AIR UNIVERSITY review

MAY-JUNE 1981

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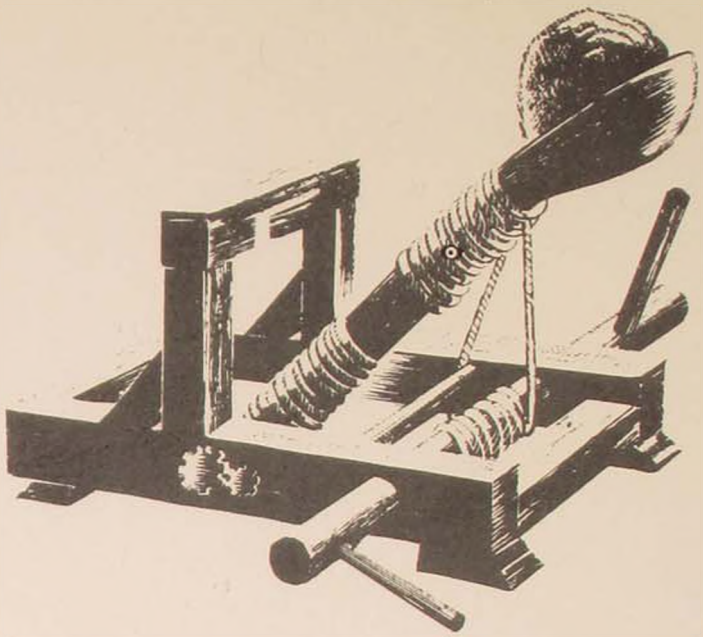
The Professional Journal of the United States Air Force

ideas, tactics, and technological reality



Technology or tactics? Which comes first?

The usual academic attitude, implicit in too much military history, holds that it is the basic tactical concept—the *idea*—that really counts. Without the *idea* of the broadside sailing ship, fighter aircraft with fixed, forward-firing ordnance, the tank, or the intercontinental ballistic missile, technologists would never have thought to develop the weaponry. History records many situations where the technological means were available but unused until a flash of inspiration—with organizational backing—put the engineers to work. A classic example is the development of the side-firing AC-47 and AC-130 gunships by the USAF; development of the tank by the British in World War I comes close. Another is our experience with drop tanks for fighter range extension during World War II.

But what about situations where the good idea is simply not technologically feasible? This is a real possibility but one that we too often tend to ignore: Can-do attitudes incline us to reject this pattern as a conceptual model; fascination with the tactical opportunities inherent in the idea prompts us to lay the blame for failure on the engineers for a lack of skill or on organizational sponsors for a lack of commitment. History, however, suggests that technological barriers often *are* insurmountable. Early recognition of the tactical opportunities of underwater attack notwithstanding, the submarine could not be a practical weapon until struggling technologists had perfected iron hulls, electric motors, reliable storage batteries, pumps for compressing air, gyroscopes, hydrostatic control devices, fuzes, and detonators needed to make the self-propelled torpedo practical, and the diesel engine. At least two generations of ballisticians and gun designers have fruitlessly pursued the Holy Grail of the caseless cartridge at considerable expense, only to find that a usable round simply could not be developed within reasonable economic bounds.

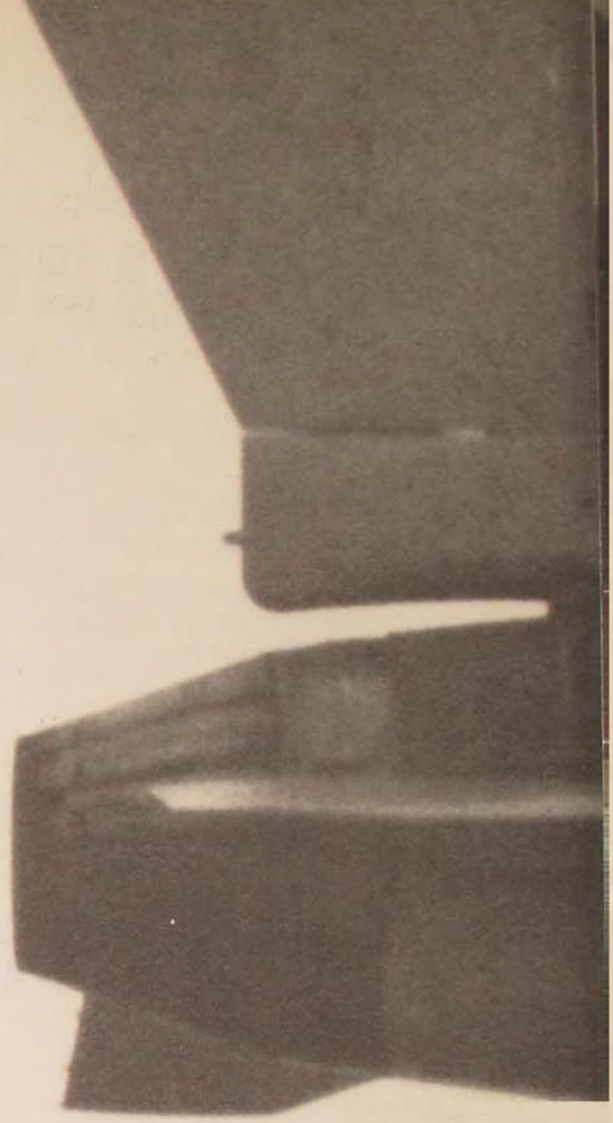
But there is a third, more prevalent pattern, where the tactician and the technologist collaborate in unglamorous harmony—or disharmony. The tactician trims his conceptual sails to fit reality, the engineer struggles to expand that reality—and both fight for organizational backing (read "money"). This is probably the most common pattern of development, surely the most instructive, and clearly the hardest to understand. But we must understand it, and that understanding can only flow from the study of relevant examples. One is the development of the turbojet, the first comprehensive study of which has just appeared: Edward W. Constant II, *The Origins of the Turbojet Revolution,* reviewed on p. 115 of this issue. Another is the subject of our first two articles, fighter aircraft development.

J.F.G.

AIR UNIVERSITY
review

Vol. XXXII No. 4 May-June 1981

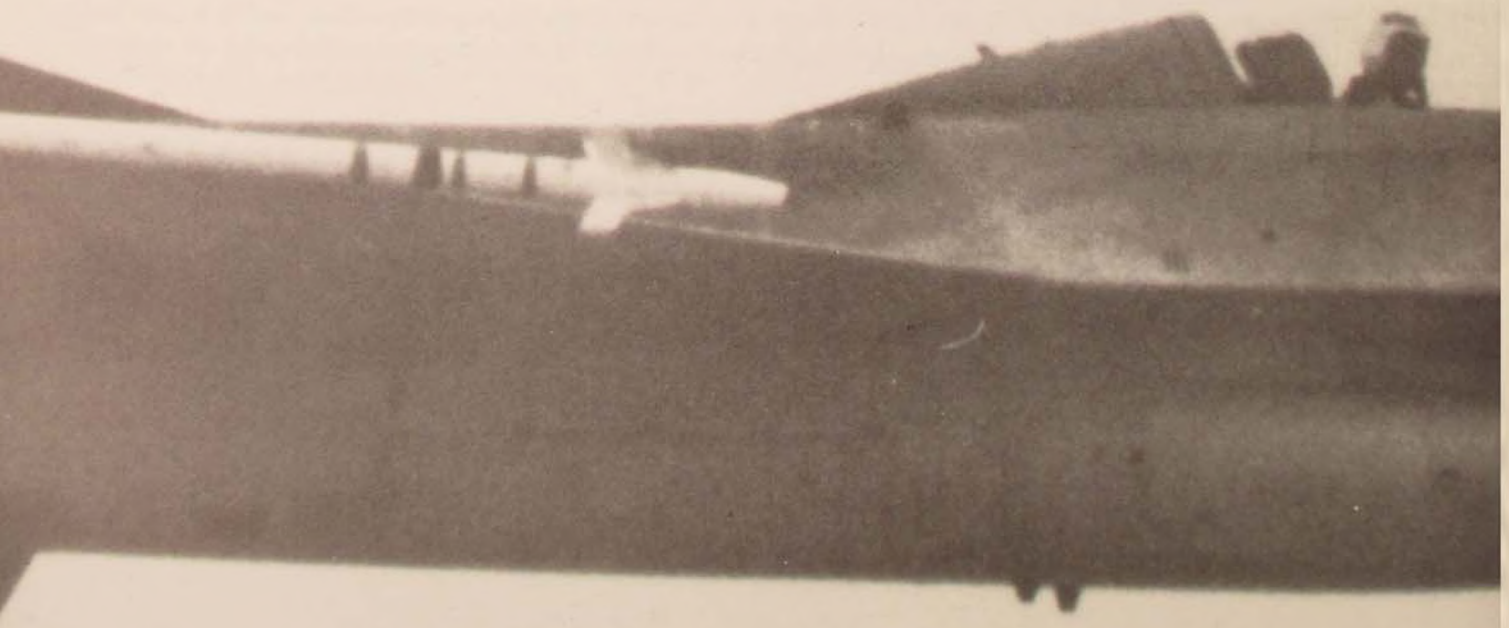
A SCRIBBLED message on the blackboard in a fighter squadron briefing room contained the words, "*Star Wars* showed the back-seater can be replaced by a machine." Spacecraft designs seen in such dramas as *Star Wars*, *Flash Gordon*, and *Battlestar Galactica* depict single-seat fighters knifing into enemy formations as the pilot's multiple, computer-generated displays inundate him with torrents of vital information. Introduction of the F-15, F-16, and A-10 into the Air Force inventory apparently confirms the merit of the single-seat tactical aircraft. But is the single-seat fighter really the panacea suggested by the movies? In light of contemporary technology and the threat, is it possible that a two-seat F-15 might actually be a better fighter than the singleseater?

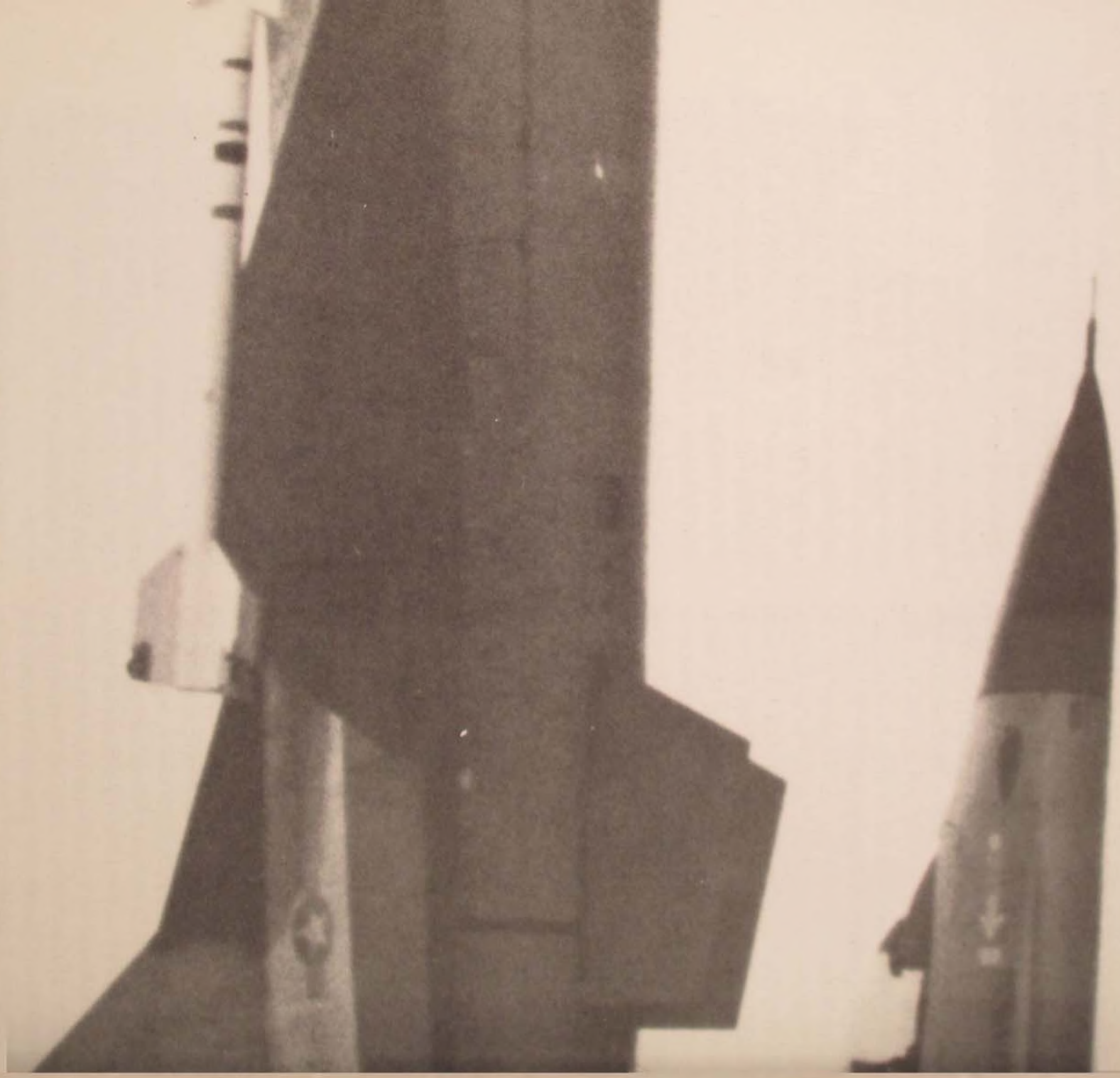


THE FIGHTER FORCE

How many seats?

MAJOR WILLIAM A. FLANAGAN





History of Fighter Development

The first fighters were two-seaters flown in World War I. One man flew the airplane, and the other fired the machine gun. These airplanes were somewhat underpowered since the rotary engines of the period could produce only 80 to 115 horsepower. Although the designers pared the weight of the airframes to 1000 pounds, further means were sought to lighten the machines even more. Eliminating the second man and his equipment was an obvious method. The synchronized machine gun that fired through the propeller arc revolutionized the fighter. With it a single pilot could aim the gun by pointing the entire airplane at the target. Lighter, more maneuverable singleseaters appeared such as the Sopwith Camel, Spad, and Fokker Dr. I triplane. The image of the lone fighter pilot as the "knight of the skies" emerged, fostered by the popular press and government publications as a welcome relief from the carnage of trench warfare. Toward the end of that war the two-seat fighter appeared again briefly. New lightweight engines rated at over 200 horsepower made possible single-seat performance while carrying an aft-facing gunner in addition to the pilot. The most respected British fighter in 1918 was a two-seat airplane, the Bristol F.2B, the only World War I British combat aircraft to remain in service until the 1930s.[1]

In the 1920s and early 1930s, the two-seat fighter generally seemed to be on the verge of extinction as the air forces of the world concentrated on the singleseater. The increased speeds of aircraft made it difficult for a rear gunner to aim his weapons due to increased wind force; an enclosed turret had to be installed with its attendant weight, drag, and complexity. Vertigo and G-forces during maneuvering also lessened the effectiveness of the aft-facing gunner. The U.S. Army Air Corps tested and discarded the two-seat Detroit-Consolidated P-30. The Royal Air Force built the Boulton-Paul Defiant with a power-operated four-gun turret, but unfortunately its success was limited by the lack of forward-firing guns. Additionally, its lack of performance and maneuverability relegated it to bomber interceptor and target-towing duties. The German Luftwaffe introduced a multiseat, multiengined fighter, the Messerschmitt Bf 110. The aircraft, designed as a long-range bomber escort, was necessarily large in order to accommodate extra fuel; hence, the airframe was also large enough to allow for a gunner. But, in the Battle of Britain, the highly maneuverable single-seat, single-engine Hawker Hurricane and Supermarine Spitfire soon proved that the German escort fighter itself needed an escort. The gunner with his single or two barrel machine gun was relatively ineffective against the eight guns of his agile attacker. The Germans withdrew the Bf 110 from daylight operations over England. At night, however, the Bf 110 proved ideal.[2]

The use of bomber fleets at night and the development of airborne radar led to a new use for the two-seat, twin-engine fighter. The pilot flew this fighter while the second man searched for targets with the aircraft's radar. When he located a target, the radar operator directed the aircraft to a position where the pilot could visually attack. Since dogfights were impossible at night, the large night fighter's lack of maneuverability was not important. Even so, by the end of the war, large 2000-plus horsepower piston engines allowed large night fighters, such as the P-61, to achieve performance comparable to that of the single-seat Mustang and Hellcat.[3] But the introduction of the Messerschmitt Me 262 jet fighter signaled the advent of the jet-engine revolution for combat aircraft.

Like piston engine technology at the beginning of World War I, jet engine technology in the late 1940s was rudimentary. Designers kept the airframe small in order to maximize the performance benefits of the early, crude jet engines. To accommodate the weight of the radar operator and his equipment, fighter de-

velopment followed two parallel courses leading to the maneuverable day fighter (F-80 and F-86) and the heavier two-seat, radar-equipped bomber interceptors. The F-86 was the primary day fighter at the beginning of the Korean War, and the primary night fighter was the piston-engine F-82 Twin Mustang. As engine technology continued to mature, the early 1950s saw the introduction of the two-seat F-89 Scorpion and F-94 Starfire designed to intercept such prop-driven bombers as the Russian Tupolev Tu-20 Bear. These interceptors were still somewhat underpowered. Since the Soviets were beginning to develop jet bombers, something had to be done to increase interceptor performance. Again attention focused on deleting the second crew member. Work began on a computerized fire control system that allowed the pilot to operate the radar and provided steering and firing commands for intercept. After numerous development problems, the F-86D Sabre and F-102 Delta Dagger entered service equipped with the new fire contol system.[4]

Fighters in the Nuclear Age

By the mid-1950s, the possibility of all-out nuclear warfare between the United States and the Soviet Union signaled changes in the role of the fighter. It was now perceived as a bomber interceptor and delivery system for nuclear weapons. The advent of air-to-air missiles also colored perceptions of the fighter role. Hence, the Air Force concentrated on developing interceptors (F-101, F-106), fighter-bombers (F-100, F-105), and a lone single-seat air superiority fighter (F-104). The U.S. Navy developed the F-4 Phantom, a fighter that could fly long-range combat air patrol and use missiles to intercept threats to the attack carrier force.

The 1960s saw jet fighters being used, not in nuclear wars but in conventional limited wars in the Middle East and Southeast Asia. Fighter aircraft engaged other fighters in the battle for air superiority. The classic maneuvering dogfight reappeared as pilots discovered that often long-range missiles shots were not feasible because of missile limitations or target identification problems. The cannon again became important since dogfights often produced situations where the enemy fighter was too close or too agile to be hit with a missile. Thus, at levels of conflict below nuclear war, there was still a requirement for an air superiority fighter to control airspace. To fulfill the air superiority role, the Air Force modified the F-4 Phantom to carry an internal cannon besides its air-to-air missiles. The F-4 destroyed 130 MiGs during the Vietnam War and became the most successful fighter of that period.

