingredients are ready, and the baker is expert. Such is the case with Richard Betts's new book, *Surprise Attack*. The first five chapters (roughly half of the entire book) form an excellent discussion of military surprise, including salient examples and the reasons that surprise is achieved. The second half of the book is a less-than-inspiring, rather pedestrian attempt to relate the previous discussion to the current world situation, particularly in Europe.

The focus of Betts's first-half efforts is sudden "surprise" attacks that start wars. His analysis is built around detailed examinations of eight case studies: the German attack on the West in 1940, the attack on Russia in 1941, Pearl Harbor, the invasion of South Korea, the Chinese attack on

United Nations forces in Korea, the 1956 Sinai campaign, the so-called Six Day War in 1967, and the so-called October War in 1973. Betts also includes an analysis of the Russian invasion of Czechoslovakia in 1968, which did not begin a war but serves as an effective connection to the second part of his study.

These five chapters are well worth reading. Betts is informative, interesting, and often brilliant in his observations. In essence, he argues that there is no such thing as a true surprise attack. In each case examined, although surprise was achieved to one extent or another, warning signals and signs were clearly present and often noted by the "surprised" party. Betts discusses with great clarity how surprise is achieved. However, the overriding theme of his analysis seems to be that surprise is most often caused by the surprised party's refusal to believe the warning signs that are almost always clearly visible. No one wants to believe that an attack is about to occur, that time and options have run out, that efforts for peace have failed, and that reason must succumb to force.

The lessons of Betts's analysis for current defense policy and planning are painfully clear and require little elaboration for the reasonably informed reader. Unfortunately, the second half of the book goes to great lengths to elaborate on the obvious, raising one's suspicions that the author intended to write a scholarly treatise on surprise attack but was told by an editor or publisher that such a book would not sell unless it was related directly to the current world situation. The shame is that the first-half analysis could have been both broader and deeper. For example, it would have been interesting to investigate intrawar surprise attacks and to compare their elements with those of attacks that began wars. Several of these intrawar surprises come quickly to mind: the Battle of Midway from both the viewpoint of the Japanese attempted surprise and the American "ambush" begs for Betts's analysis, as do the Russian counterattack at Stalingrad, the Normandy invasion, and, more recently, the Tet offensive.

It may be more helpful to critique the work that Betts produced than to speculate about a book that the author did not write. The first half of *Surprise Attack* is brilliant but incomplete; the second half is competent but unneeded. Read the first half—it will be well worth your time. Slices from this half loaf contain considerable wisdom.

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Psychic Warfare: Threat or Illusion? by Martin Ebon. New York: McGraw-Hill, 1983, 282 pages, $15.95.

Research on psi phenomena (telepathy, precognition, clairvoyance, and psychokinesis) has elicited fervent devotion as well as intense scorn. Do these phenomena exist? Do they necessitate novel metaphysical or metapsychological explanations? Can they be harnessed for peace or for war?

Psychic Warfare: Threat or Illusion? answers none of these questions. It simply recounts anecdotes that may be attributed to psi phenomena, demonstrates U.S. and Soviet

interest in them, and hypothesizes military applications. The question posed in this title is not asked until page 199 of a 219-page text (excluding notes, references, an appendix, and index), and it is never answered. Martin Ebon may be trying to present an evenhanded, "objective" approach, or he may be simply using his book title as a neat come-on. I suspect the latter for several reasons.

First, Ebon does not tell the reader the scope, purpose, or intended audience of the book. Second, he frequently pads it with trite, repetitious text, e.g., "What is one to do with a new word, a big word, . . . whose meaning is both weighty and vague? One can't ignore it; one has to try and understand it—particularly if such a word is being bandied about in the special world of psychic phenomena, covering a spectrum from the earth-shaking to the dubious." (p. 98) Third, there are glaring contradictions. For example, the Petukhov papers, which *may* have contained classified Soviet research on page 11, *do* so on page 18. Fourth, Ebon's penchant for presenting unevaluated information and then musing on its potential military applications is a rhetorical device commonly used to titillate the reader into suspending critical judgment. After all, why would the author speak about applications if the phenomena themselves were invalid? Therefore, the phenomena must be valid. Fifth, Ebon's language contains "hot" images rather than "cold" reasoning. Do Soviet researchers really have more "gusto" than Americans? (p. 204) Sixth, the author has included a bibliography lacking anything published in American psychology texts, some of which is quite supportive of psi phenomena, e.g., Stanley Krippner's *Advances in Parapsychological Research* or Benjamin B. Wolman's *Handbook of Parapsychology*. Ebon did manage to include a column by Jack Anderson and an article from the *National Enquirer*.

