AIRPOWER JOURNAL

SPRING 1988

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AIRPOWER JOURNAL

SPRING 1988, Vol. II, No. 1 AFRP 50-2

EDITORIAL

Blinders, Too, Are Made of Leather

THE *Airpower Journal* has followed with interest and some concern the issue of leather flying jackets, career irritants, flyers' bonuses, and pilot retention. The depth and breadth of concern can be discerned in the numerous letters from the field published in periodicals and newspapers oriented toward the military services.

Much of what we hear and read tells us that additional duties, staff assignments, and educational requirements are driving our flyers out of the service. Many letter writers express the feeling that these "peripheral requirements" are counterproductive and that being the best possible aviator is what will win wars. Understandably, these officers want to remain at the "pointy end of the spear." However, it is time to consider how we make effective use of that spear and to understand that its use is dependent on more than how well we fly.

Operations may be at the heart of military success, but that is not the same thing as flying an aircraft or even leading a flight of them. Those who serve at the "pointy end" are unquestionably vital to military success, for what good is a blunt spear? But there is an equally vital requirement for those with the broader knowledge of where and when to point that spear and when to thrust and when to parry. Those who currently spend their time honing the edge of the blade must also realize that attainments far beyond this are required for comprehensive success in war and that superior technical skill is not the only qualification for high or even necessarily middle rank.

For those who can see no validity for rated officers in these thoughts, we have arrived at the crux of the problem. At issue is whether one will remain an aviator-specialist or take on the broader responsibilities of the professional senior officer. The argument is with those who would remain in service if only they did not need to learn anything beyond flying (crewing) an aircraft, if they could just be spared the drudgery of staff assignments and the frustrations of educational endeavor, and yet still be assured of promotion to higher rank.

Herein lies a real threat to an effective military force. One's magnificently flown aircraft may win an engagement (perhaps more than one) yet be bested in the campaign; an aggressively led tactical unit may prevail in a battle but not necessarily win the war. An effective military force requires leaders possessing highly developed strategy and campaign-formulating talent. Where are these leaders to come from? From those whose long career experience has been that of a specialist in the cockpit and whose expertise is tactical at best?

Increased responsibility and higher military rank are secured by expanding beyond the narrow confines of a specialty to the broader requirements of a profession. Acceptance of broad responsibility, mental flexibility, and intellectual (as well as physical) preparation are the entry requirements to that realm—and all that just for a chance at achievement. Most will not make the successive cuts.

If you seek high rank and broad operational responsibility, you must commit yourself to additional duties, educational requirements, continuous study, and expansion beyond the cockpit; if you do not so aspire, "dual-tracking" is another discussion. The nation relies on its well-seasoned, broadly educated (not trained), and holistically oriented military leaders to win its wars by adeptly orchestrating the efforts of all the specialties and specialists. The decision about which road you take is yours. KWG

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WRITE ON, COLONEL HALL

After reading your Fall 1987 journal, I was delighted to see that someone else is concerned about military customs, courtesies, and professional relations ("Shortchanging Our Young Officers: Military Traditions Denied," by Lt Col Stephen C. Hall).

As a recruiter with the ANG, I also have an additional duty as an NCO Preparatory Course instructor. I too have noticed that our young airmen want more military in their lives and feel that military traditions have lost some importance.

In past classes, students seemed to take particular enjoyment in "USAF Customs and Courtesies" and an incredible amount of interest in "The NCO Professional Relationships." Our young airmen want to use terms of address and to be professional when dealing with superior enlisted and officers.

"Shortchanging Our Young Officers" brought to light the fact that officers don't always know the correct response in professional military environments. Our young enlisted are in the same situation and feel that traditions should be stressed more.

I agree with Colonel Hall when he states that military members are bound by shared customs, courtesies, traditions, and military discipline. I also feel that these areas should be expanded in PME courses.

More exposure to junior officers and airmen about proper conduct, discipline, and professional relations will add to and improve the professional arena that we all work in.

If personal development is as important as I have read, then I feel we owe young officers a better professional upbringing. How about a little "Re-Bluing"?

TSgt Roger M. Beardsley, Oregon ANG
Portland, Oregon

I have just finished reading Colonel Hall's excellent article "Shortchanging Our Young Officers" in the Fall 1987 issue and would like to comment on a couple of his ideas. As a company grade officer, I am keenly aware of many of the problems he cited. While I'm fortunate enough to work for a senior officer who has "taken me under his wing," I've had the opportunity to look back over the three years since my commissioning and analyze some of my training deficiencies.

To put it simply, it appears that the 12 weeks I spent in Officer Training School were devoted mostly to the mechanics of management. And having just completed Squadron Officer School by correspondence, I was amazed that the block devoted to officership was one of the smaller sections.

I must, however, confess a bit of confusion. What, exactly, is the difference between "officership" and "leadership"? It's not clear that they are separate subjects, yet we continually treat them so. I once listed the traits that would be necessary to be a good officer and the traits that would be necessary to be a good leader. The columns were identical. And looking at the enlisted leaders I have known and followed (I'm prior enlisted), I found that the traits I admired in them were listed in the "leadership" column.

Thus, I submit we are confusing the issue if we continue to speak of "officership" and "leadership" as two separate areas as if the traits of each were separate and uniquely identifiable. In the final analysis, people follow an individual, a human being, not a rank. I realize this sounds a bit like heresy. Please understand, I do not argue against rank structures; they are obviously necessary. I do, however, argue that attempting to lead from rank alone is the most ineffective, and the least desirable, situation. History is replete with examples of people attempting to lead by the sole virtue of rank and failing miserably. Rank does not automatically confer upon me the ability of leadership. I must, as an officer, lend credence to my rank through competence, dignity, and trust. If your people don't trust you, they won't follow you; and this usually manifests itself during those times when you give orders that must be carried out on "trust" alone. This holds true for leaders at any level.

How then do we better prepare our company grade officers and officer trainees? Colonel Hall is right in that the education process must be dynamic, occurring on a daily basis. But I believe

some immediate changes in our formal training programs would go a long way toward providing the education we need.

More emphasis should be put on the study of military history—all military history. It not only provides examples of how to be good at fighting a war but how to be a good leader too. Whether you're hitting someone over the head with a rock, a sword, or an F-15, certain strategic and tactical principles still apply. Whether you're leading a rifle company or leading flightline maintenance, certain principles of human interaction are still the same. I was particularly surprised to see that works such as Sun Tzu's *The Art of War* and von Clausewitz's *On War* were not formally required reading until Air Command and Staff College. I believe we should have to read these before we even get lieutenant bars.

Formal training in leadership has always been difficult to define, much less achieve. But drawing again from my OTS experience, there are ways. Perhaps the most interesting and useful parts of OTS for me was the Leadership Reaction Course (LRC). It gave us real, if somewhat contrived, situations to deal with. Yet we spent a total of only one full day on it in a 12-week training program. I believe a more extensive version of the LRC, used over the span of weeks on a regular basis, would be beneficial in two ways. First, it would allow instructors to better assess the potential of officer trainees. Second, it would allow our officers in training to better develop and refine their skills under "field" conditions.

Changes such as this would affect the amount of time being spent on communicative skills and management training, but I believe it would be an equitable trade. Since our officers must have a college degree, they should have a reasonable command of the English language. Four years of college English and the time spent at OTS on writing still didn't prepare me for the version of "Air Forcese" used on my installation. Every commanding officer has likes and dislikes, and attempting to second-guess them in a training course is ineffective and time-consuming. A short course on effective writing would probably fill the bill as effectively as the current time-consuming requirements. Learning behavioral models for management (and nominally, leadership) is useful, but it would be far more useful to put them into practice in leadership exercises than to merely discuss their hypothetical effects from a "chalkboard" viewpoint.

Obviously these changes are extensive and would take time to implement. But we should begin the changes now. If we do not begin to correct these errors, we will move further away from the professional dedicated force we must have. It is a move we cannot afford.

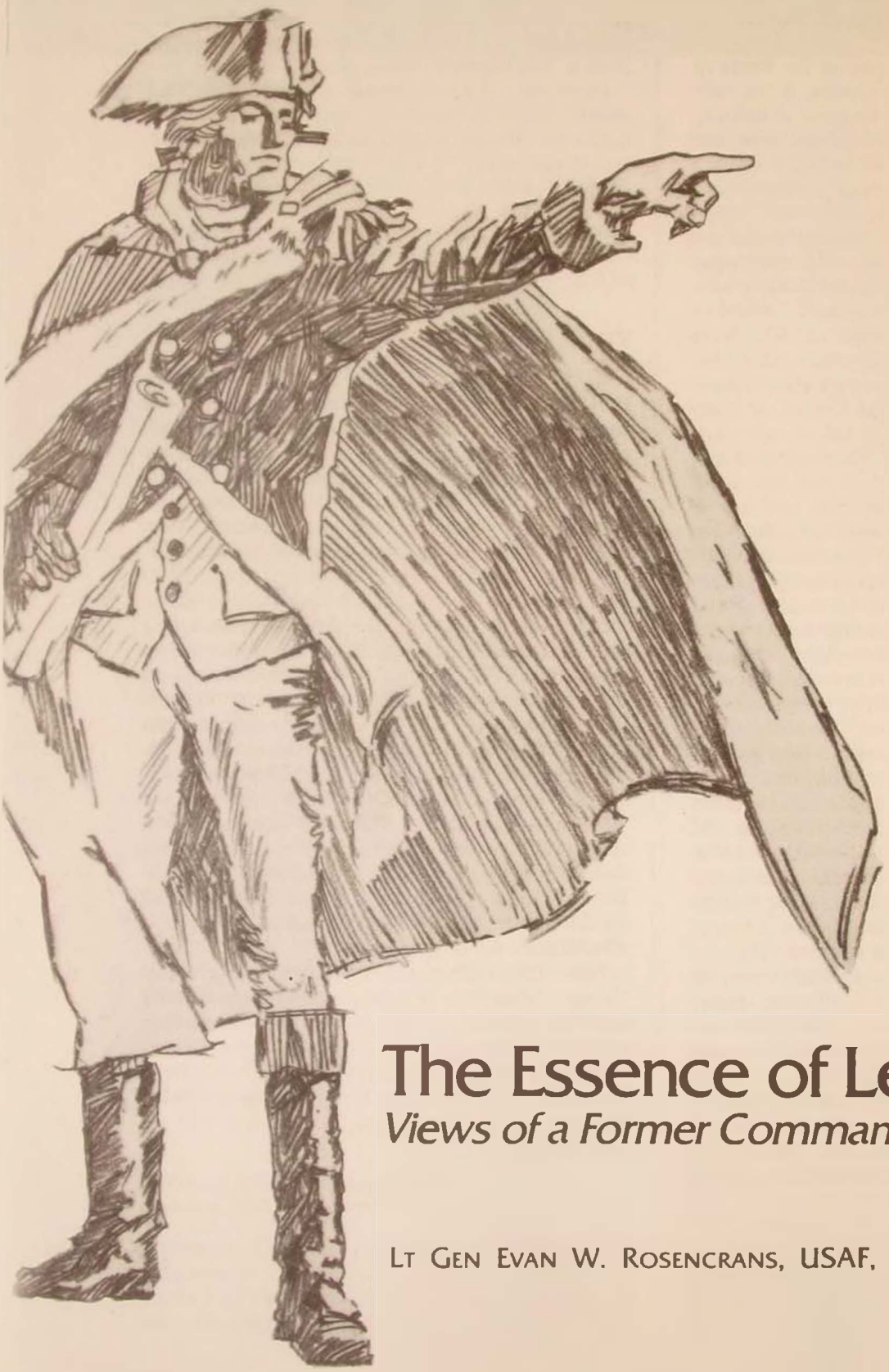
1Lt Michael K. Edgar, USAF
Grand Forks AFB, North Dakota

TITANS AND THE ENLISTED FORCE

Maj Michael A. Kirtland's "End of an Era" in the Fall 1987 edition of *Airpower Journal* did not mention one aspect of the deactivation of the Titan II that will significantly alter the complexion of the missile business. The Titan crew force was made up of both officers and enlisted crew members. There were two officers and two enlisted on every crew. The demise of Titan also ended enlisted jobs on SAC's missile operations crews. Ironically, the same issue of *Airpower Journal* contained the article "Shortchanging Our Young Officers: Military Traditions Denied," by Lt Col Stephen C. Hall, that expressed concern about, among other things, our young officers and their relationship with the enlisted corps. Titan crew duty was an excellent place to develop and learn about officer-enlisted relationships. During my own Titan tours with both the 308th Strategic Missile Wing at Little Rock AFB, Arkansas, and with the 3901st Strategic Missile Evaluation Squadron at Vandenberg AFB, California, I met and had the distinct pleasure of working with some of the very best enlisted missile folks in the business.

Now those professionals are doing other things. Many stayed as close as possible by switching over to Minuteman or Peacekeeper missile maintenance jobs. Others are scattered around the world in a myriad of AFSCs. All have quit wearing their crew blues but their contributions to peace through deterrence will be remembered.

Maj Joseph J. Mulcahy, Jr., USAF
Malmstrom AFB, Montana



The Essence of Leadership

Views of a Former Commander

Lt Gen Evan W. Rosencrans, USAF, *Retired*

*Following is an excerpt from an official US Air Force oral history interview with General Rosencrans that was conducted in July 1984 by Dr James C. Hasdorff of the USAF Historical Research Center, Maxwell AFB, Alabama.**

General Rosencrans's views on leadership and command should be carefully considered by officers aspiring to positions of high authority, as his commonsense approach points up the need for serious thought about and commitment to this important aspect of an effective combat force. General Rosencrans concluded his interview with:

FINALLY, let me address the qualities that I think are necessary in order to be a good leader and a good commander. The first and most important is courage. If you don't have courage, you are never going to be a good commander whatever your other qualifications are. The courage must extend down as well as up. Courage should not be mislabeled loyalty. Although loyalty is a requirement, courage is even more of a requirement.

Second, you must be totally honest. Your integrity must be beyond question at any time of the day or night.

Third, you have to have the ability to see beyond tomorrow. I have met so many colonels who stayed and retired as colonels because they couldn't see anything but what they were looking for tomorrow.

Fourth, we hear a lot about motivation. It's a buzz word. It's kind of like readiness. No one has ever really defined readiness; no one has ever *really* defined motivation except to say it's the ability to get others to do as you wish them to do. What people forget is, you must change the attitude before you motivate. It's attitude that's the key; then motivation will follow.

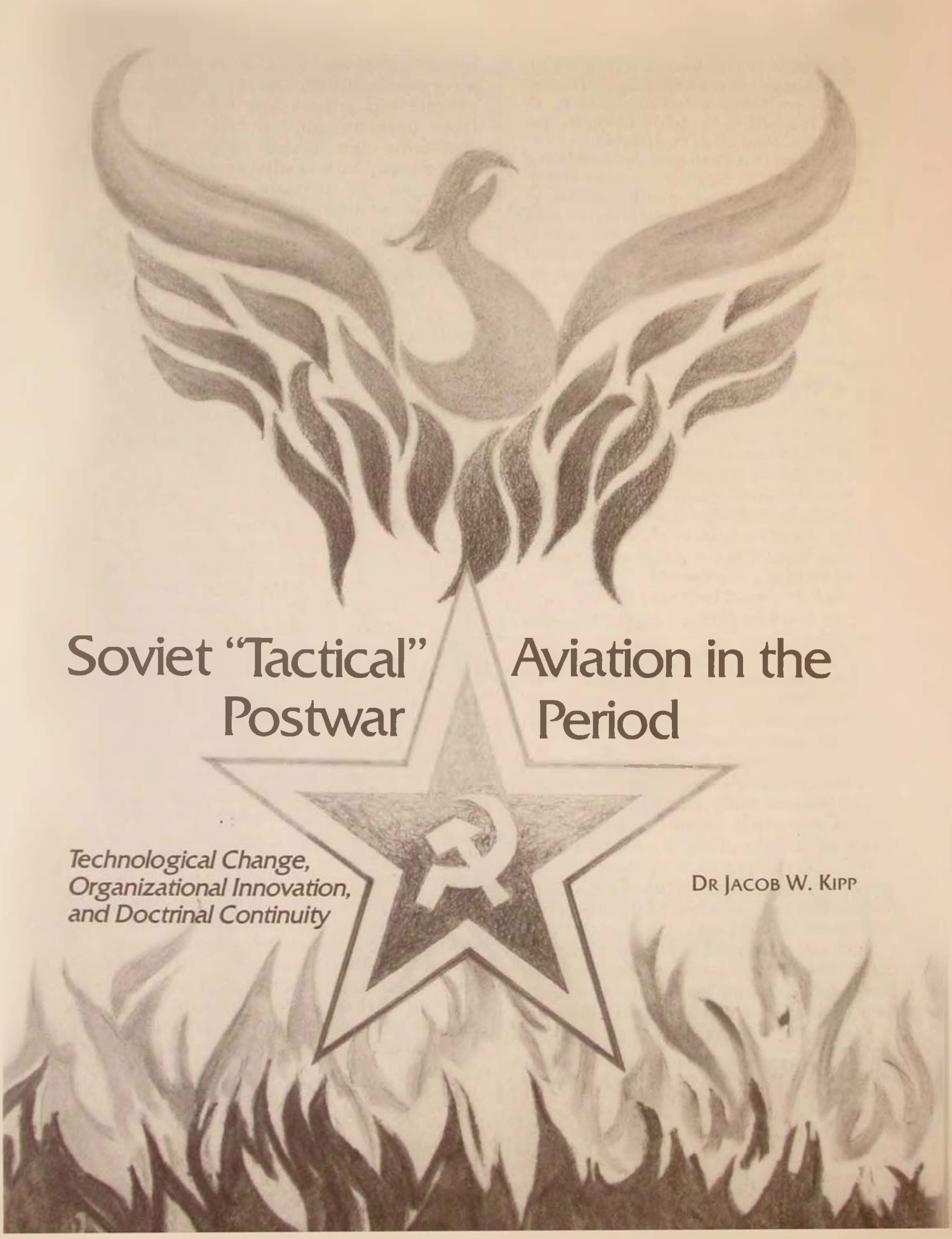
Next, you must realize that no inanimate object ever had a problem; people have problems. Airplanes that are broken don't have problems; people have problems with broken airplanes. Mess halls that don't serve good meals don't have problems; people who work in those mess halls have problems serving good meals. You get everything done through people. This relates directly back to what I said about attitude: get the attitude right, and the problems will take care of themselves because the people are motivated.

Next, never lose control of yourself; never raise your voice; never let the situation control you. Even though it appears to be out of hand, you must always be doing something to change the situation if you don't like it. You must never resign yourself to "that is the situation" or "that is the system and that's how it works." That attitude of resignation will defeat you and defeat your people. You must always be attempting to influence the situation.

Next, you must have a working knowledge of what your people are doing. You are not expected to be an expert welder or an expert aircraft mechanic or an expert supply monitor or an expert cook or anything else, but you have got to know something about all those jobs so that you can discuss them intelligently. You have to discuss them on a personal basis: "What are you doing? Tell me what you are doing and how you are doing it." Let that individual speak to you. When he is speaking to you, that's when you want to have the photographer present, and that photographer takes the picture while that airman or junior officer is speaking to you so that he can send copies of those pictures to his girlfriend and his family and pin it up in the barracks and say, "I told the general." You have got to let him know you are interested in what he is doing. You have got to let him know you know a little bit about it but you want to know more because you are interested in it and it is contributing to the mission. And if possible, learn something about him. If you have worked with a group of people for six months and you don't know something personal about each individual, you are no

Continued on page 27

*USAF Oral History Interview No. K239.0512-1594 with Lt Gen Evan W. Rosencrans, USAF, Retired, 26-27 July 1984, San Antonio, Texas, 146-48.



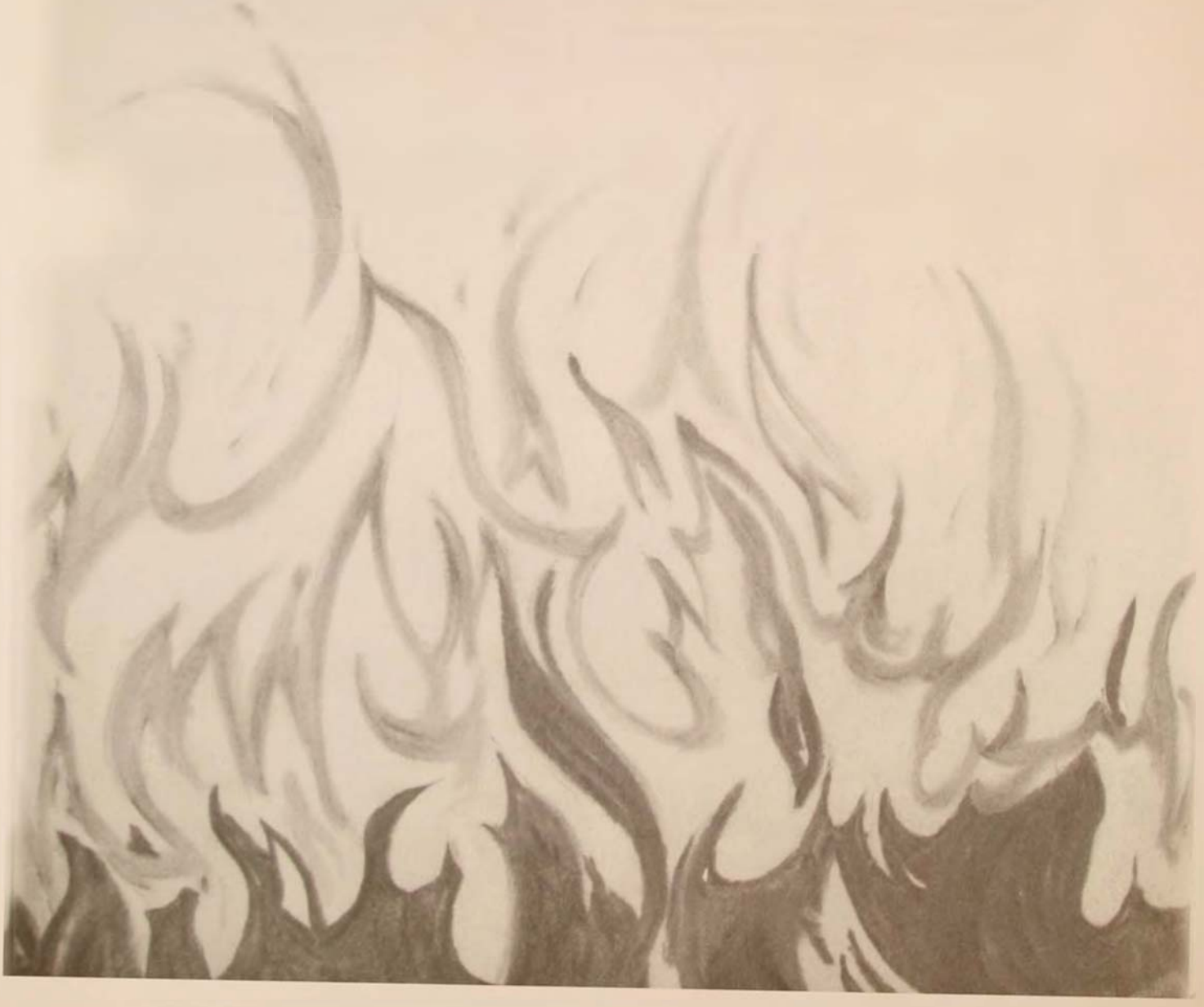
Soviet "Tactical" Aviation in the Postwar Period

Technological Change, Organizational Innovation, and Doctrinal Continuity

Dr Jacob W. Kipp

TO STEAL a title from Von Hardesty's recent fine volume on the Soviet Air Forces in the Great Patriotic War (1941-45), the development of Soviet "tactical" aviation in the postwar period might well be titled "Red Phoenix Revisited." In this case, however, Marx's famous injunction that great historical events repeat themselves as farce seems hardly to apply. The resurgence of Soviet "tactical" aviation in all its forms represents a formidable military capability that has enhanced the Soviet military's ability to conduct theater-strategic operations relying on conventional combined arms. The path to these capabilities has not been a direct one and can best be understood within the context of the development of Soviet military art in the postwar period.

At the same time, it is critical for our purposes to make quite clear the inadequacy of our conventional terms of reference in dealing with the Soviet Air Forces and Soviet military doctrine, which is not a cognate for what we mean when we use the term *military doctrine*. Crucial to our understanding of the postwar military doctrine is to recognize the unique and special role that operational art plays in linking together tactics and strategy within the context of modern war. For the purpose of this study, Soviet Air Forces will be addressed within both the operational and tactical contexts, with much greater emphasis on the former because it is the level of war where aviation has its most decisive impact on ground combat and where the Soviets recognize the need to develop mutual support and inter-



action among combat arms and branches of the armed forces.

The Great Patriotic War

When we speak of Soviet Air Forces, we have in mind a number of units that are structured functionally and that exist in a form of dual subordination to their branch, which provides training, supply and logistical support, and a command authority to control the combat employment of the units. The command authority exercising such control has traditionally identified the air combat unit's operational and tactical subordination. Thus, strategic air reserves have been referred to as reserves of the Supreme High Command (Stavka), which in wartime has meant direct subordination to Stavka control. During the Great Patriotic War, Stavka kept control of Soviet long-range aviation but employed it to support deeper strikes (up to 400 kilometers from the line of contact in multifront operations) rather than using it for strategic bombardment of what the Soviets then referred to as the "state rear." In December 1944, Stavka long-range aviation was reorganized into the 18th Air Army and subordinated directly to the command of the air forces. Under this new arrangement, the 18th Air Army took part in the Vistula-Oder, East Prussian, and Berlin operations, where it carried out strikes in the enemy's operational rear.

Soviet technological problems and an emphasis on missile and artillery development for air defense kept propeller-driven aircraft in the Soviet Air Forces well after World War II. These captured Yak fighters, bearing North Korean markings, are shown shortly before shipment to the United States in late 1950.

"Frontal aviation" refers to air assets directly under the authority of a front commander that are earmarked to strike at the enemy at operational depths. Since the 1930s, Soviet theorists had postulated the need for each front commander to have his own air army dedicated to strikes at operational depths (out to roughly 200 to 300 kilometers from the line of contact). In some operations during the final phase of the war, fronts were assigned two air armies, depending upon the nature of the theater, the depth and nature of the enemy defenses, the importance of the front's strategic axis (axes), and the need to achieve simultaneous suppression of enemy operational reserves.

At the outset of the Great Patriotic War, air assets assigned to close-support missions had been directly subordinated to an army commander, hence the designation "army aviation." Such assets were assigned to carry out missions at operational-tactical depths in cooperation with combined arms formations. These missions included air support, tactical air reconnaissance, tactical airborne landings, and logistical support of mobile groups that were the spearhead of the combined arms formation's advance. Air assets assigned directly to the tactical battle under corps and divisional command constituted "troop aviation." In the 1930s, Soviet corps and divisions had their own light planes for artillery spotting and utility missions. However, during the Great Patriotic War both army aviation and troop aviation were abolished and their assets assigned to the air armies of the fronts. During the war, the Soviet High Command centralized all air assets under the air armies assigned to front commanders. This allowed the front commander, or Stavka representative in the case of multifront operations, to dedicate his air assets to the various mis-

The air defense of the Soviet homeland was considered so important that the first MiG-15s were given to air defense units. The MiG-15 shown here carries US Air Force markings. It was flown for test purposes after its capture in 1953.

sions throughout the depth of the enemy's defenses according to his operational design.[1]

This centralization facilitated the massed employment of aviation assets on the most decisive axes in any operation throughout the depth of the defense. Developed in theory before the war and put into practice during the second period of the Great Patriotic War, this "air offensive" reached full maturity in the third and final period of the war when it was employed with great effect during the Belorussian, Jassy-Kishinev, Vistula-Oder, East Prussian, Berlin, and Manchurian operations.[2] Only in the 1960s did army and troop aviation reappear, this time in conjunction with the development of rotary aviation.[3]

Roughly speaking, there have been four distinct periods of doctrinal development since 1945, during which the composition, organization, and structure of Soviet Air Forces underwent considerable changes. By the 1980s, aviation in all its manifestations had recast operational art. Then Chief of the General Staff N. V. Ogarkov wrote in 1982 that "the air sphere in combat actions and operations has acquired an ever-growing role, which gives to modern operations a three-dimensional, deep character."[4]

The path to this present situation contained its own share of twists and ironies. That same path also offers some clues relating to the further development of Soviet Air Forces and their roles in operational art and tactics.

The Immediate Postwar Period, 1945-54

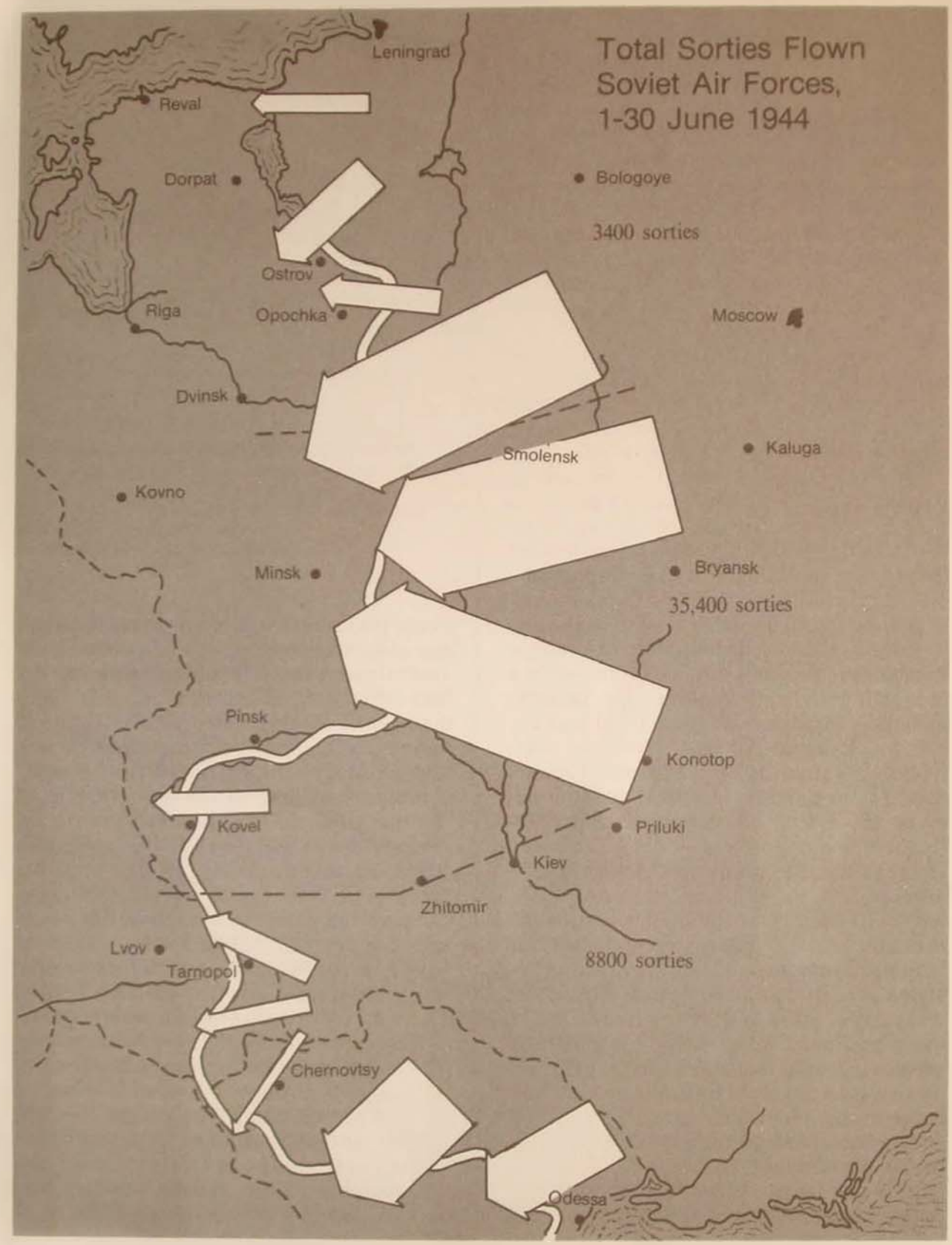
This period found the Soviet Union in a most difficult situation regarding the development of tactical aviation. On the one hand, Soviet frontal aviation in the form of its air armies had proven to be a most effective instrument in the final period of the Great Patriotic War when it was applied as part of a combined arms force to multifront, successive deep operations in Eastern Europe and Manchuria.[5] Air doctrine incorporated the basic assumptions outlined in A. N. Lapchinsky's *Vozdushnaia Armiia* (*The Air Army*) of 1939, but it stressed the centralized control of air assets to ensure the optimal application of air power during the air operation throughout the depths of the enemy's operational defenses. The air instruments of that combined arms team were fighter, ground-attack, and medium-bomber aircraft. These aircraft reflected a maturity of design and an optimization of existing technology adapted to the East European theater of operations. The emphasis was upon ruggedness, dependability, and sustainability.

On the other hand, the pace of technological changes and the emergence of the cold war forced the Soviet leadership into a major reconsideration of the composition and structure of its air forces. Although Soviet aeronautical specialists had foreseen the development of jet propulsion in the prewar period, the Soviet aircraft industry was in a difficult situation when jet-propelled aircraft made their combat appearance with the Luftwaffe.