In late 1965, however, the Air Force requested industry proposals for a new air superiority fighter. The design requirements drew heavily on Southeast Asia combat experience. The new fighter was required to have exceptional maneuverability, high speed, and a capability to launch radar-guided or heat-seeking air-to-air missiles. By September 1968, the requirement also specified one-man operation of the avionics systems, a major change from the proven two-seat F-4 then in use. This requirement eventually resulted in development of the F-15 Eagle, which will serve as the USAF's primary air superiority fighter into the 1990s.[5] In 1972 the United States Air Force requested industry to build a lightweight, maneuverable aircraft prototype in order to evaluate the current aircraft state of the art. The aircraft was to be a clear-weather fighter with emphasis on maneuverability and low cost. By 1976 this prototype had metamorphosed into the single-seat F-16 "swing force" fighter with a primary mission as fighter-bomber and a secondary role of air superiority. Thus, the Air Force enters the 1980s with an air superiority force consisting largely of single-seat fighters.

Technology and the Modern Fighter Aircraft

Technology (especially engine technology) has often driven the choice between single and two-seat fighters in the past. What changes in

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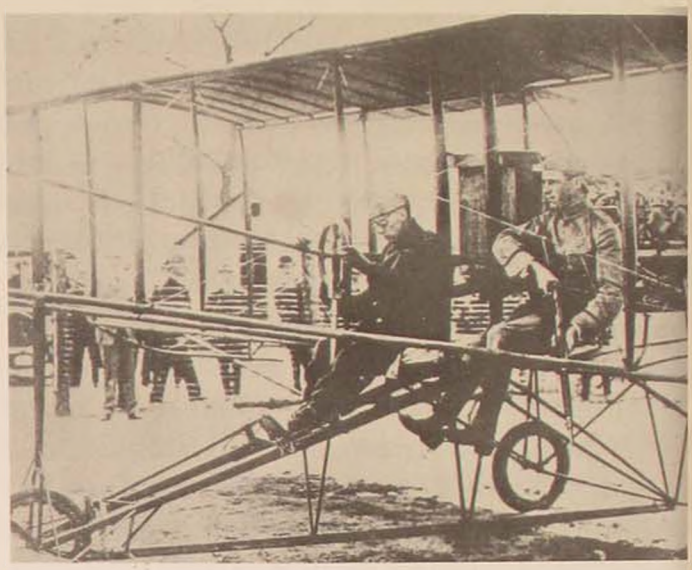

Initial experiments with aerial gunnery in 1911, using a U.S. Army Curtiss pusher, revealed two basic problems: early aero engines lacked power, and aerodynamic drag was great, particularly in pusher-type aircraft. Pushers could barely handle the observer/gunner's added weight, and performance was unacceptable.

The French Spad XIII (top) and German Fokker D. VII (above) were ultimate expressions of World War I single-seat fighter technology. Powered by liquid-cooled engines, they performed excellently by 1918 standards despite the weight of two machine guns.

World War I

The appearance over the Western Front of the Bristol F.2A Brisfit (above) in April 1917 marked the combat debut of a genuine two-seat fighter. Aerodynamically "clean" for its time, the Brisfit was as fast as its German single-seat opponents and had the power and maneuverability to hang in and fight with them. For pilots with the necessary skill and courage, the Brisfit's defensive sting of one or two rearward-facing, flexibly mounted machine guns was tactically decisive.

As important as multiseaters were in the air war, the dominant ethos of World War I air combat was that of the single-seat fighter pilot, epitomized by Rittmeister *Manfred von Richthofen (above), testing a Roland D-III, and French* Capitaine *René Paul Fonck (right), the Allied ace of aces with 75 official victories.*

The classic two-seater defensive armament of World War I, a flexible .30 caliber machine gun on an adjustable, rotating ring mount (shown on an Army Air Corps O-2) survived into the 1930s, when increasing speeds made the gunner's exposed position untenable.

technology have occurred that might influence the designer or operator's choice?

A comparison of the modern fighter with the World War II fighter shows striking differences in size. The F-15 is 64 feet long and weighs 40,000 pounds; the P-51 Mustang was 32 feet long and weighed 9200 pounds. The change in size is due mainly to the increased performance required of the modern fighter. The F-15 engines develop enough thrust for the aircraft to reach a top speed of mach 2.5 (1650 miles per hour) at altitudes up to 70,000 feet. The P-51 attained a top speed of 437 miles per hour at 25,000 feet. The drag to be overcome by the thrust of the engines increases with the *square* of the speed; therefore, if speed is doubled, the drag is *quadrupled.* Furthermore, as an aircraft maneuvers in a dogfight and the G-forces increase, the drag increases even more, and the thrust required to maintain speed must match the increased drag. The engines and the fuel necessary to feed them are main factors in determining the size of the fighter. Furthermore, good maneuverability requires the fighter to have a low wing loading (weight of the airplane divided by the wing surface area). Thus, the fighter must be lightweight (often impossible due to other mission requirements), or it must have a large wing surface. All these factors combine to produce a modern jet fighter significantly larger than its World War II predecessor.

Armament has also changed the form of the fighter aircraft. The P-51 was equipped with six .50 caliber machine guns, and most gun firings in World War II were conducted at ranges of 600 feet or less.[6] The F-15 is equipped with a cannon that has only a slightly greater effec-

tive range than the machine guns, but its principal weapons are air-to-air missiles with ranges measured in miles rather than yards. The AIM-7 Sparrow radar-guided missile can be fired in all weather conditions at ranges beyond 10 miles. The AIM-9 Sidewinder is a smaller heat-seeker missile useless in clouds, but it still has a range of 2 to 5 miles.[7] A radar set is necessary to extend a pilot's search capability to ensure the most effective use of these weapons. A second man operated the radar in the F-4, but computers have replaced the second man in the F-15. The computers filter out the target from the radar background clutter and display only targets on the pilot's radar display. All controls for the F-15 radar are placed on the stick or throttles so the pilot can control the aircraft while operating the radar. Once the pilot selects a target for attack and "locks on," the computer computes and displays the target's range, altitude, and closure and provides steering instructions for the intercept. A symbol on the pilot's gunsight indicates where the target should appear visually as the range decreases.[8]

The F-15 fire control system is well suited for the pilot location and attack of a single target. Attention today however, has shifted from the Southeast Asia limited air combat scenario to the target-rich Central European front. The shift affects the future employment of the air superiority fighter dramatically.

The F-15 and the Central European Battlefield

A war between NATO and the Warsaw Pact in Central Europe would produce the most intense air battle in history, an air battle in which NATO forces would be heavily outnumbered. With 6000 to 8000 daily combat sorties over Germany predicted by some sources, the air superiority fighter will face its most severe challenge.[9] The F-15 will face a numerically superior enemy in heavily contested airspace where communication jamming will probably reduce the effectiveness of fighter command and control. A comparison of relative strength in the area underscores the intensity of the struggle. Fifteen Soviet and East German fighter regiments (the equivalent of American wings) are deployed in East Germany alone. Conversely, NATO deploys the equivalent of only seven wings in Germany, Belgium, the Netherlands, and Denmark combined.[10] F-15 production is projected at 729 aircraft, but, according to present estimates, the Soviets have more than 1500 late-model MiG-21s and 1000 MiG-23/27s in service. Soviet military aircraft production continues at 1150 per year versus the U.S. quota of 500 aircraft.[11] The numbers point to one conclusion: the F-15 will operate in an area where the enemy enjoys numerical superiority.

The Air Force fighter community has begun to accept this fact and is examining changes in fighter tactics. An article written by an F-15 pilot for an official publication reflects the new concept of operations against large enemy fighter formations.[12] The pilot uses the F-15 radar to assess the enemy formation. He then uses the best intercept tactics possible to maximize surprise and get off the first shot. One or two targets in the formation are quickly attacked. The F-15 then departs the battle lest the hunter become the hunted. Under this concept, the classic dogfight turning engagements that occurred in Southeast Asia will be unlikely to develop in Central Europe, since an F-15 in a turning fight is easier to see and its flightpath is more easily predictable. The success of the attack will rely largely on the intercept (first) phase and the separation (last) phase. In light of the anticipated air battle scenario, an objective evaluation of the two-seat F-15 would be most prudent.

The Case for the Two-Seat Fighter

The most obvious advantage of a two-man crew is the division of labor in the cockpit. A

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World War II and beyond

By World War II, the tide had turned decisively against the multiseat fighter except as a specialized night interceptor. Aero engines of the '30s and '40s lacked the power needed to overcome the weight penalty of an added crew member in a single-engine design. On the other hand multiengine aircraft required additional engine nacelles, thus increasing weight and drag. With few exceptions, the issue of air superiority was resolved in World War II by sleek, spare, single-engine, single-seat fighters.

Though fast, the two-seat Messerschmitt Bf 110 was an all-round loser in daylight combat. High air speed forced the gunner down behind streamlined Plexiglas, which restricted his field of fire (left) and visibility (below, looking forward from the gunner's position; the second individual is a passenger in the jump seat). Worse, the Bf 110's weight and size increased its roll rate and turn radius, thus making it an easy prey for nimble single-seat fighters.

Development of a successful theme: The mainstream of World War II fighter development is represented by the Hawker Hurricane IIC (above), a prewar design; the North American P-51D (lower right), an early war design; and the late-war Supermarine Spitfire Mk XIV.

With the added weight and drag of radar for night interception, two engines were a must, and the design solutions were ingenious and varied. The twin-boom Northrop P-61 Black Widow (below, left) had some late World War II success in the Pacific as a night fighter; the F-82 Twin Mustang (right) was too late for World War II but saw limited use in Korea.

The jet era

Developing technology in the post-World War II period dramatically changed the parameters of fighter design but initially did little to overcome the inherent disadvantages of a second crew position. Much as power limitations had militated against multiplace piston-engine fighters, structural and drag considerations of the early jet era dictated tandem seating where a second seat was essential, as with trainers (an early T-33, top left) and all-weather fighters (an F-94, facing page). By the mid-50s, miniaturized radars had made limited all-weather single-seat fighters feasible (an F-86D, bottom left), yet the weight of a second crew member entailed major performance penalties. Thus singleseaters remained unchallenged in daylight during the Korean War.

Some of the aerodynamic and structural compromises of the early jet era were short-lived; others proved enduring. The "Eighty-six Dog" (above) had disappeared from the USAF inventory by the mid-'60s, but the venerable "T-Bird" (top) soldiers on into the 1980s.

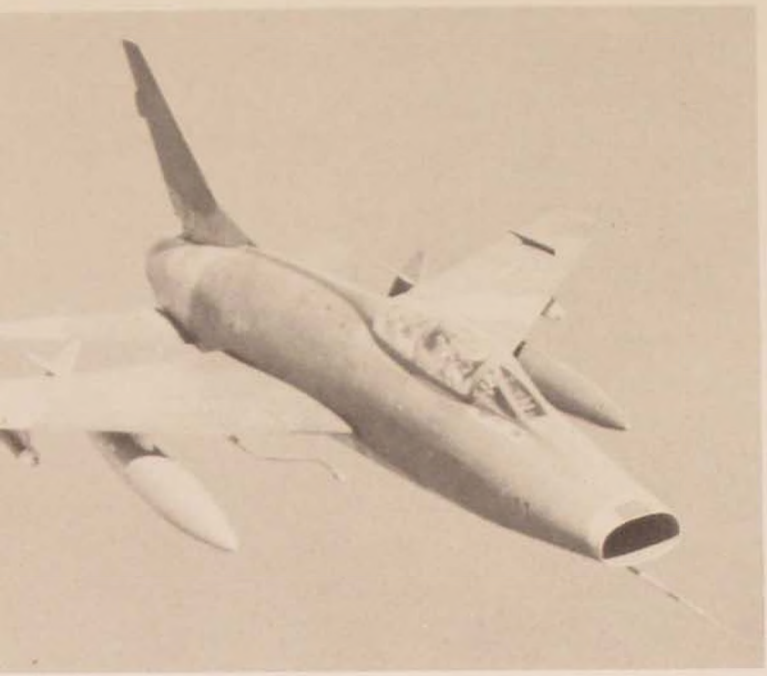
Well into the '50s, two-seat fighters (an F-94 pilot and radar observer, facing page, run their pretakeoff checklist in 1954) could not match their single-seat equivalents in performance. . . . The premier air superiority fighter of the Korean conflict was the F-86 (right, scoring on a MiG-15, framed in the white square). With its superlative handling characteristics, superior gunsight, and excellent pilot visibility, F-86 earned the affection of those who flew it

Though not ordinarily rated a classic, the F-94 Starfire (facing page, over Japan in 1953) was a remarkably successful "hurry-up" development of Lockheed's F-80/T-33/TV-2 design series. In common with many all-weather fighters of its generation, the F-94 had a limited offensive "punch" of short-range, inaccurate 2.75 inch unguided rockets.

The dawn of the multiseat jet fighter as serious competition for its single-seat equivalents can be seen in the contrast between the twin J33-powered F-89 (below) and the twin J57-powered F-101B (bottom). The F-89 was emphatically a specialized all-weather fighter, never expected to venture into contested daylight skies; not so for the McDonnell F-101 Voodoo. One of the fastest aircraft of its day, its single-seat versions, the tactical F-101C and the RF-101 reconnaissance derivative, had essentially the same weight and similar performance.

two-man crew is less easily saturated as the workload increases due to enemy threats or malfunctioning equipment. A 1975 Hughes Aircraft Company study[13] evaluated single-seat and two-seat cockpits in simulated air-to-ground strike missions. The simulated missions were unique in the sense that the crew had to react to threats displayed on the cockpit radar warning receiver (RWR) as well as threats that appeared outside the cockpit. Some of the latter threats also appeared on the RWR display, but others did not, which reflected the real-world situation of a visual attack by an enemy with his radar turned off. Crews in the simulator had to focus their attention inside and outside the cockpit in a situation similar to air-to-air combat. The results showed no significant difference in performance between one- and two-man crews when they were presented with threats only displayed on the RWR. When outside-the-cockpit threats were introduced, the two-man crew was significantly superior (40 to 95 percent) in performing the mission tasks and simultaneously detecting the threat. The second crewman was a decided advantage for visual surveillance outside the cockpit because he could share the work inside the cockpit and allow more time for important visual scanning.[14]

The increased lookout capability of the two-man crew demonstrated in the simulator is especially important for an air superiority fighter. Throughout the history of aerial combat, one fact has never changed: most pilots were shot down without being aware of the presence of the attacker. The VIII Fighter Command included the following underlined sentence in its tactics manual dated 29 May 1944. "Remember few pilots are shot down by enemies they see."[15] In Vietnam unseen MiGs accounted for an estimated 80 percent of all air-to-air losses.[16] Since the two-man crew is better able to search outside the cockpit in situations that impose high workloads, the second crew member minimizes the risk of an unseen attack and maximizes the probability of survival.



More than any other development, the appearance of the McDonnell F-4 Phantom (below, a USAF F-4E over Southeast Asia in May of 1970) marked the end of the single-seat figher's clear-cut performance superiority. Powered by two J79s, the F-4 matched its single-seat equivalents in raw performance statistics and in combat.

Two seaters, various roles

With the advent in the United States of a new generation of low-weight, high-thrust jet engines in the '60s—the Pratt and Whitney J57 and J75 and the General Electric J79—the performance distinction between single- and two-seat fighters began to blur, and two-seat versions of single-seat fighters became tactically viable. The F-100, a classic singleseater, provided the first indication of this. The two-seat F-100F, originally produced in limited numbers as a conversion trainer, was fitted as an interim antiradiation Wild Weasel aircraft (left) and used to lead suppressive attacks on SA-2 sites in North Vietnam in 1965-67.

Though produced and deployed almost exclusively as a singleseater, the J79-powered F-104 confirmed that a second seat (top, a two-seat F-104) did not necessarily entail significant performance sacrifice, a point enforced by experience with the J75-powered Republic F-105 (above, a single-seat F-105D photographed from a KC-135 over Southeast Asia). The two-seat Wild Weasel F-105G performed much the same as the singleseater.

The division of workload possible with a two-man crew provides more benefits than survivability. As described earlier, the F-15 must contend with numerically superior—perhaps several—enemy fighter formations in Central Europe. When the F-15 fire control system "locks on" to a single target and provides attack steering, it may remove other targets from the screen and deny the operator information on other enemy aircraft. A delay in "lock on" until the aircraft is near firing range allows monitoring of the overall situation, but that advantage must be balanced against the increased workload of monitoring the cockpit radar display and mentally calculating the intercept solution. A skilled radar intercept officer in the backseat could provide invaluable assistance during the intercept portion of the attack because he could devote most of his attention to the radar display and free the pilot for visual lookout and operation of the airplane. This expertise would also be useful when a system malfunction or electronic countermeasures degraded the performance of the fire control system. Most veteran air defense pilots agree that the radar intercept officer in the F-101 significantly enhanced the intercept capability of the F-101. A radar intercept officer would enhance the F-15 task of attacking numerically superior formations of maneuverable fighter-type targets.

Consideration of a two-seat aircraft raises the fundamental questions: How much larger would the airplane be, and how much performance would be lost? One can estimate the weight penalties of the second seat by examining previous two-seat conversions of single-seat jet fighters (e.g., TF-86/F-86A, F-100F/F-100D, F-106B/F-106A). Weight differences vary from the 1000 pounds of the two-gun F-100F versus the four-gun F-100D to 900 pounds for the F-106B, which also carries 500 pounds less fuel than the F-106A while retaining the full fire control system. A weight penalty of 1000 to 1300 pounds is considerably less significant on a modern 30,000-pound jet fighter

The final word in air-to-air capability . . . or a point of departure for further development? Making extensive use of microminiaturization and visual display technology, the single-seat F-15 (above, over Bitburg AB, Germany) matches or exceeds two-seat equivalents in most areas of radar-intercept and fire-control capability.

than on a 9200-pound Mustang or an 18,000-pound F-86 (actually, the two-seat TF-86, since it had no guns weighed less than the F-86A and carried 300 pounds more fuel).[17] The present two-seat F-15B weighs only 800 pounds more than the F-15A, and performance figures in flight manuals are identical for the two aircraft. The two-seat F-16B loses 1200 pounds of fuel for installation of the second seat; the F-15B retains all the fuel of the F-15A and loses only the compartment for the tactical electronic warfare support (TEWS), which could be placed elsewhere in the aircraft. One can conclude that the relative performance/weight penalty of the second crew member is less for the contemporary jet fighter than for earlier fighters and that the F-15 would suffer no appreciable loss in performance.

A possible disadvantage of the two-seat fighter is the increased life-cycle cost of the aircraft. If a single backseater in a "unit" of five two-seat F-15s sights an enemy fighter about to attack or identifies an unsafe flight condition and saves his airplane, he would in effect "pay" for the life-cycle cost of converting the *entire* unit. Marine Corps studies show that the backseater visually sighted most aerial threats in Southeast Asia.[18] Navy studies further indicate that the two-seat fighter enjoys a better flight safety record than the singleseater.[19] Thus, it seems that the backseater is cost-effective in increased survivability alone.