No one—true believers, unbelievers, or the "open-minded"—will find support in this book for his or her views on psi phenomena. However, *Psychic Warfare: Threat or Illusion?* does support the literary views that Ebon attributes to Soviet psychologists W. P. Zinchenko, A. N. Leontiev, B. M. Lomov, and A. R. Luria. These authorities state that popular writings on psi phenomena are ". . . frequently of a promotional nature . . . feeding unstable elements searching for a scientifically inaccessible, mysterious origin . . . [and exploitive of] the general public's quite natural curiosity about the unanswered secrets of the human psyche."

Ebon states that psi phenomena may support the goals of President Reagan's "Star Wars" speech. Instead, I suggest that they may support Ebon's desire to rise to media stardom. As of this writing, there have already been newspaper editorials and articles on *Psychic Warfare*. The talk-show circuit is sure to follow.

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A History of Blitzkrieg by Bryan Perrett. New York: Stein and Day, 1983, 296 pages, $17.95.

A History of Blitzkrieg is a well-written account that mainly covers familiar ground. Bryan Perrett describes the development of the technique of blitzkrieg during World War I, and he follows that discussion with a useful survey of the degrees to which each of the major military powers adopted the concept and organized the necessary force structure to implement it in the interwar years. As might be anticipated, the Germans receive the highest marks. Then the author analyzes blitzkrieg in action in Europe, North Africa, and the Far East during World War II, as well as in the Arab-Israeli clashes of 1956, 1967, and 1973. Airpower advocates will appreciate Perrett's recognition of the vital role of tactical air power in such operations.

For many readers, the most interesting part of the book may be the discussion of General William Slim's 1945 campaign in Burma. This provides a corrective for those who think of World War II in the Far East only in terms of the American effort in the Pacific. Perrett ably depicts the scope and nature of operations in Burma, which was highly suitable for armor; and he describes Slim's campaign as "the last pure application of the [blitzkrieg] technique" in the war.

It is generally understood among military analysts that the strategic essence of blitzkrieg lies in the indirect approach designed to throw the enemy off guard, while tactically the operation features a deep penetration led by armored forces around the centers of resistance with the objective of a quick, decisive victory. In the Foreword, General Sir John Hackett cautions against a literal definition of blitzkrieg as "lightning war," since "it is not through instantaneous, but in sustained action" that success is achieved. Perrett adds further limitations to a definition when he explains that the desert war waged by Rommel does not qualify as blitzkrieg "since each side fully understood the other's technique and although each in turn suffered defeats, these never approached the proportions of a rout." One may ask whether these results were a matter of understanding Rommel's technique or of being fully aware of his posture and plans through such intelligence as Ultra, which, surprisingly, Perrett never mentions. More important, these limitations by Perrett suggest that the term *blitzkrieg* is applicable only if the operation is overwhelmingly successful—a curious definition.

The final chapter, which envisions a possible future war in central Europe, seems out of character in a historical account of blitzkrieg. Perrett believes that a Soviet blitzkrieg could drive through Germany but that it would be repulsed with tactical nuclear weapons before the desired quick victory could be achieved. At that point, he foresees the possibility of a Soviet withdrawal before the war escalated to total nuclear holocaust.

There are some careless errors in the maps: Operation Compass in North Africa was in 1940, not 1941; the Normandy offenses were in June-July 1944, not 1941; it is the Orne, not the Orme, River; and on the map showing the German drive to the sea in 1940, the Albert Canal is erroneously located.

The text of the volume is enhanced with a number of photos that enable the reader to gain some visual sense of blitzkrieg. Overall, however, although the author offers useful insights into the history of blitzkrieg, there is little here that is new. With its limited documentation and bibli-

ography, *A History of Blitzkrieg* will be primarily of use to the general reader unfamiliar with the subject.