The development of Soviet jet aircraft in the postwar period followed a three-stage process. The Soviets initially relied on captured German engines to power first-generation jet aircraft that were hardly more than the airframes of propeller aircraft adapted to the new engines. Then came the production of British Nene jet engines under license. Finally, the engine design bureaus of Klimov, Mikulin, and Liul'ka began to produce Soviet engines for a generation of fighters, fighter-bombers, medium bombers, and strategic bombers.[6]

Hand in hand with the development of jet technology went a structural reorganization of Soviet Air Forces in the immediate post-

Soviet emphasis on ground support during World War II is clearly seen on this map by the number of sorties flown in support of the army during June 1944.


Total Sorties Flown
Soviet Air Forces,
1-30 June 1944
Leningrad
Reval
Dorpat
Bologoye
3400 sorties
Ostrov
Riga
Opochka
Moscow
Dvinsk
Smolensk
Kaluga
Kovno
Minsk
Bryansk
35,400 sorties
Pinsk
Konotop
Kovel
Priluki
Kiev
Zhitomir
Lvov
Tarnopol
8800 sorties
Chernovtsy
Odessa

war years. The appearance of atomic weapons and the emerging geostrategic competition with the United States brought with it renewed interest in long-range aviation. Soviet Air Forces were again divided into frontal aviation and long-range aviation. The former was by far the numerically larger force, organized into formations and units reflecting functional specialization—bomber, attack, and fighter aviation—as well as a general category of "aviation of special designation" that embraced reconnaissance, transport, medical, and utility aviation.[7]

Although Soviet interest in long-range aviation remained a feature of aviation development over the next four decades, the Soviets never developed an enthusiasm for strategic bombing as the most effective means for the delivery of deep strikes against the enemy's state rear. In part, this was a result of the geostrategic situation confronting the USSR, which made forward basing to support such strikes impossible. The low priority for strategic bomber aviation also had its roots in several other factors. First, serious consideration of strategic bombardment only came at a time when a competing delivery system (the ballistic missile) had already appeared and was under development. Second, given the commanding authority of the Soviet General Staff in formulating military art and science, there was no independent institutional voice to promote or to champion strategic bombardment as a definitive element of national military posture. Finally, we should note that the Soviet acquisition of atomic and then nuclear weapons did not lend itself to nuclear "fetishism" in the late 1940s or early 1950s. Atomic bombs, while weapons of mass destruction, could not be mass produced. Even keen American observers believed that the military impact of these weapons would be limited to strategic bombardment for an indefinite period.[8]

The Soviets responded to the US atomic threat by reorganizing their air defenses. During the Great Patriotic War, Soviet air defense forces had been organized into four

The Su-17 Fitter (right) represents about half of the Soviet fixed-wing ground-attack aircraft and has been in service for some time. The newest generation of ground-attack aircraft is the Su-25 Frogfoot, which has been used with helicopter gunships for coordinated ground attacks in Afghanistan.

fronts (the Western, Southwestern, Central, and Transcaucasian) and six armies. In 1946 these were reorganized into air defense districts. At the same time, a commander of Soviet National Air Defense Forces (PVO Strany) was appointed. He was immediately subordinated to the commander of artillery of the armed forces of the Soviet Union. This relationship reflected the fact that tubed artillery still represented the dominant weapon of air defense. In 1948, however, PVO Strany became an independent branch of the Soviet armed forces. United under its command were interceptor aviation; antiaircraft artillery (AAA); and the Ground Observation Service, which included radar units, ground observers, searchlight units, barrage balloon units, and other specialized forces. The entire country was divided into border and interior regions. In this period, the conduct of air defense actions in particular regions came under the direction of the commanders of the various military districts.[9] The importance of air defense of

The Soviets learned a great deal from US use of helicopters in Vietnam. Early transport versions were upgraded by adding rocket pods for ground attack, such as on this Mi-8 (Hip-F).

deep targets was reflected in the decision to turn the first production MiG-15s over to air defense units and in the shift from point defense toward an integrated national system that was designed to inflict heavy losses on invading bombers through integrated and sustained attacks. General Lieutenant M. M. Kir'ian has referred to this effort as "the organization of the air defense operation."[10] While this did not mean that the air defense of ground forces disappeared from Soviet military art, it did mean that top priority in the development of combat means and methods went to the defense of the state rear from the US strategic bomber threat. Development of surface-to-air missile (SAM) weaponry received a high priority owing to this particular threat.

All of these developments in the field of aviation took place at a time when the Soviet General Staff was reformulating its notions of strategic operations conducted by multiple fronts in a theater of military actions. The most crucial element to this process of working out the means of conducting strategic offensives was the digestion of the lessons learned during the Great Patriotic War itself. The emphasis was on mutual support and cooperation among all branches of the armed forces in the achievement of decisive results. The most important changes in operational art in the immediate postwar period were a determination of the need for deeper strikes into the enemy defense and an accelerated pace of advance, which was to be achieved by the total mechanization of all ground combat arms and the further development of airborne forces.

In the initial phase of a future war, frontal aviation was expected to win the battle for command of the air over the most decisive offensive axes and to set the stage for a breakthrough and exploitation on the ground, which would end with the encirclement and destruction of the opposing forces. The air offensive was divided into two parts: preparation and support. The former consisted of preliminary air strikes against the enemy's most powerful installations and air assets with the objective of paralyzing the defense and gaining command of the air. Just prior to the start of the ground operation, the focus of the air preparation would shift to direct attacks on enemy defensive positions timed to coincide with the friendly artillery preparation, the objective being to disrupt and destroy the enemy's system of fire throughout the depth of the defense. Once the breakthrough had been achieved, air units were to be redirected to provide support for the advancing forces.[11]

Thus, the immediate postwar period saw the Soviets try to fit a technologically advancing aviation into their basic design for successive deep operations. The Soviets did, however, acknowledge new missions for aviation in strategic bombardment employing atomic and later nuclear weapons and in the development of an integrated system of national air defense. As a result of the condition of the national economy, the need for immediate demobilization, and the appearance of other competing needs for research and development funding, frontal aviation was modernized at a much slower pace than existing doctrine and military art required. This period came to an end in 1953 with the death of Joseph Stalin and the appearance of the first generation of nuclear weapons, which made possible the production of weapons of truly mass destruction and set off a search for means and methods of employing such weapons.[12]

The Scientific-Technical Revolution in Military Affairs

The death of Stalin and the emergence of nuclear weapons inaugurated within the Soviet military the second period of postwar doctrinal development and a profound ferment over the implications of the new technologies of strategic destruction and delivery. For roughly a decade, Soviet military theorists associated with the General

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Staff viewed this nuclear-rocket revolution as a negation of past military experience, making the latter irrelevant to the development of military art. From 1955 they were guided by the Communist party's decision to treat science as an independent element and to accelerate the pace of scientific-technical progress. Operating from a position of absolute strategic inferiority at the start of this period, the Soviet military sought by various means to negate the US advantage while working out means and methods of using the new weapons of destruction. In 1954 the air defense forces were upgraded to an independent service with their own commander in chief, who also served as a deputy minister of defense.[13]

At the height of the Khrushchev era, Soviet military theorists recast Soviet military strategy along lines that emphasized the employment of the new weapons of mass destruction. In 1959 a new service, the Strategic Rocket Forces, was created.[14] And in the same year, a group of authors at the Voroshilov General Staff Academy authored the first study of military strategy by Soviet authors since A. A. Svechin's *Strategy* had appeared in 1926. In 1962 a new edition of this work was published under the title *Military Strategy* and under the editorship of Marshal V. D. Sokolovsky, who had been chief of the General Staff when the work was composed. This work summed up the

The Mi-24 Hind has proven to be a highly successful and lethal ground-attack helicopter. Its four-barrel Gatling gun under the nose is capable of destroying both soft and armored targets. It is generally considered to be one of the finest attack helicopters in the world.

General Staff's assumptions regarding the revolutionary impact of the nuclear-rocket revolution upon military affairs:

> Military strategy under conditions of modern war has become the strategy of deep nuclear rocket strikes in conjunction with the operations of all services of the armed forces in order to effect the simultaneous defeat and destruction of the economic potential and armed forces throughout the entire depth of the opponent's territory in order to accomplish the aims of war in a short period of time.[15]

The organizational, technological, and doctrinal implications of this emphasis on deep nuclear strikes were profound for all the services. In the early 1960s, when Khrushchev's enthusiasm for rocket weapons was most influential, it appeared that all other services would assume an auxiliary role in support of the Strategic Rocket Forces. Ground combat and airborne forces were seen as instruments to be employed after nuclear strikes had disabled the enemy forces. Then tank-heavy ground forces would complete the destruction and occupy important military, economic, and political-administrative regions. The reduced role of ground combat forces in this nuclear-dominated military art was made manifest by the decision in 1964 to abolish the post of commander in chief of Ground Forces, a decision that was reversed in 1967 with the appointment of Marshal I. G. Pavlovsky to the resurrected post.[16]

Primary emphasis in Soviet aviation during this second period was on those arms that contributed directly to strategic attack and defense. Long-range aviation was rearmed to carry air-to-surface missiles and so became truly intercontinental for the first time.[17] Frontal aviation was reconfigured for the delivery of nuclear weapons in the execution of strategic-operational tasks and found itself challenged by ballistic and air-to-surface missiles of all types. Among the most important targets for Soviet air strikes, top priority went to the destruction of enemy nuclear-delivery systems.[18] In the late 1950s "Soviet military science concluded that rockets of various types and missions were the basic and most reliable means [of delivery]."[19] Long-range aviation was rearmed with air-to-surface missiles; fighter aviation was equipped with a first generation of guided air-to-air missiles; and surface-to-air missiles emerged as a central element of PVO Strany, whose first noteworthy success with the new technology came in May 1960, when an SA-2 shot down a US U-2 reconnaissance aircraft near Sverdlovsk. A wrecked summit conference and political embarrassment for the Eisenhower administration brought the new era into focus for the non-Soviet world.

For the Soviet Air Forces, this incorporation of missile technology brought a radical reorganization of air assets and a reformulation of operational art. "Under these new conditions the air offensive as a form of employment of aviation, which was characteristic for the Great Patriotic War, lost its significance."[20] With the integration of the nuclear weapons and missile technology, air tactics underwent a radical shift in which massing of forces gave way to massing of fire. The very concept of command of the air lost its significance under the impact of nuclear-rocket weapons. There appeared in place of the struggle for command of the air the task of eliminating the enemy's means of nuclear attack by destroying his rocket and air groupings of forces.[21]

One key indicator of this shift was the reorganization of Soviet naval aviation in the late 1950s, when it was stripped of all fighter and attack aircraft and given two key missions: destruction of US aircraft carriers using long-range, missile-armed aircraft, and antisubmarine warfare using fixed-wing and helicopter assets. This decision went hand in hand with decisions to arm Soviet submarines with ballistic missiles, to equip surface combatants with surface-to-surface missiles, and to rely on SAMs and antiaircraft artillery to provide air defense for surface combatants now forced to operate farther from Soviet home waters in their struggle with US nuclear-delivery platforms.[22]

For frontal aviation, the new nuclear-

rockets seemed to provide more effective means of executing the most crucial missions in a modern war dominated by nuclear weapons. On the other hand, the development of aviation technology, especially supersonic bombers, meant that such aircraft were less effective in the role of support over or near the battlefield. At the same time, attack aviation could not meet these new requirements. Thus, attack aviation (*shturmovaia aviatsiia*) gave way to a new type of aircraft, the fighter-bomber, which first appeared in 1958. The first aircraft of this type, P. O. Sukhoi's Su-7b, entered production as a fighter but was quickly adapted to the new role.[23]

Development of the US strategic air threat in the form of SAC's manned aircraft, unmanned air-breathing missiles, and ballistic missiles did lead to greater assets being invested in PVO Strany. During the late 1950s and early 1960s, Soviet SAM weaponry appeared in ever-larger numbers and became an integrated part of a national system of air defense. In addition to the application of operations research techniques to the modeling and management of the air defense operation, Soviet PVO Strany emphasized a combined arms approach that linked together a new generation of interceptors and fixed-site SAM systems. Gradually the Soviets began exploring SAM systems optimized for long-, mid-, and short-range interception at high and low altitudes. They developed more advanced fixed, semimobile, and mobile systems and added antimissile and antispace defense to PVO Strany's missions. Radio-electronic warfare and centralized troop control figured prominently in its solutions to the existing air threat.[24]

The Soviet fixation on a single, nuclear warfighting posture lasted from roughly 1955 to 1964. Khrushchev, although by no means a military expert, exercised a profound influence in pressing such views in the face of powerful institutional interests within the Soviet armed forces and against the doubts and criticisms of Soviet military theorists associated with the General Staff.[25] Colonel General M. A. Gareev, a deputy chief of the Soviet General Staff since late 1984, has recently argued that the critics were right. He contends that in evaluating the impact of nuclear weapons, Soviet military theorists who supported Khrushchev's one-sided emphasis upon nuclear-rocket weapons went too far in dismissing the relevance of existing military theory and praxis, especially that of the Great Patriotic War.[26]

The Reemergence of Frontal Aviation

The third period of postwar doctrinal development followed this singled-minded emphasis on nuclear warfighting capabilities, which did not go without challenge. *Military Strategy*, the major Soviet work on military practice, went through three revisions in the six years between 1962 and 1968. In response to the US formulation of "flexible response" in the first years of the Kennedy administration, Soviet authors began to address the possibility that a major war between capitalism and socialism might involve an initial conventional period of undetermined length. By 1968 the certitude about the immediate and decisive role of nuclear-rocket strikes in such a war gave way to a question:

> But in essence, the argument is about the basic method of conducting a future war: will it be a land war with the use of nuclear weapons as a means of supporting the operations of ground troops, or a war that is essentially new, where the main means of solving strategic tasks will be the nuclear-rocket weapon? The theory of military art must give an answer to such important questions as: what types of strategic actions will be used in a nuclear war, and what form must military operations take?[27]

Even prior to this admission of doubt, some Soviet authors had reasserted the need to address these issues within the context of prior military experience, especially that of the Great Patriotic War. These authors, who included Marshal M. V. Zak-

harov, chief of the General Staff for much of the 1960s, reasserted the relevance of the theory of deep operations as developed in the 1930s and 1940s and applied during the Great Patriotic War. Numerous works on these subjects began to appear in the mid-1960s.[28]

This marked the beginning of frontal aviation's recovery. While some Soviet theorists had seen rocket forces replacing frontal aviation, Major General of Aviation S. L. Sokolov addressed the role of frontal aviation in support of ground forces by calling for an "alliance" between the rocket forces and frontal aviation in which the two would provide mutual support for each other. Sokolov envisioned a division of labor in which each branch would be used under conditions favorable to it. Frontal aviation's primary advantage lay in its ability to maneuver, while the rocket forces could deliver strikes over great distances in very short periods of time. Sokolov reminded his readers of the utility of frontal aviation during the Great Patriotic War, when its aircraft won air superiority and delivered telling blows against enemy ground and air forces.[29]

In the new situation brought about by the presence of nuclear weapons on the battlefield, Sokolov acknowledged that the top-priority target was the destruction or suppression of enemy nuclear-delivery systems. Here he saw a role for frontal aviation because ballistic missiles were not very effective against mobile targets. Thus, frontal aviation, equipped with air-to-surface missiles, could strike such targets with greater chance of success. He did not, however, confine frontal aviation to that mission. In more general terms, he identified two groups of missions for frontal aviation:

> The first are general-frontal missions. They include: aerial reconnaissance over the entire depth of the enemy's operational dispositions; the struggle with enemy aviation on the airfields and with their rockets at their launchers to operational depth; the destruction of enemy nuclear-rocket weapons; cover of troops and rear services from enemy air strikes; the struggle with the enemy's deep reserves, and other.
>
> The second mission (group of missions) are fulfilled by Frontal Aviation in operational or tactical cooperation with the ground forces for their support in the course of battles against an enemy with which they have direct contact. This includes: the destruction of nuclear-rocket weapons at tactical or near-operational depths; the destruction or suppression of the enemy's means of electronic warfare and command and control points on the axis of the offensive of a given operational or tactical grouping of forces, the illumination of a locale or the placement of marker lights for support of the combat actions of the ground forces at night, and occasionally individual sorties with the objective of aerial reconnaissance. This mission is fulfilled, as a role, in accordance with the plan of the all-arms strategic formation (operational formation).[30]

Taken together, these two sets of missions represented a reformulation of the concept of the air offensive but with a crucial difference. Whereas during the Great Patriotic War the air offensive had been executed by an air army according to the plan of the front commander, the new circumstances demanded strict centralized control of all air assets to coordinate the air operation throughout an entire theater.[31] At the same time, Sokolov flatly stated that the new fighter-bombers could not provide the direct close air support for ground units in their advance. He left this role to the new rocket weapons and assigned the fighter-bombers to "free-hunting" missions in the enemy rear, where they would work closely with air reconnaissance assets. The nuclear-tipped missile had replaced the ground-attack plane, but it could not provide effective fire support during an initial conventional phase.[32]

This situation became all the more pressing when Soviet military theorists began to address the problem of the initial phase of war and the experience gleaned from modern air combat in local wars. While nuclear weapons still dominated the structure and organization of the various services, Soviet

military theorists began to explore a dual-track option that would permit forces to fight conventionally and to shift to nuclear employment if the need arose. These doctrinal requirements radically exceeded what Soviet force planners could deliver in the 1960s, but they provided an agenda to guide the modernization of Soviet combat arms and support services into the next decade.

One of the first indications of this new agenda for the Soviet Air Forces was the Domodedovo Air Show of 9 July 1967, when the Soviets unveiled a new generation of aircraft that reflected a renewed commitment to frontal aviation and combined arms doctrine. On that Day of the Air Fleet, the Soviets displayed a new generation of fighters with variable geometry wings, vertical takeoff and landing aircraft (VTOL), and short takeoff and landing aircraft (STOL).[33] The new models of even conventional aircraft, including the Su-17 (Fitter-C/D), represented a substantial improvement over the earlier generation of fighter-bombers because of increased weapons load, more powerful engines, and the addition of an electronic countermeasures (ECM) pod to increase their ability to penetrate enemy radar and strike deeper targets. Foreign observers noted the increased combat capabilities of these aircraft in nonnuclear wars. In 1968 Colonel N. Semenov reintroduced the term *command of the air* to the Soviet military lexicon and flatly stated exactly the same point:

> It is becoming quite obvious from the above [a discussion of the increased capabilities of modern aircraft] that the necessity of gaining air supremacy in conducting military operations without the use of nuclear weapons in modern conditions is becoming even more acute than in the past. However, it is clear that it will be considerably more difficult to resolve this problem. It will require a reevaluation of many factors and a different approach to the use of forces and means.[34]

By the late 1960s, the Soviet Union stood in a position to explore whether such a conventional option was militarily feasible.[35]

The 1960s had been a decade devoted to securing an invulnerable strategic capability that would provide the Soviet Union with strategic parity, thus negating US strategic superiority at the outset of the decade. This situation undermined the symmetrical logic of "flexible response" and "forward defense" in NATO by undercutting the rationality of the conventional/theater-nuclear/strategic linkage, which was the keystone of NATO doctrine and the foundation of its force structure. For the Soviets, this was the military context of the era of détente between East and West. According to Soviet authors, NATO acknowledged this situation officially in 1978, although US pressure on its allies in 1977 to increase defense spending was a clear indication of the dilemma.[36] NATO sought a solution to the problem of Soviet/Warsaw Treaty Organization conventional superiority in the context of superpower strategic parity through modernization of its own theater-nuclear forces. The Soviets, while modernizing both their strategic and theater-nuclear arsenals, looked to enhanced conventional capabilities as a viable path to keeping the military instrument as a rational extension of politics.

Frontal Aviation and the Conventional Theater-Strategic Option

The fourth period of postwar doctrinal development can be seen in the Soviet approach to a conventional solution to the problem of using military power in the context of strategic nuclear parity. The approach implied a commitment to use conventional means to shift the theater-nuclear correlation of forces in favor of the USSR and its allies while seeking military decision through the operational application of a new generation of conventional weapons technology.[37] As recent writings on tactics suggest, Soviet military theorists have not ignored the presence of nuclear

weapons but have sought to adjust their force-structuring to reflect a search for optimal conventional impact and the ability to shift swiftly to nuclear combat if the situation demanded it.[38]

This posture involved a sweeping investigation of military praxis in theater-scale operations. Soviet theorists focused on three sources of experience: their own World War II experience, the experience of recent local wars, and the lessons from Soviet field exercises and wargames.

The Great Patriotic War provided the closest approximation of the scale and intensity of combat that they envisioned. This brought with it a very close examination of the problem of troop control and a consideration of automated systems to aid operational commanders in conducting modern deep operations. It culminated in the emergence of the concept of the theater-strategic operation with a TVD (theater of military operations) commander and his headquarters to direct it.[39] In operational terms, the Soviet theorists began to emphasize the decisive nature of the initial period of war as a means of successfully shifting the correlation of forces. And they sought means of applying combat power to preclude enemy recourse to nuclear weapons within the theater and to force a decision upon the opponent without either side resorting to weapons of mass destruction. Soviet writings began to emphasize surprise, deception (*maskirovka*), the tempo of the advance, and the employment of mobile groups—operational maneuver groups (OMG)—at operational depths.[40] The Soviets employed such an operational maneuver group for the first time during the *Zapad*-81 field exercise.[41]

The second source of military praxis that Soviet theorists examined in their search for a conventional option was the experience of the local wars of the last two decades. The Soviets observed the US problems with close air support and the search for solutions in Vietnam. In part, this involved the emergence of the helicopter as a combat weapon.[42]

Soviet interest in helicopters dates back to the pre-World War II period, when they pursued both autogiro and helicopter technology. In the postwar period, the machines designed by Igor Sikorsky in the United States served as an inspiration for the first generation of Soviet machines, and by the 1950s the Soviets were giving substantial attention to the military applications of helicopter technology, including heavy-lift vehicles such as the Yak-24 and Mi-6.[43] Vietnam and the earlier French employment of armed helicopters in Algeria opened up the possibility of creating armed versions. The initial Soviet response was to add weapon pods to the Mi-8T (Hip-E) which went into production in 1966.[44] This short-term solution was followed by the development of a strictly military helicopter designed for air assault and fire-support missions—the Mi-24 Hind, which first flew in the early 1970s and went into series production in 1972. The Mi-24 has since undergone numerous modifications to make it more effective as a close-fire-support system against enemy armor and infantry.

With the Hind's appearance, the Soviet aircraft industry provided the armed forces with its first true close-air-support tool since the 1950s. This air assault-attack aircraft (*desantno-shturmovik*) has continued in production for over a decade with more than 2,300 in military service by mid-1983 and many more being exported around the world.[45] Hinds and Hips are organized into squadrons (18 machines) and provide direct close-air-support assets to division and army commanders. Each division has a single squadron of such aircraft, while each army has an assault helicopter regiment (40 Hinds and 20 Hips).[46] In exercises a flight of attack helicopters has been assigned to support a motorized rifle battalion acting as a forward detachment. Forward air controllers with the battalion provide communications with a flight of attack helicopters.[47]

Army and front commanders also have available to them air assault units, which range from air assault and airmobile assault brigades and an airborne division at front

level to an air assault battalion with tank and combined arms armies. These air assault/airmobile forces have been widely used in Afghanistan in conjunction with Hind attack helicopter squadrons and have proven a deadly foe for the *mujahidin*. There is even some evidence that the Soviets have sought to adapt the Mi-24 to antihelicopter operations.[48]

At the present time, the Soviets have under development a successor generation of helicopters, with improved close-air-support and antihelicopter capabilities. These include the Mi-28 Havoc and Kamov's new Hokum, which some Western observers have identified as helicopters optimized for air-to-air combat. This development goes hand in hand with a radical improvement in the lift capability of Soviet transport helicopters, especially the Mi-26 Halo, which can carry 20 tons at a cruising speed of 158 miles per hour.[49]

In addition to pointing out the application of rotary-wing aircraft to close air support, local wars in Vietnam and the Middle East raised four other crucial questions or issues with which Soviet frontal aviation and air defense forces had to deal. First came the recognition that the decision to go with fighter-bomber aircraft as a universal type had created platforms unsuited to either role.[50] This recognition led to a shift back toward aircraft optimized for fighter, interdiction, and close-air-support missions.

The second issue concerned the transformation of modern, high-performance aircraft into effective close-support and interdiction systems against enhanced air defense forces. This led to an investigation of precision-guided munitions, which reduced air losses and radically increased the probability of destroying ground targets.[51] The Soviets developed their own first-generation, smart weapons and acquired a fourth generation of jet aircraft to deliver them, including a fixed-wing, ground-attack plane, the Su-25 (Frogfoot-A).[52]

The third issue raised by air combat in local wars related to the development and employment of modern air defense systems. The Soviets were in an obvious position to recast their air defense concepts on the basis of the experience of Vietnam, the Arab-Israeli wars of 1967 and 1973, and the Israeli invasion of Lebanon in 1982. All these conflicts underscored the need for a combined arms approach to air defense by forging SAMs, AAA, and interceptors into an integrated air defense system with increased maneuver capabilities so that forces can be regrouped to perform new tasks in the course of an operation or during a subsequent operation.[53]

In the same context, local wars provided a stimulus for a fresh look at the air defense of ground forces employing both active and supporting means.[54] This problem, in conjunction with the appearance of a new generation of cruise missiles with enhanced flight and target-acquisition capabilities, led to a reorganization of Soviet air defense forces. This reorganization has involved a shift in assets away from those dedicated to the strategic mission of homeland defense toward combined arms employment with frontal aviation in support of deep operations.[55] There has been a decline in the number of heavy interceptors over the past 15 years and an increase in the number of fighters suited for forward air defense and the struggle for air superiority. The appearance of the MiG-29 Fulcrum with STOL capability and advanced avionics and weapons seems to fit in with this shift as well.[56]

The fourth issue highlighted by the experience of local wars was the question of air combat tactics. The improvement of standoff weapons for middle-distance combat, the development of increasingly sophisticated means of electronic warfare, and the performance characteristics of third-generation jet aircraft in close combat forced the Soviets to reexamine the problem of air-to-air combat and the superiority of the two-plane "flight" as the optimal tactical formation.[57]

In all these areas, the local wars of the last three decades have provided the Soviets

with valuable data on tactical problems relating to the new technologies that have been developed for air combat, and they have allowed Soviet theorists to address the critical problems that such changes create for mutual support and cooperation at the tactical and operational levels of war. Afghanistan since 1979 has provided valuable practical experience in the application of frontal and army aviation in tactical situations.

The third and final focus of Soviet efforts to develop the concepts and force structures for the execution of theater-strategic operations has been their own exercises and wargames.[58] They have tried to use such exercises and maneuvers for the training of troops as well as for adapting arms and cooperation on the modern battlefield.[59] During *Zapad*-81, the Soviets employed an operational maneuver group with helicopter air assault and fire support to test the concept's effectiveness as part of their theater-strategic operation.[60]

Soviet authors have been quite explicit about the critical role of the air operation in their conception of such theater-strategic operations. Command of the air over the main axes of advance has been directly associated with the need to blast air corridors through enemy air defense assets. Soviet authors have linked this process to the struggle for air superiority and the antiair operation. One source notes that "questions of the preparation and conduct of the air operation for gaining command of the air, conducted with the purpose of destroying the enemy aviation grouping on specific axes, have been worked out."[61] The basis of the antiair portion of this operation was the assumption that the best means of air defense was the destruction of enemy air assets on the ground.[62] Such an operational conception places a high premium on surprise and preemption during the initial period of war. At the same time, it requires that air units and their logistical support network be both rugged and flexible in order to survive and sustain combat operations.

At the same time, Soviet authors have stressed the fact that winning the electronic battle is indispensable to the success of such air operations. This was one of the central lessons they drew from both the Israeli invasion of Lebanon and the Falklands War.[63] The Soviet approach to the theater-strategic operation as a conventional option remains true to the classic terms of Soviet deep-operation theory in its emphasis on a combined arms approach and the integration of new means of striking the enemy's operational rear. The partnership that developed between frontal aviation and Soviet rocket forces has not been abandoned under this new situation. Instead, the rocket forces have been equipped with a new generation of conventional warheads that will allow them to attack stationary targets with an effect similar to that of small tactical nuclear weapons of a generation ago.[64]

Conclusion

Some authors have compared this Soviet approach to the adaptation of modern combat means with blitzkrieg warfare.[65] Others, most notably the late Richard Simpkin, have seen these developments as a "search for simultaneity throughout the depth of the defense" in which the Soviets are banking heavily upon airmobile, mechanized forces to support their mobile groups in high-speed, offensive operations. Simpkin expressly linked this approach to new potentialities that were emerging as a result of development in helicopter aviation, which he termed as nothing less than a *rotary revolution* as profound in its implications as that associated with the mechanization of warfare in the 1930s. Simpkin saw this search for simultaneity as ongoing and unrealized but thoroughly in keeping with Soviet operational art as it was developed in the 1920s and 1930s by Marshal M. N. Tukhachevsky and his colleagues.[66] Frontal aviation has a critical role to play in such operations in cooperation with other arms and services. For all the technological changes and developments, its role still fits

within that outlined by A. N. Lapchinsky in *Vozdushnaia Armiia* on the eve of World War II when he said, "In order to conduct a maneuver war, one must win the air-land battles which begin in the air and culminate in victory on the ground and this requires the concentration of all air forces at a given time on a given front."[67] At the present time, such operations begin with the seizure of "command of the air" over the theater of military operations or on the axis of the main blow. Command of the air is achieved by a combination of blows aimed at destroying the enemy's basic aviation groupings, defeating his air defense forces, and disrupting his system of command and control.[68] For all the technological changes and organizational innovations, a core element of doctrinal continuity remains.[69] □

Notes

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40. On these developments, see S. V. Ivanov, ed., *Nachal'nyi Period Voiny (Po Opytu Kampanii i Operatsii Vtoroi Mirovoi Voiny)* (Moscow: Voyenizdat, 1974), 4–22; M. M. Kir'ian, *Vnezapnost' v Operatsiiakh Vooruzhennykh Sil SShA* (Moscow: Voyenizdat, 1982); Reznichenko, 152–73; and Ogarkov, *Istoriia Uchit Bditel'nosti*, 76–90.
41. Jeffrey Simon, *Warsaw Pact Forces: Problems of Command and Control* (Boulder, Colo.: Westview Press, 1985), 192–94. For the best discussion of the OMG, see Christopher

Donnelly, "The Soviet Operational Maneuver Group: A Challenge for NATO," *Military Review* 63, no. 3, (March 1983): 43–60.

42. Kir'ian, *Naucho-Tekhnicheskii*, 284; and I. E. Shavrov, ed., *Lokal'nye Voiny: Istoriia i Sovremennost'* (Moscow: Voyenizdat, 1981),252–53.

43. Krasovsky, *Aviatsiia i Kosmonavtika* SSSR, 324–25.

44. Bill Gunston, *Aircraft of the Soviet Union* (London: Osprey Publishing, Ltd., 1983), 196–97.

45. Ibid., 200–2.

46. Roger E. Bort, "Air Assault Brigades: New Element in the Soviet *Desant* Force Structure," *Military Review* 10 (October 1983): 34.

47. V. Perelygin, "Sviaz' v Peredovom Otriade (Iz Opyta Deistvii Sviazistov Noch'iu)," *Voennyi Vestnik*, no. 5 (May 1986): 77–80.

48. *Krusnaia Zvezda* (24 January 1984), 1; and "Takticheskaia Zadacha," *Voennyi Vestnik*, no. 5 (May 1986): 32; and "Razbor Reshenii Takticheskoi Zadachi," *Voennyi Vestnik*, no. 10 (October 1986): 16–17. Soviet authors have also analyzed Western writings on the helicopter in aerial combat. See M. Fesenko, "Vertolet Protiv Vertoleta," *Aviatsiia i Kosmonavtika*, no. 3 (March 1984): 46–47.

49. Bill Gunston and Mike Spick, *Modern Fighting Helicopters* (New York: Crescent, 1986), 76–77, 144–47. Like all other Kamov helicopters, Hokum appears to have a coaxial rotor system very different from Mil OKB's Hind or Havoc. The superiority of such a rotor system for an aerial combat environment in terms of direct shaft-to-lift power, ability to climb and descend rapidly, and maneuver swiftly by using control surfaces as against a tail rotor must be judged against the problem of rotor fouling during turns and banks when the blades are under dynamic loading. In looking at the helicopters built by Mil OKB and the park of helicopters around the world, A. M. Volodko and A. L. Litvinov pointed out recently that conventional rotor-tail-rotor ships seem to have considerable advantages over coaxial-type helicopters. It is still unclear whether the Kamov OKB has made such a breakthrough and that a new generation of coaxial interceptor-helicopters has arrived. On the Mil approach, see A. M. Volodko and A. L. Litvinov, *Osnovy Konstruktsii i Tekhnicheskoi Ekspluatatsii Odnovintovykh Vertoletov* (Moscow: Voyenizdat, 1986), 3–24.

50. Iu. Kisliakov and V. Dubrov, "Novye Cherty Vozdushnogo Boia," *Aviatsiia i Kosmonavtika*, no. 11 (November 1984): 14.

51. Kir'ian, *Voenno-Tekhnicheskii*, 287–88; and V. A. Sokolov, "Razvitie Taktiki Istrebitelei-Bombardirovshchikov v Lokal'nykh Voinakh," *Voenno-Istoricheskii Zhurnal*, no. 4 (April 1986): 65–72.