Another objection to the two-seat fighter that is difficult to assess quantitatively is best described in the words of an F-16 pilot: "Communication from ear-to-ear is much better than from cockpit to cockpit."[20] Of course, crew coordination is a factor that cannot be ignored. The Hughes simulator study noted that as threat density increased, the performance of the two-man crew was consistently better than the single-pilot performance. In the maximum threat density, however, the single crew member became more effective. In other words, the two-man crew was superior until their crew coordination broke down because of too many things happening too quickly for successful relay of information. Part of this breakdown occurred because the test called for a deliberately poorly designed two-man cockpit to force extensive intercockpit coordination.[21] But the results definitely show the need for crew coordination procedures designed for a high-threat, fast-moving situation to prevent one member of a two-man crew from hindering another member.

Experiences in Southeast Asia demonstrate the effect of proper crew coordination. For example, the U.S. Navy initiated the TOP GUN program in 1969 because it was dissatisfied with its aerial combat performance from 1966 to 1968. This program emphasized coordination between leader and wingman and between pilot and backseater. Fighter crews flew against airplanes similar to enemy aircraft in size and performance and, in the process, learned to function routinely as teams in the fast-moving aerial combat arena. The U.S. Air Force had no such program at the time. (I was a backseater in an F-4 air defense squadron and can attest to the lack of emphasis on aerial combat maneuvering and the necessary crew coordination.) When the air war over North Vietnam resumed in 1972, the Navy's kill ratio jumped from 3.7 to 1 to 13 to 1, but the Air Force's ratio changed very little—from 3 to 1 to 2 to 1.[22] Although such factors as different patrol area and force ratios prevent any simple quantitative comparisons of Navy and Air Force experience, improvements after TOP GUN were sufficiently dramatic to confirm the value of an aggressive training program. That is, crew coordination necessary to operate effectively in aerial combat can be developed, but it must be developed in training.

A second crew member can enhance the capability of the airplane only if he works as a member of a team. Training programs must focus on procedures that ensure automatic crew coordination in matters other than checklist challenge and response. The Navy experience indicates that the absence of training in

the past does not infer an impossible task. One of the pilots who took part in the original design of the F-15 admitted that the poor skill levels of the F-4 pilot/navigator backseaters in 1968 exerted a considerable influence on the single-seat choice. The same officer observed that since that time he had become convinced of the value of the backseater in offensive and defensive combat, once the proper doctrine and training program had finally been developed. In "two-versus-many" exercise engagements, the two-seat F-4 was extremely successful due to the pilot's ability to concentrate on the offensive phase as long as possible while the backseater directed the disengagement when it became necessary to "get out of Dodge."

The arguments point in one direction: a well-trained second man in the fighter aircraft can optimize its offensive and defensive potential without significantly degrading its performance. Especially in this decade the added increment of fighter capability could be critical since the Air Force will be fighting outnumbered. Attrition rates in contemporary high-intensity conflicts such as the Yom Kippur War have been significantly higher than World War II rates, and a war in Central Europe could produce astronomical losses.[23] In view of the projected total of only 729 F-15s, the Air Force must be sure that it can achieve the maximum possible benefits from its fighters in terms of enemy airplanes destroyed. The human factor in aerial combat is often overlooked in favor of simply evaluating airplanes and armament. Historically, the consistently successful fighter pilot has been a rare breed. Of 40,000 airplanes destroyed by the Luftwaffe on the Eastern Front in World War II, 30,000 were destroyed by only 300 German pilots.[24] An average 4 percent of the pilots have accounted for 40 percent of the kills in every war since World War I.[25]

In a study of successful fighter pilots, the McDonnell-Douglas Corporation developed a list of 45 common traits ranging from mechanical skills to personality traits and decision-making ability.[26] Since every fighter pilot cannot be a Hartmann or Bong or Tuck and since the United States has fighter planes that are qualitatively superior but numerically inferior to enemy planes, one can conclude that it makes sense to maximize the efficiency of the average fighter pilot with an optimum crew of two in the cockpit.

THE Air Force cannot allow itself to be swayed by the common knowledge of the past regarding the inviolability of the single-seat fighter concept. The improved performance of fighter aircraft and their armament makes today's aerial combat task much more complex and demanding. The unseen attacker must be regarded as a threat, not at a range of 200 yards but at many miles. The F-15 is not an overgrown P-51 Mustang nor will it be engaging Focke-Wulfe FW-190s. Military decision-makers must give serious consideration to converting the F-15s to two-seat aircraft. They should not permit preconceived notions based on outmoded ideas to color their judgment. Design studies that concentrate on performance and avionics capabilities alone and ignore the operator and his workload in actual combat cannot be allowed to dictate future fighter design. Buck Rogers's television spacecraft *has* a second seat, but it is usually empty. If the villains continue to get more and better ships, perhaps even Hollywood will give in and fill that seat.

Edwards AFB, California

Notes

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23. "New Look at NATO Air War," pp. 32-34.

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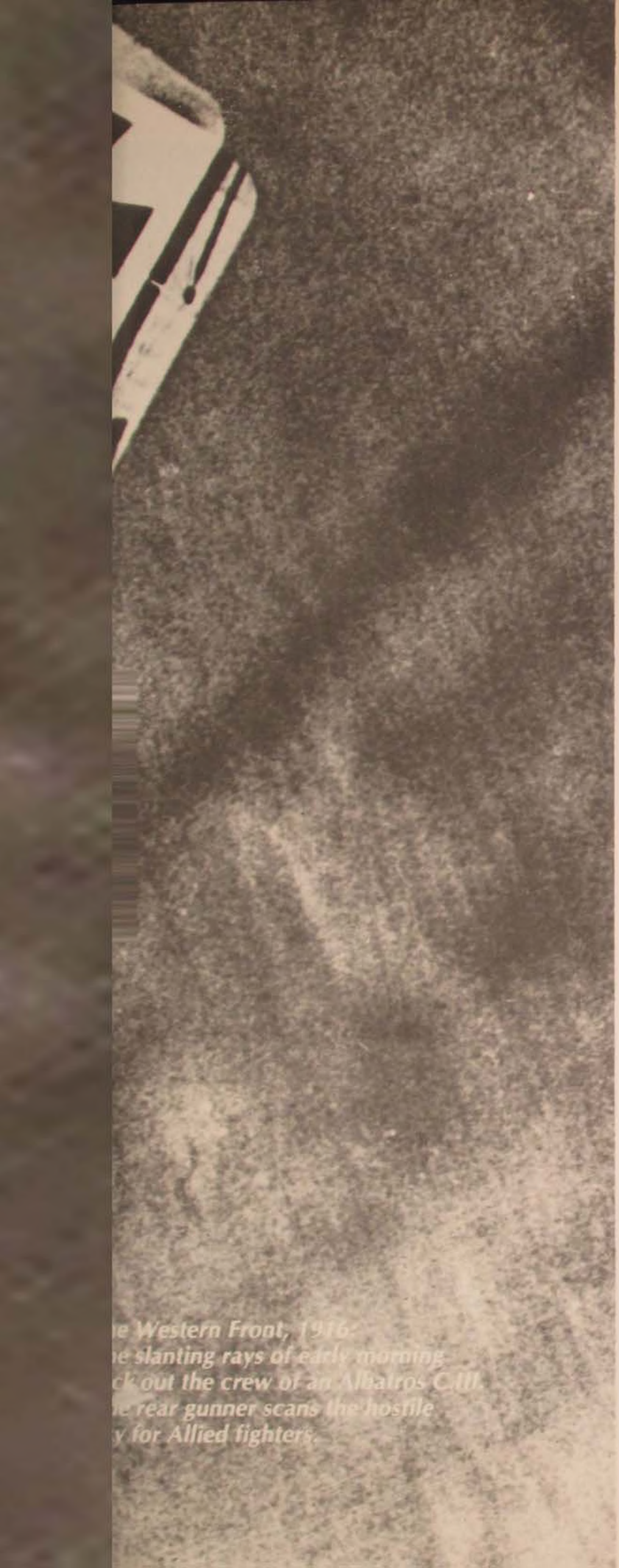
Major Flanagan's article was developed from an Air Command and Staff College research report.

IRA C. EAKER ESSAY COMPETITION

The deadline for the first annual Ira C. Eaker Essay Competition has been reached, and a review panel is already screening the entries. The final judging will take place during the summer, and winners will be announced in our September-October 1981 issue. The officers of the Ira C. Eaker Essay Competition thank you for your participation and creativity in making this first annual competition a success.



JANUS

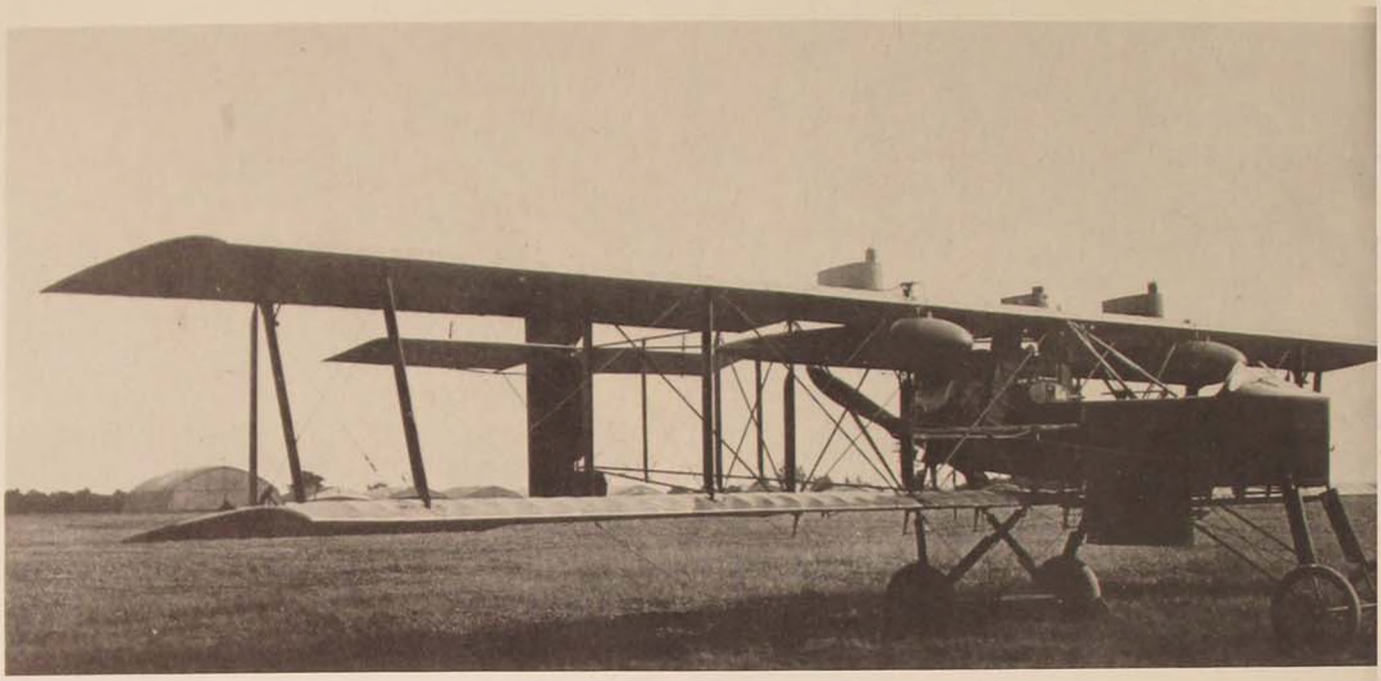
a concept for a multipurpose autonomous fighter

COLONEL RICHARD M. SUTER

UNITED STATES Air Force fighter forces face a threat that continues to grow in size and technical sophistication. Threat predictors estimate that the ratio of U.S.S.R. to U.S. tactical fighters ranges from 2:1 to as high as 5:1.[1] Traditionally the United States has attempted to overcome numerical disadvantages through better training, adroit tactics, and superior, versatile weapon systems.

Technological advances by the U.S.S.R. in advanced fighter aircraft have nearly reached parity with the United States. Any additional performance in fighter aircraft may require more of the pilot than human physical and mental limitations allow. We may have reached the limit in pilot performance. Now only a major scientific breakthrough can tip the balance.[2] Present U.S. military planners cannot anticipate a scientific breakthrough before a possible outbreak of hostilities. Therefore, innovation and technological improvements are needed *now*, to provide a kill capability to counter the quantitative advantage of an enemy that enjoys or soon will enjoy qualitative parity in fighter aircraft.

The validity of present strategy in Central Europe of fighting a purely defensive battle over NATO territory is being questioned. It is recognized in various Air Force circles, specifically Red Flag, USAF Fighter Weapons School, and Air Force Project Checkmate, that U.S.



World War I fighter development

Primitive Voisin pushers (above) were among the few aircraft in the early days of the war with a forward-firing gun. . . .The Bristol Fighter in its F.2B version (facing page, above) was the finest two-place fighter of the war. Its observer doubled effectively as a defensive lookout and gunner. . . .The Sopwith Camel (bottom), the epitome of the rotary-engine, single-seat scout, was incredibly maneuverable—and viciously unforgiving of inept pilots. It destroyed more enemy aircraft in World War I than any other British fighter.

fighters must be capable of penetrating Warsaw Pact high-threat airspace to defend NATO territory successfully. This requirement to fight an offensive battle in a sophisticated enemy threat environment may increase the pilot's task load beyond the limits of a single aircrew member. Various approaches to this problem have been suggested, but three obvious, traditional approaches question their practicality:

- Increase the fighter aircraft force by whatever factor is needed to provide quantitative parity with the U.S.S.R.;
- Increase appreciably individual aircrew training to provide the United States with a kill ratio that will bridge this numbers gap;
- Increase aircraft capability to a level higher than that of the opposition's aircraft.

The first option is obviously cost prohibitive. To achieve the fighter parity goal, the United States must increase its present fighter production by a factor of at least four.[3] The total production cost increase plus the training of associated aircrews, ground crews, and purchasing support equipment is too high for any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realistic chance of funding by Congress.

The second option is probably impossible to attain. History indicates that hundreds of fighter pilots must be screened to find a single ace. The cost of screening, training, and maintaining a force of potential aces is therefore unknown and would surely be so high as to be unobtainable from Congress.

The third option is that of increasing aircraft performance. Fighter aircraft performance, however, is rapidly approaching pilot capabilities—if it has not already surpassed them. A sustained seven-G environment taxes human physiological capabilities to the limit; it surely exceeds the capabilities of a single pilot in a radar-saturated, surface-to-air-missile intense, communications-jamming, multiplane environment. This option is thus not feasible; the physical limits of the human body preclude it.

Given the prohibitive cost and improbability of attaining the foregoing impractical options, this article explores a more viable alternative —an innovation in aircraft design that will allow a major change and produce a major U.S. advantage—in fighter employment concepts. This change can provide a credible capability to conduct offensive missions over enemy territory and counter Soviet quantitative superiority.

EXAMINATION of the birth of fighter tactics presents a clearer picture of how we got where we are today and may provide the insight needed to achieve a conceptual breakthrough. At the onset of World War I, combat aircraft were used primarily as scout or reconnaissance aircraft.[4] This use continued until each side decided to deny the other the valuable intelligence thus obtained and started a campaign to destroy enemy aircraft.

The beginning of air-to-air combat as we know it today occurred on 5 October 1914 in the skies over Rheims, France. Sergeant Joseph Frantz positioned his French Voisin pusher behind a German Aviatik biplane, permitting his gunner, Corporal Louis Quénault, to accomplish the first air-to-air, forward-firing machine kill from directly astern—the enemy's six o'clock "blind spot."[5] From this brief but deadly encounter evolved the requirement for protecting the vulnerable blind spot, so-called because it was to the pilot's rear where he could not see. The requirement for six o'clock protection has driven the design of aircraft, weapon systems, and tactics ever since.

The German counter for the six o'clock blind spot attack was to arm the observer with a flexible machine gun. This resulted in the C-class aircraft, in which the pilot sat in the front cockpit and the gunner behind. The machine gun was mounted on the cockpit coaming, and the gunner's field of fire was backward, upward, and sideways.[6] The German C-machines set the pattern: a forward-looking pilot and a rearward-firing gunner. After unsuccessful British experiments with a machine gun-armed observer in the front cockpit, the Allies followed suit. This first "fix" was effective, but it had flaws.

The most basic drawback of this arrangement stemmed from the weight of the observer, his machine gun, and his cockpit accommodations; the weight sharply reduced speed, climb rate, maneuverability, and service ceiling.[7] This forced the multiseater down into the lethal envelope of "Archie" (antiaircraft fire) and gave single-seat fighters a considerable advantage in dogfights. It was thus inevitable, though not immediately apparent, that the single-seat concept would prevail.[8]

The next alternative for countering the blind spot attack was to develop effective countertactics. Captain Oswald Boelcke, an early ace and the father of German fighter tactics, was the first to systematically investigate defensive fighter tactics and put them into practice in actual combat. Boelcke found that he was very susceptible to surprise attack when stalking his prey. The total concentration required for the attack necessarily degraded his ability to cover his own six o'clock. He had to choose: concen-

trate on the kill and expose himself to attack or divide his attention and run the risk of losing the kill. Not satisfied with either alternative, Boelcke requested the assistance of a fellow officer, Max Immelmann. They agreed to patrol as a pair. When Boelcke attacked, Immelmann would cover his six o'clock; the roles were reversed when Immelmann attacked. This was the genesis of mutual support or fighter team tactics.[9]

Later, larger formations were organized to benefit from additional sets of eyes. When an intruder was spotted, the pilot who made visual contact would pull to the front of the formation and rock his wings. This would alert the formation to turn on the enemy.[10] Flying in large formations had great offensive benefits because of the enhanced ability to see the enemy and the potential for outnumbering him, but it was impossible to control large formations once they were engaged. Combat between formations quickly broke down into a chaotic swarm of individual contests.

The early stages of World War II saw further sophistication of team tactics through the use of interplane radio communication, pioneered by the Luftwaffe during the Spanish Civil War of 1936-39. Mass formations of aircraft were employed on patrol, but one-on-one attack was still the primary method of engagement. Radio was used primarily as a warning device. As in World War I, preoccupation with accomplishing a kill left the pilot with no time to check his or anyone's six o'clock. Mutual support was frequently lost, with predictable results. This situation produced the commonly accepted—and still valid—axiom that most air-to-air kills are accomplished on an unaware target, and 90 percent of those shot down did not know they were being attacked.[11]

The Germans made some progress in coordinating tactics by radio within a four aircraft Schwarm. This led them to the development of the "finger four" formation, extending their existing mutual support doctrine by enabling one two-plane element to support another. Similarly, and apparently independently, General Claire L. Chennault trained his American Volunteer Group to fight in elements of two. These tactics were quite successful, particularly in small engagements. Still, the problem of vulnerability while concentrating on a kill remained.

As they became aware of these facts, American fighters accepted and used Boelcke's mutual support tactics. John C. Meyer, an Eighth Air Force P-47 ace, stated:

> Mainly it's my wingman's eyes that I want. One man can not see enough. It takes the leader's entire attention to destroy an E/A (enemy aircraft). If he takes time to cover his own tail, he may find the enemy has "flown the coop." Effective gunnery takes maximum mental and physical concentration.[12]

This reiterates what World War I pilots had learned: an air-to-air kill requires maximum pilot concentration on the target.