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A Matter of Honor: General William C. Westmoreland Versus CBS by Don Kowet. New York: Macmillan, 1984, 317 pages, $16.95.

Don Kowet makes a major contribution in this altogether fascinating look at the process of making the documentary "The Uncounted Enemy: A Vietnam Deception," which was aired by CBS television in January 1982. The status and number of key personalities involved; the power and influence of CBS News; the complex, arcane, and highly uncertain process of wartime intelligence-gathering and estimating; and the raw nerves still unhealed from the Vietnam War—all combine to make the libel case lodged by General William Westmoreland against CBS one of the most significant cases of its kind in many years. *A Matter of Honor* is the best work yet on the documentary and helps advance our knowledge of news media practices, methods, and standards. At its best, *A Matter of Honor* provides the reader with an account of how television documentaries are made, depicting how deadlines, techniques, pressures, personalities, political intrigues, doubt, bedlam, and numerous other factors combine to produce the final result. Chapters nine onward are particularly interesting, providing Kowet's strongest evidence and condemnation of the CBS system which permitted such a producer as George Crile to pursue the conspiracy theory to the degree that he lost objectivity and balance.

But wait! Does not Kowet, at least on occasion, stoop to the tactics that he has accused others of using? He launches a carefully orchestrated attack on the character, capabilities, mental stability, and professionalism of not only producer George Crile but also "paid consultant" Sam Adams, while remaining openly sympathetic to General Westmoreland. He accuses Crile of "coddling" friendly witnesses and claims that Adams was "obsessed" with tracking down the conspirators who manipulated intelligence estimates for political reasons. General Westmoreland, on the other hand, was "an American Caesar," who had taken refuge in his retirement "bunker" in South Carolina, occasionally coming forth to speak in defense of his role in the Vietnam War. According to Kowet, he suffered a "star chamber" proceeding at the hands of Crile and "Mike Malice" (Kowet's designation for Mike Wallace).

Like almost everything associated with "The Uncounted Enemy," *A Matter of Honor* since its publication has generated its share of controversy. It, too, has been tainted by charges of distortion and invention. After surveying the book, CBS accused Kowet of reporting as quotations "more than 100 conversations without actually talking to any of the employees involved." In a rather weak defense, Kowet maintains that he was able to "recreate" certain conversations reported in his book by using other sources and documents. (*Time*, 7 May 1984, p. 92) His acknowledgment of these fabrications, however, damages his credibility and detracts from the book's potential for becoming the definitive work on the preparation of "The Uncounted Enemy."

The military reader will be both fascinated and incensed by *A Matter of Honor*. It stirs old feelings about the role of the press in reporting the Vietnam War and raises questions in the mind of the reader regarding some of the key individuals involved. Who or what was it that made many analysts within the Military Assistance Command, Vietnam (MACV) intelligence apparatus believe that a cap had been placed on estimating total Vietcong and North Vietnamese Army strength figures? Why did General Westmoreland endure the questions from Mike Wallace after it became obvious that the interview was becoming an "ambush"?

Obviously, Kowet's account is not the "last word" on the Westmoreland-CBS controversy. There is still much more to be revealed as General Westmoreland and CBS vie in court with key witnesses placed under oath. Until then, Kowet's book can fill an important gap, both increasing our knowledge and provoking further thought about this interesting and controversial subject.

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American Leadership in World Affairs: Vietnam and the Breakdown of Consensus by Ole R. Holsti and James N. Rosenau. Boston: Allen and Unwin, 1984, 301 pages, $28.50 cloth, $9.95 paper.

It is now standard wisdom that the underlying Cold War consensus, built on the doctrine of containment, was destroyed by the Vietnam War and that we have been floundering without such consensus since the beginning of the 1970s. Kissingerian détente had shallow roots and never flowered. The Carter administration suffered grievously from inability to develop and articulate a coherent basis for foreign policy that would restore consensual support. Many reasons and speculations have been posited for Carter's failures, but it is clear that the Reagan administration, for all its exalted rhetoric, has been no more successful in forging this illusive consensus.