52. Bill Sweetman, "Sukhoi Su-25 Frogfoot," *International Defense Review*, no: 11 (November 1985): 1759–62.

53. V. K. Strel'nikov, "Razvitie Sredstv PVO i Opyt Ikh Primeneniia v Lokal'nykh Voinakh," *Voenno-Istoricheskii Zhurnal*, no. 5 (May 1986): 62–67.

54. Iu. A. Andersen, A. I. Drozhzhin, and P. M. Lozik, *Protivovozdushnaia Oborona Sukhoputnykh Voisk* (Moscow: Voyenizdat, 1979), 72–73.

55. On the abolishment of PVO Strany and the reemergence of Voiska PVO as a force designed to provide forward air defense and support of theater-strategic operations, see Russell G. Breighner, "Air Defense Forces," in *Soviet Armed Forces Review Annual*, ed. David Jones (Gulf Breeze, Fla.: Academic International Press, 1984), vol. 7 (1982–1983), 158–76.

56. Georg Panyalev, "MiG 29 Fulcrum: Details to Date," *International Defense Review*, no. 2 (February 1987): 145–47.

57. Iu. Kisliakov and V. Dubrov, "Novye Cherty Vozdushnogo Boia," *Aviatsiia i Kosmonavtika*, no. 9 (September 1984): 12–14; no. 10 (October 1984): 30–31; no. 11 (November 1984): 13–15; and no. 12 (December 1984): 30–32.

58. I. E. Shavrov and M. I. Galkin, *Metodologiia Voenno-Nauchnogo Poznaniia* (Moscow: Voyenizdat, 1977), 398–99.

59. M. A. Gareev, *Taktricheskie Ucheniia i Manevry (Istoricheskii Ocherk)* (Moscow: Voyenizdat, 1977), 5–7, 261–63.

60. Jeffrey Simon, *Warsaw Pact Forces: Problems of Command and Control* (Boulder, Colo.: Westview Press, 1985), 192–94.

61. M. M. Kir'ian et al., *Istoriia Voennogo Iskusstva* (Moscow: Voyenizdat, 1986), 404.

62. Andersen, Drozhzhin, and Lozik, 71.

63. S. V. Seroshtan, "Radioelektronnaia Bor'ba v Lokal'nykh Voinakh na Blizhnem Vostoke," *Voenno-Istoricheskii Zhurnal*, no. 3 (March 1985): 62–67; and R. Loskutov and V. Morozov, "Nekotorye Voprosy Taktiki Vooruzhennogo Konflikta v Livane v 1982 Godu," *Voenno-Istoricheskii Zhurnal*, no. 7 (July 1984): 75–78. On the Soviet analysis of the Falklands conflict, see Jacob W. Kipp, *Naval Art and the Prism of Contemporaniety: Soviet Naval Officers and the Falklands Conflict* (College Station, Tex.: Center for Strategic Technology, Texas A & M University, 1984).

64. Kerry L. Hines, "Soviet Short-Range Ballistic Missiles: Now a Conventional Deep-Strike Mission," *International Defense Review*, no. 12 (December 1985): 1909–14.

65. P. H. Vigor, *Soviet Blitzkrieg Theory* (London: Macmillan Press, 1983), 1–9.

66. Richard Simpkin, *Race to the Swift: Thoughts on Twenty-First-Century Warfare* (London: Brassey's Defence Publishers, 1985), 145–61.

67. A. N. Lapchinsky, *Vozdushnaia Armiia* (Moscow: Gosvoyenizdat, 1939), 144.

68. *Voennyi Entsiklopedicheskii Slovar'*, 2d ed. (Moscow: Voyenizdat, 1986), 205.

69. In assessing trends in the development of ground force tactics into the twenty-first century, Col Stanislaw Koziej of the Polish People's Army identified the basic direction of such changes as "the transformation of traditional land combat into air-land combat. . . ." This he explicitly associated with the development and introduction of precision weapons and helicopters on an increasingly broader scale, as well as the rapid tempo of electronization and automation of the basic processes of armed combat. See Stanislaw Koziej, "Przewidywane Kierunki Zmian w Taktyce Wojsk Ladowych," *Przeglad Wojsk Ladowych*, no. 9 (September 1986): 9.

The Essence of Leadership
Continued from page 7

leader, and you are no commander. It has to be a sincere interest.

Finally, and the most obvious, you must live what you say. If you preach honesty and morality and good conduct and whatever else you preach, such as getting the job done to the best of your ability and getting it done right the first time, that's the way you must live, because if you don't you won't get what you want from your subordinates. You have to be the shining example, and you must never fail. It is easy to be a leader and a commander from eight o'clock in the morning until five o'clock in the afternoon. From five in the afternoon until eight in the morning is when it is tough to be a commander. That's when you have to get out of bed and go get somebody out of jail. That's when the crises come up and you have to function like you have just had 24 hours of sleep and you are perfectly rested and perfectly in control of the situation. You have got to be a commander 24 hours a day. You can't be horsing around the officers club; you can't be making a spectacle of yourself out on the street. You have got to get along not only with your people but with your civilian counterparts with whom you associate.

I say this because I have tried to use these guidelines for being a commander. When I was 24 years old, before I went to Korea, I sat down and I decided at that time there were four things I would have to do so that the day I died I would consider myself successful. These are professional things, not the personal things such as being a good father and raising a family and things like that. In order to be successful, I would have to find out whether or not I was afraid to die. Would I turn and run when somebody shot at me? Would I conduct myself in combat in such a manner that it was obvious that I was afraid to die? I think with the record of 265 combat missions—most of which were ground support, armed reconnaissance, and missions of that nature—I have proven to myself that I will not turn and run when somebody shoots at me and that I am not afraid to die.

Second, I wanted to fly at least 37 combat missions. Where I got the number 37, I will never know, but I felt if I flew that many I would be successful. Obviously I made that goal.

The third thing was that if I stayed in the Air Force—and I wasn't sure at the age of 24 I was going to make it a career—I wanted to be at least a lieutenant general. Thanks to the work of many people, I became a lieutenant general.

Finally, I wanted to become a millionaire before I died. Obviously my first three objectives were counterproductive to my fourth, and I haven't reached it yet, but I am still working on it! □

IN DEVELOPING the scenario for a NATO-Soviet conflict used in *Red Storm Rising*, Tom Clancy placed a great deal of emphasis on Soviet *maskirovka*.[1] *Maskirovka* is frequently mentioned in passing in many other novels, articles, and monographs dealing with the USSR. But there have been all too few attempts to describe *maskirovka* as an entity. That is the purpose of this article. *Maskirovka* is most simply defined as a set of processes designed to mislead, confuse, and interfere with accurate data collection regarding all areas of Soviet plans, objectives, and strengths or weaknesses.

Terminology

In studying the USSR, most Westerners are faced immediately with several problems. A primary example is that of attempting to understand the Soviet/Russian perspective on events. The Russian "mindset" has been influenced by many factors of which Americans are generally unaware or the significance of which have been elusive.

For example, the term *American imperialistic interventionists* as used by the Soviets may be interpreted in the United States as a reference to our involvements in Cuba, the Philippines, or Vietnam. To the Soviets, it brings to mind the fact that during the Russian civil war, the United States, as well as Britain, France, and Japan, had military forces fighting against Bolshevik forces in Russia. This is one example of the difference in perspectives.

Another major problem is that Russian terms are not always easily translated into English. *Maskirovka* is an excellent example. In US military terms, *maskirovka* is often referred to as "camouflage," "concealment," and "deception." Translators frequently use the term *camouflage*, and the use of this single English term inherently gives the reader a biased perception of what is actually presented in the Russian. For example, research in translated Russian works where the term *camouflage* has been used creates a view that is different from research where the term *concealment* has been selected. This is complicated by the Russian

Soviet *Maskirovka*

CHARLES L. SMITH

word *kamufliazh*, which translates into English as camouflage. In the Russian context, the term refers to what in the West is classified as disruptive painting (fig. 1). Another example is the selection of decoys, dummies, or models for the Russian use of false objects. In English there are subtle differences between these terms.

Maskirovka is actually a very broad concept that encompasses many English terms. These include: *camouflage*, *concealment*, *deception*, *imitation*, *disinformation*, *secrecy*, *security*, *feints*, *diversions*, and *simulation*. While terms overlap to a great extent, a complication is that the Russian term is greater than the sum of these English terms. Thus, those in the West should attempt to grasp the entire concept rather than its components. *Maskirovka* is not a new concept in the USSR. Its roots can be traced to the Russian Imperial Army. Several Soviet authors trace it back to Dmitry Donskoy's placing a portion of his mounted forces in an adjacent forest at the Battle of Kulikovo Field in 1380. Seeing a smaller force than anticipated, the Tatars attacked, only to be suddenly overpowered by the concealed force.[2]

This concept, because of the Soviet "mind-set," permeates the entire nation. It is practiced throughout Soviet society and is not just a military term. It is a part of published Soviet data and figures as they relate to the economy, agricultural, or industrial production. An example of this, which pertains to both industry and the military, occurred in the period before World War II and at the onset of Operation Barbarossa. The USSR had purchased 100-mm artillery pieces from Germany before the war, and German intelligence estimates of the capabilities of the Red Army were based in part on the use of these guns. Following their invasion in June 1941, the Germans were shocked to encounter much more powerful Soviet 130-mm artillery pieces. The USSR had purchased the German guns and scrapped them while producing their own guns at the same time—a classic instance of *maskirovka*.

Implementation

Due to its complex nature, the concept of *maskirovka* is incompletely understood in the West. This article contains three simplified models to illustrate the concept by reflecting its implementation, organizational, and doctrinal-philosophical aspects. Obviously, these are not all-inclusive but rather provide a beginning framework for understanding. The implementation aspects include form, type, environment, and nature of activity (fig. 2). These factors have been subdivided into additional categories. Within the Soviet military, gaps in the implementation of *maskirovka* are considered a breach of security and are recognized as a threat to survival.

Forms

The forms of *maskirovka*, as shown in figure 2, consist of concealment, imitation, simu-

We often translate the Russian term maskirovka *as "camouflage." To the Soviet military person, the term means much more.*

Figure 1.

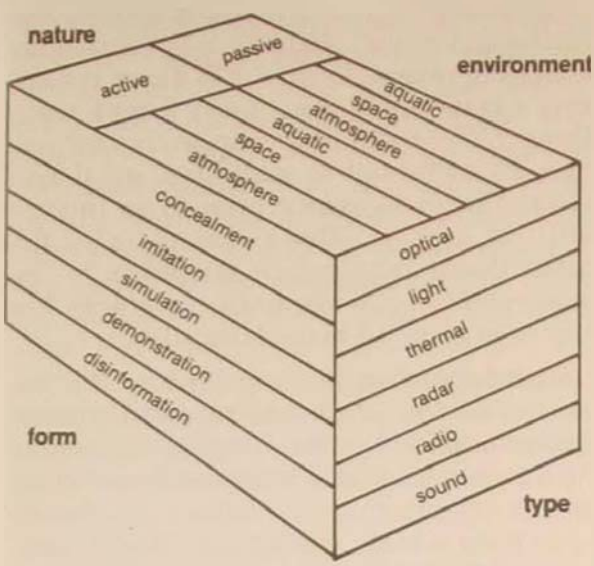

Figure 2.

Maskirovka implementation crosses the spectrum of techniques in various environments. Gaps in implementation are considered a breach of security by the Soviets.

Concealment through the use of netting and other techniques is used to reduce detection by intelligence sources. Properly done it can be a very effective technique.

lation, demonstrative actions, and disinformation. These may be employed singly but are most commonly conducted in conjunction with one another.

Concealment. This is one of the primary forms of *maskirovka* and involves a series of measures to eliminate or reduce possible detection of revealing signs of troops, equipment, plans, or production. Construction or modification of ships under overhead awnings is a form of concealment as is the use of smoke screens on the battlefield. In the Russian context, this form of *maskirovka* is similar to the English term *concealment*, plus *camouflage*. It involves the use of such things as nets, screens, and other devices (fig. 3). The construction of tanks and armored personnel carriers within automobile plants is another means of concealment.

Imitation. Imitation involves the creation of false objects that appear to be real. Use of collapsible and pneumatic mock-ups of military equipment on the battlefield is one kind of imitation. A number of Soviet articles on *maskirovka* cite the successful uses of these objects during the Great Patriotic War (1941–45).[3] On several occasions during the war, turrets from damaged tanks were placed on wooden frames to imitate

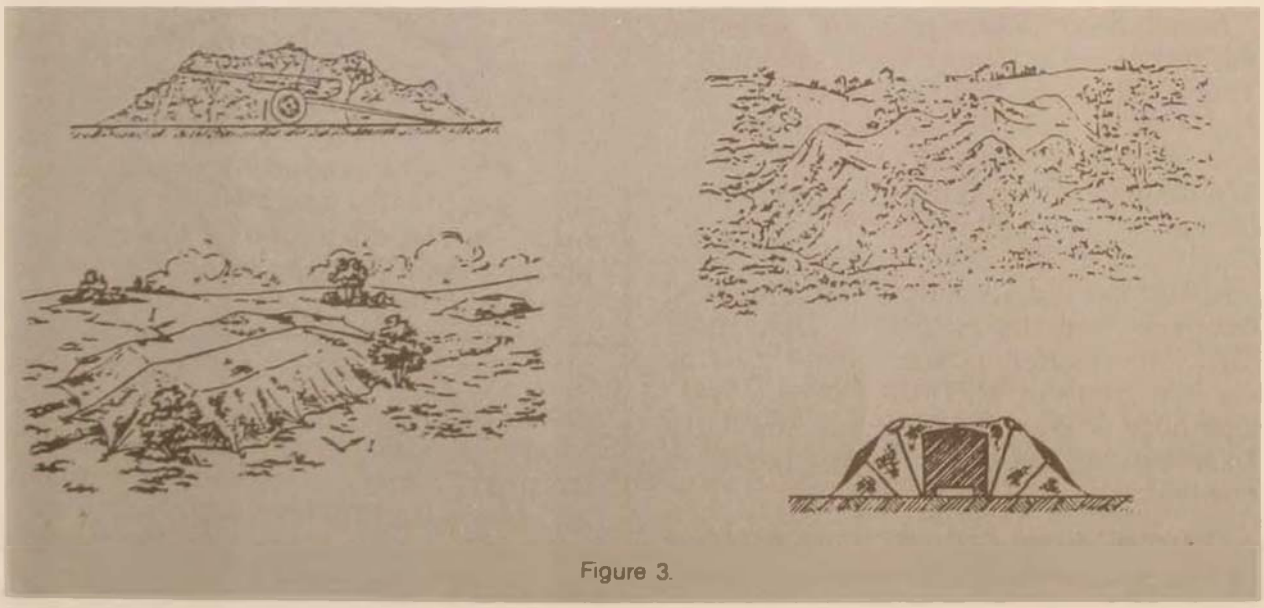

Figure 3.

Maskirovka Methods	Types of maskirovka					
	optical	light	thermal	radar	sound	radio
disruptive painting (kamuflirazh)	X		X			
maskirovka nets	X	X	X	X		
decoys and dummies	X			X		
decoy devices	X	X	X	X	X	X
feigned activity	X	X	X	X	X	X
smoke	X	X	X			
blackouts and brownouts	X	X	X	X		

Figure 4.

The Soviets have analyzed the types of maskirovka *and how each method affects mission concealment and deception. This thorough approach is much more a part of Soviet doctrine than its US counterpart.*

actual tanks. This technique has also been demonstrated in Soviet exercises. During one exercise, a damaged bridge was repaired but still appeared damaged while a decoy bridge was erected upstream. The "enemy" made repeated strikes against the decoy while not bothering the repaired structure. Another example of imitation would be the construction of an airfield or factory that is not used.

Simulation. Closely related to imitation but of a more active nature is simulation. This involves creating the distinctive signs and activity near features or objects that concealment is designed to hide. Creation of a dummy antiaircraft site using collapsible mock-ups is imitation; however, equipping the site with devices that emit noise and smoke, together with movement of troops around the facility, is simulation. This latter technique was widely used by the Red Army in the Great Patriotic War.[4] One false artillery position that simulated such activity was struck by 117 bombs in one day.

Demonstrative Actions. Demonstrative actions or feints serve to mislead an enemy or opponent regarding plans or military operations. A Soviet offensive may begin with attacks in several locations to divert the enemy's attention to areas away from a main thrust.[5] The zones of demonstrative actions may be subjected to excessive aerial and ground reconnaissance prior to an intense artillery barrage. The actual point of the main thrust may not be subjected to the same level of activity until the enemy has begun to respond to the false attacks.

Disinformation. As practiced by the Soviets, disinformation has received a great deal of attention in recent years. Examples such as sending false letters and providing untrue information to Western journalists have been widely publicized. One department of the KGB, or Committee of State Security, deals with disinformation of this nature at many levels. Disinformation can take many approaches. When the Germans invaded the USSR in 1941, they were using Soviet-produced maps. These proved to be highly inaccurate, showing factories and towns where there were swamps or showing trails where major roads existed. The

A downward-pointing light is employed by Soviet soldiers to evade detection while allowing the individual to see at night.

Figure 5.

drive toward Murmansk was greatly slowed when the Germans realized that a road that they thought their tanks could use did not exist. This forced the vehicles to travel over rough, rocky terrain at much slower speeds.

Disinformation by all military units regarding impending operations has also been widely noted. Prior to the Soviet amphibious assault at Novorossiysk on the Black Sea in September 1943, false orders were published stating that this would be a diversionary landing and that the actual main landing would occur two days later farther to the west. When the actual landing began, the Germans were waiting for the "real" assault.

Types

Another means of approaching the concept of *maskirovka* is to analyze its various types (figs. 2 and 4). These have been well documented in Soviet military writings. Here again, these may be divided into several subcategories. Several of the types generally conform to bands of the electromagnetic spectrum and function against military reconnaissance systems such as aerial photography and radar or against target acquisition systems. Other types are designed to counter radio, acoustical, or other attempts to gather information. Specific resources or methods are designed for use in the various types of *maskirovka*.

The relationship between these factors was discussed in an article written by two East German officers. The article was later republished in *Voyennaya Mysl'*, the journal of the Soviet General Staff and most prestigious of all Soviet military journals.[6] Adding additional significance is the fact that the entry in the *Soviet Military Encyclopedia* on *maskirovka* is very similar to the earlier article.[7]

Optical/Light. *Maskirovka* can also be divided into a variety of types that cut across the forms previously described. For example, optical/light *maskirovka* is used to counter reconnaissance systems that involve photography as well as human observation. It may employ a series of nets or screens, either artificial or natural, surrounding the sides and top of a complex or installation. Another form may simply be signs giving false identities to facilities. Also included in this type of *maskirovka* are the use of camouflage clothing, the utilization of terrain to mask movement of forces, and the use of smoke screens. The primary purpose of screens and nets is to alter the apparent shape of the object as well as its shadow. The Soviet definition of optical *maskirovka* includes the near or reflected infrared portion of the electromagnetic spectrum. Thus, activities include those designed to counter "camouflage-detecting films." Special paints are employed in the manufacture of screens and nets to present realistic imagery.[8] Blackouts and night-vision devices serve to ensure light *maskirovka*. One device is designed to constantly point downward, thereby allowing

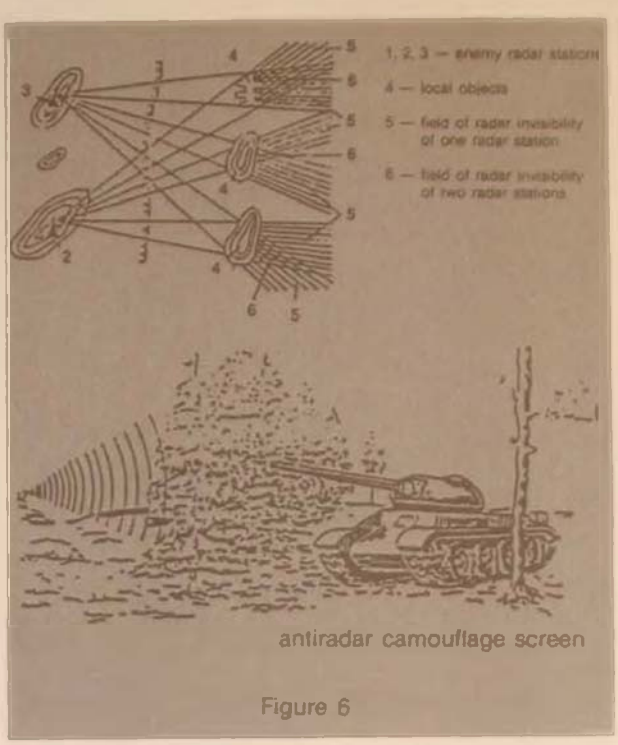

Figure 6

Radar maskirovka. Both radar-absorbent and radar-reflecting techniques are used to misdirect enemy intelligence.

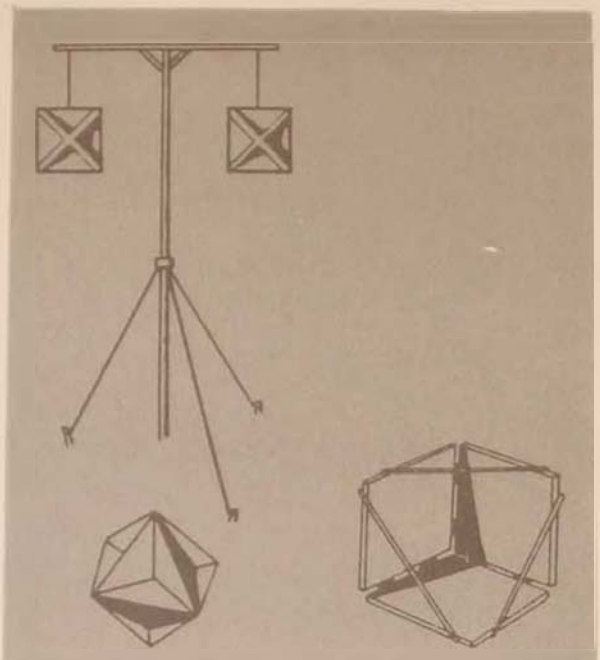

Figure 7.

Three different types of radar reflectors. These reflectors are designed to make it difficult to determine accurately the location or amount of activity in a given area. Each motorized rifle battalion carries 30 of the corner radar reflectors.

light to be applied where required without being detected (fig. 5).

Optical and light types of *maskirovka* may be employed to achieve several forms of *maskirovka*. The most obvious is the use of nets, screens, and blackouts to conceal items, while mock-ups and dummy lights serve as a form of imitation. In such instances, nets and screens that are badly in need of repair may be placed over mock-ups to indicate poorly executed *maskirovka*.[9] Construction of an apparently real runway complete with dummy aircraft at an airfield is another form of imitation. Movement of empty vehicles using their headlights along secondary roads at night or during the day with the goal of replicating a buildup of forces in an area is the application of light or optical means to achieve simulation or demonstration.

Thermal. Thermal *maskirovka* is employed to deny information to enemy reconnaissance and guidance systems that employ sensors in the thermal portion of the electromagnetic spectrum. Here also the method of employment varies with the form. There are two primary ways of employing thermal *maskirovka* to facilitate concealment. Both have the objective of reducing the thermal contrast between the object to be concealed and the background surrounding it. Special air- or water-cooling systems, insulation, and other methods may be used to reduce temperatures or dissipate heat. Thermal screens and special paints may also be employed. On one exercise, a field kitchen was located under tall coniferous trees and excess heat piped underground away from the site to other parts of the forest. This piping and the tall trees effectively dispersed the heat. A second method is to increase the temperature of the overall background. This may be accomplished through the use of heaters. Heaters may also be used to initiate and simulate activity in a different location. At the same time that the field kitchen was being concealed, a fire was placed on an iron plate under a canvas cover away from the kitchen.[10] This created a thermal replication of the kitchen. Reconnaissance or other thermal sensors would detect the simulated kitchen but not the actual one, thereby causing an enemy to make an invalid assumption.

Radar. Radar *maskirovka* employs several techniques to counter all forms of radar. Figure 6 shows two primary techniques for countering radar. One is to analyze topographic maps and relief models to determine areas of "radar shadow" or dead space where known ground-based radars cannot scan. Another technique to deceive ground-based radars is to place an object behind a net containing metallic or other radar-reflecting strips. The first technique involves the elimination or reduction of any radar return, while the second bombards the sensor with radar energy. Another means of accomplishing the first method is through the use of special coatings and may be considered in the design of weapon systems. In a

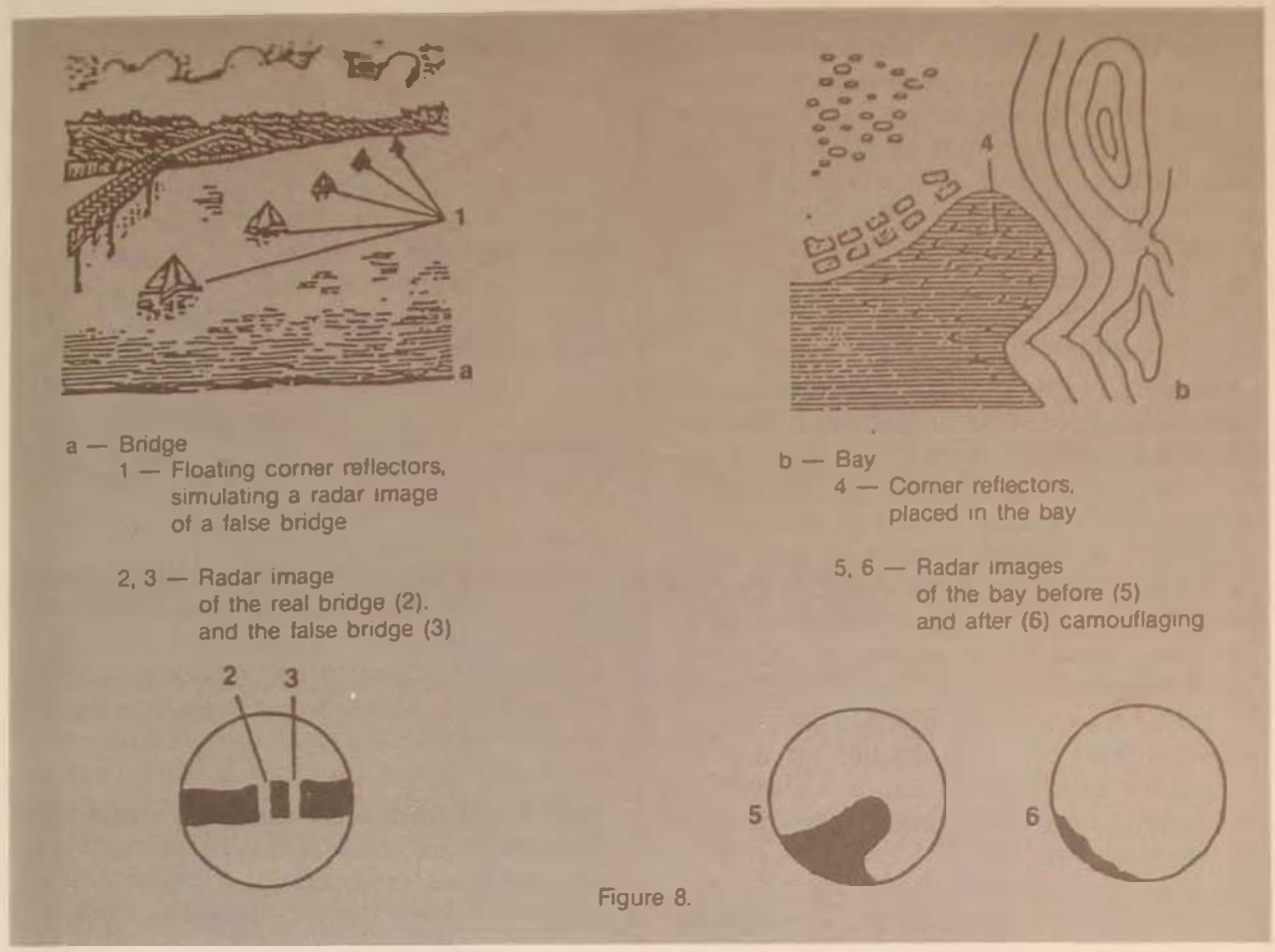

Figure 8.

Two examples of radar reflectors in use. On the left, radar reflectors are used to simulate a second bridge on the radar return. At right, corner reflectors are used to disguise the actual size of a bay of water.

1973 article, one Soviet naval author in discussing *maskirovka* of ships pointed out that right angles on ships create bright returns on radar scopes or imagery.[11] The *Typhoon*-class submarine, which appeared in 1983, has very few right angles on the superstructure, a form of stealth technology.

Radar reflectors are a passive means of jamming radar systems. These may be corner, pyramid, spherical, or dipole reflectors that are designed to reflect radar energy back to the sending radars. When suspended in pairs along a road or scattered in an area, corner reflectors create a bright return on a radar scope that masks any activity along the road or within the area (fig. 7).[12] The sensor will indicate that something is present but will give no indication of its nature. This makes it difficult to accurately detect movement along the road or activity in the area, thus adding an element of confusion and possibly concealing any activities. Corner reflectors may be issued or produced in the field from wood and metallic foil. During the mid-1970s, each Soviet motor rifle battalion was provided 30 corner reflectors.

Radar reflectors may also be used for imitation and simulation. Corner reflectors placed inside or beside dummy tanks will imitate the radar image of a tank.[13] Radar reflectors may be placed on motorcycles that travel up and down roads to simulate heavy traffic. An article in the *Soviet Military En-*

cyclopedia by Maj Gen A. I. Palii, of the Engineer Troops, contains a discussion and sketches showing the use of radar reflectors to alter the landscape as it appears on radar (fig. 8).[14] Reflectors can be used to create false bridges as well as to make coves appear to be solid ground. One Soviet book points out the success of similar reflectors used by the Germans to deceive 100 American and British aircraft who dropped their bombs on a lake in Berlin.[15]

Sound. Complete silence is obviously a major means of sound *maskirovka*. Troops, equipment, and other facilities should operate as quietly as possible in combat to avoid detection. The reverse of this is employed for imitation simulation and demonstrative actions as well as for disinformation. During the preparations for the L'vov-Sandomierz offensive in 1944, Col Leonid Brezhnev, as political officer for the 18th Army, was responsible for creating the sounds of two tank armies on the left wing of the 1st Ukrainian Front. This was an area where there were very few troops. Using loudspeakers, the Soviets were able to convince the Germans that a major thrust was to come from this location. At least one German division was deployed from the region of the real Soviet attack to defend the left wing of the front from an anticipated attack by the false tank armies.[16]

Radio/Radar. Radios are both a blessing and a curse. They allow speedy communications but often reveal locations of facilities otherwise concealed. Analysis of the pattern of radio use may, for example, help identify command posts. One means of reducing this problem is to disperse radio antennas away from command posts, thereby focusing an enemy's attention on another area. Radios also serve as a means of simulation, demonstration, and disinformation. Apparent inadvertent transmissions may actually be designed to spread false information. A simulation such as the one Secretary Brezhnev was involved with required false radio transmissions to replicate the Soviet tank armies. In other instances, large

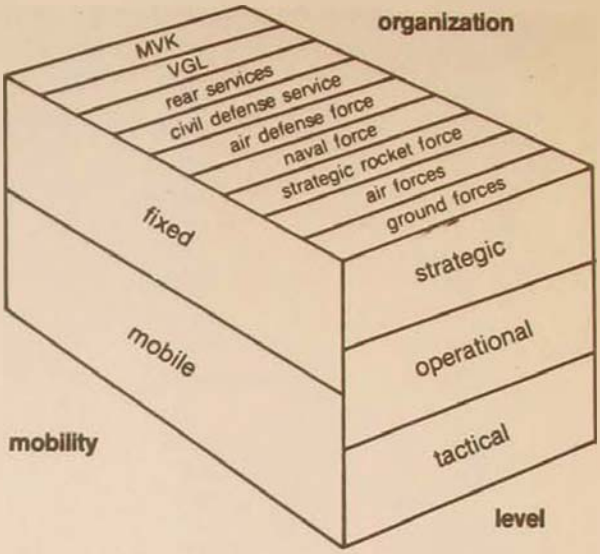

Figure 9.

The diagram above shows the organizational structure of maskirovka as well as the spectrum of organizations that are involved.

Soviet tank units were relocated while their command and other radios remained in the old positions and continued broadcasting.

Environment and Activity

Maskirovka may be conducted in any environment to deny information to sensors. Sound *maskirovka* onboard a submerged submarine is designed to counteract acoustical sensors within the aquatic environment. Regardless of the environment, the form and type of *maskirovka* may be either active or passive. While most aspects of *maskirovka* involve some form of activity, others (such as silence) require none. The best example of active and passive actions is in an area of radar. The use of special radar-reflecting or absorbing netting and possibly radar reflectors tied down in an area is considered passive. Moving reflectors up and down a road is considered active, as is jamming an enemy's radar systems using false transmissions or dispersing radar-reflecting chaff. In the Soviet military, these active methods are part of normal *maskirovka*,

while in the West they are considered radio electronic warfare.

Organization

Maskirovka has many organizational factors. The second of the three simplistic models shows the organizational factors (fig. 9). These factors include the level of implementation, mobility, and the branch of the armed forces involved.