During the air war in Korea, a further refinement of Boelcke's tactics—again, based on interplane radio communication—surfaced in the form of the "fighting wing" concept.

> The first element (two aircraft) flew ahead and below, about a thousand feet below, and the wingman, who was two or three hundred feet back and to one side, watched the rear. He seldom fired unless he was told to do so or found himself alone by some unusual circumstances.[13]

By the Korean War, these tactics were widely accepted, and teamwork was indispensable to survival. With the advent of jet fighters, high-altitude combat, and flashing closure speeds, the lone wolf fighter pilot became a historic curiosity.[14] In 1955, then Major Frederick "Boots" C. Blesse, a respected fighter tactician and an ace with 10 kills in Korea, defined the role of the wingman as that "of supplying the eyes to the rear for the lead aircraft."[15] The "welded wingman" theory was taught as the primary method of employment at the USAF Fighter Weapons School through late 1970. This theory was the dominant fighter employment method in Southeast Asia and proved

Continued on page 30

The rear gunner's position changed little in the early postwar years. The air-cooled, drum fed, .30 caliber Lewis gun mounted on a rotating Scarff ring could be adjusted to give maximum field of fire (shown on right on the Army Air Corps 1922 Engineering Division TP 1 fighter and on a DH-4M bomber, below). The closeness of pilot and observer was essential for effective tactical coordination.

The last Air Corps fighter with a rearward-facing observer/gunner: the Consolidated PB-2A (above) at March Field, California, in 1937. . . .The need for streamlining reduced the gunner's field of fire, and a single .30 caliber machine gun (below) looked less and less of a threat at higher speeds and against all-metal airframes. The gunner could now communicate with his pilot by intercom.

effective so long as it was used in a low-intensity air-to-air scenario.

More flexible tactics—the "loose deuce," "double attack," and "fluid two"—emerged late in the Southeast Asia conflict and have become the vogue.[16] Although these tactical concepts attempt to define both aircraft as "shooters"—that is, they are allowed to attempt a kill under certain circumstances—the major responsibility of the "free fighter" is still to protect the attacking fighter while he concentrates on the kill.[17] This mutual support or "shooter cover" represents no great change from Boelcke. Most of the time the wingman —be he "welded," or "fluid," or "loose"—is nothing more than an extra set of eyes in an airborne, radio-equipped warning device. The theory of using *two* aircraft to kill *one* still prevails.[18]

Blind spot coverage deserves further discussion. Most fighter pilots consider blind spot solely in terms of lookout capability in the six o'clock quadrant. The F-15 and F-16 were therefore designed to minimize or eliminate the restrictions to rearward vision that existed in earlier fighters such as the F-4, F-5, and F-105. Nevertheless, the great importance attached to their wingman's eyes by earlier aces such as John C. Meyer and "Boots" Blesse, both of whom flew aircraft with a bubble canopy and good six o'clock visibility—the P-47 and the F-86 respectively—leads us to a penetrating question: If the 360° visibility in a horizontal plane which a bubble canopy confers is the answer to six o'clock coverage, why their intense concern? They already had that visibility! The answer can be found in Meyer's statement, "It takes the leader's entire attention to destroy an enemy aircraft." He was concerned not so much about his lookout capability as with "division of attention."

Indeed, historically increased lookout capability has never solved the six o'clock problem, an implicit perception that goes back to Oswald Boelcke. Captain Boelcke began his career in the Fokker E-3, a fighter with outstanding cockpit visibility, even in comparison with the F-15 and F-16. His entire upper body was free of the cockpit without so much as a canopy to impair his field of view. He could even see below his aircraft by leaning over the side and straining a little. Yet with this superior lookout capability, Boelcke elected to solicit another set of eyes to cover his blind spot. Why? The answer lies in the terminal phase of the attack, the requirement for "total attention to the kill."

Any experienced air-to-air fighter realizes that one of the most important steps in air combat, whether offensive or defensive, is to divide the opponent's attention. When a pilot's attention is divided, his game plan breaks down, resulting in maneuvers performed solely on conditioned reflex. Reflex action is predictable almost by definition, and a predictable target is an easy kill. For example, a conditioned reflex familiar to all fighter pilots is the left-hand break. It is more natural for most pilots to go left; left-hand landing patterns and left-hand gunnery patterns are easier. It is easier to push on the control stick than to pull, and a right-hand world likes to go left. For whatever reason, there is and always has been a left turn mind-set in the fighter community. Call "break" without stating the direction, and an entire squadron will break left as a group. The left-turn reflex became so obvious in Southeast Asia, that enemy ground gunners would automatically lead our fighters to the left as they pulled off from a bomb pass. The reason? The pilots' total attention had been on tracking the pipper. It was a "natural" reaction after bomb release to pull back on the stick and "push" it to the left.

A familiar example of the consequences of division of attention is the two-versus-one air battle. It is much easier to kill the single aircraft, not just because he is outnumbered but because he must also divide his attention between the actions of two threats—even if one attacker is not shooting. Similarly, it is easier defensively to avoid attack at 100-feet altitude than at 10,000 feet, because the attacker's attention is divided

between you and the rocks and trees. Therefore, it appears that it was not a lack of visibility that prompted Boelcke's desire for a wingman but his need to devote undivided attention to the execution of the kill.

Observations by successful Israeli fighter pilots (10 kills or more) concerning air combat tactics reinforce this point. In a multiplane engagement, shots of opportunity are more the rule than the exception, and a pilot's freedom of action was his key to success. One pilot cited at least five kills lost because he had to check his six o'clock during the terminal phase of the attack, causing him to lose his position of advantage or disrupting his tracking solution.[19] World War II fighter pilot Major Walker M. Mahurin sums it up quite well:

> In regard to looking behind and around, I realize that it is a subject that has been harped on by every guy that has spent one measly hour on a combat operation. It is an absolute necessity. The result is most obvious. The Hun will never bag an American fighter if the Yank sees him coming in time to take proper evasive action. *"It is still a bad thing to spend all one's time looking behind. The idea behind fighter aircraft is that they will seek out the enemy and destroy him. A pilot will never accomplish this aim by looking behind him all of the time."*[20]

Now recall what started Boelcke's dilemma: the loss of his observer. The observer provided the pilot with two major benefits: he freed the pilot's attention so the pilot could concentrate totally on his kill and provided a formidable threat to the six o'clock attacker.

> Firing from such a steady platform, the observer's fire was deadly, so much so that pilots who attacked two-seaters from an angle covered by the observer's field of fire seldom desired to repeat the performance if they survived.[21]

The reason for the abandonment of the rear gunner was the need for increased aircraft performance, but does this reason still apply? Today's power plants are capable of providing huge amounts of thrust at all realistic combat engagement speeds, and the few hundred pounds of weight represented by an additional crew member is no longer critical.

TODAY, U.S. tactical fighter forces are blessed with three new weapon platforms, and these "thoroughbreds" do their specialized jobs well. The F-15 is a great air superiority fighter, but the only aircraft in history to approach the A-10 as specialized close-air-support tank killers were the Ilyushin I1-2 Sturmovik and the Junkers Ju 87 Stuka.[22] The multinational F-16 was designed as a lightweight, low-cost, export fighter with an all-round capability. Taken individually or together, these are highly capable aircraft, but with the phaseout of the F-4, U.S. fighter forces lack a capable "workhorse" fighter, a long-range, multirole aircraft capable of fighting its way in and out through a serious air-to-air threat.

How can we best satisfy this requirement? We have pressed tactics for our existing aircraft about as far as they can go; dramatic technological breakthroughs are unlikely in the near term. A reevaluation of the observer's role is necessary to help alleviate the numerical disadvantage the United States faces. Aircraft power plants are capable of providing excess thrust, and the state of aerodynamic art is such that aircraft are being built that exceed pilot capabilities. In a central European war scenario, where we will have to fight outnumbered, two-ship employment represents an unaffordable waste of valuable resources. The United States can no longer afford the luxury of two multimillion-dollar fighters providing support to each other in the combat arena, especially with odds from 2:1 to 5:1 against us and our allies. If every fighter aircraft could be made mission effective by providing its own blind spot lookout, these odds could be dramatically improved. Additionally, strike aircraft entering highly defended enemy territory cannot afford to mass for mutual coverage. The more dispersed the greater the freedom of action, and the enemy is thus denied the lucrative

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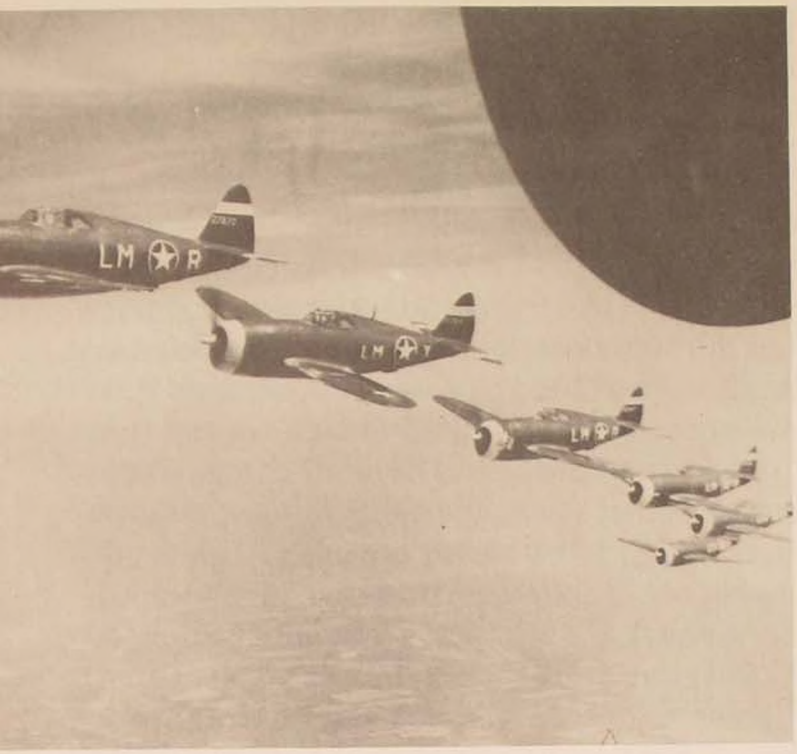
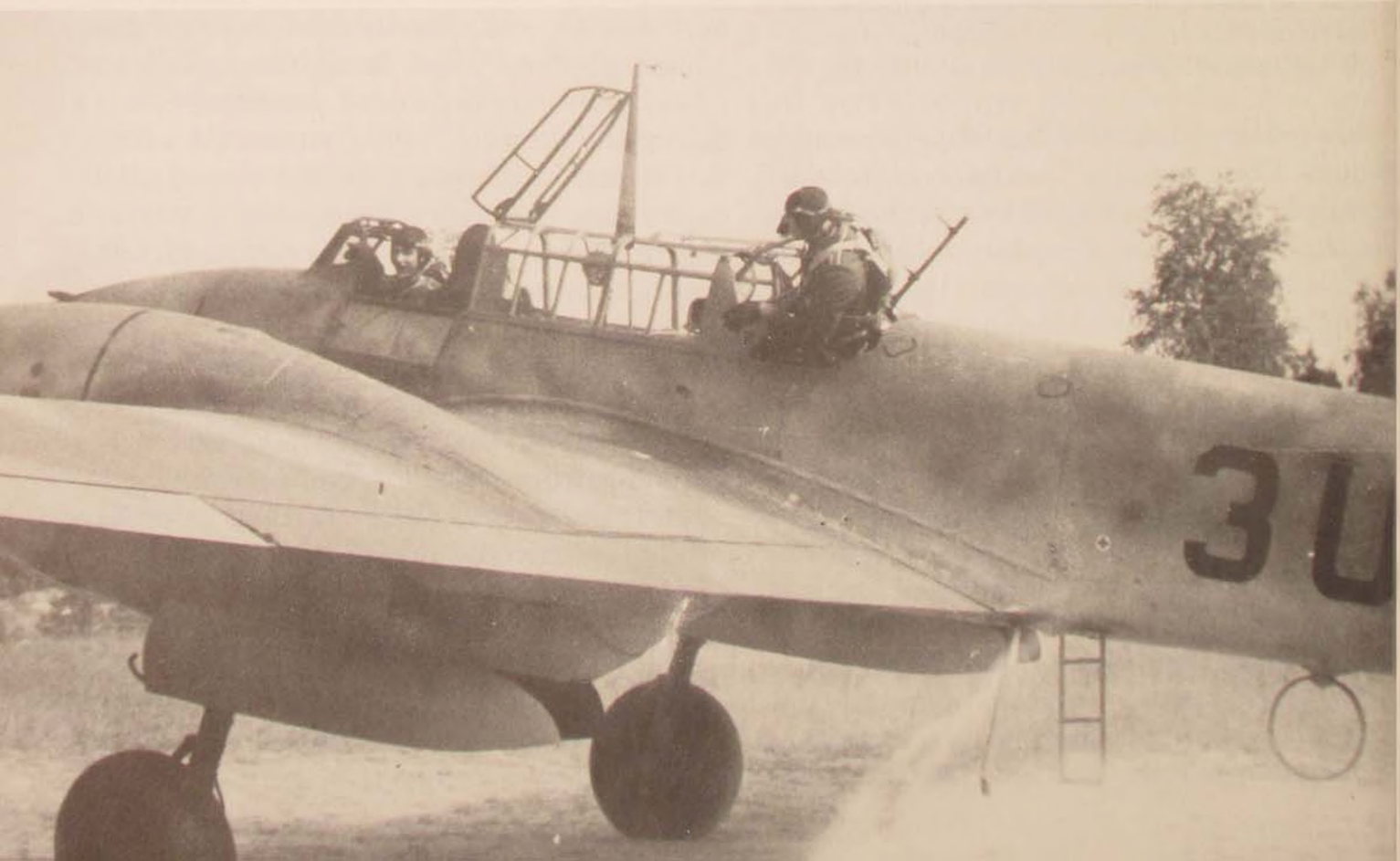
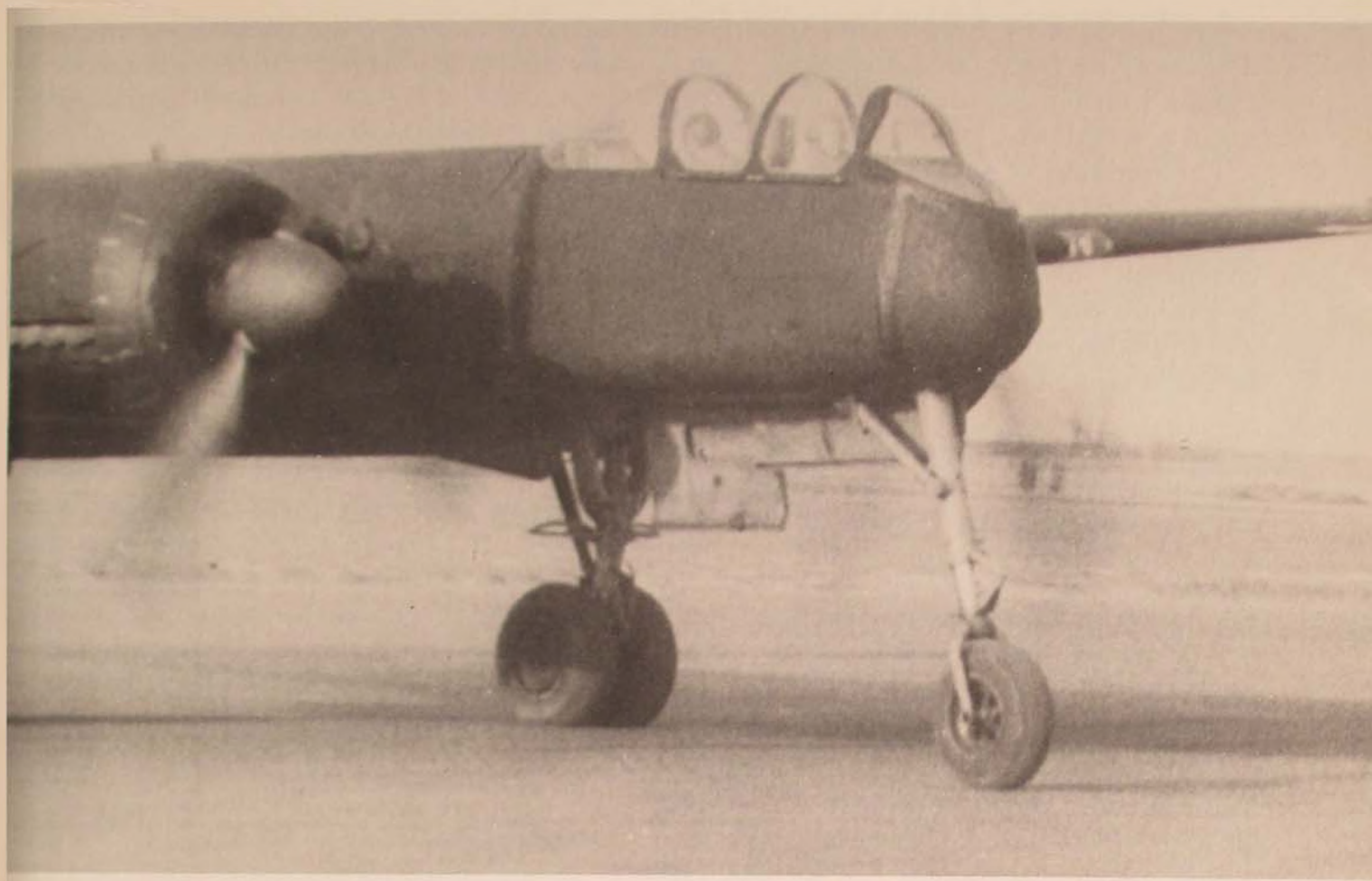


Visual lookout provided by wingmen and transmitted by radio was standard during World War II (left, Eighth Air Force P-47s in nontactical formation over England, 1943). . . . The rearward-facing observer/gunner made a last stand in the Luftwaffe. The Bf 110's 7.62 mm defensive gun (bottom) was of little value; its firepower was inadequate, and the Bf 110 was so unwieldy that the gunner had few chances. . . .The remotely controlled 13 mm barbettes on the Me 410 (below) were the most sophisticated rearward-firing armament ever mounted on an operational fighter; quite complex, they never worked properly.





The Ju 87 Stuka's rear gun (right) was apparently more effective than that of the Bf 110, perhaps because the Ju 87 was so unwieldy that the gun was the only option . . . . Probably the most effective and advanced back-to-back fighter ever was the Heinkel He 219 Uhu (above, the third prototype taxiing in from a test flight at Erprobungstelle Rechlin, the Luftwaffe's proving ground). Wartime photographs of operating He 219s are extremely rare; this one was located on 35 mm movie film and printed by Jay Spenser of the National Air and Space Museum.

target provided by large masses of aircraft. The concept? Janus, an autonomous tactical fighter, which makes use of back-to-back seating in a "workhorse," multipurpose platform.