Now two prominent political scientists with backgrounds in research methodology have attempted to verify Vietnam's role in the breakdown of foreign policy consensus among America's leadership elite. Through an exhaustive survey questionnaire mailed to a cross section of "leadership elite," first in 1976 and again in 1980, the authors strive to amass systematic data to document what has previously been surmised.

The issues addressed fall into three clusters of questions: First, what was the impact of Vietnam on beliefs of leaders, and have these views persisted with passing of time? Second, what are the cleavages today, and how do they cut across various societal lines? Finally, are things different in the early Reagan administration from what they were during the Carter and Ford years?

The authors' rather complex conclusions make *American Leadership in World Affairs* a difficult and not an engaging work. Mainly, the book will appeal to specialists

or to professors who would like to assign their advanced political science students an exercise in methodological analysis. The study does have merit, but personally I find the earlier speculative/argumentative approach toward subjects of this type more provocative than this form of "scientific analysis." *American Leadership in World Affairs* is an academic text, and the general reader will not find it inspiring.

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Military Leadership: In Pursuit of Excellence edited by Robert L. Taylor and William E. Rosenbach. Boulder, Colorado: Westview Press, 1984, 253 pages, $25.00 cloth, $15.00 paper.

Leadership, like virtue, means different things to different people. The collection of readings presented in *Military Leadership: In Pursuit of Excellence* provides the leadership theorist, researcher, and practitioner with a broad range of well-selected perspectives on directing and influencing the behavior of people. In this stimulating anthology, twenty-two contributors from different areas of expertise present a series of insightful writings on key leadership issues. Reading this volume provides one with a thorough understanding of the leadership process and the elements of leadership.

The work consists of four parts. Part one emphasizes the individual nature of leadership. It stresses leadership as a necessary component of individual and organizational effectiveness. Correctly, the authors state that leadership is a match between the person and the situation; more often than not, the situation is described in terms of a crisis. The message is clear: there is no more serious crisis than war (or the threat of war). Thus, the need for leadership in military organizations has always been a central concern. Although not all leadership situations can be termed as crises, they, too, can present significant challenges to the leader.

Part two addresses the dilemma of leadership and management. Here the writers suggest that managers focus on doing things right, while leaders focus on doing the right things. Editors Robert L. Taylor and William E. Rosenbach make clear the different concepts of leadership and management. However, within the context of the military, both leadership and management are necessary for success; we cannot afford to emphasize one to the exclusion of the other. To achieve the complex mission objectives of today's military environment, a special combination of leadership and effective management is needed.

A key assertion in part three is that leadership cannot be static. The authors contend that the military is more complex in both form and substance than ever before. However, the personal qualities necessary for successful leadership today and in the future are quite similar to those fundamental and basic attributes embodied by leaders of the past. Among the key ingredients essential to positive leadership today are the abilities to solve problems, make decisions, take risks, envision, manifest a sense of humor, maintain a positive self-concept, and embody integrity. The leader makes demands, challenges the status quo, shakes things up. A leader must stir our blood, not appeal to our reason. The leader's purpose is to focus on their people's hopes and ambitions, to define these in simple terms, to inspire, and to make what followers already want seem attainable, significant, and achievable. This section of the book makes a key point: although both leaders and managers begin as trained specialists, only those who are creative generalists emerge as leaders.

Part four asserts that the chance to fail must be given leader candidates. If leadership is a developmental process, then we must allow our people both in the classroom and on the job to test their skills and gain confidence through experience. Absolute perfection at every step in one's career is an unrealistic expectation, particularly true in light of the complexities characterized by the military environment today. Another central theme in this final part of the book emphasizes effective leadership as primarily an achievement of the followers; therefore, followership deserves much more consideration than it often is afforded.

To turn the pages of this excellent book is to be reminded once again of the continuing importance of leadership study at all levels throughout the military establishment. *Military Leadership: In Pursuit of Excellence* should have a strong appeal to anyone with a serious interest in the study of leadership.

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AWARD

The Air University Review Awards Committee has selected "The Israeli Strike against Osiraq: The Dynamics of Fear and Proliferation in the Middle East," by Lucien S. Vandenbroucke, as the outstanding article in the September-October 1984 issue of the *Review.*

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