Level

Maskirovka is employed at all levels of military activity. At the tactical level, it often involves more concealment and imitation than simulation and disinformation. Here the primary objective is to make the location of small units difficult to determine. Operational as well as strategic *maskirovka* are based on successful tactical efforts. At these higher levels, larger units and greater areas are involved with greater emphasis on simulation, demonstrative actions, and disinformation.

Mobility

The mobile or fixed nature of an object has a great bearing on the implementation aspects of *maskirovka*. In this regard, items such as tanks or field artillery frequently assume both modes. Thus, while in a fixed mode, a tank may be masked by netting. While it is in motion, such netting is uncalled for and other means of concealment are required.

Branch of Armed Forces

The aspects already described, as well as the doctrinal inputs detailed below, apply to all branches or services of the Soviet armed forces. Aspects that apply to small units in the Ground Forces apply also to naval troops, KGB border guards, troops of the Ministry of Internal Affairs (MVD), and to troops of the other forces and services. *Maskirovka* at the operational level would involve close coordination between the five branches and Rear Services of the Minister of Defense's forces, as well as with the KGB's border guards and MVD troops. This is especially true at the front and theater of military operations (TVD) levels during wartime when these may be under one commander.

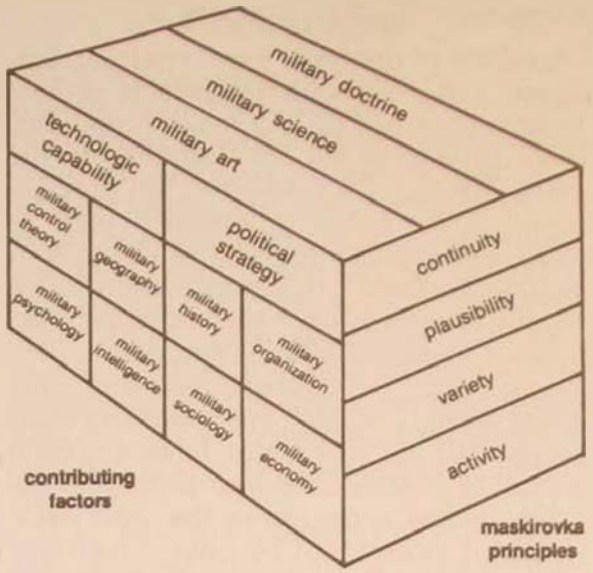

Figure 10.

Maskirovka principles and contributing factors. Soviet maskirovka is the product of a carefully designed hierarchy of military thought.

Doctrine

All Soviet military operations are based on a carefully defined and structured hierarchy of military thought (fig. 10). These include military doctrine, science, and art, as well as numerous contributing factors.

Political strategy, technical capabilities, and many other factors have an impact on Soviet military doctrine, science, and art. An analysis of these factors is beyond the scope of this article; however, in the realm of *maskirovka* they all have led to the formulation of several principles.

Principles

Regardless of the type, form, environment, nature, and organizational aspects, *maskirovka* is governed by four major principles. These principles are not described in the *Soviet Military Encyclopedia*, but they are discussed by military personnel both in books and articles. In spite of changes in technology, these principles remain valid, and the Soviets believe they must be practiced for *maskirovka* to be successful. Several principles have subelements that some Soviet military authors may regard as separate guidelines. They also have a certain amount of overlap. The four principles described below appear to be the most pertinent and consistent in Soviet military writings. These are activity, plausibility, variety, and continuity.

Activity. The principle of activity or aggressiveness stresses that all *maskirovka* must be persistent to give the enemy a false idea. The objective is to cause the enemy to make incorrect estimates of a situation.[17] Once a form or type of *maskirovka* has been implemented, it may become necessary to change it. For example, after an airfield has been attacked and has once again become operational after repairs, *maskirovka* efforts might be made to make it appear still out of commission and abandoned.

Plausibility. All efforts at *maskirovka* must be plausible. This is an especially important principle. Regardless of the type or form of *maskirovka* involved, the enemy must believe what he sees is real when in fact it is not.[18] At the tactical level, slit trenches must not be cut across natural contours but should blend with the terrain. *Maskirovka* that does not blend into the background will, in effect, pinpoint the location of the object. Placing a dark-colored net over a tank in an area of sand and light brush is obviously less plausible than using a matted sand-colored net. False targets should be located in sites where their presence would be expected; that is, a radar site would not normally be located in a deep depression.

Variety. Repetitious patterns of *maskirovka* must be avoided and variety employed. This is the principle of variety. Some German sources indicate that Soviet efforts at *maskirovka* during the Second World War were predictable. As German forces moved into new positions, they scanned the areas held by the Red Army in an attempt to locate specific positions such as command posts. They would suspect certain locations as the site of these positions based upon their past experiences. In many instances, such suspicions were confirmed. Several authors have pointed out that the Soviets tend to follow the "approved" solution to many matters, including locations for units and command functions. Soviet attempts at disinformation also were said to follow a pattern that, once recognized, revealed the *maskirovka* effort.

Continuity. The final principle is that of continuity both in peace as well as in war. It is difficult to successfully employ *maskirovka* on a new factory or installation after all construction has been completed. *Maskirovka* must be part of all plans and must be continued throughout an operation. An extremely significant example of a violation of this principle occurred in 1962 and led to the Cuban missile crisis. *Maskirovka* efforts were employed from the beginning of the operation to conceal deployment of missiles to Cuba. However, no efforts at concealment were made during the construction of launch sites. US reconnaissance assets were able to detect these sites based upon their pattern.

Research and Writings

Maskirovka has been the subject of many articles in Soviet military periodicals and books. Several of these are accounts of research either within the USSR or from foreign sources. Obviously, because of the nature of the topic, many specifics are not presented in their analyses. Soviet articles "based on foreign sources" often serve as a means of discussing or presenting techniques and technologies that the Soviet mil-

itary believes would add to its *maskirovka* efforts. Because of this, articles and descriptions of this type should be carefully scrutinized. While the implications have not been ascertained, a 1969 Soviet book described in detail several means of reducing radar returns. Items analyzed included West German ceramic plates that dispersed radar energy, a West German three-layer absorbing material, and a corrugated-surface material designed in Britain that also absorbed radar energy.[19]

The same purpose is served by articles that cite examples of "good" or "bad" *maskirovka* from the Great Patriotic War. To a large extent, these reviews of military history provide insights into current views and ongoing debates. Soviet *maskirovka* has also been studied in the West to a limited extent. One problem has been that of scale. Research and articles have included in-depth studies of smaller components such as smoke screens without analyzing how these mesh into the entire concept. Other approaches have been to discuss several main components without examples of implementation. Although these have added greatly to the understanding of *maskirovka*, additional studies and analysis are needed.

Conclusions

This article began by citing examples of *maskirovka* in the novel *Red Storm Rising*. The author of that book presents numerous examples of military *maskirovka*, including the use of noise decoys by submarines, dispersal of radio antennas and transmitters around command posts, and stealth aircraft. The article then focused on the Soviet armed forces and used three simplified models as a means of addressing the topic. As indicated in the article, *maskirovka* is a complex and well-structured Russian concept that is also well funded and carefully planned.

In spite of the numerous military examples included, the book *Red Storm Rising* uses *maskirovka* primarily to describe activities in the political arena. Some of the aspects described in the book differ from those employed by the military, but other factors are essentially the same. Disinformation rather than concealment may become the primary form, but the four principles still are of utmost significance.

Because of this, *maskirovka* must be understood in its broadest context by all who deal with the USSR. □

Notes

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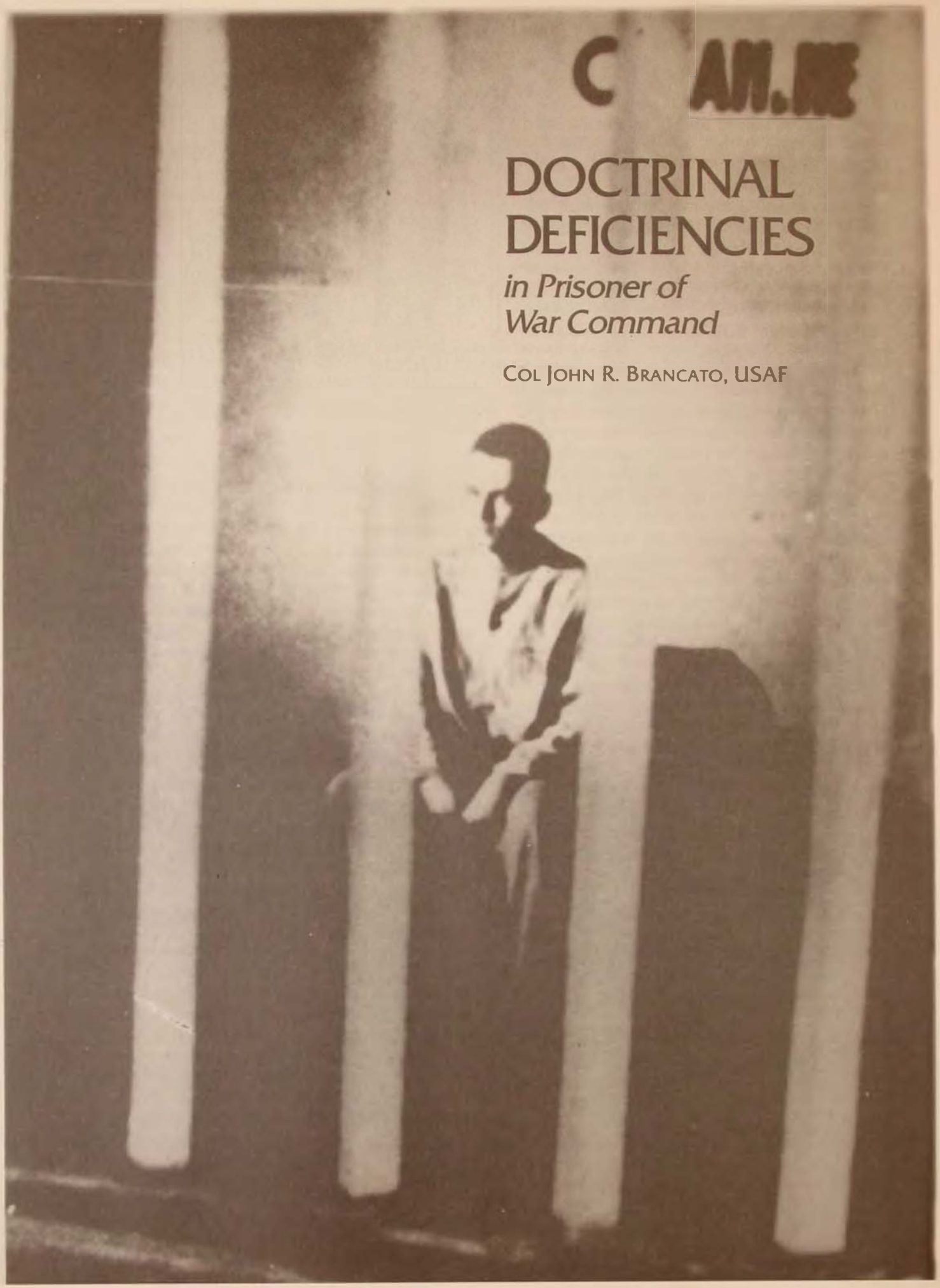


DOCTRINAL DEFICIENCIES

in Prisoner of War Command

COL JOHN R. BRANCATO, USAF

MUCH IS written of late about the need for warriors to think in terms of fighting across a spectrum of conflict—the range of violence experienced and applied by a nation's armed forces. On the one end, there is total war; on the other, low-intensity conflict. Somewhere in between lie limited war and a variety of lesser and greater scenarios. Each point in the spectrum is characterized by different strategies, different doctrine, different tactics, and even different weapons. Warriors, it is said, should study the differences in order to prepare themselves to fight any kind of conflict when the need arises.[1]

Despite all this emphasis, there is one point on the conflict spectrum that has been largely ignored—perhaps forgotten—in the US armed forces. This is the conflict waged by and against prisoners of war (POWs).

That the condition of being a POW is even on the spectrum is perhaps not fully understood within the military establishment. However, two short policy pronouncements at the highest levels of government make it clear that it is. The first is Article III of the *Code of Conduct for Members of the Armed Forces of the United States*,[2] an executive order of the president that has this pertinent statement: "If I am captured, I will continue to resist by all means available." The second is a Department of Defense directive that states:

> The duty of a member of the Armed Forces to continue resistance . . . by all means available is not lessened by the misfortune of capture. Contrary to the 1949 Geneva Conventions, enemies which U.S. forces have engaged since 1949 have regarded the PW compound *as an extension of the battlefield*. The United States PW must be prepared for this fact.[3] (Emphasis added.)

This article explores some of the gaps in US doctrine on the all-important matter of POW command. It identifies deficiencies—some of which were pointed out by American servicemen who were prisoners in the Vietnam War—that, for some reason, have not been remedied to this day. It proposes derivative doctrinal solutions.

Background

The need for effective command in a POW environment is captured succinctly in a Department of Defense pamphlet on the *Code of Conduct*: "Strong leadership [is] essential to discipline. Discipline is the key to camp organization, resistance, and even survival."[4] To achieve the goal of strong leadership, Article IV of the *Code of Conduct* provides, among other things, "If I am senior, I will take command."

Those eight words, although seemingly clear and straightforward, have proven exceedingly ambiguous in war, most recently in the Vietnam War. The problem appears to be a lack of appreciation by policymakers of the variety of circumstances that prisoners of war face. This, in turn, has resulted in a lack of interpretative doctrine on the subject.

Left unanswered are a number of questions. Is every prisoner *eligible* to command? What is the definition of *senior*? What if the senior prisoner *declines* the command? What if the senior prisoner is physically, mentally, or morally *unfit* to command? What is the *extent* of the command—a room, a building, the entire compound?

There is some evidence that, in the review of the *Code of Conduct* conducted by the Department of Defense immediately following the Vietnam War, the US Army desired to have questions such as these answered.[5] However, the principal concern of the other services at that time was not the technical problems of POW command but the issue of how much a prisoner was expected to endure under torture— that is, when and how much information should he be permitted to divulge to his captors without violating the *Code of Conduct*?

That issue was resolved in a 1977 amendment to the *Code of Conduct*, which changed two words in Article V. Instead of

"I am *bound* to give *only* name, rank, service number, and date of birth," the code now provides, "I am *required* to give name, rank, service number, and date of birth."[6] (Emphasis added.) Thus, there is no longer a connotation of impropriety to giving more than the so-called big four.

Another important concern during the postwar review was the lack of a clear statement in military law on whether a member of one military service could be under the command of a member of another military service. Despite the nation's long history of unified fighting, there was confusion on this point after Ted Guy, an Air Force colonel held by the Vietcong, preferred charges under the Uniform Code of Military Justice against three Marine and five Army enlisted men after they all were repatriated. According to evidence from a variety of sources, the enlisted men formed what was referred to as the "Peace Committee" while in captivity and at every opportunity they defied Colonel Guy, who was the senior officer and commander in their POW compound.

They also collaborated with the Vietcong, to whom they voluntarily gave information that led to Colonel Guy's brutal torture, and they freely made statements against the Vietnam War and against the United States.[7] Such conduct in any previous war fought by the United States would surely have resulted in court-martial and severe punishment.

However, the secretaries of the Army and Navy dismissed Colonel Guy's charges, both on the technical uncertainty of whether the "Peace Committee" was under Colonel Guy's orders in the camp and on the political grounds of putting the unpopular Vietnam War behind the country. One of the enlisted men committed suicide. Another went on to become a spokesman for Marxist causes.[8]

This, and other cases like it, led to improvements in 1978 in the *Manual for Courts-Martial, United States*, which now states expressly what many military lawyers previously believed was implied by enforceable custom—that a member of the US armed forces can indeed be prosecuted for disobeying an order of the senior US officer who takes command in a POW environment, regardless of the senior prisoner's service or department.[9]

Having considered the larger issues of permissible disclosures and cross-service command, perhaps it is now time for the Department of Defense to resolve the technical problems of POW command—problems that touch on basic doctrine—before the

Rules for conduct of POW camps seemed fairly straightforward for World War II POWs, even when the Geneva Convention was not strictly followed by the enemy. Since that conflict, the question has become much more complicated. Pictured here are POWs captured on Bataan shortly after their release from Bilibid Prison in February 1945.

next war. In this connection, AFM 1–1, *Basic Aerospace Doctrine of the United States Air Force*, states that "command structures are developed . . . *in peacetime* to ensure smooth transition from normal conditions to . . . war."[10] (Emphasis added.)

Some Doctrinal Deficiencies and Solutions

Who is eligible to command? Who has seniority? What if the senior person is either reluctant or unfit to command? And how far does one's command extend within the POW environment? Such fundamental questions point up the need for clear doctrine.

Who Is Eligible to Command?

Every service except the US Marine Corps has its own rules on eligibility to command. In the US Air Force, for example, chaplains and enlisted members may never command, and health care providers may command health care activities only. Judge advocates may command but only with the *advance* approval of the judge advocate general.[11] The Army and the Navy have rules restricting still other categories of servicemen from general command. In the Marine Corps, everybody is eligible to command, but the Marine Corps has no chaplains or physicians.

The Department of Defense has taken the position that the individual eligibility rules of the services should apply in a POW camp. However, it has explicitly recognized that an enlisted member may be the senior prisoner in a particular camp or setting and may, therefore, command under that circumstance.[12]

The Geneva Convention Relative to the Treatment of Prisoners of War,[13] a treaty ratified by the United States that ranks with acts of Congress as the "law of the land," looms over both the service rules and the Department of Defense pronouncement. It expressly provides that, with the exception of chaplains and medical personnel, all military members are combatants. Chaplains and medical personnel are noncombatants and, accordingly, cannot be considered or treated as prisoners of war, even while they can be detained by an opposing armed force (Article 33).

The real problem here, of course, is the Department of Defense requirement to follow individual service rules on eligibility. Even in a POW camp, it seems, individual service prerogatives are not easily subordinated. Colonel Guy's predicament with the enlisted "Peace Committee" was not an isolated case of legal uncertainty. In the early days of the Vietnam War, there was even a question *among officers* as to whether POW command was unified. This, too, was

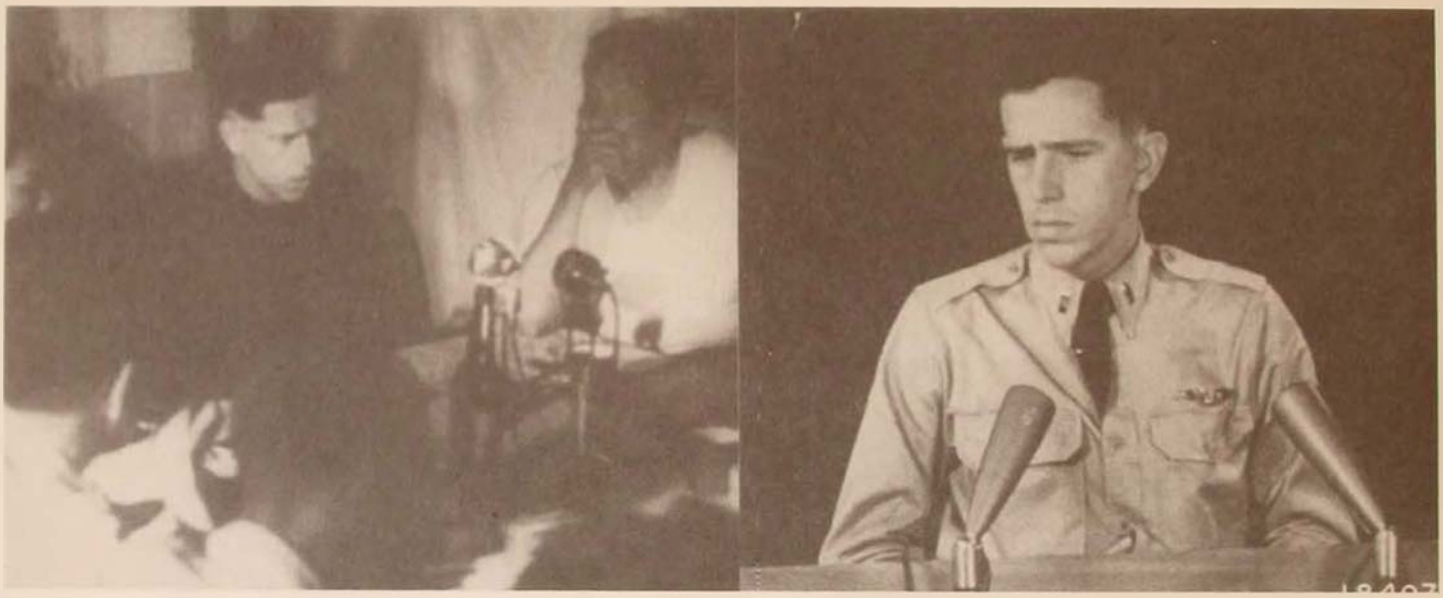
doubtless the product of prevailing notions of service independence, as this passage from Adm Jeremiah Denton's book, *When Hell Was in Session*, illustrates:

> One thing Larry [Maj Larry Guarino] and I had to settle was the chain of command. The Code of Conduct demands that in a POW situation, command must be established on a rank and seniority basis; that is, when officers of equal rank are involved, seniority takes precedence. Larry thought that was fine, but since he was in the Air Force and I was in the Navy, what we had was two one-man armies. Eventually, I convinced him that he was wrong. The senior ranking officer is in command over men of all services. So far as Larry and I were concerned, that was me. Larry gave in gracefully and agreed to accept my orders. Perhaps it seemed like a Mickey Mouse exercise, but the question of command soon became of immense importance.[14]

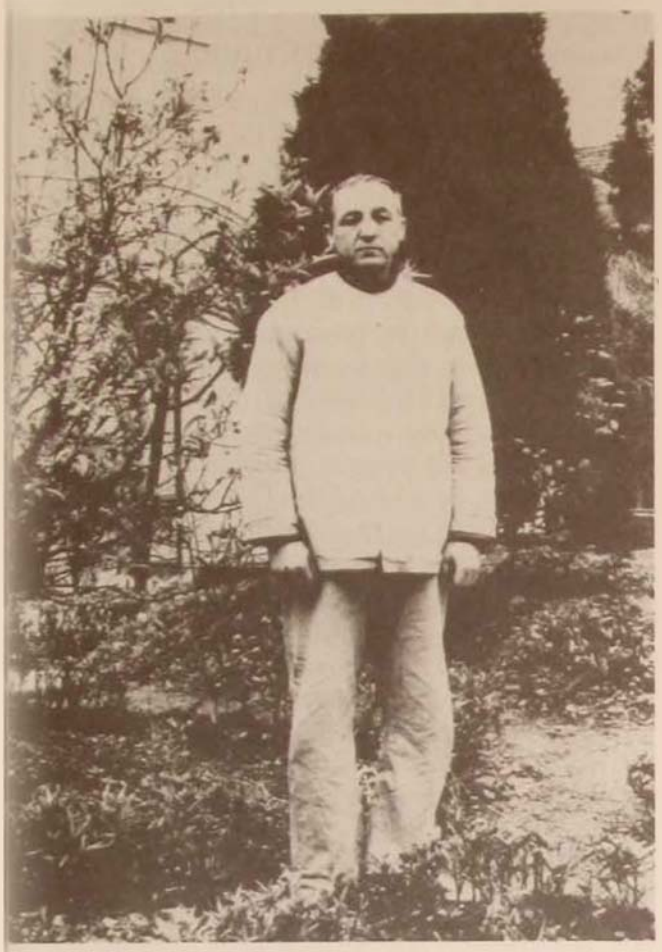
If command in a POW camp is unified command, then the eligibility rules should be uniform for all the services, if for no other reason than ease of application under wartime conditions.[15] The categorization in the relevant Geneva Convention seems compelling. If all are combatants except chaplains and medical personnel, then everybody except chaplains and medical personnel should be eligible to command in a POW environment.

Also, enlisted persons might indeed be called on to command if there are no officer prisoners. One vivid example involved a group of exclusively enlisted prisoners in Vietnam, which included an American soldier by the name of George E. Smith. Smith apparently was not only opposed to the US military presence in Vietnam in particular but also to US military authority in general. Challenging the authority of the senior enlisted man in this group, Smith told him:

> Go get your damned court and try me right here! Otherwise, you son of a bitch, keep your



The actions of POWs became a serious question in the Korean War and revisions were made as to expected conduct, but no overall doctrine was ever developed. Air Force 1st Lt Floyd O'Neal is shown at left giving a confession that was forced out of him by his captors and at right after his release, at which time the confession was retracted.



Lt Col (later Brig Gen) Robinson Risner was one of the senior POWs in Vietnam. His rank in the chain of command and his span of authority while a prisoner are two of the doctrinal issues that are still unresolved.

mouth shut. I'll punch you in the goddamned nose.[16]

Smith then did what he threatened, punching his enlisted commander in the face. When he returned to the United States, he wrote a book in which he recounted this—a book which by its own admission is sympathetic to the Vietcong.[17] Like the members of the "Peace Committee," Smith was not court-martialed on return.

The concept of POW command by the senior enlisted member is not without legal problems, however. It potentially conflicts with the applicable Geneva Convention.[18] Under Article 79, the convention introduces the concept of "prisoner of war representative," which is roughly equivalent to the position of commander. The senior officer is the prisoner of war representative in camps containing both officers and enlisted members, or officers only. However, in camps containing enlisted members only, the convention provides that the prisoner of war representative will be elected for six-month terms by secret ballot of the prisoners. By legal interpretation, the Department of Defense has resolved this apparent conflict between the convention and the *Code of Conduct* as follows:

> The Geneva Conventions . . . provide additional guidance to the effect that in . . . camps containing enlisted personnel only, [the] prisoner's representative will be elected. . . . [S]uch a representative is regarded by U.S. policy as only [a] spokesman for the senior military person. The prisoner's representative does not have command, unless the [prisoners] elect . . . the senior military person. The senior military person shall assume and retain actual command, covertly if necessary.[19]

Clearly, the Department of Defense should promulgate uniform rules on command eligibility, at least for POW camps. Until this happens, out of mathematical necessity alone, the US Air Force at least should change its regulation on command eligibility to permit enlisted command in a POW environment. There are those who would argue that US Air Force publications on this subject should also emphasize an institutional intent to deal with any George E. Smiths in blue uniform with the utmost severity.[20]

Who Is Senior?

This problem was summarized by Brig Gen Robinson Risner, who was a prisoner of the North Vietnamese for seven years:

> Establishing who was the senior ranking officer was no small task as the number of POWs increased through the years. There were several factors which complicated this. Some of us were given promotions while we were in prison. Yet, verification of the effective date of the promotion was almost impossible. Conceivably, we could hear about a recent promotion almost at the time it occurred. But due to bombing pauses or the lack of pilots being shot down, we might not learn of another promotion until months or years after it was effected. To solve that, we went by the rank at the time of shoot-down. Mine was lieutenant colonel. Although I became full colonel in less than three months after shoot-down [in 1965], in the POW chain of command I remained a lieutenant colonel until 1971, when an exception was made by [the senior ranking prisoner in Vietnam] Colonel John Flynn.[21]

There is no guidance in the *Code of Conduct*, Department of Defense publications, or service regulations on how to deal with the problem of defining the senior prisoner. Yet there ought to be because this has proved to be a matter of grave concern among real prisoners.[22]

One solution is the one actually used in Vietnam, as explained by General Risner. Another, and perhaps better, solution is to honor reports of promotions and promotion effective dates brought in by new prisoners, but only when the newcomer can state that he has either seen the written promotion order or has been officially instructed to make such a report if he himself should ever become a prisoner.

Anything short of representations such as these would seem to be too unreliable for the other prisoners to honor. For example, rumors may not be true; announcements of promotion selection may be confused with actual promotion, which usually follows at a later date; and action may be taken to delay a promotion or rescind a promotion selection without public awareness.

In any case, there is a need for a rule here, and for everyone to know what the rule is. Otherwise, the command situation in a POW camp can be confusing and ripe for disagreement and dissension.

What If the Senior Prisoner Declines Command?

In his book titled *In Love and War*, which he coauthored with his wife, Vice Adm James B. Stockdale tells of a time when, after being returned to the main compound after he was held in isolation by the North Vietnamese, he asked fellow prisoner, Comdr (later Rear Adm) Jeremiah A. Denton, Jr., to remain in command even though Stockdale, then also a commander, was senior. Stockdale felt he could not take command because he was emotionally "out of gas."[23] In a 1974 speech, the senior American prisoner, Brig Gen John P. Flynn (a colonel in Vietnam, later a lieutenant general) said he approved of this practice.[24] Other prisoners described cases of senior officers in their camps who declined command because they did not wish the exposure to their captors that command brought them.[25]

It seems reasonable to permit the senior prisoner to decline command if he is physically incapacitated, and perhaps even if, in his own mind, he is not mentally able to command. Yet, there is no central guidance on these points, and the Department of Defense has taken the position that command "may not be evaded."[26]

Certainly, the Department of Defense position is a rule of accountability applying to the senior prisoner, not a rule appointing the senior prisoner to command. It is well settled in military law that, while the duty of taking command may devolve on the senior, command itself does not automatically devolve. Command must be affirmatively taken, either by assuming it or by being formally appointed to it.[27] Therefore, if the senior prisoner declines command, he may have violated the *Code of Conduct* or another applicable directive, but command itself is left open for the next senior prisoner to take.

What is needed here is a policy pronouncement to the effect that there are acceptable and unacceptable reasons for declining command in a POW camp. In either case, however, the next senior pris-

oner has the duty of taking command. The Department of Defense has already placed such a duty on the next senior prisoner,[28] but it has not recognized a distinction between acceptable and unacceptable reasons.

What If the Senior Prisoner Is Unfit to Command?

This is closely related to the previous question. Just as there are acceptable and unacceptable reasons for declining command, there are different kinds of unfitness. Some prisoners may be physically or mentally unfit, others morally unfit. In either case, what is contemplated here is a procedure for relieving a senior of command when he will not give it up himself—that is, when he will *not* decline to take it or continue it.

Obviously, this presupposes that a junior prisoner will be willing to unilaterally relieve a senior prisoner who does not wish to be relieved. In a non-POW context, there are no rules prescribing such a procedure in any of the services, even though the fictional mutineers in Herman Wouk's famous book, *The Caine Mutiny*, thought the US Navy had such a set of rules. The unwritten rule of military law is simply one of proceeding at your own risk, based on reasonableness and necessity under the circumstances. Nothing was ever written out of fear that a written procedure might encourage its own use.

Yet, a POW environment is surely different. Captivity means long periods without communication with superior authorities. In Vietnam, there were at least two reported cases in which superior officers, who were prisoners themselves, attempted to relieve lesser commanders for cause. One involved a Navy captain and the other a Marine lieutenant colonel. Each disobeyed orders not to meet with visiting "peace" delegations led by Jane Fonda and Ramsey Clark. Each attempt at removal was ultimately successful but troubled. After repatriation, Admiral Stockdale preferred charges against the two officers under the Uniform Code of Military Justice. However, the charges were dismissed by the secretary of the Navy.[29]

If the Department of Defense agrees that necessity allows—perhaps even demands—that a junior relieve a senior who, for example, is collaborating with the enemy, then should not the department be willing to authorize this in a written rule where specific procedures and safeguards can be prescribed? If the people of the United States have expressly authorized the vice president to relieve a reluctant president—and have prescribed a detailed procedure for doing so in the next to the last amendment to the United States Constitution,[30] then there should be sufficient precedent to authorize a similar procedure in POW camps.

What Is the Extent of POW Command?

This question evolves from a concern with reliable communications. If the senior prisoner in a compound has communications with all of the prisoners in the compound, is it necessary to have a commander in each of the buildings? If lack of a means of communicating with each other precludes having a camp commander, is it necessary to have a commander in each room if the senior prisoner in the building can communicate with everyone in the building?

Issues such as these introduce the principle that command should extend as far as communications extend. In other words, a prisoner in solitary confinement—truly isolated from the rest of the prisoners—cannot effectively command the rest. On the other hand, a prisoner in one building can indeed command prisoners in another if he can directly or indirectly communicate with them, and they with him.

General Risner described the situation in Vietnam:

> [Another] obstacle was the geographical location of the various cellblocks within a given prison, as well as the number of different prisons. Many men were constantly being shuffled from one cell to another. Finally, the most difficult obstacle was simply the process of com-

> munications itself. For instance, when I just went to the Zoo in 1965, I was able to contact all of the people in all of the buildings. I could get a message to them and an answer in a maximum of two days. The Vietnamese started cracking down on this and made it more difficult. When I was moved into isolation, I had only intermittent contact for the next few years.[31]

Admiral Denton emphasized the importance of communications:

> There was one advantage in the new location. Colonel Flynn, who had been isolated, was in Building Zero. With so many of us now in the same building, he could be in touch with the rest of the camp, *which enabled him to exercise command.*[32] (Emphasis added.)

This principle of span of communications is founded on logic and reason. Had it been expressed formally—perhaps in a well-taught Department of Defense directive—at the time of the Vietnam War (it still has not been), US prisoners would have been more sure of themselves in taking command at the appropriate time.

Conclusion

Military doctrine is simply what is officially understood to be the best way to do military things.[33] To be effective, it must be widely taught and widely believed.[34] However, it cannot be either if it is neither formulated nor articulated.