The question of one seat versus two has been debated since World War I. In the 1960s and '70s, this issue divided the tactical fighter community. Advocates of the single-seat fighter aircraft inveigh against cockpit confusion and additional weight; they support the premise that it does not take two men to handle the job.

These arguments deserve an answer. The "cockpit confusion" objection to a two-seat fighter rests on concern that the need to take periodic votes between cockpits would delay the decision-making process, perhaps fatally. In fact, Air Force and Navy experience with the F-4 in Southeast Asia demonstrates—at the very least—that this problem can be overcome. There are strong counterarguments that the extra set of eyeballs in the F-4 made it a more effective air-to-air fighter and a safer air-to-ground vehicle, particularly at night. The weight penalty argument can be similarly answered. Today, the state of the art of engine design and aerodynamics is such that these problems are easily overcome. The point is made by comparing the single-seat F-15A to the two-seat F-15B. Energy/maneuverability charts show that the performance of the two aircraft is virtually identical. The total combat weight difference averages approximately 800 pounds, and the difference in specific energy (P_S) is less than 100 feet per second, a negligible amount when comparing aircraft that can maintain energy rates as high as that of the F-15.[23] The two aircraft are so close in performance that the flying qualities test and evaluation for the singleseater was accomplished in a B-model two-seat F-15.[24].

A final pro-single-seat argument is that, although there are many pilot tasks to accomplish, they do not all come at once; therefore, a fighter pilot can handle them alone.[25] This argument, like most single-seat arguments, turns out to be limited to the visual day arena and low electronic-warfare threat environments.[26] Even the F-X Fighter Decision Coordinating Paper 19 took this stand:

> During F-X Concept formulation, numerous studies were made to determine optimum crew size. They showed that, given sufficient automation, one man could perform standoff and all-weather counterair missions, "*except*" in a high false alarm environment as might result from heavy ground clutter or jamming causing radar interference.[27]

The increasing all-weather night requirement and the increasingly dense electronic-warfare/surface-to-air missile environment have been passed off as "we won't do that." When the USAF single-seat community admits that this threat must eventually be faced, they generally conclude that someone else should do it—and probably in a two-seat fighter. The Navy consensus is on somewhat different lines:

> . . .Navy fighers, in contrast, require two men because of the recognized need for a high target kill probability in Forward Air Defense (FAD) versus massed bomber raids, which could use heavy jamming and occur in any visibility situations. The second man concentrates on fire control sensor returns "looking through" the adverse effects of weather, clutter and electronic countermeasures.[28]

Single-seat advocates in general tend to concede that in weather, night, and heavy electronic warfare the two-seat fighter is needed, but they still support the single-seat aircraft as a day fighter. Former Secretary of Defense Harold Brown, speaking in 1965 as Secretary of the Air Force on the lessons learned in Vietnam, stated that a fair-weather, day-only fighter was not a major Air Force need:

> Our objective is to be able to pick up and destroy any type of tactical target, day or night, in any weather and in any terrain. The Army doesn't stop fighting at sundown or when it rains.[29]

To conclude the discussion of single-seat versus two-seat fighters, quotations from two

reliable studies support the two-man configuration as the most desirable for the multirole fighter of today.

> A second crew member can contribute to the success of the mission in many ways, such as identifying targets (visually or radar), operate the guidance and control of standoff weapons, and operate sensors, ECM, and defensive armament as an aid to penetrating some kinds of enemy defenses.[30]
>
> Based on the studies to date, it is recommended that the advanced multimission aircraft weapon system have a two-man crew.[31]

In the past we have produced two-seat fighter aircraft, but the question of optimum aircrew placement was not systematically addressed. Side-by-side seating, as in the F-111, not only restricts the vision of both crew members to the rear but also restricts the visibility of one flank for each crew member.

Tandem seating with both aircrew members facing forward offers real advantages but also leaves much to be desired:

> Probably one of the most advantageous aspects of the two-crew member fighter is the extra search capability of the world outside the cockpit. Because of the increased visual area of search, two observers should be able to detect an object much sooner than one observer. In order to gain full utilization of a second crew member, he must be provided with little obstruction to his search pattern. Should one of the crew member's view be blocked, such as in a tandem arrangement, then the value of an extra man for visual search is reduced.[32]

Why limit the rear member's vision with the front seater's headrest as well as his own? An observer seated facing the rear would have a full field of view of the most vulnerable area of a fighter. By moving the "wingman's" eyes into the rear cockpit of the "lead" aircraft, one would create a powerful force multiplier. A single aircraft would then be capable of engaging in air-to-air or air-to-ground missions autonomously without the distractive over-the-shoulder lookout problem.[33] The natural practice for men fighting outnumbered is, significantly, back-to-back. It is very rare indeed to find two men fighting a crowd "front-to-back," with one swinging over the other man's shoulders.

However, there is apprehension over the physiological aspects of back-to-back seating in a fighter, relating specifically to whether man can withstand the observer's tolerance to G-forces and vertigo in backward maneuvering. The widespread use of dive bombers with a rearward-facing gunner in World War II provides the answer.

These aircraft were designed specifically for erratic maneuvering. Most dive bombers were designed for a 70° dive angle, and the Ju 87 Stuka was a natural at 90°. Not only was the dive exciting, the pullout was a real attention getter. Nor was the experience limited to Axis aircraft; the Douglas SBD Dauntless, designated the A-24 in U.S. Army service, was perhaps the most successful dive bomber of the war. Some versions of the Russian Il-2 Sturmovik, a highly successful ground attack aircraft not ordinarily used as a classic dive bomber, had a rearward-facing gunner. In all cases, the results were the same; dive bombers tended to be vulnerable in the air-to-air arena—mostly because of weight/power limitations—but no adverse physiological effects on the rear seater are mentioned in any relevant contemporary accounts.[34] Practical World War II operational experience substantiates the point that flying backward is simply a matter of acclimatization and faith in the man up front. The Human Resources Laboratory considers the difference between jet and conventional aircraft to be just a question of degree and a matter of training.[35]

The question of left-right orientation is invariably raised by doubters of the Janus concept. What is the left to the man facing the rear is right to the man facing forward. This problem seems more formidable than it is; a solution to the problem used with the Dauntless was to paint the canopy rails on the right side of the aircraft green and the canopy rails on

the left side red. Bogey or threat calls were given first in color code and then in clock position, the clock position running only from zero to six o'clock. A typical call might be "Bogey at green three o'clock level" or "Bogies at our red four o'clock high." This way both crew members initially looked in the same direction.[36]

Another question is the one that addresses aircrew ejection from a back-to-back fighter. Again, World War II experience provides relevant data, this time in the form of the Heinkel He 219 night fighter. The He 219, an extremely successful night fighter, was an advanced aircraft with many innovations, one being the new pilot escape system. This system, featuring back-to-back seats and using compressed air cartridges, was the first ejection mechanism used in an operational aircraft.

From personal inspection of the last existing He 219, it is apparent that the back-to-back seats could eject both aircrew members together in an A-frame configuration or each as a single, a remarkably sophisticated setup for 1944.[37] The back-to-back ejection-seat state of the art is hardly in its infancy.

Why did the Navy abandon the rearward-facing backseat when they developed the F-4 and F-14? During the development of the F-4s, the Navy considered the era of the dogfight to be a thing of the past. There was a general acceptance of the missile-shooter concept, replacing the "gunfighter" philosophy. The Navy considered the primary F-4 mission to be that of a fleet defense interceptor, where a fulltime radar operator was needed to handle the excessive task loading. Since the F-4 was built without guns and with the rear cockpit facing forward, no thought was given to using the operator for anything but looking at the radarscope. During the development of the F-14, the only consideration given to cockpit placement was whether the pilot and radar operator should be placed side-by-side or tandem. Consideration was apparently never given to a rearward-facing aft cockpit, possibly for

Two seats or one? An F-16A and F-16B with wingtip-mounted AIM-9J Sidewinders fly over Edwards AFB, California, 1977.

Advice from an ace: Captain Oswald Boelcke, German Air Force, ca 1916:

Try to secure advantages before fighting. If possible, keep the sun behind you.

Always carry through an attack when you have started it.

Fire only at close range and only when your opponent is properly in your sights.

Always keep your eye on your opponent, and never let yourself be deceived by ruses.

In any form of attack it is essential to assail your opponent from behind.

If your opponent dives on you, do not try to evade his onslaught but fly to meet it.

When over the enemy's lines, never forget your own line of retreat.

Attack on principle in groups of four or six. When the fight breaks up into a series of single combats, take care that several do not go for one opponent.

the same reasons as with the F-4—or was it because of forgetfulness of lessons learned?[38]

A positive look at the Janus-configured aircraft reveals many additional spin-offs and advantages. The change to back-to-back seating is not purely a defensive move; on the contrary, it will provide an increased offensive capability. By eliminating the necessity for the pilot to divide his attention, more time, flexibility, and attack opportunities will be available. The pilot will be able to press the attack immediately on targets of opportunity without first having to clear himself. The concept also allows for better control of a greater proportion of a fighter force for a longer duration during the developing stages of an engagement. Single Janus-configured aircraft can be released from formation to engage threats while the integrity of the formation is retained. The Janus-configured fighter is not formation dependent, negating the problem of a single intruder's drawing off a strike force's escort, two aircraft at a time.

Other recent changes in air-to-air combat also point to the inherent advantages of Janus. First, the intelligence community predicts that Soviet forces will make extensive use of communication jamming. As a result, our current tactics manuals outline elaborate "chatter mark" procedures that will at best only partially alleviate the problem, a "last-gasp" attempt to salvage mutual support tactics. Mutual support through radio contact may well be almost nonexistent in a communication-jamming environment.

Another problem for which Janus offers a solution is the dilemma posed by the need and the ability to maintain high sustained G-loads for extended periods. Under high G-stress, a pilot cannot move his head as freely and rapidly as under normal circumstances. His ability to check his six o'clock is degraded, thus increasing the time necessary to make the kill. A Janus-configured aircraft could partially relieve this problem.

The additional man seated backward in the

attack role of a fighter would have definite advantages. Obvious advantages are increased target acquisition and a more accurate navigation capability. A Boeing study in 1968 concluded:

> A two-man crew consisting of a pilot and NFO (Navigation Flight Officer) visually acquired the test targets at a significantly greater range than one-man crews (pilot only). The one-man pilots acquired targets at an average acquisition range of 5,818 ft. while two-man crews acquired them at 7,576 ft. . . . two-man crews performed significantly better than one-man crews. Two-man crews failed to update on only five of 40 occasions, while one-man crews missed 15 out of 35 update requirements.
>
> Based on the studies to date, it is recommended that the advanced multimission aircraft weapons system have a two-man crew.[39]

Red Flag experience regularly demonstrates not only that two-seat fighters acquire target sooner and more reliably than singleseaters but that first-strike delivery accuracy is better, as is reattack accuracy.[40]

The value of a rear-facing observer for warning of possible surface-to-air missile and antiaircraft artillery threats is also apparent. In the air-to-ground mode, a fighter's most vulnerable time is just prior to bomb release and during pullup immediately after the release.[41] Prior to bomb release, the pilot faces the threat and can vary the flight path in response to it. After bomb impact, however, with the enemy on the ground no longer immobilized by the fighter's weapons, the pilot's back is toward the threat and his actions are only a "best-guess." With an observer seated backward facing the threat, however, an accurate picture can be passed to the pilot, who would then have lifesaving information he has previously been denied. Another advantage of Janus is the assistance given during low-altitude flying. When flying at 500 knots and less than 100 feet above ground level, a pilot must concentrate all his attention on terrain following to avoid impact with the ground. The luxury of having his six o'clock constantly and automatically cleared relieves him of a dangerous diversion of attention vital to survival.

The inherent advantages of Janus could be further enhanced by low-risk adaptations of existing technology such as forward-looking, ground-map, and air-to-air radar for the observer. If the radar possessed a "track-while-scan" capability, the pilot could concentrate on the attack of a hostile aircraft while the observer searched for additional targets or bogies that may pose a threat to the attack. A rear-viewing radar and TISEO (target identification system, electro-optical) combination scope could provide the observer with a rearward, beyond-visual-range detection and identification system that could cover not only the direct six o'clock but also the "belly blind spot" beneath the aircraft. Flares, directional electronic countermeasures, and even rearward-delivering weapons could be employed by the observer. A ram-air delivered, high fragmentation, white phosphorous dispenser munition such as the CBU-2, designed to distract and deter rather than destroy, is another possibility. Other observer functions can be postulated, but the major benefit is the acquisition of rearward-looking *eyes* and an additional *brain;* these are vital—the rest represents added potential and should be carefully evaluated so as not to "over-gadget" a new-found asset.

THE United States Air Force fighter forces face a Soviet threat that continues to grow in quantity, quality, and technological sophistication. Fighter aircraft performance and system sophistication are rapidly surpassing man's physical limitations. Thus, increased performance may require replacement by real changes in aircraft design. These design innovations must complement and enhance our tactics, providing us with the capability to offset Soviet numerical superiority.

The need for undivided attention while flying fighter aircraft is critical and has been repeatedly verified; the concept of team fighting emerged

as the solution for this problem. Early experiments with two-seat, back-to-back fighters were abandoned due to thrust-to-weight limitations; our present technological capability has bypassed this problem. We can now produce two-seat fighters with performance characteristics essentially identical to those of singleseaters. Back-to-back seating is therefore worthy of serious evaluation. This seating arrangement effectively eliminates a major vulnerability that has been inherent in fighters since World War I: the blind six o'clock position.

A Janus-configured aircraft provides impressive advantages:

- It permits 360-degree visual coverage and gives the pilot *processed* information regarding enemy threats;
- It overcomes the requirement for two-ship attack formation and allows all aircraft to attack autonomously;
- It lessens dependence during the attack;
- It reduces the impact of communication-jamming.

The impact of these advantages would be a substantially increased air-to-air capability, a more effective air-to-ground strike capability, and an increased force survivability. Even perfunctory analysis suggests a synergistic cumulative impact, making Janus a potent force multiplier. The ability to use multimillion-dollar fighters autonomously offers enormous advantages which cannot be ignored.

The total benefits of a Janus-configured fighter using today's technology cannot be ascertained without comprehensive testing under actual flight conditions. Measured in light of the potential for increased fighter effectiveness, the cost of the test would be minuscule. We cannot afford to ignore the potential of Janus.

Hq PACAF

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Colonel Suter's article was developed from an Air War College course paper.

Air University Establishes the Airpower Research Institute

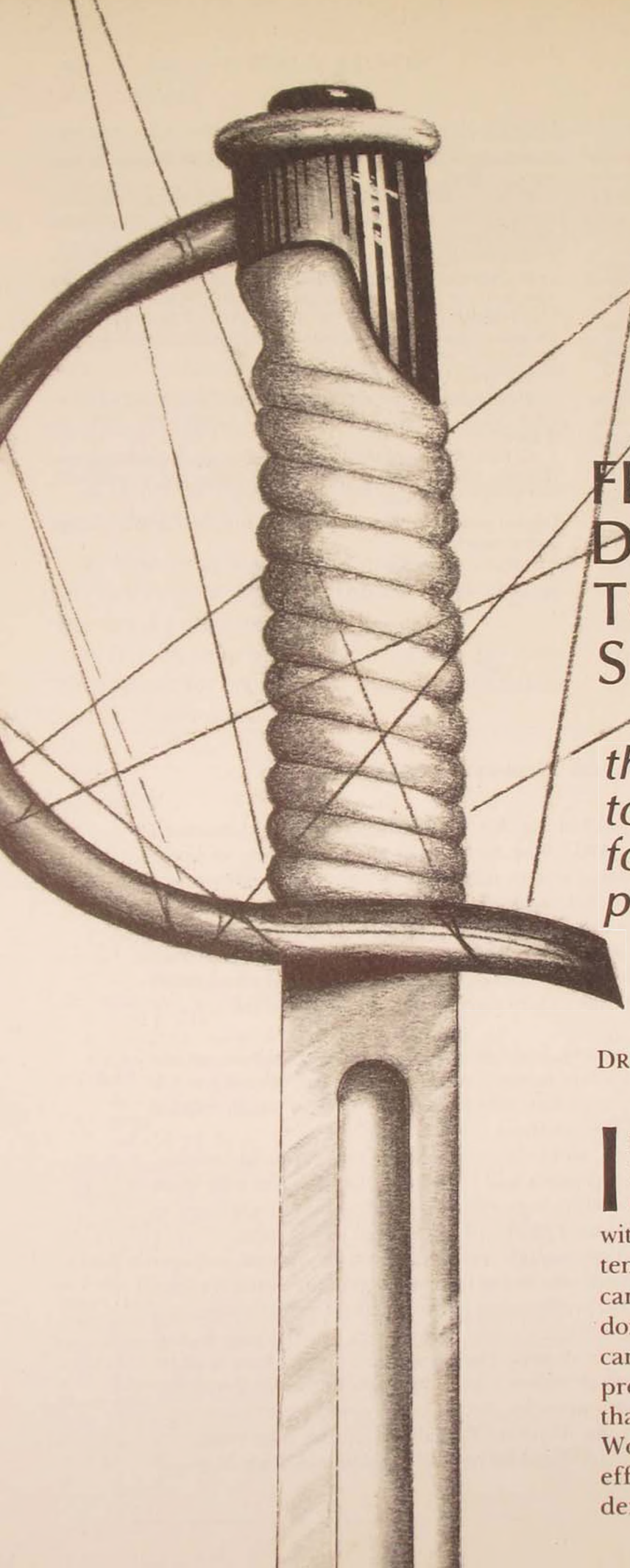
The Air University has established, within the Air War College, a new organization called the Airpower Research Institute (ARI). The Airpower Research Institute will provide a setting in which in-depth background studies relating to airpower as an instrument of national policy can be conducted to provide a sounder basis for decision-making at the highest echelons, where the formulation and evaluation of options and recommendations on airpower strategy and policy take place. The basic assumptions of the Institute are that military forces cannot be employed successfully without adequate conceptual preparation and that the Air Force mission will continue to face formidable challenges in the areas of doctrine, strategy, and employment.

Research projects at the Airpower Research Institute are to be pursued by both active-duty and reserve Air Force officers and civilian research associates who will normally work individually, though an interdisciplinary approach may be used on projects which require a variety of backgrounds for comprehensive analysis.

This mix of academics, military officers, and civilians from the Department of Defense, in which a variety of viewpoints and backgrounds will come into play, coupled with close interaction with Air University professional military education institutions, is expected to provide an atmosphere that will be a constant source of intellectual stimulation.

The Airpower Research Institute will concentrate its efforts on (1) technical, politico-economic, and military trends that are pertinent to the long-range planning efforts of the USAF and its major components; (2) past, present, and future airpower-employment concepts in terms of doctrine, strategy, and technology; and (3) military professionalism and the challenges of military officership in a changing environment. Its products will be published by Air University and receive wide dissemination throughout the Air Force, the Department of Defense, other government agencies, and relevant civilian communities.

Those desiring more information on the Airpower Research Institute may write Airpower Research Institute, Air University (ATC), Maxwell AFB, Alabama, 36112, or call (205) 293-7074 or AUTOVON 875-7074.



FROM DEFENSE POLICY TO NATIONAL SECURITY POLICY

the tortuous adjustment for American military professionals

DR. JOHN P. LOVELL

IN the years immediately following World War II, the concept of national security became elevated to the level of a commanding idea, with overtones that heavily influenced the content and style of virtually all facets of American foreign policy for decades.[1] In an era dominated by national security concerns, American military professionals came to assume a prominence in the policy process far greater than that which they had enjoyed in pre-World War II America. Moreover, in their effort to respond to the new and multifaceted demands imposed on them in contributing to

and carrying out national security policies, military professionals developed a breadth and depth of expertise that far exceeded what had been required in earlier times.

Yet the increase in professional expertise has not been accompanied by a proportionate increase in professional self-esteem. On the contrary, although subject to considerable fluctuation in the past decade, the pattern has been one of widespread professional malaise and frustration.

Some have pointed to the humiliation of the Vietnam experience to explain the unsettled state of professional self-esteem. Others point to policies introduced in the wake of the Vietnam failure that have affected military personnel adversely. These include reductions in force, a diminution of fringe benefits, and a transition to an all-volunteer force plagued (especially in ground combat units) by poorly educated recruits.

It is clear that the Vietnam experience and its aftermath have posed troublesome challenges for American military professionals. I contend, however, that longer-term trends provide a more fundamental explanation of the threats to military-professionalism that have been experienced. In the context of post-World War II concerns with satisfying national security goals, the relationship of the military to the civilian sector has become altered. The explicit dimensions of change in the relationship, described in a series of propositions below, reveal a paradoxical pattern of military-professionalism simultaneously being promoted, augmented, thwarted, and undermined.

The Argument Outlined

Proposition 1. The concept of national security gained wide currency only after World War II, with a meaning distinct from terms such as *military policy* and *defense policy,* which had been prevalent earlier.

Proposition 2. By the early 1950s (the McCarthy era), the expression of concern by U.S. civilian and military officials for national security had become virtually indistinguishable from concern with combating communism. However, widespread adoption of the concept after World War II represented an intellectual adjustment that civilian and military officials had made to the complexities of the postwar world, and not simply their surrogate for anticommunism.

Proposition 3. The creation of an integrated structure for national security affairs cast civilians in roles that intruded into what previously had been the exclusive domain of military expertise. At the same time, the roles assigned to the armed forces made demands on them for increased expertise and breadth of perspective.

Proposition 4. The modern era of deterrence, limited wars, counterinsurgency and counterterrorist operations, nuclear war-gaming, and military alliances and assistance programs has introduced complexity and sometimes contradictions into the missions assigned to U.S. military units and personnel. The measures used to assess performance have become more ambiguous.

Proposition 5. The heating of the Cold War (in Korea, Vietnam, and more recently in Afghanistan) generated demands for quantitative and qualitative increases in the military establishment. However, each resulting increase was paralleled by increasing emphasis on centralized control of military operations.

Proposition 6. The American armed forces have become a far more formidable, professionalized institution than in the pre-World War II era. Yet as individuals, military professionals tend to have less autonomy and to experience more challenges to their distinctive professional competence, *even from within the military hierarchy,* than was characteristic of earlier times.

Proposition 7. The threat of professional self-confidence imposed by the reduction of uniquely military expertise has been compounded by a trend toward machine or technol-

ogy-intensive military organization.

Proposition 8. Uncertainty and ambiguity regarding mission and measures of performance, demands for greater breadth of perspective and depth of professional expertise, technology-dependence, and a loss of autonomy have undermined the professional self-esteem of career military personnel.

THE nature and magnitude of the change in American policy perspectives that occurred with World War II can be fully appreciated only with some reference to historical experience and traditions.

The feasibility and desirability of continuing the tradition of avoiding political entanglements abroad (notably with European powers) had become a matter of serious debate in America as early as the 1880s and 1890s. The advice that George Washington gave in his farewell message, reaffirmed by Thomas Jefferson in his first inaugural address and adhered to by his successors on into the post-Reconstruction years, was essentially discarded by American policymakers during the Spanish-American War. Efforts to assume the traditional foreign policy posture again were made during the Taft and first Wilson administrations, only to be abandoned with the commitment of American troops to battle in Europe in 1917.

However, faith in the belief or hope that Americans could remain isolated from foreign embroilments was revived with a new intensity in the years after World War I. The onset of a worldwide economic depression, coupled with the collapse of disarmament negotiations and the specter of growing militarism in both Europe and Asia, generated deep anxieties among Americans. Isolationist proposals such as the Neutrality Acts were broadly supported. Even more restrictive measures such as the Ludlow Resolution (which would have required a popular referendum in order for war to be declared) were only narrowly defeated.

Republican administrations following Wilson prided themselves on trimming the military establishment to the bone.[2] Isolationist fervor became even more intense. Domestic issues assumed still higher priority when Roosevelt assumed office at the onset of an economic depression, despite an awareness of strategic realities on Roosevelt's part which exceeded that of both his Republican predecessors and his Democratic Secretary of State.

Perhaps above all, Roosevelt had a keen sense of domestic-political sentiment. Thus, for example, he appointed a high-level committee to study war-mobilization needs in 1934, only to ensure that the committee died of inaction within a few months when the congressional Nye Committee objected.

In the summer of 1938, Roosevelt asked Bernard Baruch to head a defense coordination board, to provide top-level planning for mobilization of the American society for war. But by the end of the year, FDR had decided that the proposal would be unacceptable to the American public. Finally, in August 1939, he created a war resources board similar to the boards he had considered in 1934 and 1938, but when the board submitted its report to him in November 1939, he declined to make the report public and permitted the board to expire.[3]

Until late in his second term, Roosevelt's overriding preoccupation was with his New Deal program for economic recovery, and he was content to rely heavily on Secretary of State Cordell Hull in defining the orientation of American foreign policy.

Hull's outlook was archetypical of the "legalistic-moralistic approach to international problems" that George Kennan has described as a characteristic American weakness.[4] He believed, as had Wilson, that "power politics" in world affairs had become outmoded and that an enlightened spirit of peaceful negotiation could and must prevail.[5] Under his leadership, the State Department was expected to promote peace, as through reciprocal trade

agreements, not to prepare for distasteful contingencies that would require the commitment of American armed forces.

It was contrary to Hull's principles that the military should be included in the design of foreign policy. However, increasingly in the months following Germany's invasion of Poland in September 1939, President Roosevelt turned to military advisers to help him reshape American programs for possible involvement in war. Hull was resentful of his loss of exclusive prerogative for shaping foreign policy and for the resulting changes that were occurring. However, his resentment was increasingly expressed in the form of withdrawal from the arena of policy discussion rather than by assertiveness. For example, he declined comment on proposals submitted by the military chiefs to the President in late 1940 calling for rearmament in the Pacific, on the grounds that "the recommendations were of a technical military nature outside the proper field of his Department." And when the military delegation that had attended an Anglo-American conference to discuss joint strategic planning circulated its reports early in 1941, Hull refused to look at them.[6] After Pearl Harbor, he was virtually a nonparticipant in the strategic policy process.

For their part, American military officials in the interwar years had lamented the isolationist mood and feared the consequences of a policy of unpreparedness. Yet most of them adhered strongly to the traditional view that the military professional must have no concern for political matters, nor should he have any voice in shaping policy beyond giving advice regarding issues of a narrowly technical military nature.

The case can be overstated. Military men flew the mail when the postmaster general canceled contracts with civilian carriers; they also participated in prominent New Deal programs such as the Civilian Conservation Corps (CCC). Moreover, the Army Industrial College, which had been created in 1924, was producing a small cadre of military officers (from all arms of service) familiar with problems of industrial mobilization in the event of war.[7] In a similar vein, in the reorganization of the Army General Staff that had occurred after World War I, a War Plans Division was created with responsibilities to include assessing the probable impact on military operations of societal resource levels and of diplomatic and economic policies. By 1939, in fulfillment of this responsibility, the War Plans Division was maintaining regular liaison with the Departments of State, Treasury, Interior, Agriculture, Commerce, and Justice.[8]

The breadth of perspective required in the War Plans Division made it an exception to the pattern within the Army General Staff, to say nothing of the military establishment as a whole. In general, parochial concerns with the immediate problem of carrying out assigned training and maintenance tasks with insufficient personnel and equipment predominated. The relatively few members of the War Plans Division had a highly restricted view of the range of policy matters on which they might appropriately comment.[9] Their view was not significantly different from that presented by the Army Command and General Staff College:

> Politics and strategy are radically and fundamentally things apart. Strategy begins where politics ends. All that soldiers ask is that once the policy is settled, strategy and command shall be regarded as being in a sphere apart from politics.[10]

World War II and especially American involvement after Pearl Harbor moved military professionals from the periphery to the center of the policy process and resulted in a radical alteration of views. Although the State Department under Cordell Hull tended to be shunted aside by the shift in emphasis to wartime concerns, other components of the civilian sector became far more involved than ever before in the policy process as a result of wartime mobilization.

Industrialists, many of whom had been held at arm's length during the peak New Deal

years, became active in wartime production. Organized labor became involved in manpower planning and farmers in lend-lease programs. Thousands of academics moved into administrative and research assignments in government or into positions to assist in the design of military recruitment, testing, and training programs. Scientists, who traditionally had remained aloof from and wary of government, became heavily involved in wartime roles of crucial importance.[11]

It is not surprising that a key lesson almost universally drawn from the wartime experience by civilian and military officials alike was that the American response to the exigencies of the postwar era would require intelligence and policy coordination on a scale lacking early in the war (for example, at Pearl Harbor) but largely achieved by the war's end. A related lesson, for which Munich and Pearl Harbor were appropriate shorthands, was that democracies could never again afford to indulge in wishful military unpreparedness.[12] The conversion that had been experienced by Senator Arthur Vandenberg, a leading prewar isolationist, was typical of that which a large segment of the American populace had shared. As Vandenberg recalled,

> Prior to World War II, the oceans were virtual moats around our continental bastions. All this changed progressively at Pearl Harbor and thereafter. It became very obvious to me that this was a different world in which we had to sustain our own freedoms. . . . All of the changes rendered obsolete all of our prior thinking regarding our own national security.[13]

The success achieved in World War II was not attributable to the armed forces alone—far from it. Only the integrated efforts of all sectors of government and the population as a whole had made success possible, and only comparable integration of effort could assure security in the future.

The most important institutional manifestation of these lessons learned was the National Security Act of 1947. Under provisions of the act, the armed forces were unified (albeit loosely) under a Secretary of Defense (later the Department of Defense). The collective wisdom of the various service chiefs was to continue to be available to the President, as it had been during the war, through formalization of the Joint Chiefs of Staff. Intelligence gathering was to be coordinated by the Central Intelligence Agency. A National Security Resources Board, a Munitions Board, and a Research and Development Board, respectively, were to institutionalize the means whereby the skills of scientists, engineers, economists, industrialists, and others from the civilian sector could be brought to bear on issues affecting the nation's security. Finally, to provide the President with a top-level advisory body that represented leadership of the key departments involved in national security matters and that drew on the intelligence provided by the CIA, the National Security Council was created.

Some observers have described the National Security Act as a cornerstone in the building of a post-World War II national security state.[14] Whether it is accurate to speak of the emergence of a national security state in postwar America is perhaps more a semantic than a substantive issue. ("Whether a 'cow' is a cow is for the people to decide," as Ludwig Wittgenstein used to say regarding definitional disputes.) The national security state serves as a analytical construct, and, like all analytical constructs, it represents an oversimplification of complex phenomena, with particular features exaggerated or highlighted in the hope that patterns and relationships among the phenomena can thereby be better understood.

Thus, Daniel Yergin's discussion of the origins of the national security state focuses on the triumph of Riga axioms over Yalta axioms.[15] The resulting discussion is far from a full explanation of the roots of U.S. postwar policies toward the Soviet Union, but it does provide a helpful framework for understanding the influence that the prewar experience of American diplomats in Stalinist Russia had

on postwar policies. Similarly, Richard Barnet's discussion of the operational code of the national security manager is somewhat overgeneralized in its application.[16] Still, it captures elements of a mindset prevalent enough to provide useful insights into aspects of policy behavior that otherwise might seem inexplicable.

In more strident variations on the theme, such as that of Marcus Raskin,[17] the post-World War II concern with national security is seen as a euphemism for the militaristic impulse of the ruling elite. National security served as a rallying cry designed to mobilize support for rearmament, with the fear of being branded as communist used to silence those who would object to militaristic policies.

One can acknowledge the importance of elites in shaping postwar American policies, the inclination of the President to "scare hell out of the American people" in an effort to mobilize support for the national security policy of containment, and the pernicious tendency in postwar American politics for anticommunist witch-hunting to be used to intimidate left-of-center critics.

However, only by making the fallacious assumption that policy perspectives that had become widely shared by the early 1950s were equally present from 1945 to 1949 can one sustain the argument that the concept of national security was nothing more than a code word for arming-to-the-teeth against communism. Moreover, only by ignoring policy initiatives that were taken in the early postwar years to *limit* military influence can one equate the concept of national security with militarism.

The ouster of Secretary of Agriculture Henry Wallace from the cabinet in September 1946 doubtless was an important early indication of the loss of influence of the left-wing of the Democratic Party on the Truman administration's foreign policies.[18] Moreover, enunciation of the Truman Doctrine in March 1947 was made in terms of such a broad commitment to the defense of "free peoples" that even such relatively tough-minded policy advisers as George Kennan shuddered.[19]

The oft-noted ambivalence of the Truman administration toward military policies must be acknowledged, however. Despite his evident determination to remain firm if not intransigent in his dealing with Stalin and despite initiation of programs and policies such as the Greek-Turkish Aid Program, the Military Assistance Program, and the NATO alliance, not until the outbreak of the Korean War did Truman depart from his insistence on bare-bone ceilings for defense. The American military buildup that came with involvement in fighting in Korea tended to affirm the view that the key to national security was military supremacy, a view that had been articulated in January 1950 in NSC-68.[20]

The equation of national security with military might that came with NSC-68 and Korea, however, represented an important shift in priorities, not merely a logical extension of the national security perspectives that had prevailed in policy circles since the end of World War II. Truman's State of the Union address in 1947, for example, gave eloquent testimony to a view of national security which, far from being militaristic in emphasis, might well be described as antimilitaristic (but not antimilitary) in tone:

> National security does not consist only of an army, a navy, and an air force. It rests on a much broader basis. It depends on a sound economy of prices and wages, on prosperous agriculture, on satisfied and productive workers, on a competitive private enterprise free from monopolistic repression, on continued industrial harmony and production, on civil liberties and human freedoms—on all the forces which create in our men and women a strong moral fiber and spiritual stamina.[21]

To be sure, even during his years of insistence on penurious defense budgets, Truman was an advocate of military preparedness. For example, as early as the fall of 1945 he was urging Congress to introduce a program of universal military training (UMT). The cynic might point to such advocacy as evidence that

Truman's multifaceted requisites of national security (quoted above) were mere hollow rhetoric, used to conceal an orientation that was essentially militaristic. However, it seems clear that like many other American advocates of universal military training, Truman saw UMT as the best way to ensure military preparedness without encouraging militarism or an undue increase in the influence of the military establishment. As Truman emphasizes in his memoirs, he believed that UMT was more democratic than a program of selective service because no ablebodied male would be exempted from UMT. Moreover, he saw UMT as entirely consistent with the American historical tradition, in which a body of citizen-soldiers (militia) was to provide the democratic alternative to maintaining a large standing army.[22] It was military *training* that was to be universal, as General George C. Marshall, another UMT advocate, emphasized in his 1945 report as Army Chief of Staff; the specter of a huge mass army would thereby be avoided, not promoted.[23]

Despite the arguments of Truman, Marshall, and other proponents of UMT to the contrary, many in Congress and among the public at large continued to fear that UMT was the first step on the road to militarism. Thus, legislation for UMT was never enacted.

A year prior to the scuttling of UMT proposals in favor of selective military conscription, a National Security Act had been passed. Some critics have viewed this legislation as the product of rampant militarism, laying the foundation for a national security state. More accurately, the act was simply another product of widely shared wartime experience. The organizational structure created by the act, although certainly not an inevitable outcome of postwar planning in its specific content, was a highly predictable outcome in terms of general scope and purposes. As explained by James Forrestal, key architect of the act, in testimony supporting it, "The complexity of the modern world, the telescoping of the factors of time and space, require the closest relationship possible between our military and our national policy-making organizations—that is, between the War and Navy Departments and the Department of State.[24] This was an observation that had some far-reaching organizational implications—but surely it was a point of view shared not simply by a tiny elite but by a majority of Americans who had reflected on the experience of the war.

An effective military establishment was the keystone of a successful national security policy, and it is true that some civilians—notably those in the State Department who had experienced the muffling of their voices relative to those of the military during the war—feared military dominance of the national security apparatus. However, what is notable about the National Security Act is not the prominence given to the military role in policymaking but rather the prominence given to civilians as key advisers to the President in national security matters. The key body established by the National Security Act, of course, was a National Security Council (NSC). All of the statutory members of the NSC were (and are) civilians, with the Joint Chiefs of Staff in turn serving as advisers to the NSC. Civilians headed the National Security Resources Board, the Munitions Board, and the Research and Development Board. The CIA was an important exception to the pattern, with a military man selected as its head, although large numbers of persons in key positions in the agency were civilians. The armed forces were subordinate not only to the President as commander-in-chief but also to a civilian Secretary of Defense and civilian secretaries of the three principal arms of service. The Secretary of Defense, in turn, was prohibited by provisions of the Act of 1947 from having his own military staff.

Moreover, with such related organizational developments in national security affairs as the creation of Rand with Air Force sponsorship, the Operations Research Office of the Army, the Navy's Operations Evaluation Group, and

the General Advisory Committee of the Atomic Energy Commission, civilians began to shape strategic doctrine and military planning to a degree that had been unthinkable in the prewar era.

But if the postwar consensus was that national security was too multifaceted to leave to the generals and admirals, it also implied that "the modern major-general" ought to know more than drill and fortifications. Social, political, psychological, economic, and technological factors had to be taken into account in military planning, operations, and training to a far greater extent than in the past. The increasing emphasis on the deterrence mission in the nuclear age added its own complexities. As a former head of the Department of Social Sciences at West Point observed, the expertise required of the modern military professional included "the management and application of military resources in deterrent, peacekeeping, and combat roles in the context of rapid technological, social, and political change."[25]

The requisites of the deterrence mission have not necessarily been consistent with those of the mission of preparing to fight; likewise, the requirement to be sensitive to dimensions of social and political change in the world is not necessarily readily integrated with a demand to be technically proficient. Ambiguities regarding mission are associated with ambiguities regarding the measures by which one's performance as a military professional will be measured. Is combat-related technical proficiency the key skill that should be cultivated? What real payoff in career terms can one expect with the development of foreign-language proficiency? How important are public relations skills? Is effectiveness in dealing with congressional staffers the mark of a true military professional, or the mark of a military man who has abandoned professionalism?