Why is there a doctrinal void here? It appears that no one can say with certainty. Perhaps the repatriation of the US prisoners from Vietnam has made the problem less urgent, even though no one had a good perception of the problem until the repatriation. Perhaps the lack of hostilities in the years following the Vietnam War has given the matter a low priority. Perhaps people still believe that the eight words, "If I am senior, I will take command," are all that is necessary for thinking warriors.

One thing is certain. In time of actual war, when there were prisoners of war, these eight words were not enough. They bred confusion at least in four of the five areas presented in this article.[35]

An old and recurring theme in Russian poetry says that when one discovers he has traveled far on the wrong road, he should still turn around and go back. In the American version, it is said that it is never too late to fix something that is broken if you have not used it. Such is the case for doctrine on POW command.

The suggested solutions to the problems presented in this article are founded on the principles of simplicity and effect.[36] That is, they will be relatively easy to teach and relatively easy to learn once they are adopted and written. Also, they will work. Most important, they will help ensure that future battles, waged by future prisoners of war, will not be soon forgotten on the spectrum of conflict. □

Notes

1. See, for example, Thomas A. Fabyanic, "War, Doctrine, and the Air War College," *Air University Review*, January-February 1986, 9.

2. Executive Order (EO) 10631, CFR (*Code of Federal Regulations*), title 3, 1954–1958 comp., page 266; as amended by EO 12017, *Federal Register* 42, no. 214, 3 November 1977, CFR, title 3, pt. 152 (1978). Hereafter cited as the *Code of Conduct*.

3. DOD Directive 1300.7, *Training and Education Measures Necessary to Support the Code of Conduct*, 19 December 1984, encl. 2, para. B3(a). This directive is attached to AFR 50–3, *Code of Conduct Training*, 25 April 1986.

4. AFP 34-10 (DOD Gen.-11A), *Code of the US Fighting Force*, 1979, 10; DOD Directive 1300.7, encl. 2, para. B4(a)(2).

5. Department of Defense, *Report of Defense Review Committee for the Code of Conduct*, Washington, D.C.: Office of the Secretary of Defense (Manpower, Reserve Affairs, and Logistics), 1976, vol. 2, IV–29.

6. In its entirety, Article V states:

> When questioned, should I become a prisoner of war, I am required to give name, rank, service number and date of birth. I will evade answering further questions to the utmost of my ability. I will make no oral or written statements disloyal to my country and its allies or harmful to their cause.

7. Zalin Grant, *Survivors* (New York: W. W. Norton, 1975).

8. For another example of misconduct by US servicemen who were prisoners of war in Vietnam, see James N. Rowe, *Five Years to Freedom* (Boston: Little, Brown and Company, 1971), 196. Major Rowe reported that one US soldier complained to him, "Who elected you [commander]?"

9. *Manual for Courts-Martial, United States*, 1984, pt. IV, paras. 13c(1), 14c(1)(a)(i), and 16c(2)(c)(i). Hereafter cited as MCM.

10. AFM 1–1, *Basic Aerospace Doctrine of the United States Air Force*, 16 March 1984, 4–3.

11. AFR 35–54, *Rank, Precedence, and Command*, 15 September 1984, paras. 9, 11a, 11b, and 11c; AFR 110–1, *The Judge Advocate General's Department*, 7 August 1986, para. 6; *US Code*, title 10, sec. 8581 (1982).

12. DOD Directive 1300.7, paras. B4(a)(4) and C4.

13. Adopted by the United States on 2 February 1956. See *Treaties and Other International Acts Series* (TIAS) 3364, *United States Treaties and Other International Agreements* (UST), vol. 6, 3316; *United Nations Treaty Series* (UNTS), vol. 75, 135. This is one of four conventions of 1949. Each is a separate treaty to which the United States is a party.

14. Jeremiah A. Denton, Jr., *When Hell Was in Session* (Mobile, Ala.: Traditional Press, 1982), 28.

15. It is unified. See DOD Directive 1300.7, encl. 2, para. B4(a)(4). See also the improvements to the *Manual for Courts-Martial, United States* in the sections listed in note 9 above, which aid unified command. Another associated issue that never came up in the Vietnam War was whether the command can be *combined*. There is no guidance in any US directive, regulation, or doctrinal pronouncement on this. However, just as the American colonel did in the movie *Von Ryan's Express*, the senior American officer prisoner in Vietnam did impose his will on allied prisoners. He recounted that "we called ourselves the 4th Allied POW Wing because this was the fourth war in which we have had allied prisoners and, of course, the allies being the three Thais and one South Vietnamese." Address by Brig Gen John P. Flynn, to the Air Command and Staff College, 24 June 1974 (Unpublished text available in the USAF Historical Research Center, Maxwell AFB, Alabama). One commentator has suggested that the question of whether American soldiers will submit themselves to the command of a senior prisoner who is from an allied nation is a decision for the senior ranking American prisoner. See Donald L. Manes, Jr., "Barbed Wire Command: The Legal Nature of the Command Responsibilities of the Senior Prisoner in a Prisoner of War Camp," *Military Law Review*, October 1960, 17. Perhaps the nineteenth-century observation of Gen Sir Edward Hamley applies here: "[Tactics is] the opinion of the senior officer present." Quoted in Jay Luvaas, *The Education of an Army: British Military Thought, 1815–1940* (Chicago: University of Chicago Press, 1964), 153.

16. George E. Smith, *P.O.W.: Two Years with the Vietcong* (Berkeley, Calif.: Ramparts Press, 1971), 116-17.

17. Ibid.

18. See note 13.

19. DOD Directive 1300.7, encl. 2, para. B4(a)(6). See also AFP 34–10, 10; and AFP 35–19, *Prisoner of War: Rights and Obligations under the Geneva Convention*, 1 March 1980, 7. Note that there is no express recognition in the *Manual for Courts-Martial, United States* of the proposition that an enlisted member of one military service can be prosecuted for disobeying an order of the senior prisoner in command who is an enlisted member of another military service. In the opinion of many military lawyers, however, an enlisted commander in a POW camp has the same authority (to issue orders that must be obeyed but not to impose nonjudicial punishment under the Uniform Code of Military Justice) as a commander who is a commissioned officer, regardless of service, under the enforceable customs of the armed forces. See the pertinent sections of the MCM cited in note 9 for the situation on senior prisoners who are commissioned officers.

20. The Smith case illustrates why it is important for commanders and judge advocates, if they desire to attain a higher plane of effectiveness, to be students of military history. Commanders should consider Clark Becker's "scientific" observation: "The history that lies inert in unread books does no work in the world." Jay Luvaas, "Military History: Is It Still Practicable?", *Parameters*, March 1982, 13. Lawyers should remember Sir Walter Scott's observation in *Guy Mannering* that a lawyer who knows only the law is a mere mechanic, but a lawyer who also is a student of history can presume to call himself an architect.

21. Robinson Risner, *The Passing of the Night* (New York: Random House, 1973), 203.

22. John A. Dramesi, in *Code of Honor* (New York: W.W. Norton, 1975), makes the following statement:

> [T]here were disagreements. Paul Brudino said we should change the rules for determining who was senior because Risner was not the senior ranking officer and he felt Ligon did not deserve to be leading us because of his long unwillingness to take command while we were in Little Vegas. I said to Paul, "Well, it depends on what rules have been established. As far as I know, at the Zoo, it was your rule to determine seniority according to your rank at the time you were shot down." He denied giving that order and insisted that Risner should be the ranking officer. "Well, that's the way it is now," I said, "unless, of course, the criteria for determining rank or seniority are revised." (pp. 192–93)

23. Jim and Sybil Stockdale, *In Love and War: The Story of a Family's Ordeal and Sacrifice During the Vietnam Years* (New York: Harper and Row, 1984), 400.

24. Flynn, 14.

25. Dramesi, 20.

26. DOD Directive 1300.7, encl. 2, para. B4(a)(4).

27. AFR 35–54, para. 10.

28. DOD Directive 1300.7, encl. 2, para. B4(a)(4): "If the senior person is incapacitated or otherwise unable to act for any reason, command will be assumed by the next senior person."

29. Holman J. Barnes, Jr., "A New Look at the Code of Conduct" (Unpublished thesis presented to The Judge Advocate General's School, United States Army, 1974, 52-53, available in Air University Library, Maxwell AFB, Alabama). Jane Fonda was thought by many former Vietnam POWs, several judge advocates, and some others to be an actual traitor for her actions during the war. These included her activities in Hanoi (such as posing on an antiaircraft gun and making pro-North Vietnamese speeches to American POWs), and her activities in the United States (such as calling American POWs "liars" when they said they were tortured by the North Vietnamese). She has recently said through her publicist that she "very much regrets all the pain and hurt that [she] caused." See "Fond of Fonda?" *Air Force Times*, 17 August 1987, 68.

30. Amendment 25 to the US Constitution is unartfully written and fraught with procedural ambiguities. The procedure can be written more simply for prisoners of war.

31. Risner, 203–4.

32. Denton, 168. Denton, Risner, and Dramesi all reported that, on occasion, several prisoners assumed command of different but overlapping locations, or the same location in quick succession. See, for example, Risner, 206: "[T]here were four [commanders] in a matter of a few days. Needless to say, there were a lot of code names going around and quite a bit of confusion." Lower ranking prisoners were mainly concerned with the leader of their own building. See Jay Jensen, *Six Years in Hell* (Bountiful, Utah: Horizon Publishers, 1974), 149.

33. This popular view of doctrine has been attributed to Maj Gen I. B. Holley, Jr., USAFR, Retired, arguably the academician who has had the greatest influence on the development of aerospace doctrine since World War II. See Dennis M. Drew, "Of Trees and Leaves: A New View of Doctrine," *Air University Review*, January-February 1982, 41.

34. Robert C. Ehrhart, "Some Thoughts on Air Force Doctrine," *Air University Review*, March-April 1980, 35, quoting Maj Gen Dale O. Smith: "The best doctrine is worthless if it is not well known and believed."

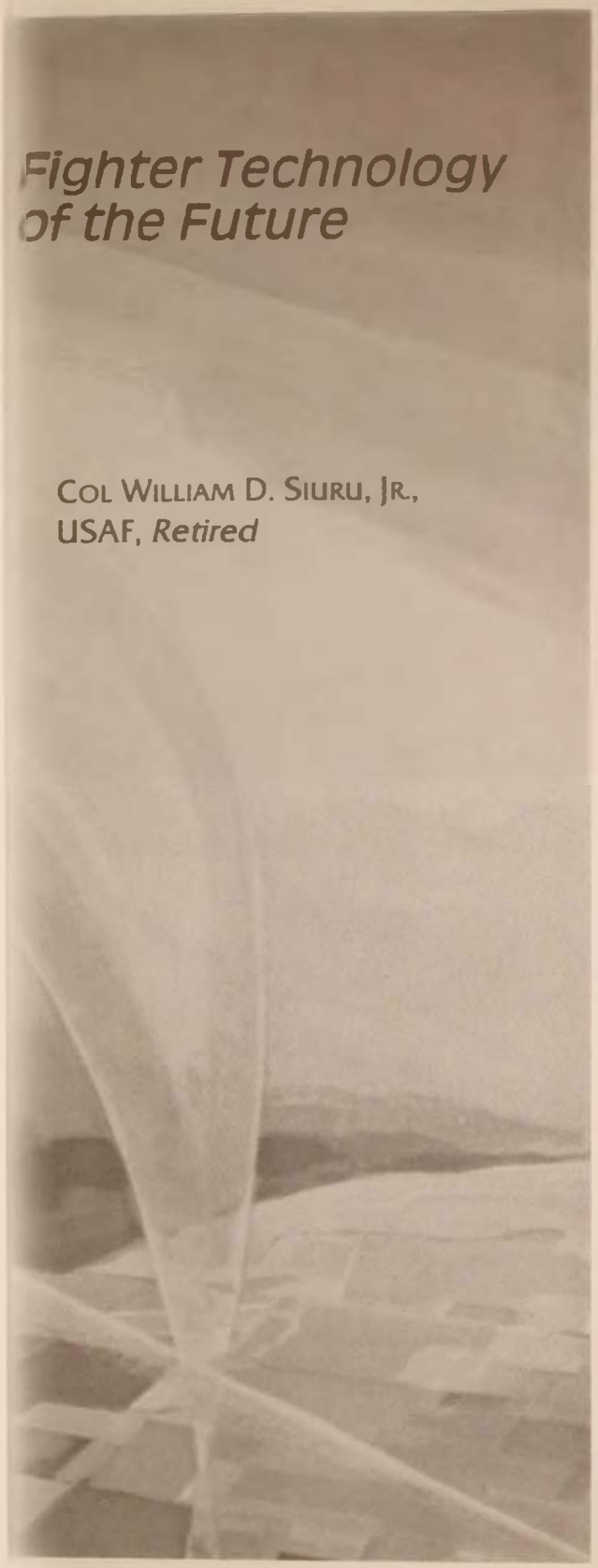
35. For two other areas of potential trouble, see note 15 (command of or by allies), and note 19 and accompanying text (command in camps with no officers).

36. AFM 1–1 (p. 2–9) states, "Command structures . . . and procedures must all be clear, simple, and unencumbered to permit ease of execution."


Supermaneuverability

Fighter Technology of the Future

COL WILLIAM D. SIURU, JR.,
USAF, *Retired*

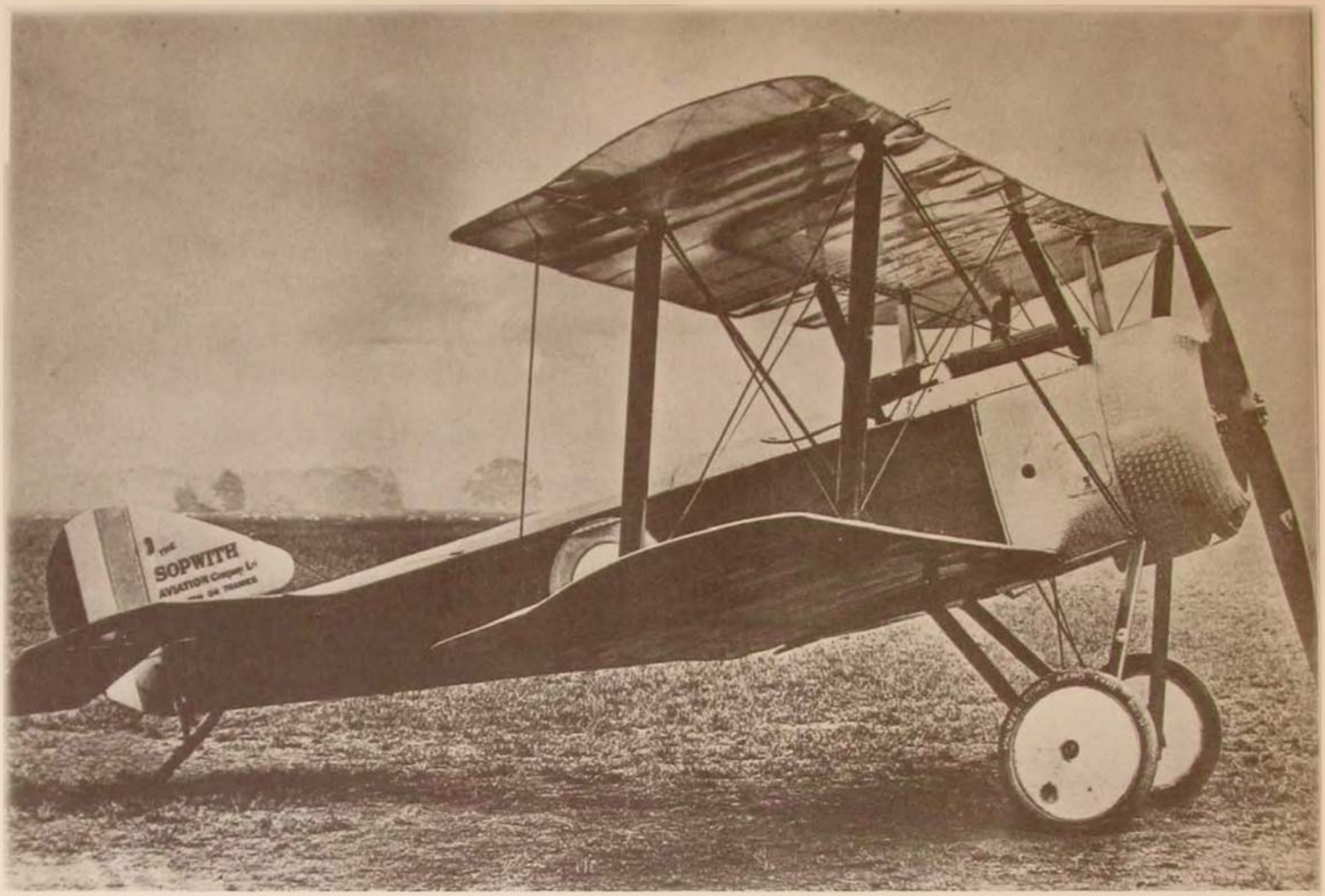


Editor's Note: *Colonel Siuru's survey of possible technological innovations and potential capabilities may seem a bit outside the* Airpower Journal's *usual focus on the broader issues of using one's fighting forces to best effect. It may also appear somewhat technically oriented to our readers who are not in the pilot or engineer specialties. Both of these observations may be true.*

However, as has often been submitted in this journal, there is a relationship between doctrine and technology which if not carefully assessed and redefined periodically can lead a military force astray. This may be due to a doctrine outstripped by new technological capabilities or by an overly ambitious doctrine not in consonance with technical realities.

In this instance, one wonders what changes to tactical and especially operational doctrine we should be contemplating when and if supermaneuverability comes to fruition in operational forces. The advent of radar was initially seen as simply better "eyes" for extending a search area, but quickly made its impact felt in the entire realm of tactical and operational air doctrine. Some forces were quick to use the capability to advantage (modified their doctrine) while others were not. Now may be the time to consider the integration of supermaneuverability into our doctrine. Your ideas are welcome.

THE MANNED fighter quite likely will be around well into the twenty-first century both in an air-to-air and air-to-ground role. To date, no unmanned, remotely piloted vehicle has shown the potential of attaining the potency of the marriage between a skilled pilot and a well-designed fighter, and this is not expected to change in the near future. Thus, the emphasis today is on technology that will allow fighters to survive and win in combat. There is great interest today in an area of technology that goes under the generic title of "supermaneuverability."



Here are three examples of aircraft whose success in combat was due to their agility: the Sopwith Camel (above) of World War I, the P-51 Mustang (right) of World War II, and the F-86 Sabre (below) of the Korean War. Our next generation of fighters will need to maintain this agility advantage through the use of supermaneuverability if they are to follow in the successful path of their predecessors.

What Is Supermaneuverability?

Credit for coining the word *supermaneuverability* goes to Dr W. B. Herbst, who introduced the idea in 1980. Doctor Herbst, of West Germany's Messerschmitt-Bölkow-Blohm, defined supermaneuverability as the capability to execute maneuvers with controlled sideslip at angles of attack well beyond those for maximum lift. Today Doctor Herbst's definition is termed *poststall maneuvering* and is one of many important ideas included in the category of supermaneuverability.

The term *supermaneuverability* has been expanded to other concepts that can dramatically enlarge the flight envelope of an aircraft in terms of airspeed, turn rate, climb rate, acceleration, and so forth. Supermaneuverability implies capabilities and technology demands beyond those achievable through more efficient wings, better performing engines, or more sophisticated flight control systems. Capabilities such as increased usable lift, dynamic lift overshoot, thrust vectoring, and unsteady aerodynamic effects used in synergetic fashion are all means of obtaining greatly enhanced maneuverability.

Why Supermaneuverability?

Ever since the first fighter appeared in World War I, agility has been the key as to who survives in an aerial duel. Interestingly, the emphasis on agility has been rather cyclic since the fighters of World War I. Agility seems to receive the greatest emphasis during and right after a war when actual combat experience demonstrates its importance. Examples of very agile fighters include the Sopwith Camel of World War I, the P-51 Mustang of World War II, the F-86 Sabrejet used in the Korean conflict, and the F-15 and F-16 that were designed around experience gained in Vietnam. There seems to be a tendency to forget experiences during times of peace and to sacrifice agility in favor of greater speeds and more sophisticated electronics and weapons, which leads to heavier and more cumbersome fighters. Fortunately, the current high interest in supermaneuverability indicates this experience may not be repeated.

The best way to ensure combat survivability is to have both the best aircraft and the best pilot to fly it. In the past, the United States has leaned on the assumption that even though the Soviet and American fighter pilots are probably equal in ability, our fighters were more capable because we had a technology advantage. This is definitely changing. The experts believe that new Soviet fighters like the Su-27 Flanker, MiG-29 Fulcrum, and MiG-31 Foxhound are approaching the capabilities of our F-14s, F-15s, F-16s, and F-18s. To give our pilots the edge, new designs incorporating advanced technologies are needed as well as revised tactics to get the most out of the improvements. Enhanced maneuvering is high on the list of these technologies.

One of the things that has changed the tactics of air-to-air combat in recent years is the all-aspect missile. With the normal infrared (IR) heat-seeking missile, a pilot had to maneuver so that he was behind the enemy to make a kill since IR missiles had to home in on the hot engine exhaust. Today radar-guided missiles and missiles with much more sensitive IR sensors can home in on other parts of an aircraft. These all-aspect missiles can be fired from any direction, and fighters so equipped need only to get their noses pointed in the general direction of the enemy. The fighter pilot who can get his nose pointed within the required field of view first is the one most likely to survive.

While increased turn rate might seem to be the obvious answer, it is not always the best solution. For one thing, high turn rates mean high G-loads, and today's fighters are pushing the acceleration tolerance of even the most physically fit pilots. Also, high turn rates result in high drag, which can quickly decelerate an aircraft to the point where the aircraft has lost the maneuverability advantage that comes with high speed. As any fighter pilot knows, the name

of the game is to be able to fire the first shot while still retaining enough speed to fly away to make another kill or to avoid being killed.

Supermaneuverability can also be important in allowing an aircraft to avoid an enemy missile. With very high agility, the fighter would be able to outfly the missile and break lock with the missile's guidance system. Aircraft with greatly enhanced maneuverability could perform some very erratic evasive maneuvers.

Incidentally, supermaneuverability is not limited to manned fighters. Most of the supermaneuverability concepts could also be used on unmanned craft such as air-to-air missiles. Thus, we could have supermaneuverable missiles trying to destroy supermaneuverable aircraft and supermaneuverable aircraft evading supermaneuverable missiles.

Poststall Maneuvering

The enhanced maneuvering concept receiving the greatest interest today is the idea of "poststall maneuvering," that is, flying at very high angles of attack, perhaps even up to 70 to 90 degrees for short periods of time. Poststall maneuvering will allow fighters to make drastic changes in direction within extremely short distances and times. As an example of poststall maneuvering, let us look at an engagement between two fighters, one with poststall maneuvering capability and one without it (fig. 1). The supermaneuverable fighter could turn much faster than a conventional aircraft and dissipate much less energy in the process. Quite conceivably, it would have the adversary in its weapon system field of view several critical seconds before the other aircraft has completed its turn and is in firing position.

Normally, even the best designed wings will stall at angles of attack above 20 degrees. Stalls usually result in "departure" normally leading to loss of control. To make poststall maneuvering work, the aircraft will have to be controllable at very high angles of attack. Lack of controllability at high angles of attack occurs because normal control surfaces lose their effectiveness. Airspeed is often quite low when there is a high angle of attack, and the violent vortices in the wake of a stalled wing have a drastic effect on the vertical and tail surfaces. This means that conventional aerodynamic control surfaces such as rudders and elevators

will have to be helped by other techniques such as vectored engine thrust to maintain control.

Other Ways to Achieve Supermaneuverability

One method to enhance maneuvering capability is to simply use all lift inherent in a particular design, although the word *simply* might be an oversimplification. For example, many fighters could fly at higher angles of attack without stalling and thus generate more lift, but they are limited by such detrimental aerodynamic phenomena as buffeting, wing rock, nose slice, and poor directional stability. Some of the phenomena can be corrected by subtle changes in aircraft design that result from wind-tunnel testing and computer simulations.

A measure of supermaneuverability can be obtained through dynamic lift overshoot. Here the idea is to increase the angle of attack so rapidly that the airflow remains attached to the wing well beyond the angle it would normally separate, thus providing a momentary increase in lift that could be used for enhanced maneuvering.

One method to achieve dynamic lift overshoot is to use a rapidly rotating airfoil, that is, one that oscillates or pitches and plunges at high frequencies. Although this concept is still in a very exploratory stage, wind-tunnel tests, computer simulations, and experience with helicopter rotor blades have demonstrated the potential of this idea.

Other Unique Ways to Fly

While perhaps not strictly fitting the definition of supermaneuverability, there are other ideas that could give future fighters the capability needed to survive in combat.

One way of obtaining unconventional maneuvering is by using thrust vectoring, that is, changing the direction of the thrust produced by an aircraft's engine. Incidentally, thrust vectoring is one improved agility technique that is already in use on an operational military fighter, the AV-8 Har-

The maneuverability of the F-16 (left) and F-15 (below) were developed from lessons learned in Vietnam. Test aircraft such as the Agile Falcon indicate we may not have forgotten those lessons as has often been the case in peacetime aircraft development.

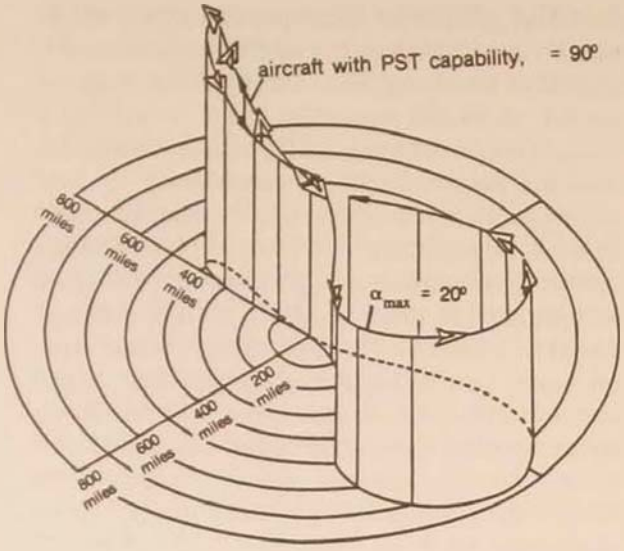


Figure 1.

Poststall maneuvering (PST) capabilities will allow aircraft to fly at angles of attack well beyond the point of stall, in this case by pointing the nose up, rolling 180 degrees, and dropping back to a more normal angle of attack for the kill. The non-PST aircraft would still be completing its turn.

Getting the maximum usable lift is highly dependent on the aircraft's design, with different techniques working for each aircraft. The end objective is to prevent departure at high angles of attack.

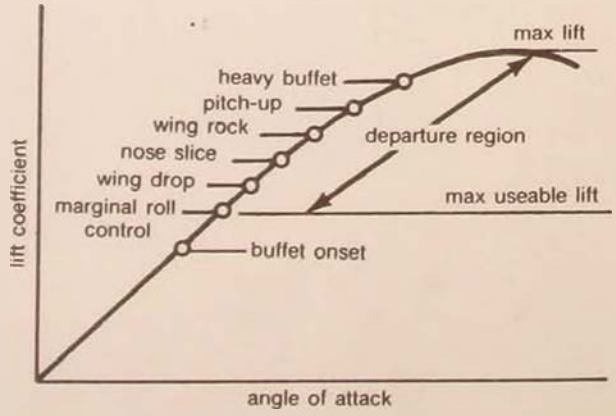


Figure 2.

rier, a vertical and/or short takeoff and landing (VSTOL) aircraft used by the US Marine Corps as well as the Royal Air Force and Navy. While the Harrier was aimed at VSTOL capability, pilots soon found that by swiveling the Pegasus engine's four nozzles in flight, some unique and useful maneuvers are possible. Thus "vectoring in forward flight" (VIFF) was born. For instance, by using VIFF the Harrier can decelerate more rapidly than other aircraft and can do it without reducing engine rpms that will be needed for subsequent acceleration or without extending telltale speed brakes.

Two-dimensional, rectangular nozzles with horizontal doors for thrust deflection are an alternative to swiveling nozzles. Besides deflecting thrust, the nozzles can reverse the thrust to reduce landing distances or to increase in-flight maneuverability. While rectangular nozzles cannot deflect the exhaust to the degree found in the Harrier, the thrust-vectoring capability is still substantial. The thrust vectoring available from the two-dimensional nozzle is especially valuable for maneuvering at high angles of attack and low speeds where ordinary aerodynamic control surfaces lose their effectiveness. For this reason, some form of thrust vectoring will undoubtedly be an integral part of any supermaneuvering technique.

Thrust vectoring brings with it another important capability—a short takeoff and landing (STOL) ability. This feature is needed in future fighters as well as in other military aircraft because in any future major war, aircraft will probably have to work out of severely bomb-cratered airfields.

Other ways to use unconventional aerodynamics to achieve enhanced maneuverability were investigated in the control configuration vehicle (CCV) and the advanced fighter technology integration (AFTI) programs (fig. 3). In these programs, modified F-16s demonstrated some very new ways to fly. Normally an aircraft flies in "coupled modes" so that when it turns it also rolls and when it climbs the angle of at-

tack increases. In the CCV and AFTI F-16s, the maneuvers were decoupled. When decoupled, the aircraft can rise vertically without raising its nose, raise or lower its nose without climbing, make a wings-level turn, or fly straight ahead while pointing its nose off centerline, and perform several other interesting maneuvers. The decoupled maneuvers demonstrated by the modified F-16s would be especially attractive for fast and precise pointing before firing weapons in air-to-air combat. The extra few seconds and increased accuracy could give the pilot the necessary edge to survive.

The joined wing is another concept that could provide enhanced maneuverability (fig. 4). A joined-wing aircraft has its tail wing swept forward to be joined with the rearward swept main wing so that the wings form a diamond when viewed from the top or head-on. Besides providing a lighter, stiffer aircraft with decreased drag, this concept makes some interesting flight motions possible. To move sideways without rolling, the control surfaces on the front and rear wings could be deflected in unison to provide equal but canceling rolling movements. To make rapid pitch-up maneuvers, the front and rear surfaces could be deflected in opposing directions. Moving all surfaces downward results in lift augmentation that allows the aircraft to rise essentially vertically.

Some degree of enhanced agility can be achieved by using high technology to improve already proven aircraft designs. Take, for example, the mission adaptive wing (MAW). With flexible composite materials and actuators buried inside the wing, the wing's surface contour can be changed without using conventional flow-disrupting empennages such as flaps, spoilers, and ail-

The AV-8 VSTOL aircraft, with its maneuverable thrust nozzles, showed in the Falklands conflict the advantages of aircraft capable of vectoring in forward flight (VIFF) over conventional aircraft in air-to-air combat.

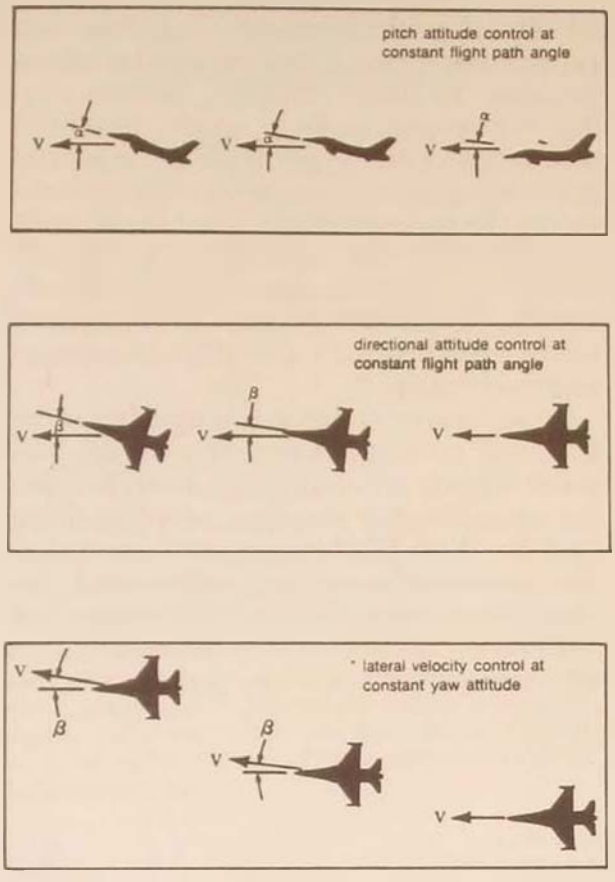


Figure 3.

Shown above are some of the unique maneuvers that are possible when an aircraft's maneuvering modes are uncoupled. These maneuvers have been demonstrated in modified F-16s as part of the Controlled Configuration Vehicle and Advanced Fighter Technology Integration programs.

erons. This means that the wing is less prone to stall at high angles of attack during high G turns and that high lift-to-drag ratios needed for enhanced agility are possible.

The Importance of Controllability

The above discussion of concepts has frequently mentioned the importance of being able to effectively control an aircraft during unconventional maneuvers. Controllability and maneuverability go hand in hand, the formal definition of agility being the sum of the two factors. A highly maneuverable fighter that is difficult to control will not be successful, and the opposite is also true. The F-86 and MiG-15 are examples of the need for agility. The MiG-15 could easily outmaneuver the F-86, but it was harder to control. Therefore, F-86 pilots were able to achieve impressive kill ratios over the MiG-15 by controlling the F-86's flight path better to get into position to make a kill.