Despite these mounting ambiguities, it is true that the American military in the post-World War II era attained a position of importance critical to the success of many governmental policies. Never before in peacetime had the military assumed such vast and far-flung responsibilities, ranging from occupation and postwar reconstruction to foreign military advisory and assistance duties. In early postwar occupation roles, individual military leaders such as General Douglas MacArthur in Japan and General Lucius D. Clay in Germany exercised enormous influence over American policies, sometimes to the consternation of officials in the State Department.[26] With subsequent American armed involvement first in Korea and later in Vietnam, the military in general became a key instrument of American policy.

Some critics have complained, especially in response to military actions in Vietnam, that the military had become too powerful and were able to carry out operations contrary to American best interests and principles.[27] The general pattern over the decades since World War II, however, has been one of a growing tendency on the part of American presidents and their top civilian advisers to assume control over military operations, even to the point of dictating details of tactics and maneuver believed by military professionals to be within their exclusive province of specialized competence. The confrontation between Secretary of Defense Robert S. McNamara and the Chief of Naval Operations, Admiral George W. Anderson, during the Cuban missile crisis is a classic example of the trend. McNamara was not willing to concede, as Anderson insisted, that the Navy's long-established expertise in conducting blockades entitled it to conduct this one without civilian direction.[28]

Even such an apparent deviation from the general pattern as the action taken by General John D. Lavelle in Vietnam in 1972 serves only to underscore the point that military professionals increasingly have felt hampered by what they have perceived as civilian meddling. Lavelle was relieved of command of the Seventh Air Force and permitted to retire from the service when it was discovered that he had ordered 24 bombing missions in violation of established

"protective-reaction-strike-only" policies. Moreover, he had ordered records of the missions altered to cover-up the policy violations. The point here is not that Lavelle's actions were justified but that they were taken because "he felt deep frustration about constraints on the air war, and about the fact that airmen were killed because of those constraints." His civilian as well as military superiors had urged him to be more aggressive in the conduct of the air war in Vietnam at the same time that they were imposing restrictions which, in his view, made it more difficult to carry out aggressive actions effectively.[29]

Although it was during the tenure of Secretary of Defense Melvin R. Laird that General Lavelle was relieved of command, Laird's general willingness to work closely with the Joint Chiefs of Staff and to respect their judgment led to a reduction in civilian-military strains that had been experienced during the McNamara years. Nevertheless, the trend toward centralized control that was so evident in the McNamara era continued under Laird and has continued subsequently. It is a trend that is explicable in part—perhaps in large part—simply as the outgrowth of developments in communication technology. Washington keeps tighter reins on the actions of U.S. military (and civilian) personnel in Seoul or Berlin or on board the *Enterprise* because *it is now possible* to monitor such actions on a continuous basis. The current emphasis on command, communications, and control (C^3) reflects such developments.

A related factor that must be included in an explanation of the trend toward centralization of control is one describable in terms of organizational learning. Especially as the result of experience in foreign policy crises, failures in the past that were attributable at least in part to lack of guidance from Washington or to breakdowns in communication between Washington and commanders in the field have led to an increasing emphasis on the development of finely tuned, centralized crisis-management systems. Thus, the control that was exercised from Washington during the Cuban missile crisis in part represented a reaction to earlier failures to exercise an appropriate degree of control over the Bay of Pigs invasion. The close monitoring and direction of actions leading to the rescue of the *Mayaguez* and its crew were prompted in part by the still fresh memories of faulty communication and a failure to prevent the crew of the *Pueblo* from being seized and taken to North Korea to be imprisoned.[30]

Although the rationale for centralization of control has been articulated most often in terms of the imperatives of crisis management, the centralization impulse is evident also in relatively routine operations. The impulse is reflected not merely in the tendency of civilian officials in Washington to issue directives governing facets of routine military activity ranging from the housing of personnel to supply purchasing procedures. It also is reflected in the tendency of top military officials to grant less autonomy to subordinate commanders than was the case in an earlier era.[31] Such a tendency is explicable in part in terms of personnel policies that foster a rapid turnover in command positions, thereby encouraging top officials to overdirect and oversupervise in order to prevent the rapid fluctuations in policies and procedures that might come if local command autonomy were permitted. Related factors are the PR-consciousness of modern military managers and the high visibility-to-media criticism of those in top positions. As William L. Hauser has noted, "In order to decentralize, high-level leaders and managers must be willing to accept some error, abuse, and inefficiency on the part of subordinate units."[32] But such risks are precisely of the sort that officials in highly exposed positions are unlikely to be willing to assume.

Military professionals in command and in staff positions not only have become increasingly dependent on guidance from their superiors, they have also become increasingly dependent on technology.[33] Sophisticated tech-

nological equipment such as computers, radar, and electronic sensors have become more complex as they have become more ubiquitous in military organizations.

The trend toward technological dependence is evident even in the infantry, the prototype of the traditional, labor-intensive fighting unit. It is in the more traditional military organization that the trend has been most threatening to professional self-image, for reasons well described by Morris Janowitz in his examination of the struggle among military technologists, military managers, and heroic leaders.[34] The trend is now even more pronounced than it was when Janowitz identified it in *The Professional Soldier* twenty-one years ago. Paradoxically, the military professional of today is quite likely to be both more skilled technologically than was his counterpart of twenty years earlier and more technologically dependent. He is more likely today to define his tasks in terms that reflect extended exposure to managerial paradigms and managerial jargon; yet like his counterpart a generation earlier, he probably insists that his role is primarily one of leadership rather than one of management.

The Concept of Professionalism Reconsidered

The pattern of thirty-five years of experience of American military professionals with being asked to contribute to national security is one in which they have found the demand for professionalism expanded and intensified (greater breadth of expertise, more technological and managerial competence) at the same time that they have felt hampered and thwarted in the exercise of independent professional judgment (through a blurring of boundaries between military and civilian domains of expertise, through centralized control, and through increased dependence on advanced technology). The pattern is one that requires us to rethink the concept of professionalism. In Samuel P. Huntington's classic treatment of the subject, a persuasive case was made for defining professionalism in terms of advanced expertise, corporateness, and social responsibility.[35] However, especially when the effort was made to apply these three criteria to the relative degree of professionalism displayed by military organizations across time and across political systems, various scholars expressed doubts about the utility of this definition. If a military establishment acquired greater expertise over the years but also was showing an increased propensity to meddle in politics in pursuit of parochial self-interests (thereby displaying a lack of social responsibility), was it becoming more professionalized or less professionalized?

A similar question arises with the pattern of adjustment of the American military establishment to the national security era since World War II: Has American military professionalism increased or decreased over the past several decades? No clear answer emerges if one attempts mechanically to measure professionalism using the three criteria suggested by Huntington.

Clarification is provided with the introduction of some distinctions. It is useful, first of all, to distinguish between the extent to which a particular institution, such as the military, has become professionalized and the professionalism displayed by the particular individuals within the institution. Second, as suggested recently by Richard Betts, it is useful to distinguish among individuals by the positions they occupy and to recognize that the professionalism to be expected to some extent will be a function of position and not merely of the individuals who occupy the position.[36]

The professionalism of institutions can be identified most readily by structures, doctrine, procedures, and institutionalized standards, whereas the professionalism of individuals is most evident in attitudes and behavior (the former relevant to the degree that they permit inferences about the latter).

Thus, we may say that an institution such as

the military is professional to the extent that:

- it develops structures (such as schools and staff organizations), doctrine, and procedures for the systematic accumulation, dissemination, and use of task-related knowledge, and for the effective and efficient use of resources to carry out assigned tasks (missions);
- it develops and maintains standards for performance;
- its personnel selection and advancement reflect such standards.

In general, this measure of institutional professionalism corresponds to the corporatism that Huntington discusses. Expertise per se is not a measure of institutional professionalism. However, the standards of performance serve to provide an institutionalized guarantee of requisite levels of expertise: the higher the standards the more professional the institution. Similarly, although the professionalism of an institution as a whole is not appropriately measured by the social responsibility of its various members, standards of performance surely include norms of conduct and ethics that are highly relevant to the social responsibility of the institution.

The professionalism of individuals, as distinct from the institutions of which they are a part, is appropriately determined by the skill and judgment they put into practice in the performance of professionally relevant tasks and the commitment they demonstrate to the ideals of the profession and its corporate development.

Even though individuals may acquire more expertise as they gain additional professional career experience, they may find themselves in assignments that either deny them the opportunity to exercise their skill and judgment fully or that detract from their commitment to professional ideals and corporate concerns. Betts's observation is relevant here. Briefly, he notes that the higher a professional rises in the governmental hierarchy, the more politicized will be the process by which he is selected and the nature of the duties that he is assigned. Thus, "pure professionals" are more likely to be found among military officers below flag rank than among those whose flag-rank positions push them inexorably into the political arena.[37]

The insight is a useful one (especially as applied by Betts to a clarification of the debate between traditional administrative theorists and bureaucratic revisionists). However, it is important to recognize that those below flag rank are not necessarily "pure professionals." Just as high-ranking positions impose demands through a fusion of responsibilities with those of the civilian sector, lower-ranking positions impose the demands and constraints of subordination. The full exercise of professional skill and judgment may thereby be denied or constrained.

Frustrations associated with constraints and competing role demands may erode the individual's professional commitment. As Andrew Bacevich has observed,

> The indispensable prerequisite of military professionalism is personal autonomy. Individual commitment—freely undertaken, willingly offered—underlies the professional's dedication to common purposes, shared values, and internally regulated standards of performance.[38]

The distinctions between institutional and individual professionalism and variations in individual professionalism that are explicable in terms of position help one to comprehend the paradoxical pattern of military professionalism that is being simultaneously fostered and thwarted in the national security era. The state has tended to promote the professional development of American military institutions, in general, by urging them to raise standards of performance and modify structures, doctrines, and procedures in ways that would enable them to respond to more complex and challenging demands. On the other hand, for various reasons previously stated, individual professionalism has been threatened to some extent (with variation from one assignment and position in the hierarchy to another) by trends in recent decades.

As noted earlier, some of the intrusions on autonomy, which have been frustrating to military professionals, have been unintended consequences of measures taken for other reasons (for example, availability of technology that can enlarge the volume of information available to decision-makers). Yet there are compelling reasons why the state denies full autonomy to professionals. Professional expertise is power, and the autonomous exercise of expertise is power beyond state control, which is unacceptable. The final paradox the student or practitioner of military professionalism must confront is that autonomy per se is no guarantee that professionalism will be enhanced. The often unprofessional conduct of Army bureau chiefs in the years before the Root reforms illustrates the point.[39]

THUS, no simple solutions emerge, either from the perspective of society as a whole or from that of the military professional. There is no turning back to what some might describe as the halcyon days of the pre-World War II era. The society and American military personnel need to understand that military professionalism has been made more complicated and more challenging by the demands of the national security era. The commitment to and encouragement of military professionalism are as needed today as ever before; but the imperatives of civilian control, among other reasons, dictate the imposition of continued constraints on professional autonomy.

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This article in somewhat different form was presented to the Twentieth Anniversary National Conference of the Inter-University Seminar on Armed Forces and Society, Chicago,23-25 October 1980.

Notes

1. I agree with Daniel Yergin that it is reasonable to describe national security as a commanding idea in post-World War II America, although as the subsequent discussion will make clear, I disagree somewhat with Yergin on the meaning that was given to the concept by policymakers in the early years after the war. For his views, see Daniel H. Yergin, *Shattered Peace: The Origins of the Cold War and the National Security State* (Boston, 1977).

2. On the eve of the 1932 elections, the Republicans boasted proudly in campaign literature that the American Army "through successive reductions had reached the irreducible minimum consistent with self-reliance, self-respect and security." Republican Party National Committee, *Campaign Textbook 1932*, pp. 86-87.

3. Bernard M. Baruch, *The Public Years* (New York, 1960), pp. 263-82.

4. George F. Kennan, *American Diplomacy 1900-1950* (New York, 1959), pp. 86-87.

5. As Hull observed of the principles of international law and moral conduct he was promoting in the 1930s, "to me there was nothing vague about them. They were solid, living, all-essential rules. If the world followed them, the world could live at peace forever. If the world ignored them, war would be eternal. . . . To me these doctrines were as vital in international relations as the Ten Commandments in personal relations." Cordell Hull, *The Memoirs of Cordell Hull*, 2 vols. (New York, 1948), I:536. See Also the commentary by Donald F. Drummond, "Cordell Hull," in *An Uncertain Tradition: American Secretaries of State in the Twentieth Century*, edited by Norman A. Graebner (New York, 1961), chapter 10.

6. Mark S. Watson, *Chief of Staff: Prewar Plans and Preparations*, United States Army in World War II (Washington: Chief of Military History Office, Department of the Army, 1950), p. 123, quoted with commentary by Harvey C. Mansfield, in Walter Millis, *Arms and the State: Civil-Military Elements in National Policy* (New York: Twentieth Century Fund, 1958), pp. 50-51.

7. However, as Baruch has observed, programs such as those of the Army Industrial College were "only small islands of concern in a sea of indifference": *The Public Years*, pp. 264-65. See also James E. Hewes, Jr., *From Root to McNamara: Army Organization and Administration, 1900-1963*, Special Studies (Washington: Center of Military History, U.S. Army, 1975), pp. 50-56.

8. Ray S. Cline, *Washington Command Post: The Operations Division*, United States Army in World War II, The War Department (Washington: Office of the Chief of Military History, Department of the Army, 1951), chapter 2. The War Plans Division was redesignated the Operations Division in 1942.

9. Ibid., p. 44.

10. U.S. Army, Command and General Staff School, *Principles of Strategy* (1936), pp. 19-20, quoted by Samuel P. Huntington, *The Soldier and the State* (Cambridge, Massachusetts, 1959), p. 308.

11. The dramatic change that occurred in the realm of pure, as distinct from applied, science is described by Daniel S. Greenberg, *The Politics of Pure Science* (New York, 1967), chapters 3-5. Greenberg notes that with the resulting altered relationship, in the early postwar years "it is evident that something between seduction and rape repeatedly occurred, but at various points it is by no means certain which party was the aggressor and which the victim," p. 124.

12. The shorthands were appropriate in the sense that they accurately refer to the historical events most salient to those that experienced them. This is not to deny that the lessons learned sometimes have been misapplied to more recent circumstances. See Ernest R. May, *The Lessons of the Past: The Use and Misuse of History in American Foreign Policy* (New York, 1973).

13. Arthur H. Vandenberg, Jr., with Joe Alex Morris, *The Private Papers of Senator Vandenberg* (Boston, 1952), p. 577.

14. For example, Yergin, *Shattered Peace;* Richard J. Barnet, *Roots of War* (Baltimore, 1973); Marcus G. Raskin, *The Politics of National Security* (New Brunswick, New Jersey, 1979).

15. Yergin, especially chapters 1, 2, 8.

16. Barnet, *Roots of War,* Part I.

17. Raskin.

18. For details, see Richard J. Walton, *Henry Wallace, Harry Truman, and the Cold War* (New York, 1976), chapter 13.

19. George Kennan, *Memoirs, 1925-1950* (Boston, 1967), chapter 5.

20. The full text of NSC-68 was made available the year it was declassified, in *Naval War College Review,* May-June 1975, pp. 51-108. See also the analysis by Sam Postbrief, "Departure from Incrementalism in U.S. Strategic Planning: The Origins of NSC-68," *Naval War College Review,* March-April 1980, pp. 34-57.

21. Harry S. Truman, Second Annual Message, January 6, 1947, reproduced in *American Military Thought,* edited by Walter Millis (Indianapolis, 1966), pp. 459-63, 462.

22. Harry S. Truman, *Year of Decisions,* 2 vols. (New York, 1965), 1:561-63.

23. U.S. Army, Chief of Staff, *Biennial Report of the Chief of Staff, July 1, 1943 to June 30, 1945,* excerpted in Millis, *American Military Thought,* pp. 436-45.

24. U.S., Congress, House of Representatives, Committee on Expenditures in the Executive Departments, *Hearings: National Security Act of 1947,* 80th Cong., 1st sess., 24 April 1947, p. 99.

25. Amos A. Jordan, Jr., "Officer Education," in *Handbook of Military Institutions,* edited by Roger W. Little (Beverly Hills, California, 1971), p. 212, quoted with approving comment by a member of the faculty of the Army War College, Colonel Donald F. Bletz, "The 'Modern Major General' (Vintage 1980)," *Parameters,* vol. 4, no. 2, 1974, pp. 40-51.

26. As Jack Raymond has noted, "It was symptomatic of the relative positions of the State and War Departments that when Clay left for his assignment as Military Governor in Germany, April 1945, he conferred with many persons in Washington but no State Department officials. 'Nor was it suggested that I do so,' General Clay afterward recalled." Jack Raymond, *Power at the Pentagon* (New York, 1964), p. 103.

27. Such criticisms were especially in abundance in the late 1960s and early 1970s. For a collection of the views of concerned members of the Congress from that era, see Erwin Knoll and N.J. McFadden, editors, *American Militarism 1970* (New York, 1969).

28. A reporter who was especially privy to recollections of the events by participants in the crisis decision-making has provided a most colorful account of the confrontation. When Admiral Anderson allegedly waved the manual of Navy regulations in McNamara's face, explaining that everything he needed to know about blockades was in there, McNamara is said to have replied testily, "I don't give a damn what John Paul Jones would have done. I want to know what you are going to do, now." Elie Abel, *The Missile Crisis* (New York, 1966), p. 137.

29. See the detailed account by George C. Wilson, "Washington: The Lavelle Case," *Atlantic Monthly,* December 1972, pp. 6-27. The opinion expressed in the quotation is attributed by Wilson to associates of Lavelle.

30. See Richard G. Head, Frisco W. Short, and Robert C. McFarlane, *Crisis Resolution: Presidential Decision Making in the Mayaguez and Korean Confrontations* (Boulder, Colorado, 1978).

31. One example of this tendency toward increasing centralization of control, with a resulting reduction in autonomy in subordinate commands, is the trend in the relationship between the service academies and the headquarters of the parent arms of service. The trend is described in John P. Lovell, *Neither Athens Nor Sparta? The American Service Academies in Transition* (Bloomington, Indiana, 1979), pp. 220-25.

32. William L. Hauser, "A Smaller Army? Adapting to the All-Volunteer Situation," *Parameters,* September 1979, p. 6.

33. See John C. Binkley and Donald B. Vought, "The Six-Million Dollar G-3: Military Professionalism in the Computer Age," paper presented at the Southeast Regional Conference of the Inter-University Seminar on Armed Forces and Society, Air University, 3-5 June 1979.