An integral part of enhanced maneuverability is relaxed static stability. Most aircraft are designed to be inherently stable so that they automatically return to straight and level flight, for example, after a wind gust or a pilot command. While good static stability means a forgiving airplane, it is incompatible with the superior maneuverability desired in a fighter. Today's newer fighters are normally designed with relaxed static stability, that is, with little, zero, or even negative static stability. Without the sophisticated stability augmentation systems used in modern fighters, pilots could not maintain control of their aircraft.

Future aircraft with superior agility will integrate many technologies such as propulsion, aerodynamics, and controllability

The joined wing creates a combined effect with a forward-swept tail and rearward-swept main wing. The control surfaces can then be used to effect lift and pitch without rolling the aircraft.

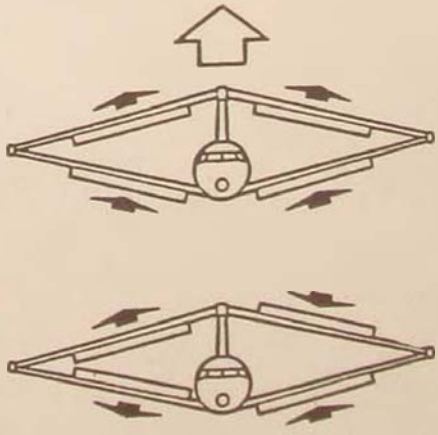


Figure 4.

obtained through advanced digital fly-by-wire and later, fly-by-light control systems. The latter uses fiber optics in lieu of wires.

Could the Pilot Be the Weakest Link?

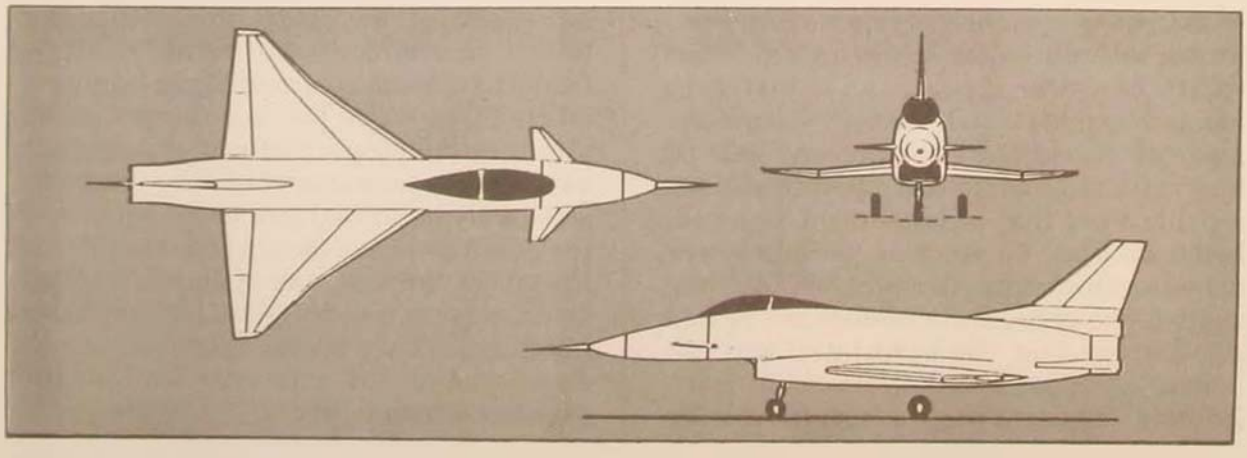
While technology can be used to produce supermaneuverable fighters, it might be the physiological capabilities of the human pilot that could put the upper limit on maneuverability. For example, the pilot can become disoriented when his aircraft moves against intuition and experience. It may take extensive training to get used to flying sideways, flying at attitudes well into the stall regime, or being able to point the nose up or down without climbing or diving. Control systems may have to be designed so that the pilot only provides the initial command while the computer performs the rest of the maneuver sequence.

Then there is the problem of gravity-induced loss of consciousness (G-LOC). This occurs when there is a rapid or sustained increase in Gs and the body's defensive mechanics cannot maintain sufficient blood pressure in the brain. G-LOC occurs suddenly, with the pilot being unconscious for approximately one-half minute, enough to spell disaster in a high-performance aircraft. Even when the pilot recovers, he could still be disoriented for quite awhile and be unable to handle the high stress of close air combat and perhaps not even to fly safely.

There must be solutions to the physiological problems associated with supermaneuverability. G-suits will have to be more responsive. Because G-LOC depends on how high the head is elevated above the heart, the pilot's seat could be reclined. Inclinations of about 65 degrees are needed, so the seat would have to be articulated so the pilot can sit more erect for normal flight and then recline for combat maneuvering. Other solutions could include special drugs. For instance, carbon dioxide injected into the oxygen seems to help, and even the use of "smelling salts" may speed up the recovery of consciousness.

Techniques are needed to detect when the pilot becomes unconscious and automatic flight controls must take over. Because things happen so rapidly in high-

The X-31A aircraft has been designed to "break the stall barrier." Under joint US and West German development, the X-31A will incorporate several new technologies to expand the flight envelope.



performance aircraft, detection must be done instantaneously and preferably before complete pilot blackout. Techniques must have low false alarm rates so that override does not occur while the pilot is conscious and still in control, especially during combat.

Some of the methods currently being researched include detecting the drooping or lolling of the pilot's head that is associated with loss of consciousness. There is also the monitoring of the pilot's grip on the controls. A more sophisticated measurement involves sensing the loss of blood pressure pulse in an artery near the brain with a special sensor mounted in the pilot's helmet. Another technique involves monitoring the pilot's eye-blink rate. It is well known that just before a person blacks out, the eyes stop blinking automatically and there is a fixed stare.

Several detection devices would be used in "jury" fashion to reduce false alarms. Furthermore, this could be augmented by monitoring the G history of the flight and determining when the aircraft is in a high G environment and when override might be needed because of the possibility of blackout.

Developing Supermaneuverable Fighters

The development of any new aircraft can be extremely expensive. Some of the unproven techniques for achieving enhanced agility could be dangerous if tested in manned experimental aircraft. Therefore, much of the initial development will be done with simulators that provide realism approaching that experienced in a real fighter cockpit. To see how various supermaneuverable concepts might fare in actual combat, two or more simulators can be tied together so that the simulated aircraft "flown" by experienced pilots can interact. Different maneuvering concepts can be changed on the simulator usually by rewriting software rather than designing and building new expensive hardware. Thus, new ideas can be tested fairly inexpensively and without endangering an aircraft or its pilot.

One safe and relatively cheap way to flight-test new ideas is to use a remotely piloted research vehicle (RPRV). These subscale, unmanned aircraft, which are remotely controlled by a "pilot" on the ground, are built at reduced scale and need not be man-rated. One successful RPRV was Rockwell International's Highly Maneuverable Aircraft Technology (HiMAT) RPRV built a few years ago, which produced much important design data for future fighters.

No matter how much computer simulation is done or how many RPRVs are flown, the best concepts will still have to be flight-tested with a live pilot behind the stick. For example, the CCV and AFTI F-16s mentioned previously tested some unique maneuvering techniques, and the mission adaptive wing has been grafted to a F-111 for flight-testing. Now the Grumman-built X-29 is flight-testing some other ideas.

Another "X" airplane that will be used in supermaneuverability developments is the X-31 Enhanced Fighter Maneuverability (EFM) program. The primary emphasis of this joint US-West German program will be on poststall maneuvering at very high angles of attack. Rockwell International and Messerschmitt-Bölkow-Blohm plan to have the X-31 flying by 1989.

Enhanced maneuverability, ranging from minor changes in current aircraft to revolutionary new aircraft, will be needed if our fighters are to survive and win in future aerial conflicts. While the technology community is developing a plethora of potentially valuable supermaneuverability concepts, an equally important part of the equation is the development of tactics and doctrine that can make the best use of the technology. Thus, experienced air tacticians and fighter pilots must have an important role in the development of effective and usable supermaneuverability. □

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THE HUMAN ELEMENT AND AIR COMBAT

Some Napoleonic Comparisons

MAJ MARK K. WELLS, USAF

For the military professional, there is no simple formula to learn warfighting. Gaining that knowledge is a continuous process that is the product of institutionalized education and training, experience, and personal effort.

AFM 1–1, *Basic Aerospace Doctrine of the United States Air Force*

DESPITE THE renewed popularity of military history, Air Force members have different opinions about the value of the discipline. While no one denies its importance in general terms, debates about the proper way to study and use it continue, especially in Air

Force institutions like the US Air Force Academy and the Air University.[1] By its nature, history is a highly subjective discipline. A "high-tech" service like the Air Force sometimes struggles with subjects not easily quantified or defined by workable equations. Additionally, many Air Force officers, particularly aviators, have a difficult

time relating much of the military history they read to what they expect to do in combat. Aviators who are used to dealing with state-of-the-art technology and high-speed aircraft are often reluctant to see any connection between what they are training to do and what was done on any battlefield even 10 years earlier.

Several recent books can help potential combat aviators overcome this difficulty. The best, like John Keegan's *The Face of Battle* and Richard Holmes's *Acts of War*, do so by dealing with the human dimension of ground combat.[2] It is important for avia-

The modern airman can learn many lessons from the World War I experiences of the average aircrew and of dashing aces such as Baron Manfred von Richthofen (right) and Capt Eddie Rickenbacker (below), who learned their lessons from their cavalry predecessors.


LM
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Death came quickly in B-17 formations such as the one above and was not as impersonal as we often depict. That is a lesson of combat for all ages. The fighter squadron of World War II (left) needed as much cohesion as that required of any ground unit. The aircrews were closer to their Army counterparts, and the lessons learned came from the same sources.

tors to take this kind of historical analysis one step further, however, and consider the human dimension in air combat. By doing so they can enhance the usefulness of all the military history they read.

In this regard, it is possible to compare air and ground combat in any era. While it is difficult to single out any particular emotion, circumstance, or example of behavior and demonstrate its primacy in ground or air battle, several seem to stand out frequently in combat narratives. These include motivation, action under fire, cohesion, and leadership. A quick survey of the Napoleonic era, to use just one example, will find many comparisons within this framework. Enough comparisons can be demonstrated to validate this kind of approach in other periods of military history. The goal is to demonstrate the one constant that runs throughout conflict—the role of man.

Motivation

Motivation, sometimes called the "will to combat," clearly relates to both air and ground engagements. An explanation of the nature and character of motivation has been the subject of many volumes.

The motivation to air combat can easily be identified with nineteenth-century concepts of honor and chivalry. The earliest combat aviators were often compared to dashing cavalrymen of the Napoleonic Wars. Most of the comparisons were driven by the need for governments to create heroes, mired as the armies were in the tragedy of World War I's ground stalemate. The new, glamorous, and relatively clean air war provided the kind of setting necessary for the creation of these heroes.[3]

A closer examination of typical Napoleonic cavalrymen reveals that these superficial comparisons are more accurate than might be expected. Consider, for example, historian David Chandler's description of Napoleonic hussars as "the darling of the ladies . . . expected to maintain the highest standard of bravery, swaggering bravado, and boasting."[4] Such a description could easily fit the stereotypical combat aviator, especially the fighter pilot.

According to Chandler, part of the motivation for cavalry combat was the love of fighting, sport, and hunting. Combatants respected their mounted enemies for holding similar ideas. Cavalrymen were admonished to ride well, die unflinchingly, and acknowledge courageous opponents. So, too, are fighting airmen.[5]

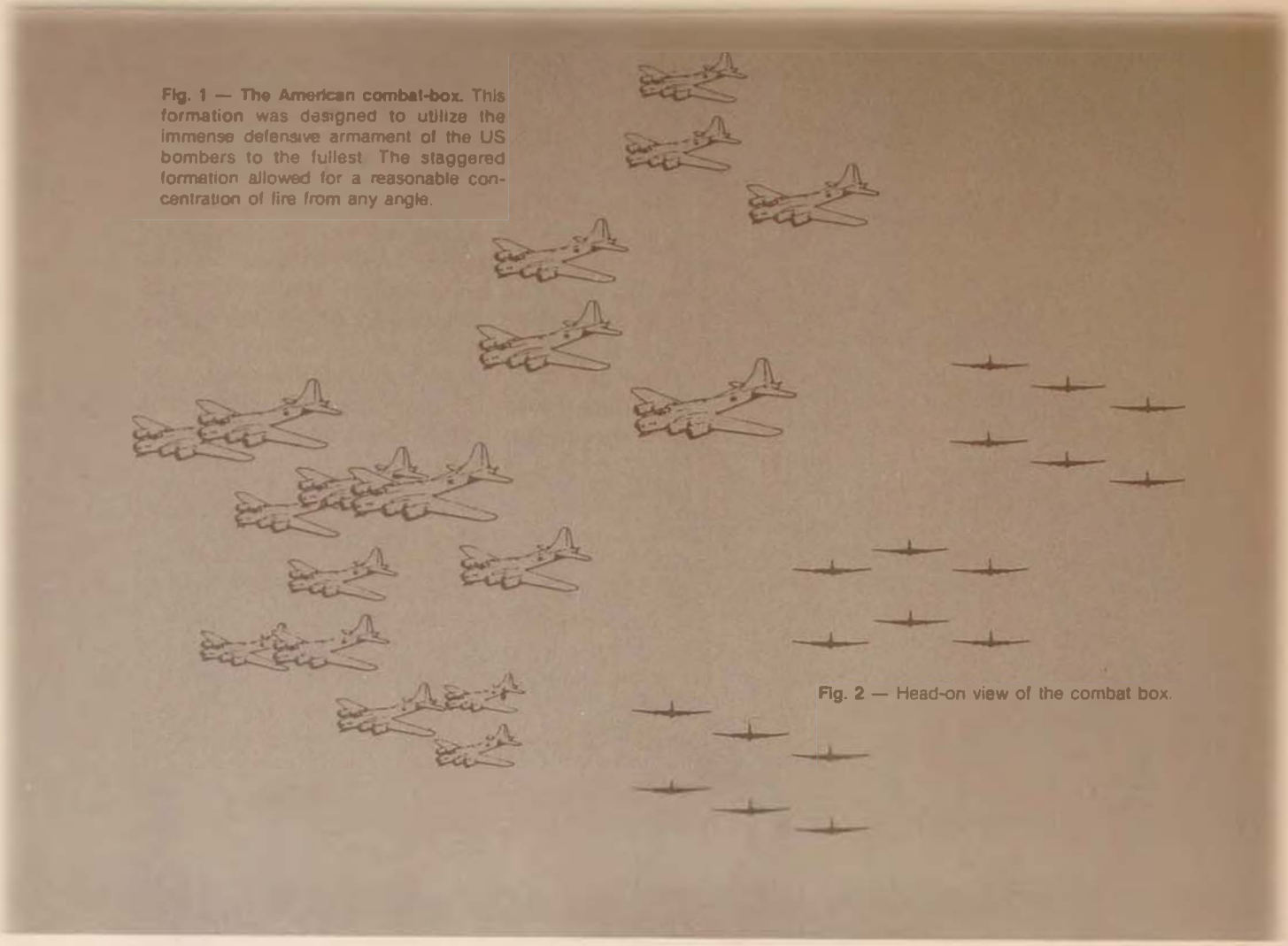


Fig. 1 — The American combat-box. This formation was designed to utilize the immense defensive armament of the US bombers to the fullest. The staggered formation allowed for a reasonable concentration of fire from any angle.

Fig. 2 — Head-on view of the combat box.

Examine the words of the famous German ace, Baron Manfred von Richthofen. His letters and combat reports are filled with allusions to chivalry, sportsmanship, the cavalier spirit, and hunting. He recorded his impressions of his most famous adversary, Maj Lanoe Hawker, in terms strikingly similar to those used by a participant in a nineteenth-century cavalry duel:

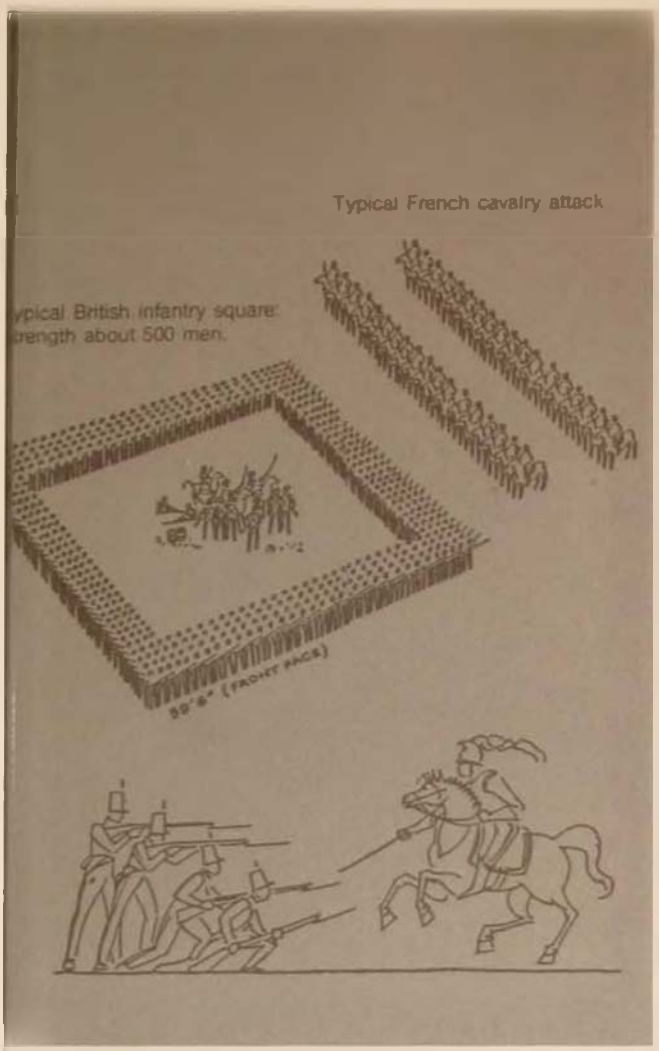
> But he was a plucky devil. With me behind and above him, he even turned round and waved his arm at me, as though to say, "How is it going?" He was a fine sportsman, but I knew that in time my close presence behind him would be too much for him.[6]

Richthofen demonstrates a similar tone when he criticizes his brother, also an ace, for being too much of a shooter and not enough of a hunter. The motivation to combat, Richthofen believed, should be that of the nineteenth-century cavalry competitor, not the hot-blooded zealot.[7]

Such sentiments are not reserved only for romantic notions of World War I. For example, during the Battle of Britain in 1940, a British fighter pilot described his motivation to combat this way: "It's love of the sport rather than sense of duty that makes you go on without minding how much you are shot up."[8]

Obviously, sportsman-like competitiveness was not the only motivator for nineteenth-century cavalrymen or for modern aviators. The will to combat must be driven by an intense desire to defeat the enemy. Col Charles H. MacDonald, a World War II ace with 27 kills, put it this way:

> If I were to pick out the most valuable personal traits of a fighter pilot, aggressiveness would rate high on the list. Time and again, I have



seen aggressive action, even from a disadvantageous position, completely rout a powerful Nip formation.[9]

Colonel MacDonald's comments on aggressiveness and, by implication, resolution may be considered a restatement of the thoughts of a nineteenth-century "ace" of cavalry, Joachim Murat. Murat, a marshal of France, was famous for his incredible bravery and aggressiveness on the battlefield. He was reputedly fond of saying, "Show me a hussar older than 30 years, and I'll show you a coward!"[10]

While it's not possible to speak for all participants and every engagement, even a superficial analysis clearly shows a connection between the motivation to air combat and the esprit of Napoleonic cavalrymen. Battles in the air can be directly compared to nineteenth-century encounters on this basis.

Under Fire

In combat the actual circumstances of directly confronting an enemy can vary widely. Despite this, even a cursory examination of combat narratives reveals frequent similarities in the behavior and feelings of participants. In the most general terms, it is fair to say that most combatants feel, at one time or the other, either brave, afraid, aggressive, timid, lonely, or confused. We find these kinds of feelings often expressed in stories of both the Napoleonic period and throughout modern aerial warfare. Moreover, the actual details of engagements in both eras bear a close resemblance.

Eyewitness accounts of air-to-air engagements can sound hauntingly like written histories of cavalry encounters. An American, Oscar LeBoutillier, described a typical World War I dogfight this way:

> In those few vicious moments the sky was literally filled with tracers; thin, white threads crisscrossing in every direction. Aeroplanes were everywhere. They flashed in and out of the clouds, above, below, and in front of me. I had my hands full trying to get onto an enemy's tail, avoid a collision, and get a burst off. It was like trying to catch lightning in a bottle![11]

LeBoutillier's observations match this description of a Napoleonic cavalry encounter:

> The impact would usually result in a melee, in which both sides would lose formation, and the soldiers would mingle in a formless mass of individual combats. . . . It was almost impossible to control cavalrymen who had just sustained and survived an impact and were fighting at close quarters for life, loot, and glory.[12]

Not surprisingly, these kinds of experiences evoke the strongest emotions in soldiers and airmen. Frequently the violence and stress of their circumstances seems to overwhelm the combatants. That they continue to function at all is a tribute to man's ability to prepare warriors for the impact of combat.

In this regard, aerial warfare is all too

In the transition from the Army Air Forces of World War II to the separate Air Force of the Korean War (far right), many of the ties between ground combat and aerial combat seem to have been lost. The need to learn from common sources of experience remains just as strong.

often depicted as relatively clean, even antiseptic. Nothing could be further from the truth. Imagine the scene inside a B-17 as it was vividly recorded by a historian of the Schweinfurt raids:

> The bombers drive ahead through a whirlwind of steel splinters and flame and jagged chunks of red-hot metal. The steel is everywhere: it crashes into wings and engines, slams into bulkheads and airplane bodies. And into the bodies of men, spewing out blood, tissue, intestines, and brains.[13]

Inside the dressed formations of Napoleonic infantry, a soldier's view was not very different from his twentieth-century flying counterpart:

> One shot killed and wounded twenty-five of the 4th Company, another of the same kind killed poor Fisher, my captain, and eighteen of our company . . . and another took the 8th and killed or wounded twenty-three. . . . At the same time poor Fisher was hit I was speaking to him, and I got all over his brains, his head was blown to atoms.[14]

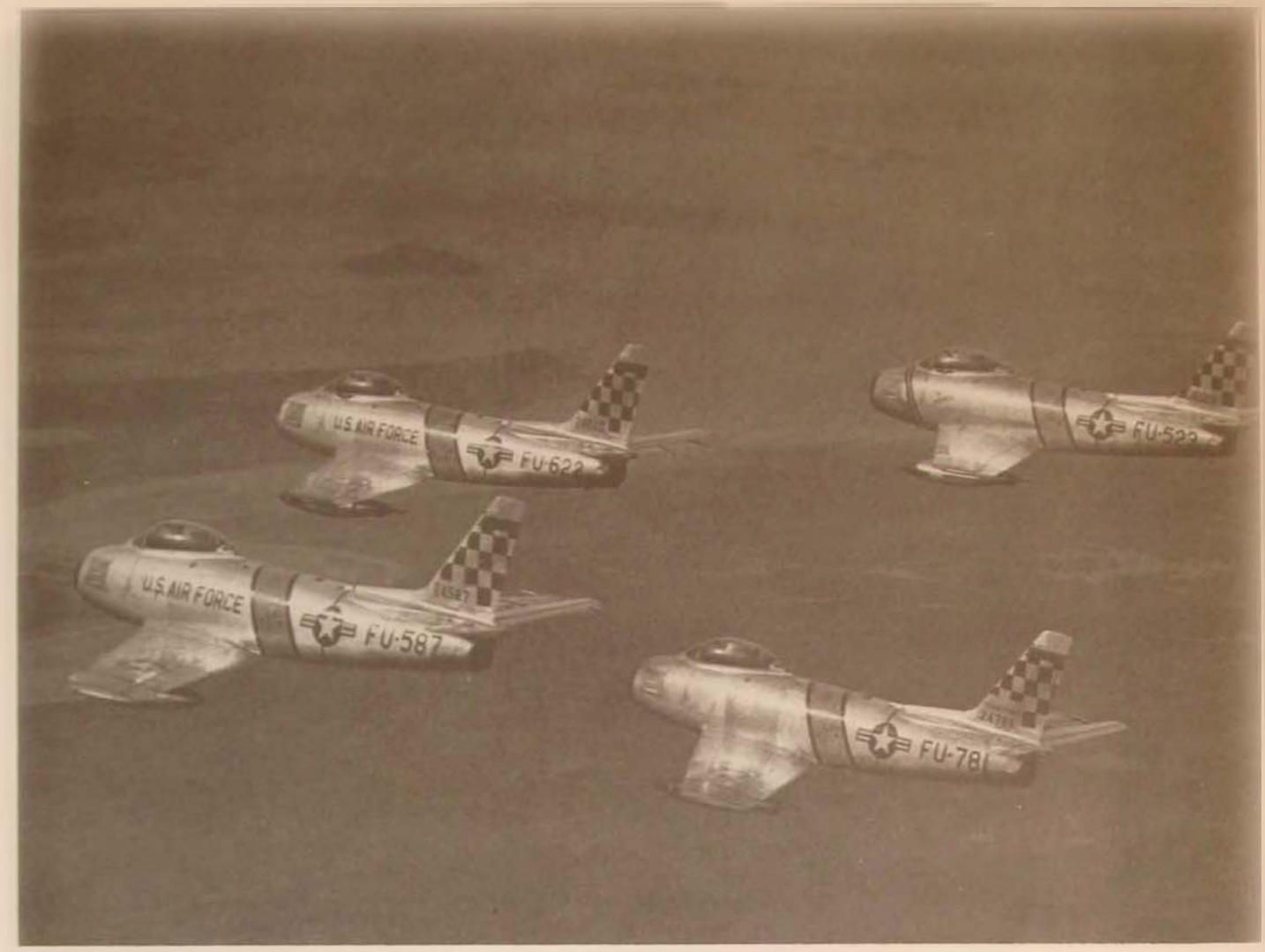
It is remarkable that anybody could function in such an environment. Even so, a look at some of the reflections of combat participants during the actual moment of confrontation finds other comparisons. A high percentage of participants are scared stiff, for example, but carry on despite their fears. Capt Richard S. Drury, an Air Force A-1E pilot, described diving on enemy gun positions during the Vietnam War this way:

> I felt a sort of a cold numbness throughout my body as I rolled in on the muzzle flashes below. The tracers came up the way heavy hail comes down from a thunderstorm. I was scared and breathing hard. The pass seemed like an hour, but only seconds passed until I was pulling up and jinking away.[15]

The tone of Drury's comments, and the physical aspects of his situation are similar to those experienced by Capt Cavalie Mercer near Mont-Saint Jean in 1815. Mercer and his artillery troops, like their aviator counterpart, were the subject of intense enemy fire:

> A black speck caught my eye, and I instantly knew what it was. The conviction that one never sees a shot coming towards you unless directly in its line flashed across my mind, together with the certainty that my doom was sealed. . . . Under such a fire, one may be said to have had a thousand narrow escapes: and made me feel in full force the goodness of him who protected me among so many dangers.[16]

Even without further examples, it is fair to conclude that much of the physical circumstances and human behavior of combat participants in both the Napoleonic Wars



and modern aerial combat are related. This relationship is further demonstrated if we consider cohesion.

Cohesion

By any definition, cohesion is one of the most important human elements in any combat. Gen S. L. A. Marshall's classic work *Men Against Fire* identified it as the difference between defeat and victory when in contact with the enemy. Soldiers who maintain group integrity and feel the common bonds of support consistently perform better when engaged. Marshall's research pinpointed cohesion as the pivotal factor in ground combat participation.[17] For infantrymen or cavalrymen of the Napoleonic era, this meant advancing and using their weapons against the enemy.

Loss of cohesion can lead to disaster, especially in offensive operations. Consider for a moment one of the more famous incidents relating to this situation. It occurred at the Battle of Waterloo in 1815. Early in the engagement, French infantry advanced against Wellington's left center. Met by steadfast British infantry and artillery, the French were repulsed. Wellington thereafter directed the British cavalry to charge and complete the rout. The French fled, but the British horsemen, excited by their victory, lost all cohesion. A participant observed:

> In fact our men were out of hand . . . every officer within hearing exerted themselves to the utmost to reform the men; but the helplessness of the enemy offered too great a temptation. If we could have formed a hundred men we could have made a respectable retreat, and saved many; but we could effect no formation,

> and were as helpless against their [counter] attack as their infantry had been against us.[18]

The British unit's failure to maintain cohesion was caused by its members' eagerness, overaggressiveness, and eventual panic. It led to their destruction. Cohesion is no less important to the combat aviator.

Among other things, formation flying is designed to foster teamwork, mutual support, and cohesion.[19] From the earliest days of aerial combat, loss of formation or loss of cohesion often proved fatal. This principle was frequently demonstrated during World War II.

As an example, let us look at the account of US Navy ace Edward "Butch" O'Hare as he described attacking a much larger group of Japanese fighters:

> The entire enemy formation scattered as we tore into them. They broke up into sections and singles, climbing vertically in panic to gain precious altitude. . . . The battle seemed to last an hour, but actually it lasted only a few minutes. . . . The record credited our lonely eight Hellcats with 23 confirmed kills and 11 probables.[20]

In O'Hare's dogfight, the Japanese were not able to maintain any kind of defensive cohesion and were defeated.

The accounts of rarely publicized Soviet-Israeli dogfights over the Suez Canal in 1970 repeat the message of the previous passage. According to Israeli participants, the Soviet MiG pilots tended to lose cohesion, even break up and panic, as soon as the engagement started:

> In the words of one of the Israeli pilots who participated in that encounter, the Soviets flew into combat like a bull after a red flag. As though they were knocking their heads against a wall. They were like ripe fruit waiting to be picked.[21]

These comparisons to the unfortunate British cavalry more than a century before are obvious. Whether forces are engaged offensively or defensively, cohesion can become a vital measure of success.

Another dramatic example of the importance of cohesion to nineteenth-century battlefields was the use of the square. Employed by infantry to defend itself against cavalry charges, the success or failure of the formation was absolutely dependent on the integrity of its component sides. If, as in the Battle of Quatre Bras in June 1815, an infantry square's cohesion was broken, disaster could result: "The 2nd Battalion 44th Regiment was attacked in the rear by the Lancers, who were slaughtering our supernumeraries and rear rank men."[22]

If, however, the square managed to maintain its cohesion, it was generally impervious to even the most violent mounted attack. Only with the help of artillery might the normal outcome be changed. Attackers therefore made great efforts to bombard the square with missile weapons in the hopes of making it disintegrate. Timely charges were designed to complete its dissolution.

It does not take a great deal of imagination to compare the Napoleonic infantry square to a World War II B-17 combat formation. Created by Gen Curtis E. LeMay precisely to improve cohesion and defensive firepower, the "combat box" was also only as good as its components.[23] German attempts to destroy the cohesion of the combat box and to break up a formation of bombers sound just like the combined attempts of French cavalry and artillery to reduce British squares at Waterloo.

> [1943] As the stream of Flying Fortresses neared the target, a definite change in the pattern of attacks emerged. The masses of twin-engine strikes sent rockets into the midst of the formations, scattering the planes and diluting the effectiveness of their defensive fire screen. The moment a cripple showed, a swarm of single engine fighters immediately pounced to deliver the coup de grace.[24]

> [1815] Late in the day the French had brought up two guns on the crest of our position, which fired grape into our square with very deadly effect. . . . Though suffering sadly, and disordered by our poor wounded fellows clinging to their comrades thinking they were being abandoned, our little square retained its formation, and we reached the hedge.[25]

For a more up-to-date comparison to air

combat, we need only look to the B-52 cell and trail formations used in the Linebacker bombing campaigns over North Vietnam. It is possible to think of the electronic countermeasures of the cells as contiguous sides of a defensive structure. It should come as no surprise that the North Vietnamese attempted to bombard the sophisticated B-52 "squares" in a way similar to their nineteenth-century French counterparts. North Vietnamese surface-to-air missile barrages appear designed to break the integrity of the cells and bomber streams as they approached the target area.[26] Dealt with individually, the B-52s were far more vulnerable.

Leadership

In the often chaotic conditions of battle, the psychology of leadership remains timeless. Despite individual styles, successful combat leaders often seem to share several common personality traits.[27] The circumstances under which these traits manifest themselves also share a resemblance.

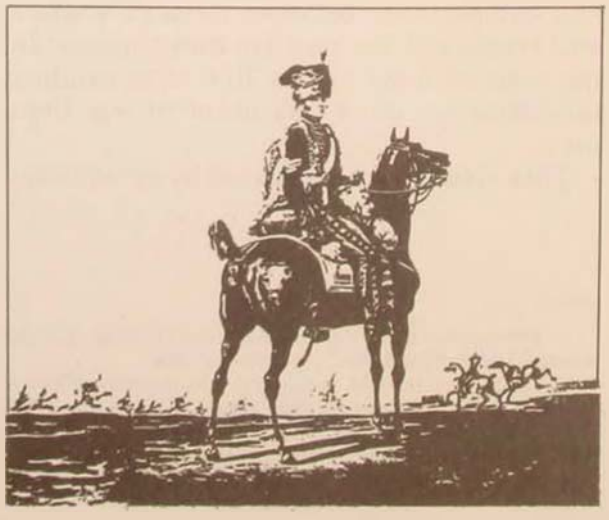
Consider, for example, the courage and determination of nineteenth-century British officers as they tried to rally their men to attack the enemy. A foot soldier had this to say about the impact of his commander:

> General Graham at this critical moment darted to the front, and by one short word, loud and inspiring, made nought of the [French] marshal's bravery and combinations. The word was, "Charge!" Like electric fluid it shot from the centre of the British line to the extremities of its flanks, instantaneously followed by the well-known thundering British cheer, sure precursor of the rush of British bayonets.[28]

A century later, Capt Eddie Rickenbacker would have a similar electrifying effect on the 94th Aero Squadron as it faced mounting casualties. A veteran who observed Rickenbacker notes the former racing car driver's role:

> He drove himself to exhaustion. He'd fly the required patrol. Then he and I would come back to the field, have a cup of coffee, get into

The modern Air Force leader shares many things with the Napoleonic Hussar, especially the human element in warfare.



> our second ships and go hunting by ourselves. Most of the pilots he killed never knew what hit them. Out of the sun, a quick burst and gone . . . he developed into the most natural leader I ever saw.[29]

Gallantry in combat can also be a common denominator of any age and situation. Frequent circumstances exist where individual acts of heroism sound almost identical. Judge the similarities in these examples of courage in the face of adverse odds; the first from the Napoleonic era and the second from World War II:

> He was a brave fellow, and bore himself like a hero; with his sword waving in the air, he cheered the men on, as he went dashing upon the enemy, and hewing and slashing them in tremendous style. Fine fellow! His conduct indeed made an impression upon me that I shall never forget.[30]

> In company with the other fighters, First Lieutenant DeBlanc instantly engaged the hostile planes, and aggressively countered their repeated efforts to drive off our bombers. . . . DeBlanc courageously remained on the scene despite a rapidly diminishing fuel supply and, boldly challenging the enemy's superior numbers of float planes, fought a valiant battle against terrific odds.[31]

Some may yet contend that these kinds of comparisons are too contrived. It is fashionable nowadays to point to the incredible acceleration in the technology of warfare and argue that the fundamental nature of combat has changed.[32] If this argument is valid, any comparisons between modern warfare and warfare of the past are meaningless. In the slanted logic of this line of reasoning, machines are more important in war than man.

This view is not supported by eyewitness evidence from contemporary battlefields or air combat engagements. Admittedly, many things have changed in conflict since the Napoleonic Wars. The physical factors of battle are different. The size and composition of forces vary greatly. Spatial and geometric relationships are altogether different, as are terrain and logistical factors. All these aside, several noted experts would agree that the combat psychology of participants in both eras remains essentially the same. In the words of one:

> Combat psychology constitutes the most stable, most timeless dimension of war. While the political goals of a particular conflict, weapons technologies, and above all else, the tactics appropriate against a given adversary on a given day can all change virtually overnight, "combat is combat and a combatant is a combatant."[33]

On this basis, combat comparisons from any era and any form of warfare remain valid. Short of experiencing combat or spending a great deal of time with combat veterans, about the only way to learn of the nature of war is to study firsthand accounts. Even so, it is very important that potential combat aviators do not confine themselves strictly to the observations of past aerial warriors. As we have seen, there are enough similarities in the Napoleonic era to justify a lifetime of study in that one period alone. The same is true for virtually any age of conflict.

Ultimately, the question for all those with the potential for serving in combat must be, "How can I improve my understanding of myself and the nature of war?" The answer can begin with a comparative study of the human element in military history. □

Notes

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net assessment

Debating Counterforce: A Conventional Approach in a Nuclear Age by Charles-Philippe David. Boulder, Colorado 80301: Westview Press Inc., 1987, 260 pages, $27.50.

Charles-Philippe David, the son of Senator Paul David of Canada, earned his doctorate from Princeton and is currently a Canadian defense specialist at the College Militaire Royal de Saint-Jean, Quebec. In *Debating Counterforce*, he critically challenges the American reader to examine and reevaluate the question that has been at the core of US defense policy since 6 August 1945: "What is the proper role for nuclear weapons to play in today's world?"

For David the answer to this question is limited to deterrence and, to him, the belief that nuclear weapons can be incorporated into actual operational use is a chimera. Although his views are clearly at odds with Air Force doctrine, his treatment of the issues provides a thoughtful insight into the strategist's problem of reconciling Clausewitz with the atom.

David argues that deterrence has been the product of a constantly developing and at times contradictory nuclear policy that is progressing toward ineffectiveness. The reason for this can be found in Einstein's famous quote:

> The splitting of the atom has changed everything save our mode of thinking and thus we are drifting toward a catastrophe beyond comparison. We shall require a substantially new manner of thinking if mankind is to survive.

Although deeply critical of US policy, he does an admirable job of objectively outlining its development from 1946, when Bernard Brodie and William Borden published diametrically opposed theses, to today's debates on the Strategic Defense Initiative (SDI). However, when he explores the background of a given policy, the viewpoints of the "apocalyptics" (Brodie camp) and the "conventionalists" (Borden camp) are polarized into mutually exclusive extremes that defy compromise. If there is a central weakness to his work it is this "yin-and-yang" approach, which consistently casts the conventionalists as a dark force that ignores the warnings of the apocalyptics. This impression possibly could have been avoided had the author more fully developed the basic concerns of the apocalyptics. Too often, the reader is given a thorough rationale for a conventional position that is then countered with a weakly presented apocalyptic view.

The single point of agreement between the two camps is shown to be the belief that deterrence must be the central goal. This agreement extends to the realization that absolute deterrence cannot be guaranteed. At this point the conventionalists and apocalyptics part company. The conventionalists support developing plans for limiting nuclear war if deterrence fails, while the apocalyptics maintain that nuclear war will be so horrible that it is meaningless to plan in terms of its occurrence. Again what is lacking is a development of the apocalyptic rationale. Had the author addressed these issues more fully the reader would be better able to appreciate the nuances of this complicated debate.

The author's arguments are distractingly dependent on numerous references and quotes from the exceptional bibliography. Because of this, *Debating Counterforce* does not stand alone as a reference work. What it does accomplish very well is to draw attention to the conflict between the two extremes of nuclear strategic thought. As a minimum, the reader should be committed to exploring Brodie, Kahn, and Kissinger if the full value is to be drawn from David's first and hopefully not his last book.

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Understanding War: History and Theory of Combat by T. N. Dupuy. New York 10017: Paragon Books, 1987, 320 pages, $24.95.

"Students of military art and military science have long sought fundamental laws or theories that would explain the interactions of military forces in combat and the outcomes of battles." (p. xxi) So reads the introduction to Col T. N. Dupuy's *Understanding War*. A statement on the dust jacket calls this book "a sustained and rigorously argued attempt to put forward a general

theory of military combat, one which will be valid across history and potent in its applications for strategies and tactics in military policy."

Colonel Dupuy reasons that there are "two basic ways to use military history. One is to read descriptive military history to obtain a general appreciation for past wars and famous leaders. The other is to use information and data from military history as the basis for historical analysis." (p. xxiii)

His historical analysis "seeks to bring to bear on present problems relevant lessons of the past." The military analyst "must develop combat hypotheses by mean [sic] of patterns discerned from studying large quantities of combat data." (p. xxiii)

Military leaders have always searched for guidelines, principles, or maxims to help win battles. *Understanding War* considers the concepts of Napoleon, Carl von Clausewitz, and Antoine Henri Jomini and relates them to the beginnings of today's concept of a theory of combat. Furthermore, the concepts of two British theorists, J. F. C. Fuller and Frederick W. Lanchester, are discussed. Both have had a profound impact on analytical military thinking.

Colonel Dupuy discusses Clausewitz's *On War* and shows how Clausewitz attempted to quantify his military thinking. What could a quantifiable theory of combat do for us? Dupuy says it could:

- Provide a framework for assuring consistency in the modeling or simulation of combat.
- Help analysts to understand human behavior in combat.
- Provide specific means for dealing with the influence of behavioral factors, such as suppressive fire.
- Provide a yardstick for the evaluation of military judgment, to the benefit of both military and civilian decisionmakers.

Understanding War is tightly focused toward a theory of combat. Dupuy defines it as "the embodiment of a set of fundamental principles governing or explaining military combat, whose purpose is to provide a basis for the formulation of doctrine and to assist military commanders and planners to engage successfully in combat at any level." (p. 79)

He shows how Clausewitz's Law of Numbers can be written as combat power (P) equals the number of troops (N) times the variable circumstances affecting a force in battle (V) times the quality of force (Q). Therefore, $P = NVQ$. Dupuy transforms this equation into his combat power formula, which is the basic equation of his Quantified Judgment Model (QJM). The variable (N) transforms into force strength (e.g., weapon strength). The variable (V) becomes the environmental and operational force effects (e.g., terrain, weather, season, force posture, mobility, fatigue, morale, training, etc.). Finally, the variable (Q) becomes the relative combat effectiveness of troops (e.g., the factor explaining the difference between theoretical outcome and actual outcome ratios).

The application of the QJM is illustrated in the 1940 Flanders campaign between the Germans and the French and British. From this engagement, Dupuy goes on to illustrate other principles from his combat model:

Relative combat effectiveness
Diminishing returns in combat
Movement and rates of advance
Attrition in combat
Friction in combat
Technology and human behavior in combat

Understanding War takes all these inputs and uses practical application of the QJM to an analysis of recent events, including the 1982 war in Lebanon.

My only criticism of this book is the lack of explanation about the methodology used. Without this information, one must question the validity of the models presented.

Gen John R. Galvin, presently serving as SACEUR/USCINCEUR says in the book's Foreword that "the key question is, how much will battle prediction lend itself to mathematical analysis and how much will always be dependent on subjective judgment?" The search for such a formula is very complex. This book deserves serious attention because it provides a number of important analytical propositions.

If the old adage "know your enemy" has any validity or truth, then the Soviets' theory and use of their Correlation of Forces may be years ahead of us in the arena of a practical mathematical model of combat. We need to explore Colonel Dupuy's theories and look at their ability to assist in our nation's defense. We can all profit by reading this, his latest book.

Maj Barry R. Hess, USAF
RAF Mildenhall, United Kingdom

March to Armageddon: The United States and the Nuclear Arms Race, 1939 to the Present by Ronald E. Powaski. New York 10016: Oxford University Press, 1987, 300 pages, $19.95.

The recent events involving a possible treaty eliminating Soviet and American intermediate-range nuclear missiles has again brought the nuclear arms race into the public forum. Yet, tracing the debate over American nuclear policy back to the dawn of the nuclear age can be frustrating. It has been veiled in secrecy from the beginning, and public view has been afforded only when a crisis or the search for political advantage forces the issue into the spotlight. With the nuclear weapons debate becoming a prominent issue in the American political scene of the eighties, historians are again examining the complicated process that gave shape to America's nuclear policy.

In *March to Armageddon*, Ronald Powaski attempts to assemble a one-volume history of the nuclear arms race from 1939 to the present. Not unexpectedly, considering the dearth of information about Soviet nuclear policy decisions, the book concentrates almost exclusively on how American policy evolved and the role this policy played in the arms race. In particular, Powaski is concerned with the question, why has every American president since Truman promised to curb the growing number of nuclear weapons, but none have done so? The answer, he maintains, lies in America's reliance on power politics, congressional refusal to curb nuclear weapons procurement, a history of public indifference to nuclear issues, and the tremendous influence of the military-industrial complex.

Relying primarily on secondary sources, Powaski chronologically examines America's growing nuclear capability and the often haphazard development of policy concerning its possible use. He offers no startling new insights into the A-bomb's development, but vociferously denounces Brig Gen Leslie Groves's "compartmentalization" security system as detrimental to any debate (in or out of government) concerning the development and use of nuclear weapons. In detailing Truman's decision to drop the bomb on Japan, Powaski determines that the United States was negligent in not seeking out all possible avenues of negotiation, being instead more concerned with demonstrating our new-found military might to the Soviet Union. Moving into the fifties, *March to Armageddon* focuses on how interservice rivalry, Eisenhower's New Look defense policy, the growing military-industrial complex, and the bomber/missile gap hysteria fueled America's increasing nuclear buildup. Kennedy appears as the belligerent cold warrior, determined to find "greatness" in confronting the Soviet Union. Covering the balance of the sixties and seventies is a cogent review of the tortured diplomatic and domestic political process that resulted in SALT I and the ABM Treaty. As the book moves into the eighties it assumes more the tone and structure of a debate over Reagan's nuclear policy.

In attempting to deal with this complicated subject over a period approaching half a century, the book is very ambitious. It is this very ambitiousness that leads to some problems. Though Powaski does an excellent job creating an effective and thorough chronology, each area receives an extremely abbreviated treatment. This treatment is most often in the form of a short narrative that includes a synthesis of what other commentators have concluded about the described event or period. Unless you are familiar with a particular area, you are clearly at the author's mercy for the background and applicable arguments, and though appearing objective on the surface, Powaski's general thrust is revisionist. Sections often conclude with an argument or statement critical of American motives and actions. After discussing McNamara's decision to deploy the Minuteman I, Powaski concludes the section with an observation by I. F. Stone that implies that the decision resulted from the devious machinations within an insatiable military-industrial complex. In discussing Congress's role in policy development, *March to Armageddon* is distinctly critical in tone until the period in the eighties when objection to the Reagan's defense buildup and SDI program appear.

Despite its revisionist slant, the book does have merit. Powaski does an excellent job in examining the efforts by those opposed to American nuclear policy and the continuing arms race. This opposition existed from the very beginning of nuclear research but found a public voice beginning in the sixties. Those not familiar with the early efforts by Neils Bohr, Vannevar Bush, and others to create an international regulatory group will appreciate Powaski's discussion.

Despite some weaknesses in objectivity, *March to Armageddon* is a welcome addition to the literature on American nuclear policy. If read with the skepticism one should have when dealing with evidence about any emotionally charged topic, the exposure to different interpre-

tations will be valuable. With its thorough chronology and excellent endnotes, the book is even more valuable as a one-volume reference work on America's evolving nuclear policy.

Maj Budd A. Jones, Jr., USAF
USAF Academy, Colorado

The Other Side of Time by Brendan Phibbs. Boston, Massachusetts 02108: Little, Brown and Company, 1987, 341 pages, $17.95.

Dr Brendan Phibbs chronicles his World War II experiences as a combat command surgeon in an armored unit that spearheaded many attacks on the enemy. He treated casualties at the frontlines, often in the streets, in destroyed buildings, or in advancing halftracks. He did not make rounds in a rear-echelon hospital but huddled shoulder to shoulder with the men while they were fighting.

At the time Pearl Harbor was bombed and the United States entered the war, he was a physician halfway through a 12-month internship. Shortly thereafter he sought a commission in the Medical Corps of the US Army and received first lieutenant's bars. He served in combat in France and Germany with Combat Command B, 12th Armored Division, Seventh US Army, ending the war as a major watching concentration camp victims from Dachau die from hunger.

He has written this book not only as a skilled surgeon but as a humanitarian. With the aid of many notes taken during the war and a memory of war that still burns brightly 40 years later, he transfers to the reader images of men dead and dying. The use of technical details and medical terminology is deliberately limited. The writing style is informal and easy to read. There is a sprinkling of German words in the text that lend an additional flavor to particular scenes. There are a few scenes graphically depicted in the book that drive home the point that war is about killing:

> We heard the next day how the line of tanks went slithering through the mud against the pillboxes, the young commander standing in the turret waving a map case because the radios weren't working. Orange light winked from behind concrete across the wide field and Mike's head was torn from his body; his trunk slid kicking into the turret spouting incredible volumes of blood. The carotid arteries and the jugulars were hosepipes. Crimson drenched the young soldier inside the tank, who screamed and screamed and pounded with his fists and pushed away at the windpipe and the twitching cervical muscles and the scarlet geysers that filled the air where his colonel's head had been. (p. 81)

Doctor Phibbs tells of attempting to treat mortally wounded soldiers. He tells of men with limbs cruelly amputated by modern weaponry. He speaks of head wounds too severe to dress in gauze. Amid the gore, he delves into the personalities of the soldiers, contrasting (in his view) the ideas and opinions of the enlisted men versus those of the officer ranks. He points out the conflict that arises because of these differences.

The book has a constant negative undercurrent toward the officers who planned, ordered, and led men into battle. Obviously a humanitarian, the author did not adjust well to the fact that good men were being led into battle, and subsequent death, by less than perfect leaders who were more often promoted as a matter of expediency than because of qualifications. In World War II, the US Army did not have the personnel systems available to manage "whole-person" and "best-qualified" promotion systems. Nor did it have the time to do so during its rapid wartime expansion, a point the author seems to overlook.

A combat command surgeon can be likened to a flight surgeon assigned to a flying squadron medical element or to a commander of an air transportable hospital deployed to a tactical location. This surgeon stays up on the battle plans, the tactics to be used, the expected outcome, and the projected casualties. The surgeon also keeps abreast of the latest in warfare by associating with the officers and enlisted personnel in the unit. Doctor Phibb's book makes an excellent example of the surgeon's role in this capacity.

This book is not a source for information on logistics planning; therefore, medical planners must look elsewhere for references. Although it is of limited use historically, the book is entertaining and gives a frank view of war and suffering—useful for physicians and for other medical personnel.

MSgt William D. Buhrman, USAF
George AFB, California

Space and National Security by Paul B. Stares. Washington, D.C. 20036: Brookings Institution Press, 1987, 219 pages, $28.95 in hardback, $10.95 in paperback.

Paul B. Stares states that the purpose of his book, *Space and National Security*, is to address whether the United States should proceed with the development of antisatellite (ASAT) weap-

ons. From the first page, the answer Stares offers on this proposition is no.

One hundred sixty-five pages offer background. Long chapters discuss the general operational characteristics of the Soviet and American military space programs, the contribution of military satellites to security and warfighting capabilities, current threats to and countermeasures for US satellites, and arms control in space. These chapters appear to offer a thorough grounding in these subjects, including illustrative tables and charts and considerable technical information. Basically, these chapters live up to the nominal promise of the title and are written in a clear and highly readable style. The conclusions of these chapters are limited and carry appropriate caveats. Appendixes totaling 24 pages detail superpower space surveillance and survivability capabilities.

In his 7-page introduction and his 13-page summary and recommendations, Stares asserts that going ahead with the US ASAT program could have several negative consequences. These consequences are that America's space systems would be less secure in wartime, that the threat of their loss would inject dangerous uncertainties into each superpower's calculations during a severe crisis, and that the use of ASAT weapons could escalate a conflict in undesirable and uncontrollable ways.

Stares asserts that if the United States does not go ahead with its ASAT program, an arms control treaty could limit Soviet capabilities to a level less threatening to US interests than a Soviet-American ASAT future. Stares devotes two pages to evidencing this contention.

"With the appropriate precautions to increase the survivability and redundancy of the exposed satellites," Stares writes, "the risk from Soviet residual threats can be brought under control." He cites as proof for this statement the assertions by the program office of the Strategic Defense Initiative that space-based antimissile systems can be made survivable in an unconstrained ASAT future. "If the official SDI view is ill-founded or overly optimistic," Stares states, "then one must ask whether the United States would rather live with the lesser threat posed by Soviet residual ASAT systems." The implications here are that SDI does not intend to rely on space-to-space ASATs to defend its forces and that arms control verification would effectively constrain development and deployment of any new Soviet ASAT system.

As sole evidence that the United States can verify compliance and thus effectively constrain residual and new Soviet ASAT systems, Stares quotes Maj Gen Thomas C. Brandt, deputy to the chief of staff, who said, "We have an excellent capability to monitor the employment of the (current) Soviet ASAT."

Stares also states in his summary and recommendations that SDI is a threat to meaningful ASAT limitations because the techniques for intercepting satellites and ballistic missiles are so similar. This expert opinion has received a degree of notoriety.

As a study in the history and technology of space and national security, Stares's book is an excellent addition to any military space library. However, it is not organized around its thesis. The support for that thesis is terse, and the support does not flow from the subject matter; rather, new evidence is introduced in the summary and recommendations. As a logical argument against the continuance of the US ASAT program, Stares's book is less than comprehensive.

Maj Thomas C. Blow, USAF
Maxwell AFB, Alabama

Tactics: A Soviet View by V. G. Reznichenko. Washington, D.C. 20402: US Government Printing Office, 1987, 246 pages, $7.00.

The Soviet Military Thought series provides translations of published Soviet works on select military issues. Tactics is book No. 21 in the series. It is also an integrated sequel to several previous translations including *The Offensive, The Basic Principles of Operational Art and Tactics,* and *Fundamentals of Tactical Command and Control.* Written in 1984, this volume is a reflection of the growth in Soviet doctrine and military art and includes Soviet reflections on Afghanistan under the guise of "mountain" or "special condition" operations. The book also reflects a continuation of the traditional Soviet methodology for dealing with instruction of the Soviet officer corps step by step, principle by principle.

A complete description of the tactical battlefield establishes the foundation for the book. That description is of the modern combined arms battlefield that has evolved with current Soviet doctrine. The 40-page description is very comprehensive, yet concise, and is potentially the most valuable contribution to budding Soviet observers. Within that description are tactical zones similar to the zones of operation described

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by Antoine Henri Jomini. Other concepts and methodology for warfighting at the tactical level strongly reflect Jomini's attempt to provide a "cookbook" for the conduct of war. It also reflects the general attempt by Soviets to use a scientific approach to war. The content of the book is an extension of the offensive nature of Marxist-Leninist doctrine and the lessons of the Great Patriotic War (World War II). As is common in Soviet military writing, that war is often cited as validation of a concept. The largest portion and greatest detail in the book focuses on the offensive nature of tactical operations. The emphasis on the offense is followed by defensive operations, and the book concludes with a discussion of logistics at the tactical level. In describing the defense, it emphasizes a defense that exists to prepare for the offensive, a basic Clausewitzian view of the defense. The concepts of logistical support and combined arms movement, as well as movement along independent lines of operation toward the point of engagement, are also a reflection of the principles of Jomini.

While the book focuses on the offense, defense, and logistics, its emphasis on combined arms warfare provides cohesiveness. The book explains tactical operations in the context of operational art and strategy in a combined arms environment. Consequently, other theories of Carl von Clausewitz surface, including a focus on the center of gravity via the main axis of attack. That position also places potentially independent tactics in the broader perspective of an integrated echeloned offensive at the grand tactical level, reflecting Sir B. H. Liddell Hart's expanding torrent. The book repeatedly cites the Great Patriotic War as an example of tactical principles, but it also presents the impacts of newer conflicts.

Afghanistan has placed new emphasis on mountain operations and the new applications of existing systems. "Valleys (ravines) are entered only after the subunits have captured the adjacent heights. Strikes against enemy forces putting up resistance in valleys (ravines) are carried out by fire support helicopters, artillery, and mortars." (p. 121) In addition, the Soviets describe the ease and strength of defensive operations in mountainous terrain.

The book is somewhat simplistic and discontinuous at face value, but when considered in the context of the Soviet military series, it completes the spectrum of conflict from strategy through operational art or grand tactics to tactics. An initial reading of *Tactics* provides you with an encyclopedia of concepts related to tactical operations in war. Only in the context of previous books in the series does it become a coherent text on the conduct of tactical operations. Read in this context, *Tactics* becomes a valuable reference tool for analyzing Soviet tactical ground operations.

Maj Milton C. Nielsen, USAF
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The Impact of US Forces in Korea by Lee Suk Bok. Washington, D.C. 20319: National Defense University Press, 1987, 101 pages, $4.00.

This short book is not ordinary. It describes candidly an allied officer's views on how our military's presence has affected his people's lives and their living. It affords military readers a unique opportunity to "see ourselves as others see us" and to appreciate the consequence of uninformed decisions—how they affect our and our allies' "hearth and home" for a very long and costly time. The examples are strictly from the Korean experience, but the lessons are universal.

It begins with a glimpse at the historical and geopolitical situation that brought US forces to Korea following the defeat of Japan, ending its 35-year occupation of Korea. The book outlines and discusses the quality of several US decisions that have shaped the fate of Korea. For example, the choice of the 38th parallel as the dividing line between the US and Soviet occupation zones was made by two US Army staff officers, a colonel and a major. They worked at midnight with a 30-minute suspense, a small-scale wall map of the Far East, and vague guidelines from the State-War-Navy Coordinating Committee. In another decision, the US occupation forces initially chose to retain "despotic Japanese colonial" rulers in government positions when popular Korean leaders of the provisional government, previously exiled in China, were available. This decision may have cost an early and peaceful unification of the peninsula. Similarly, the US military government chose Koreans who were former members of the Japanese army to attend its English language school. Students from this school later formed the officer corps for the Republic of Korea (ROK) army. Korean officers loyal to the provisional government would not attend classes with "the enemy," and the ROK military lost much of its tradition, talent, and credibility. Later, disregarding intelligence information, Gen Douglas MacArthur recom-

mended withdrawal of most of the 45,000 US troops in Korea—setting the stage for North Korea's invasion and a bitter war. During the war, MacArthur, perhaps trying to atone, pursued the retreating North Koreans too far north, prompting China's entrance into the conflict. Later, the decision to accept Kaesong, located below the 38th parallel, as the location for armistice talks prevented UN forces from pushing the western front to the Yesong River area, where more defendable terrain was available. The line still stands just 25 miles north of Seoul, requiring a concentration of forces around the capital and leaving no ground to give or room for maneuver.

The book also describes the positive and negative effects rapid westernization has had on Korea. It covers the growing pains of a culture not fully prepared for democracy, the distress experienced by an economy grown dependent on US servicemen's dollars, and the social problems of unaccepted mixed-blood children and transcultural marriages.

While the book gives gracious credit to the United States for maintaining a balance of power in the world, deterring further war on the peninsula, and contributing to the ROK's economic strength, it also lays blame for many of Korea's problems at the feet of the United States. It claims that the presence of US forces in Korea has made ROK forces weak and dependent, while simultaneously claiming past US troop withdrawals have been premature. On one hand, it says US presence has stimulated a North Korean arms buildup and forced Soviet and Chinese support for the North. On the other hand, it reminds the United States of its responsibility to check Soviet expansionism in the Asia-Pacific region. The reader is left with a feeling that a superpower's allies may become like spoiled children—difficult to please. As in all things, it appears there are advantages and disadvantages in combined security.

These points aside, the lessons to be learned from this book should cause us some reflection. As the author puts it, "Americans do not often put themselves in Koreans' shoes. The ability to do this occasionally is very important in working effectively with Koreans, and it reduces the chances of friction or misunderstandings." (p. 75) We would do well to apply this prescription in our relations worldwide.

Col Lee Suk Bok is an ROK army officer whose entire life has been affected by the impact of US forces in his homeland. He wrote this book while attending the National Defense University as a member of its first class of international fellows. His writing style is obviously affected by the disadvantage of writing in a language other than his native tongue. However, the points he makes and the insights he gives are well worth accommodating his walk in our linguistic shoes.

This is an important book for those who work with or make decisions concerning our allies—Korean or otherwise.

Maj Richard B. Clark, USAF
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Wilbur and Orville: A Biography of the Wright Brothers by Fred Howard. New York 10022: Alfred A. Knopf, 1987. 530 pages, $24.95 in hardback.

Larger-than-life heroes all too often become lost in myth, fable, and deification. *Wilbur and Orville*, Fred Howard's new biography about the Wright brothers, not only humanizes the fathers of aviation but shows once more that genius is 90 percent hard work. In tracing the Wrights' path toward immortality, Howard details the brothers' total commitment to controlled flight. While the Kitty Hawk story has been often told, rarely has it been developed with such a smooth mixture of technical data and narrative prose. It is a fascinating success story that has more twists, villains, greed, altruism, and old-fashioned heroics than a made-for-TV movie. It was primarily the steadfast belief by the Wrights in their own genius that secured for them their rightful place in history as the "true" inventors of the airplane. Institutions (including the influential Smithsonian), lawyers, and powerful business interests spent years and fortunes trying to discredit the importance of their controlled flights in December 1903. What may surprise many aviation buffs is the amount of energy and invaluable time expended by the Wrights in legal fights over critical patents. Potentially their most productive years were tied up in court and in attempts to market their invention. It would be years following the initial flights at Kill Devil Hill before they could interest the US government in their flying machine. Howard's graphic portrayal of this struggle is so effective you sometimes feel as if you are in the Wright camp on North Carolina's outer bank. Despite the mosquitoes and foul December weather, you are as confident as the Dayton bicycle mechanics that man will fly.

Why were the Wrights successful when others with greater funds (Samuel Langley was given a

War Department grant of $50,000) and more formal training were not? The reasons are several. First of all, the Wright brothers approached the problem of developing a flying machine systematically. They researched the available information on flying/gliding and then set out in a very pragmatic fashion to test their theories. Nothing was left to chance. Weather data, for example, was collected to find a test site. North Carolina was the closest place that met the requirements for constant winds during their bicycle shop's slow winter season. Through painful trial and error (both brothers would have brushes with death in flying accidents), the Wrights learned to fly. They built experimental gliders to test wing arrangements and control surfaces. When they were not flying, they were trying to "puzzle through" some temporary roadblock. It was in this arena that their mechanical pragmatism became the genius of invention.

Imagine, if you will, learning to fly an airplane at the same time you are inventing it! There were few, if any, precedents for what they were learning to do above the shifting sand dunes. When they tried too steep a turn or applied too much rudder, they crashed. In this fashion they developed the first rudimentary basics of flying. Very carefully and patiently they "invented" three-dimensional control of a flying machine. It was this system of wing warping, used in conjunction with a vertical rudder, that became the basis for the Wright patent for controlling flying machines. After their historic flight on 17 December 1903, the Wrights spent the next several years improving their invention and trying to market it in both the United States and Europe.

Perhaps the most valuable contribution that Howard has made in this volume is his careful pursuit of the Wright story following the first flight. The Wright brothers are pictured in full possession of pettiness, jealousy, and all the frailties of "normal" humans. In discussing their battles with other aviation pioneers, the author provides an excellent survey of the uncertainty they all faced. Fred Howard shows by comparing the work of these early aviators that it was clearly the Wright brothers who took the airplane from an experimental stage to a practical working machine. It is an exciting story well worth reading.

Col Pat O. Clifton, USAF
Kelly AFB, Texas

Military Objectives in Soviet Foreign Policy by Michael MccGwire. Washington, D.C. 20036: Brookings Institution Press, 1987, 586 pages, $39.95 in hardback, $18.95 in paperback.

This is undoubtedly one of the most provocative books ever written on the Soviet military. MccGwire argues the case for a strictly logical relationship between Soviet force development and Soviet strategy and doctrine. He relates the changes in force structure over the last 20 years beginning with the Soviet perception in December 1966 that escalation to an intercontinental nuclear exchange with the United States was no longer inevitable in the event of a war breaking out either at the theater or local level between the two states or their respective allies. Therefore, the strictly theater operation in Europe and Asia became a feasible proposition and one that required new trends in force structure, conventional and nuclear alike, to implement a strategy for fighting such wars while deterring the US strategic nuclear forces. MccGwire then proceeds to chart the ensuing 20-year development in terms of the logical requirements imposed by Soviet strategy for fighting and winning such a war while preventing the nuclear exchange.

Thus, we get a grand tour of the ensuing weapons programs of the Brezhnev period conceived of in the light of these strategic requirements. This is by no means the standard litany of Soviet weapons programs that they are simply stockpiling weapons for no conceivable strategic purpose. On the contrary, MccGwire seeks to underscore the shifting perspectives on war and strategy over this 20-year period, the most fruitful in Soviet strategic thought since 1937. His mastery of the data and of the evidence is unquestioned, as is his capacity for marshaling the data into a coherent argument with a real strategic point to it. Disdainful of the "bean-counting" fallacy that afflicts much of American thinking about the Soviet military, MccGwire offers instead a compelling and articulated alternative view of Soviet military developments.

However, such a view is not wholly to everyone's taste, including this reviewer's. It is difficult to see the relationship between these developments and Soviet foreign policy that is promised in the title. Indeed, such a relationship is absent. The political dimension is absent in regard to international relations of the USSR and to the internal politics of the military services with the possible exception of the debate between Adm S. G. Gorshkov and the leadership on the role of the Soviet navy, a debate that ultimately was won by Marshal N. V. Ogarkov and the army

against Gorshkov. Moreover, in his analysis of what the Soviets consider to be the real strategic requirements of their position, the author sometimes sounds remarkably like an apologist for them, which he surely is not. Just because the Soviets may assume they have these requirements does not confer upon them an ex post facto rationality or allay the fears of all their neighbors as to the purposes for which these enormous stocks may be used. The explanation offered by MccGwire for the introduction of the SS-20 as merely a routine upgrading of the SS-4 and SS-5 surely is insufficient to ease European fears of Soviet motives. In the absence of a political dimension to the analysis of the years 1966–85, it becomes difficult to understand the enormous concern generated about where the Soviet leadership and the military were going. Regrettably, though MccGwire also suggests, rightly I believe, a new reorientation of Soviet military strategy during 1983–85, the pressure of publication deadlines prevents him from discussing where Gorbachev's programs are leading the Soviet military. Of necessity the study ends with the year 1985. That is unfortunate in light of recent developments—Gorbachev's admission that there is a Soviet space defense system; possible changes in Soviet perspectives on local war as a result of Afghanistan; and the hue and cry about a new Soviet defense doctrine coupled with the search for usable military conventional power in the European theater, which explains the Soviet military's support for an intermediate-range nuclear force (INF) agreement. These criticisms notwithstanding, the book is must reading for all those who study Soviet military programs either out of obligation, or curiosity, or both. Even if we disagree with the author, we will not soon find a better exponent of his case.

Dr Stephen Blank
Maxwell AFB, Alabama

Wars Without Splendor: The US Military and Low-Level Conflict by Ernest Evans. Westport, Connecticut 06881: Greenwood Press, 1987, 160 pages, $27.95.

This book attempts to place the US involvement with low-level conflict in historical and policy contexts, to define its parameters, and to suggest a revised military approach. It defines low-level conflict as having lower casualty rates over time than conventional conflict and as being either subnational or of an indirect or proxy form when it involves two or more countries. The author's carrying argument is that the academic and governmental counterinsurgency "craze" of the early 1960s precipitated significant attitudinal and policy backlash as the Vietnam War "traumatized" the United States. But now circumstances permit needed enhancements or restructuring of military capability for low-intensity operations—counterinsurgency, aid to insurgents, counterterrorism, peacekeeping, and reversal of coups.

There is nothing new here that the public-domain literature of this decade (especially Sam Sarkesian, Bard O'Neill, and Stephen Sloan) has not covered much more effectively. The book surveys the literature on such subjects as hostage rescues and peacekeeping operations, but it totally lacks citations or references to US military doctrinal and training publications that are available to the public. The weaknesses of the work are due in good part to this omission. As examples, the author stumbles on airlift mobility (not considering the C-141 aircraft while dealing with the C-5 and C-130); the nature and doctrine of US Army Ranger forces; and the actual, dedicated force structure capabilities of the US Air Force in low-intensity operations.

The book has a logical enough plan, but its heavy use of repetition and enumeration in the first 130 pages of text make it tiring, and the book as a whole gives the impression of lectures and article segments more or less fitted together. The author's references/citations could lend support to this judgment. However, a list of sources, a bibliographic essay, and substantive chapter notes are helpful aids for the reader who might wish to inquire further on points.

The two-thirds portion of the book that defines and evaluates the problem is better than the remainder, which offers what appears to be a hurried and very superficial policy/structural remedy. In the former, the author does better with peacekeeping and terrorism than with counterinsurgency or "aiding insurgents," where he never really dissects or defines these complex and controversial doctrines. As for the latter part of the book, he simply does not have the defense establishment or legislative references, operational concept familiarity, or enough pages to do more than sweep a large hand across a small map. For example, his repeated use of the term *covert* and the total absence of *clandestine* reveals an unfamiliarity with the important legal and operational differences between plausible denial of sponsorship and the

undetected, surprise conduct of small military operations. This is more troublesome as the author apparently believes that the Green Berets were almost exclusively directed by the CIA during their Vietnam War operations. To hold this out to readers without any mention of the Military Assistance Command Studies and Observation Group (MACSOG) and its geographic subcommands, suggests secondhand information or poor advice from interviewees. Finally, the author never uses the term *special operations forces* (SOF), which includes Rangers, Army Special Forces (Green Berets), and Navy SEALs, whom he considers in the book. But the term also includes psychological operations battalions, US Air Force SOF (fixed-wing and helicopter insertion, extraction, resupply, and fire-support aircraft; combat controllers; etc.), and civil affairs units, none of which he mentions. This calls into question his sketchy capability-restructuring advice. According to the briefly stated credentials of the author, he is perhaps out of his depth here, although he has presented an orderly low-level conflict overview that is suitable for a nonexpert civilian reader. To a military reader I would suggest a quick reading of Part I and the bibliography but no more.

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To Chain the Dog of War: The War Power of Congress in History and War by Francis D. Wormuth and Edwin B. Firmage. Dallas, Texas 75275: Southern Methodist University Press, 1987, 360 pages, $27.50.

In this scholarly and exhaustive legal study, the authors examine the power to initiate war in American constitutional law and the history of the uses of that power. In either case, Wormuth and Firmage are no friends of the "imperial presidency." Yes, the authors concede, the Constitution does direct the legislative and the executive branches to share power in conducting foreign policy. But when it comes to war, Wormuth and Firmage insist the office of the president has never carried the power of war and peace. Instead, the Constitution assigns the power to initiate war solely to Congress. The president, as commander in chief, performs vital functions in conducting war, but the "composition, structure, use, and actions of the armed forces are entirely determined by acts of Congress." The only exception to this exclusive power to initiate war is the presidential choice to use military force to repel a sudden attack on the United States. Wormuth and Firmage argue that the framers of the Constitution intentionally gave Congress the war power as a check against the impulsive use of military force by the executive branch. The authors claim this exclusive congressional power to initiate war was one of the wisest of many checks and balances built into our Constitution, but they also admit this division of power has not prevented presidents from committing acts of war without congressional authorization.

Wormuth and Firmage particularly deplore the recent attempts by "controversialists" to strip the legal authority to initiate war away from Congress and give it to the president. The authors argue that Congress has aided and abetted this revisionism by illegally bargaining away its rightful control of the war clause of the Constitution. As a result, presidents since Franklin D. Roosevelt have systematically invaded the legislative power of Congress to declare war and have tried to exercise unilateral war powers without the concurrence of Congress. The consequence, according to Wormuth and Firmage, is that presidential conduct in the Cuban missile crisis, Vietnam, El Salvador, Nicaragua, Iran, and Lebanon has been, to one degree or another, illegal.

Wormuth and Firmage's remedy is for Congress to take back what it has unconstitutionally given away. In order of severity, the authors suggest that Congress use its control over the budget, the power of advice and consent, "sense of Congress" resolutions and formal censures, the legislative veto, legal action through the judicial system, and impeachment as ways to correct the imbalance of power that exists. These corrections are necessary, according to the authors, because the War Powers Resolution of 1973 is not a complete remedy for the present imbalance. Wormuth and Firmage argue that section 8 of the resolution gives the president a "blank check" to engage in acts of war if he has *advance* authorization from Congress. The authors firmly point out that "only Congress may declare war, and it may declare only present wars, not future wars." Since you cannot be in a future state of war, Wormuth and Firmage see section 8 as yet another unconstitutional delegation of congressional war power to the president.

Finally, the authors believe that the Whiggish bias against executive power that the framers wove into the Constitution is relevant and prac-

tical today. Wormuth and Firmage believe the nature of war in the nuclear age does not make deliberation and debate an anachronistic luxury. If anything, they argue a nuclear world demands that "collective conscience, rather than individual whim, must prevail." Instead of having an unfettered president, the authors argue deliberation and debate are essential before we take those first steps toward a nuclear war that, once taken, may not be retraceable. To Wormuth and Firmage, speed and efficiency are the ends of a totalitarian state, and not those of a republic dedicated to liberty.

This is a thoughtful and erudite work. One sees, however, an implicit political vision behind the call for strict presidential compliance with the Constitution. The authors share the traditional American view of war as a temporary aberration from the status quo. This nostalgic attitude does not jibe with a world where hostile states use war, across its broad spectrum, as a common instrument of policy and not as an instrument of last resort. A system of deliberately awkward consensus building would encourage American isolationism (an impulse that has hardly died) and would curtail the active role of the United States as the bulwark against dictatorships of the Left. Given the executive branch's recent illegalities, the authors would probably argue that in either case it is all for the best.

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Makers of the United States Air Force edited by John L. Frisbee. Washington, D.C. 20402: Office of Air Force History, 1987, 327 pages, $13.00.

Makers of the United States Air Force is a collection of 12 biographical essays of men who made major contributions to the US Air Force but whose names and contributions are not well known. In his "Introduction: Men with a Mission," editor John Frisbee explains that Mitchell, Arnold, Spaatz, and LeMay were deliberately left off the list of 70 from which these 12 were chosen. Emphasizing their personal impact on the evolution of the Air Force, the careers of these 12—Benjamin Foulois, Frank Andrews, Harold George, Hugh Knerr, George Kenney, William Kepner, Elwood Quesada, Hoyt Vandenberg, Benjamin O. Davis, Jr., Nathan Twining, Bernard Schriever, and Robinson Risner—are presented. These 12 provide a chronological cross section of Air Force history from the 1910 experience of Benny Foulois with pilot training by correspondence to Robbie Risner's leadership as a fighter pilot and POW in the Vietnam War.

The strength of this work lies in the qualification of the individual authors. For those at all familiar with Air Force history, such names as DeWitt S. Copp, Haywood S. Hansell, and Noel F. Parrish are familiar. The individual chapters reflect the variety of authors, ranging from Jacob Neufeld's highly analytical "Bernard A. Schriever: Challenging the Unknown," outlining Schriever's impact on Air Force research and development, to T. R. Milton's journalistic and adulatory "Robinson Risner: The Indispensable Ingredient," which recounts Risner's exploits in Vietnam. All of the chapters are worth reading.

Within the length restraints of these short biographies, there are issues one would like to see included that are omitted. John Schlight, in his chapter on Elwood Quesada, makes the important point that in the twenties and thirties "Air Corps officers still formed a relatively small and exclusive group, most of whom knew each other. . . ." (p. 180) Only in Murray Green's piece on Hugh Knerr, however, does one get a significant glimpse of the competition and disagreement inevitable in any group. Were the Air Corps officers of the twenties and thirties as unified in outlook as they appear in this book? Were there competitive cliques? Were the mavericks and iconoclasts run off? Claire Chennault certainly felt run off for championing pursuit aviation against the claims of the strategic bombing advocates. (See Martha Byrd, *Chennault: Giving Wings to the Tiger* [Tuscaloosa, Ala.: University of Alabama Press, 1987], 60, 62, and 101.) The role of Harold George as the "Apostle of Air Power" because of his work at the Air Corps Tactical School and his part in the writing of "Air War Plans Division—Plan No. 1" (AWPD-1), related here by his subordinate and friend Haywood Hansell, has been told by the same author elsewhere. (See Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan: A Memoir* [Washington, D.C.: Office of Air Force History, 1986] and *The Air Plan that Defeated Hitler* [Atlanta, Ga.: Higgins-McArthur/Longino and Porter, Inc., 1972].) A slight compression of that story to permit more than a one-page summary of George's contribution as the World War II commander of the Air Transport Command would have improved the book.

This work is not, and was not designed to be, a survey history of the US Air Force. It also does

not provide a full picture of the 12 men presented. A much longer book would be required to include the details of their private lives.

The authors do, however, occasionally provide personal anecdotes to enliven their text. Donald Mrozek recounts the following exchange between Generals LeMay and Twining in August 1945 when Twining arrived to replace LeMay as commander of Twentieth Air Force:

LeMay: "What in hell are you doing here, Nate?"

Twining: "If you don't know, Curt, it's too late."

Mrozek's source for this exchange is the oral history interview of Twining held at the Columbia University Oral History Project.

This anecdote illustrates one of the characteristics of oral history. The same words, with the names changed, in the LeMay-Twining exchange have been recounted as the exchange between Generals Hansell and LeMay when LeMay took over command of XXI Bomber Command in January 1945. Oral historians often find that various individuals recount identical lines as being used at different times and places. The words may have been used as recalled, or the participant, years later, may believe they were used because they would have been so effective and appropriate.

The book is laid out for the general Air Force reader. The editor includes 112 well-selected illustrations, which he has placed in the text at appropriate spots. At the end of each chapter is a short section on "Sources." It provides a guide to further reading for those interested. There are no footnotes or endnotes. In this reviewer's copy, unfortunately, the Government Printing Office binding is so shoddy that the pages started coming out before the first reading was complete.

Makers of the United States Air Force is good official history and partially fills a huge role in Air Force history. All Air Force professionals should read it to expand their understanding of their service. All of our professional military schools should use it immediately. Once a few cycles of students have read it, it should settle at one level to avoid repetition. That level should be Squadron Officer School. Read it—it's fun.

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Nuclear Blackmail and Nuclear Balance by Richard K. Betts. Washington, D.C. 20036: Brookings Institution Press, 1987, 240 pages, $28.95 in hardback, $10.95 in paperback.

I liked this book. Being an individual who normally would not pick up, much less read, a nonfiction book with this title, my first sentence is very complimentary. Those of you who read authors like Michener will understand when I say it took a while to warm to this book. In fact, the author's introductory chapter bewilders one with its self-diagnosing questions on the "what ifs" of nuclear blackmail. He also has a confusing habit of continually redefining the main theme of his book. I don't believe he is using the correct terminology when he refers to his main focus or main theme of the book. He is more often than not referring to an intrinsic part of the overall picture he is painting—the threat of nuclear weapon use and how political leaders perceived this threat over the past four decades.

The meat of the book, chapters 2 through 5, is interestingly assembled and nicely fitted together. He presents each blackmail case as a case study, an interesting way to present historical data. Case studies permit the novice to enjoy and understand the event, how it fits into history, and its significance. The case study also permits the author to weave the facts into a palatable story applying the political tone of the era. The author bases his categorization of lower risk and upper risk cases on his interpretation of the significance of their level of danger. His process of identifying the relative threat in his various case studies is seemingly set in concrete in chapter 2 but becomes fluid by chapter 5.

I felt very comfortable with the author's insights into the worlds of the various presidents. He seems to have a genuine understanding of both their political views and personal beliefs. While he uses this insight to develop the case studies, the only part lacking is the view from the other end of the barrel. Unlike a fictionalized account in which one can fabricate an answer or possible course of action, without an insider's knowledge of Moscow's true action and beliefs, it is difficult to draw complete conclusions about every incident the way our author does. He does a fine job in giving a factual accounting of the incidents as best we know it; however, you come away from the book with this small voice saying that we are the "bad guys" in this book. We are the ones drawing our guns first. The author readily admits that he does not have all the informa-

tion and that this fact can have an impact on how our reaction to the various events/crises would be tempered. This admission does not deter him, however, from pointing the blame at the United States.

The author ends the book by looking to the future and the likelihood of future nuclear coercion. He feels that because of parity, future nuclear threats should be minimal or nonexistent. He discusses a number of possibilities that would help the world avoid a nuclear showdown. One of the possibilities he discounts as only appealing to "a political minority" is the United States becoming the lead nuclear power again. I don't agree that this idea appeals to only a political minority. I believe most Americans would feel most comfortable with being in the lead again. Allow me to make one final observation. Perhaps I am not the individual to whom his book is targeted; however, if the purpose of the book is to inform and make a couple of bucks, I'd drop a couple of the 10-dollar words and not begin sentences with the word *and*.

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The Future of Air Power by Neville Brown. London: Croom Helm, 1986, 309 pages, $27.50 hardback.

Any attempt to link the past, present, and future of air power in technical, tactical, technological, psychological, and strategic terms must result in either a reckless jumble of nonsequiturs or a stunning achievement. With Neville Brown's *The Future of Air Power*, the result is unquestionably the latter.

This is a highly readable, fascinating account of a subject of near overwhelming proportions. Well documented and splendidly developed, Brown's book reviews the history, present status, and possible—if not likely—future of air power, particularly in light of the technological dimension.*The Future of Air Power* devotes attention to electronic warfare, airfield vulnerability, the balance in deterrence between manned aircraft and ballistic missiles, geography, surprise attack, the continued importance of human factors, and the long gestation period for new technology.

Brown, professor in International Security Affairs, University of Birmingham (England), looks at both Western and Soviet air doctrines and especially how they are influenced by the endless oscillation between offense and defense, between "stealth" and "gotcha." It is in the area of "novel technology" that *The Future of Air Power* is most captivating and germane. Working from F. W. Lanchester's Square Law (developed in 1916)—a marginal increase in number is liable to be more consequential than a marginal gain in quality—Brown warns that the West's long-vaunted technological edge may not eternally tip the balance away from Soviet numbers. However "belated" Soviet imitation of Western high technology may be—and Brown scarcely credits Soviet R&D with even marginal innovation—profound differences in priorities provide the Soviets with a longer term opportunity for taking advantage of new technologies than the West enjoys. Technology, therefore, tends to be applied in military terms faster in the Soviet Union than in the West. Assuming the Soviets are less constrained by competing priorities than in the West, getting things off the drawing boards faster—and in larger numbers—could result in a cumulative Western catastrophe.

Fortunately, however, Lanchester's Square Law is reduced in application by the scientific magic of the sigmoid, or S-curve, which refers to the progressive acceleration *and* retardation of improvements resulting from a given technological evolution. Thus, new genres of air weaponry tend to mature slowly and unsteadily. For example, the variable-geometry wing, made famous in 1964 by the F-111, was actually patented in France in 1890 (13 years before the Wright *Flyer*) and extensively studied in a wind tunnel by the late 1940s. Similarly, cruise missiles may have "come of age" in the 1970s but they date to the 1920s and were seriously pursued in the 1940s (in two particularly famous versions—manned, the Japanese Kamikaze, and unmanned, the German V-1). More commonplace examples include radar, jet propulsion, and the helicopter.

Almost as fascinating is Brown's chapter on economy and availability versus exotic capability. Here unfolds the synergistic complication of spellbindingly wondrous—and spellbindingly expensive—technologies. Alas, however, a wondrous "edge" doesn't stay sharp very long any more, and it may be readily nullified by an equally wondrous—and occasionally simple and inexpensive—counter. Thus, a look-down, shoot-down aircraft made of miracle materials, packed with black boxes, computers, IFFs, and coated with multiple layers of radar-proof paint may still be brought down by rifle bullets. Ad-

ditionally, how much added capability do we buy for every extra dollar we spend? Doubling the cost seldom doubles the capability. To be sure, significant increases in expenditure tend to provide only marginal increases in capability. For Brown, this is merely a fact of life and one that must be meshed with what we can or are willing to afford. Evaluated in light of the Square Law, five items of reasonable capability at a cost of 2X each might be better—and certainly far cheaper—than three of slightly superior capability at a cost of 4X each.

For Brown, nothing about aviation's future is simple. Advances and counteradvances complicate exceedingly complex issues to a point of near hopelessness. Also complicating is time. Just as the time for an innovation going from cutting edge to obsolescence is now compressed, time likely will be compressed in an East-West war, Brown believes. Whereas battle losses in previous conflicts may or may not have been decisive at any given moment, they become increasingly critical the shorter the war. Therefore, mundane features such as airfield vulnerability, tactics, geography, weather, and human factors (fatigue, skill, motivation, valor) become all the more vital.

Aircraft need not be destroyed, only damaged; aircrews not killed, just wounded; and runways not demolished, only cratered to achieve profound tactical advantage. Less-than-perfect destruction may be as useful—and much easier to achieve (especially for the side with the advantage in numbers). Turning to the weather for an example, Brown suggests that 10 or 15 percent of missions canceled or reduced in effectiveness by poor weather may not be decisive in operations lasting months or years, but they may lose the battle, campaign, and war when the time from start to finish is weeks.

Accordingly, the historic capabilities of air power—to achieve surprise, to mass—are magnified in a shorter, albeit more intense, conflict. Applying the Square Law, again superior numbers of relatively inferior aircraft, radars, antiaircraft missiles, or aircrews may tip the balance away from smaller numbers of superior items.

Of all air power roles, none is more critical for future warfare and none more demanding of planners and commanders of all services than close air support. Yet for all his emphasis on tactical warfare and close air support, Brown is no advocate of merging air forces back with armies. But neither must air power be completely divorced from land and sea power. More than ever before, the three arms—land, sea, and air—must work together.

The future always asks more questions than it answers and Brown's book is no exception. But if questions about the future cannot be answered readily, at least asking them can help prepare us for what we might otherwise inadequately anticipate. *The Future of Air Power* provides a global and long-range look at a military dimension for which truly "the sky's no limit." This is a work to learn from and to enjoy. Rare indeed.

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SHAPE, Belgium

Arms Control and the Atlantic Community by Werner J. Feld. New York 10010: Praeger Publishers, 1987, 192 pages, $35.95 hardback.

Completed June 1986, published 1987, this slim volume is a salutary example of the unexpected stalking not just the unwary, but even the best prepared.

Werner Feld's opening premise is that the Chernobyl disaster should serve to focus all nations' attention on the need for a responsible approach to arms reductions, especially nuclear. The author's preface regrets lack of progress on nuclear weapons reduction, claiming "we must do better in our arms control efforts" if we "want to avoid future Chernobyls." Leaving aside this not entirely helpful confusion of politico-military procedure and civilian industrial incompetence, one must still sympathize with an author whose researches led him to his entirely reasonable assessment of lack of movement in East-West discussions. Within months of publication, we now know, there was simply dramatic forward movement. The December 1987 Washington INF accord will—if ratified—remove considerable numbers of nuclear-delivery vehicles from the inventories of both East and West.

But Feld's unfortunate timing is our gain. We can dip into his book with the benefit of hindsight. The approximately 100 pages of text (another 40 contain a glossary, list of acronyms, and the text of the 1979 SALT II Treaty) open with a review of arms control negotiations since SALT II: nuclear, chemical, and conventional. Then Feld examines the history of the interplay between the US and the European NATO partners before assessing prospects for arms control in the second Reagan administration. Here again, pursuing his principal theme of European interests, he reflects on the possible spectrum of US-

European interaction, and its influence on the chances of creating effective détente through arms control. The book closes by reviewing more recent events (of 1986) and examining scenarios for the future, looking particularly at ways to develop a common "European" defense policy. The author's bottom line is that the youth of today can plan for a meaningful future only if there is an end to the arms race and, in particular, if they can then live in a nuclear-free world.

It is debatable whether such a world is attainable, or indeed desirable. The process of scientific discovery does not lend itself to reversal. Nuclear know-how is here forever, like it or not. But a world with considerably reduced nuclear stockpiles, with stability in the conventional confrontation, is a worthwhile target. It has been the stated aim of NATO's defense policy since 1949. However, it has always been clear that arms control, aimed at reducing manpower and weapons, could not be just an end in itself. It is a complement, a vital adjunct, to the search for political stability.

Feld's book thus has a sound approach in dealing not only with arms control efforts but also with the political interplay both between NATO nations themselves and between East and West. Some editorial confusions mar the presentation of historical data: the opening chapter, on negotiating history, takes the reader up to early 1986. The final chapter has details from later that year (later, in fact, than when the author signed his preface). That minor irritant does not devalue the overall survey. The central chapters are comprehensive in coverage of European interests, especially in unraveling the complex threads of European attitudes to SDI. The evolution of US nuclear arms control policy is well documented.

No doubt many have had their attention drawn to arms control by the December 1987 Washington ceremony. Feld's book—and especially his final chapter, written as the prospects for such a ceremony were still far from bright—is a readable and useful survey of recent events in the processes of arms control. Those processes, to quote Feld, are usually "glacial" in their slowness. But 1987, the year after he finished his book, has seen remarkable events, not just in the nuclear arena. In February the 23 NATO and Warsaw Pact nations opened discussions in Vienna which should lead to new negotiations on conventional stability across the whole of Europe. In the closing months of 1987, teams of Eastern and Western military inspectors were implementing the terms of the Stockholm Conference on Disarmament in Europe. Who would have believed it possible for a US Army colonel and his colleagues to move freely around and photograph a Soviet exercise near Minsk, having demanded that right of inspection just 36 hours earlier?

Arms control is here to stay. Any newly awakened interest will doubtless be stimulated by more of such surprises in the future. Feld's study provides a competent introduction to the topic.

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Creating Strategic Vision: Long-Range Planning for National Security by Perry M. Smith et al., Washington, D.C. 20319: National Defense University Press, 1987, 133 pages, $3.25 paperback.

When my wife saw this book she asked what it was about. When I told her it dealt with planning 10 to 20 years into the future, she laughed and said, "They can't even plan what you're doing next week. How can they expect to do anything like that?" Certainly, any type of planning involves a degree of forecasting about the future. The further ahead you plan, the more forecasting you must do.

Creating Strategic Vision is a collection of five essays dealing with long-range planning. The authors discuss the methods of forecasting and give us an example of one in action: alternative futures.

This is an important book. In the post-Reagan-buildup period Congress will be cutting the defense budget to help deal with the deficit. We can't afford to buy every item available, so our acquisitions must have some type of direction—a plan. This book is about making such a plan.

The first essay, by Maj Gen Perry M. Smith, USAF, Retired, is an excellent introduction and overview of long-range planning. According to General Smith, the key to long-range planning is freeing ourselves of restrictive thinking. One of the best methods to accomplish this is alternative futures. As Smith puts it, "By considering a world beyond the year 2000 when the Soviet Union might no longer be a superpower or when the United States might be facing one or more high-technology military threats or when the international economic system has collapsed or when a significant number of terrorist groups possess suitcase-sized nuclear weapons, the

planner might find avenues of creative inquiry."(p. 4)

General Smith stresses two other important points. First, the future is not beyond our control. Second, a strong commitment from the leader is essential. One of the obstacles to long-range planning is determinism—believing the future is determined by forces outside our control. We can influence the future, and our tool is long-range planning. By establishing our objectives and our plan, we can make policy decisions and acquisition decisions designed to make our vision of the future come true. Maybe we can't totally design and build the future, but we can shape a part of it in our favor. To do this, we've got to have strong commitment from the leader of our organization. Without that commitment and support, long-range planning will never work.

The second essay, by Col Jerrold P. Allen, USAF, is a comparison of long-range planning in four US government agencies—the Navy, the Federal Emergency Management Agency (FEMA), NASA, and the Air Force.

According to Colonel Allen, the Navy began with a six-month study of business strategic planning and found what it thought were the necessary parts of a strategic planning program. By far the most important part was active participation by the key leaders, but unfortunately this part was lacking in the Navy's effort. Without the support of the Navy's leadership, its long-range planning organization withered on the vine and was disbanded in June of 1982.

FEMA's experience offers another example of noninterest by key leadership. This resulted in a long-range planning program Allen calls virtually nonexistent.

The major success story of long-range planning is NASA. With strong, active participation by its leadership NASA ran three major programs—Mercury, Gemini, and Apollo—along with a host of unmanned explorations in the span of one decade, culminating in manned landings on the moon. Until the *Challenger* disaster, space shuttle flights had almost become routine. As Allen puts it, "Despite the *Challenger* disaster and its current difficulties, NASA is the government's leader in the successful use of long-range planning systems."(p. 30)

The Air Force began its long-range planning effort in 1978 and has since institutionalized the process. Colonel Allen describes the formal process in great detail. So far, no judgment can be made on the success or failure of this program, other than that it's still alive and appears to be effective.

The next essay, written by Col John H. Stewart II, USAF, is an explanation of the nuts and bolts of long-range planning methods. Colonel Stewart describes alternative futures and distinguishes between predictions and projections. A prediction is an idea or opinion about the future, and a projection is an extrapolation from known data based on valid assumptions and current trends.

Colonel Stewart also goes into long-range planning models, including the Futures Group's strategy formulation process, William Ascher and William Overholt's strategic planning model, and the Air Force's force structure development model. He discusses how each model functions, points out key parts of each, and speaks to their strengths and weaknesses.

Another part of Colonel Stewart's essay explains alternative futures. Stewart probes deeply into alternative futures methods, discussing trend extrapolation, simulation modeling, cross-impact matrix analysis, and the Delphi technique. Once again, he tells us not only how each works but also where they're most effective and where they're least effective.

There are also two methods not as grounded in scientific method as the others: expert judgment and genius forecasting. Although more intuitive than the others these methods are every bit as valid. Expert judgment is the judgment of a person based on extensive expertise in the area in question. According to Stewart, "In virtually all future-oriented work, Expert Judgment is the link between the real world and methodologies which would otherwise be sterile."(p. 80) Genius forecasting is more of a vision springing forth from the mind of a so-called Renaissance Person. Colonel Stewart identifies such figures as Isaac Asimov and Herman Kahn as examples. As the author says, though, "The credibility of Genius Forecasting relies almost totally on the credibility of the person doing it," and our Renaissance people "are in short supply."(p. 81)

The final essay, written by Dr F. Douglas Whitehouse, is a case study of how to do strategic planning. Doctor Whitehouse reviews how to set national objectives based on national values and how to project future environments. These environments are based on what we know of past and current trends, events, and patterns of interaction. Next, Doctor Whitehouse discusses alternative strategies to match the different environments—including a hedging strategy

for use if unforeseen circumstances arise.

The second half of Whitehouse's essay is an example of setting US strategy to cope with two alternative Soviet futures: one where the Soviet Union is weakened, and the other with an economically and militarily strong Soviet Union. He stresses the need for a US strategy to encourage the first outcome and to discourage the latter, then he shows us how much a strategy might evolve.

This book serves as an excellent introduction to long-range planning. For such a small book it's packed with information. From why we should plan, to the methods of planning, to an example of long-range planning, this is a well-put-together addition to every professional's bookshelf.

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A Soldier's Disgrace by Don J. Synder. Peterborough, New Hampshire 03458: Yankee Publishing, 1987, 254 pages, $15.95 hardback.

On 3 November 1955 a jury of 10 United States Army officers, convened as members of a general court-martial, voted to convict Maj Ronald E. Alley, a US Army Reserve officer on extended active duty, of multiple counts of unlawful communication with the enemy while a prisoner of the North Koreans. They also recommended a sentence of dismissal from the service, forfeiture of all pay and allowances, and 10 years confinement. This sentence was affirmed upon review. Major Alley thus became the only US military officer in this century actually convicted and sentenced to prison for collaborating with the enemy while a prisoner of war.

The author attempts to show that the conviction of Major Alley was improper; that he was in fact guilty of no conduct that would warrant conviction on the charges; and that his actions as a prisoner, while perhaps not strictly conforming to accepted practice, were justified under the unique circumstances. The author further argues that, in any event, Major Alley's conduct as a prisoner was no worse than that of many other officers who were not prosecuted or convicted. To single him out for punishment was manifestly unfair.

The basic thesis of the book is that the Army needed a scapegoat; that for various reasons, which are detailed, Major Alley was a candidate; and that the Army, eager to deflect criticism of the quality and fidelity of its officer corps, conspired to build a case against him. According to Synder, the Army used questionable and unreliable evidence, pressured prosecution witnesses to ensure favorable testimony, suppressed evidence favorable to the accused, and attempted to intimidate witnesses favorable to the defense. Synder also alleges that command influence was present and evident to members of the court.

Synder builds a *prima facie* case for the proposition that Ronald Alley was unfairly punished. Unfortunately, he does not go beyond this initial showing. This at least seemed to be the opinion of a majority of the Army Board for Correction of Military Records, which reviewed Synder's evidence in 1982 and ruled that the court-martial decision had been "manifestly correct." Synder does not accept this decision and apparently feels that the Army is still practicing a "cover-up." However, other than a generalized belief that Army officials do not want to admit that the military justice system could have erred, he does not advance a credible motivation for a deliberate cover-up of events which occurred over three decades ago.

Ronald Alley died in 1978. He is thus past caring whether his honor is vindicated. But his widow and his children still live, and the tragedy of this story is that it appears from this account that it may have indeed been possible to prove that Alley was denied a fair trial. Synder's account of the hearing before the Army Board in 1982 reveals that neither Synder nor the lawyer who was representing Alley's family—apparently on a *pro bono* basis—was properly prepared to present the case. The vote was close, three to two. Had the evidence been better presented, in standard legal form with sworn statements and affidavits, it might have proved more persuasive.

These comments are not meant to demean Synder's considerable efforts to right what he perceives, perhaps correctly, as a terrible injustice. His documentation and assemblage of the facts may be adequate by journalistic standards, but as presented in his book, they do not meet the standard of proof ordinarily required to overturn a court verdict. Nevertheless, the book will convince many that Major Alley was unfairly treated by the Army, that he was innocent of the charges, and that he indeed was a man of honor, rather than a traitor. They may be right.

Lt Col Harvey J. Crawford, USAF
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USAF Academy Military History Symposium

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

Air Force Intelligence Conference

Air Force Intelligence is sponsoring a conference on "The Soviet Union—Towards the Twenty-First Century: Political-Military Affairs in the Gorbachev Era." The conference will be held 19-22 October in Arlington, Virginia. Individuals interested in presenting papers or participating in one of the panels should contact: Conference on Soviet Affairs, AFIS/INIS, The Pentagon, Washington, DC 20330-5110, or telephone (202) 695-7266.

0-2A Departs

The last of the 0-2A aircraft have left the inventory. Originally bought as light observation and forward air control aircraft, they were used extensively during the Vietnam War. In more recent years they were used as forward air control training aircraft and in a utility role for Air Force Systems Command.

B-1B Arrives

The 100th B-1B aircraft rolled off the assembly line in January prior to delivery to McConnell AFB, Kansas, in May. Final production was completed a month and half ahead of schedule. The Air Force now has four wings of B-1B aircraft.

390th Bomb Group

The 390th Bombardment Group (H) is seeking memorabilia for its new museum. The museum, located in Tucson, Arizona, former home of the 390th Strategic Missile Wing, needs pictures and memorabilia that reflect life and activity in the European Theater of Operations during World War II. For donations or information please write: Edward J. Dempsey, 22 South Westminster Drive, Vincentown, NJ 08088.

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The *Airpower Journal* (ISSN 0897-0823), Air Force Recurring Publication 50-2, is published quarterly. Subscriptions are available from the Superintendant of Documents, US Government Printing Office, Washington, D.C. 20402. Annual rates are $9.50 domestic and $11.90 outside the United States. The GPO stock number is 708-007-00000-5.

The *Journal* welcomes unsolicited manuscripts. Address them to Editor, *Airpower Journal*, Walker Hall, Maxwell AFB, Alabama 36112-5532. Submit double-spaced, typed manuscripts in duplicate. *Journal* telephone listings are AUTOVON 875-5322 and commercial (205) 293-5322.

HOT TOPICS FOR THE SUMMER

- Strategic Defense Initiative
- SPETSNAZ
- "Over There" in the Air

AIRPOWER JOURNAL

Summer 1988