34. Morris Janowitz, *The Professional Soldier: A Social and Political Portrait* (Glencoe, Illinois, 1960).

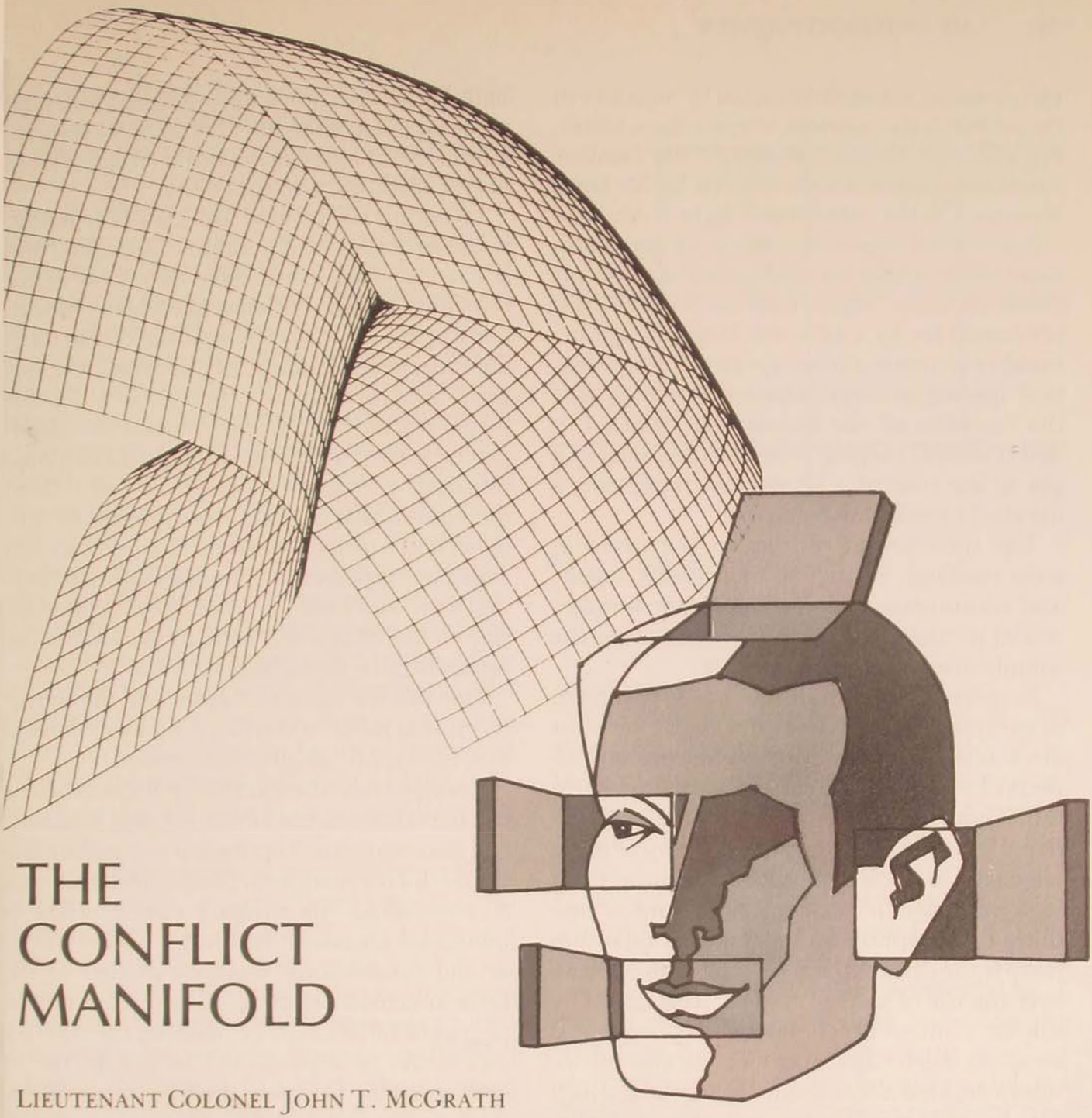
35. Huntington.

36. Richard K. Betts, *Soldiers, Statesmen, and Cold War Crises* (Cambridge, Massachusetts, 1977).

37. Ibid., chapter 3.

38. Captain Andrew J. Bacevich, Jr., USA, "Progressivism, Professionalism, and Reform," *Parameters,* March 1979, p. 66.

39. Williston B. Palmer, "Excerpts from the Evolution of Military Policy in the United States—Five Lectures Delivered at the Army Information School, Carlisle Barracks, PA, 1946," reprinted in U.S., Senate, Committee on Armed Services, *Hearings: National Defense Establishment,* 80th Cong., 1st sess., 1947, Part 3, pp. 652-59. Also John D. Wainwright, "Root Versus Bliss: The Shaping of the Army War College," *Parameters,* vol. 4, 1974, pp. 52-65.



THE CONFLICT MANIFOLD

LIEUTENANT COLONEL JOHN T. MCGRATH

THE so-called spectrum of potential conflict is used today as a model of warfare and a basis for national strategy. Professional military education courses depict it as a continuum ranging from political agitation on one extreme to total thermonuclear war on the other.[1] Unfortunately, a "spectrum" is woefully outdated as a model on which to base our future lives and fortunes and should be replaced by a multidimensional "conflict manifold."

The word *spectrum* is defined in terms of the light and radio spectrum, which emphasizes the orderliness (by wavelength) and the continuous aspects of our everyday use of the word *spectrum*. But spectra come in many shapes and sizes; they may be continuous or discontinuous, linear or nonlinear. For exam-

ple, ordinary sunlight refracted by moisture in the air forms the rainbow, whose colors, blending into one another, comprise the familiar continuous spectrum discovered by Sir Isaac Newton. On the other hand, light from individual atoms forms a discontinuous spectrum; these spectral lines are evident in the different colors of "neon" signs (each color of which is accounted for by a different atomic gas). Our number system is a linear spectrum, with identical spacing between adjacent elements. But the response of the human ear, which can detect sounds ranging from the dropping of a pin to the roar of a jet engine, represents a decidedly nonlinear spectrum.

The spectrum of conflict, as portrayed in most readings, is single-dimensioned, linear, and continuous. It is probably the simplest model possible, but it is just too naïve for the complexities of modern warfare.

Evidence for discontinuity in the spectrum of conflict comes from several areas; the most obvious is the nuclear versus conventional aspects of war. Whereas there is a clear progression from 500- to 750- to 1000-pound conventional bombs, or even from one to two to three megatons in nuclear weapons, the jump from high-explosive to nuclear detonations is anything but continuous. Indeed, this quantum jump is the central point of issue in the debate over the use of tactical nuclear weapons. The use or nonuse of chemical and biological weapons, herbicides, and their ilk also constitutes a decided discontinuity. Targeting, which can be industrial, military, or population oriented, also represents distinct subsets that cannot blend into one another as do the colors of the rainbow.

The linearity of warfare is likewise open to doubt. The incredible range of available weapons, from stones and slingshots to smart bombs and cruise missiles, can be ordered in degree of complexity. But it would be folly to assume that the step from muzzle-loader to repeating rifle is identical in impact to that from gravity bomb to cruise missile. The issues of war are similarly nonlinear in scope, ranging from simple occupation of territory to complex economic subtleties. The countries involved vary widely in size, ideology, and capability.

In noting the diverse aspects of targeting, weapons, issues, and political constraints, one is hard pressed to conceive of war as being one-dimensional. An example that comes to mind is the use of an Olympic boycott to meet the Russian challenge in Afghanistan. Without going into its ultimate efficacy (on which the jury is still out), the decision to use the Olympics is clearly an example of multidimensional thinking. The grain embargo added a third dimension, that of economics. Had the President chosen to match military intervention with a military response, i.e., one-dimensional thinking, we would have reverted to the brinkmanship of the Dulles era, with an increase in the unpredictable probability of war.

One can cite more examples, but the simple fact is that modern conflict is neither continuous, linear, nor single-dimensioned.

Consequently, the spectrum must be replaced by a multidimensional model, perhaps nonlinear and discontinuous. Topological mathematicians would call it a manifold; hence, the name conflict manifold. Its primary characteristic is multidimensionality. Instead of having nuclear and conventional weapons as part of the same dimension, each would have its own. The degree of independence between the two factors would be represented by the degree of orthogonality between the two dimensions. Completely independent factors would be represented by dimensions that are totally orthogonal or perpendicular. The conventional and nuclear weaponry dimensions might be continuous; within each of these dimensions, there is a smooth gradation in size and efficacy of weapons employed.

A third dimension, targeting, might then be added; this would likely be a discontinuous dimension with a discrete point for each type of target, namely, industrial, military, etc. A fourth dimension might contain the issues in-

volved, a political dimension. A fifth could be the cost or economic dimension, etc.[2]

The number of dimensions is immaterial; it does not matter that it is virtually impossible to visualize five or more dimensions as being mutually perpendicular. The important point is that each independent factor in conflict can be assigned its own dimension; this dimension is then tailored to that factor's continuity or discontinuity, linearity or nonlinearity. Interactions between factors would be represented by a hypersurface in this multidimensional space.

One result of such a model of conflict is that choices are no longer restricted to sliding in one direction or the other along a unidimensional scale. This unfortunately complicates matters. However, the real world is indeed very complicated and seldom conforms to simple models. This complexity of choice was always present but perhaps masked by the choice of model. By conceptually freeing our model from a linear spectrum, we enlarge the range of our strategies. We can be more specific in response, with greater delineation of purpose, as opposed to the simple strategy of "upping the ante."[3]

Our multidimensional manifold has another striking benefit; it can accommodate the "catastrophe theory" of René Thom.[4] This is a mathematical theory that can be used to explain unpredictable events, hence the term *catastrophe*. Unpredictable behavior is characteristic of many systems, whether mechanical, physical, biological, or social. The example commonly used to illustrate this theory is the "flee or fight" choice.[5] When confronted by an adversary, an animal has two general choices, fleeing or fighting. Its first inclination is to flee or avoid the conflict if possible. But, if pushed further, the fleeing animal reaches a point where it turns suddenly and fights; we commonly say it has been pushed too far. If the adversary retreats, the animal will continue to fight, even in a regime where it had previously resorted to flight. Further retreat by the adversary will cause the animal to break off the attack just as abruptly as it started.

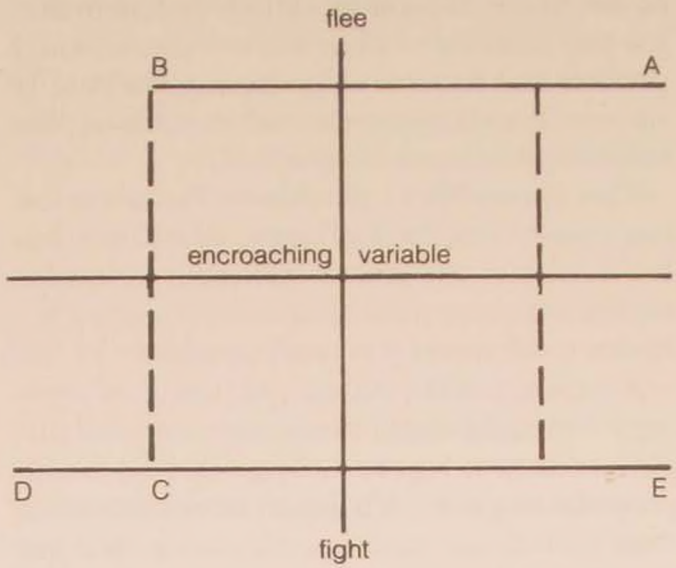


Figure 1. Encroaching variable

The concept is diagrammed in Figure 1. As the encroaching variable moves to the left along the horizontal axis, the tendency is to continue to flee, along the path A to B. But a point is reached, B, where the fleeing one turns and fights. This is represented by an abrupt drop to point C. Further encroachment keeps the animal fighting in going from C to D. If the encroachment variable is eased or retreats (moves to the right along the horizontal axis), the animal continues to fight, shown by the path C to E. At E it breaks off the attack as abruptly as it started. This behavior exhibits a double-valued function in the region of concern; the term *hysteresis* is normally used to describe it.

The value of Thom's work lies in seeing this graph as part of a surface, as shown in Figure 2. As the path from A to D is traced, the subject falls off a ledge, so to speak, from the area of fleeing behavior to the area of fighting behavior. In returning to A along the same path, the fight behavior continues to point E, and then "falls up" to the upper surface. This abrupt "falling up and down" is the catastrophe part

of the theory. More important for us, note that it is part of a fold or pleat in a two-dimensional surface; it is possible to go from point A to D via point F and never encounter the catastrophic behavior that occurs at the fold.

This exemplifies only one of Thom's seven elementary catastrophe figures, called the cusp, but illustrates the point. The theory includes surfaces of many dimensions, representing behavior controlled by several variables.

Avoidance of the catastrophe requires moving into an additional dimension, over the single one used in Figure 1. By going back to the proposal to place each aspect of conflict in its own dimension, perhaps targeting changes would be a better path to take than a switch to nuclear weaponry in a given situation. Perhaps negotiation would be the additional dimension to be used. For example, in Afghanistan reliance on a purely military dimension could possibly carry us to the brink of a "catastrophe." Open military counterforce might place the Russians in a flee or fight position with its inherent unpredictability. Since it is so difficult to determine the parameters controlling the situation and the behavior changes are so drastic, the situation is virtually out of control. In contrast, the boycott puts the Soviets in the more predictable dimension of world opinion. Their actions (such as overpreparation for the games, internal and external propaganda, and the use of American tourists as unwitting pawns) are what we would normally expect of a nation put in their position—and these actions do not lead to war.

The Iranian situation is a second example. The Iranians were certainly using multidimensional thinking in taking international hostages. Our consideration of such alternatives as blockade, embargo, and military rescue were apparently multidimensional. The catastrophe fold comparable to flee or fight that we are trying to avoid was putting the Iranians into a kill or release the hostages position.

In the Russian case, we want the Russians to leave Afghanistan. In Iran, we wanted freedom for the hostages. But we have not wanted to force either country into a behavior region where a slight change in conditions would abruptly trigger war or death of the hostages.

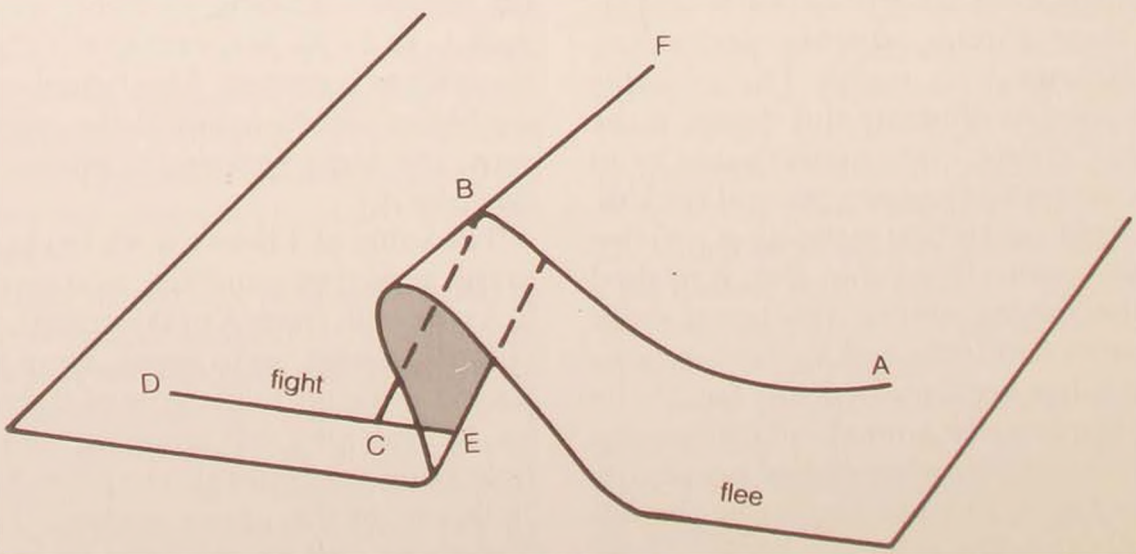


Figure 2. The catastrophe fold

The intent is to find a way (dimension) to achieve the end without crossing a catastrophe fold. In either case, the single-minded pursuit of only one dimension, e.g., invade/not invade or rescue/not rescue, would likely be disastrous.

We are certainly not constrained to two dimensions or combinations of two dimensions, although these cases are easily pictured. Perhaps we rely too often on pictures or visual aids to clarify and represent our conceptual thinking, to the extent that we fail to generalize sufficiently or include ideas that defy direct visualization. The conflict manifold, as opposed to the spectrum of conflict, is thus a step in the right direction, removing some of our conceptual barriers.

It is relatively straightforward to look at a portion of reality and devise a model to account for its characteristics. The linear, continuous spectrum of conflict was a decent first try at a representation of warfare, but a real gain is made when the model furthers our knowledge of reality. Here, the spectrum of conflict is too limited—it lacks power. A model of conflict as a multidimensional manifold, with the idiosyncrasies and pathology of a mathematical hypersurface, increases our predictive power tremendously. It remains to refine and modify the manifold as predictions are compared with experience.

The point to be made here is not the adoption of topological mathematics or any other scientific area into political thinking. The emphasis is on a shift in viewpoint from the linear, one-dimensional spectrum of conflict to a multidimensional manifold. This multidimensional approach allows the incorporation into decisions of such worthwhile ideas as catastrophe theory, allows greater flexibility in planning, and probably conforms better to reality. If this shift in viewpoint is seriously pursued, the final model may not look like anything proposed here, but it is a start.

United States Air Force Academy

Notes

1. *Fundamentals of Strategy*, Air Command and Staff College, Course 1F, Lesson 3 (Gunter AFS, Alabama: Extension Course Institute, Air University, 1976), p. 21; *National Security Strategy*, Air Command and Staff College, Course 1F, Lesson 4 (Gunter AFS, Alabama: Extension Course Institute, Air University, 1976), p. 30.
2. E.C. Zeeman, "Catastrophe Theory," *Scientific American*, April 1976, pp. 76, 80.
3. *Air Force Policy Letter for Commanders*, 1 October 1978, p. 1.
4. R. Landauer, "Stability in the Dissipative Steady State," *Physics Today*, November 1978, p. 23; René Thom, *Structural Stability and Morphogenesis: An Outline of a General Theory of Models*, translated by D.H. Fowler (Menlo Park, California: W.A. Benjamin, Inc., 1975).
5. Zeeman, p. 65.

For he who fights and runs away
May live to fight another day;
But he who is in battle slain
Can never rise and fight again.

Oliver Goldsmith
The Art of Poetry on a New Plan (1761)

military affairs abroad

JAPAN-SOUTH KOREA SECURITY TIES

DR. EDWARD A. OLSEN

THE Japanese are acutely sensitive to the threat of major hostilities on the Korean peninsula. Japan's proximity to Korea, the reliance on American defense commitments that Japan shares with the Republic of Korea, and the probable use of United States bases on Japanese territory to defend South Korea would make nearly inevitable Japan's involvement in a future Korean war.

The collapse of American-supported governments in Indochina in 1975 and Vietnam's blitzkrieg conquest of Cambodia in 1979 aroused Japanese uneasiness over the possibility that North Korea might attempt to emulate Hanoi's example in Northeast Asia. Tokyo also was concerned that the Indochina experience might lead to a premature withdrawal of United States forces from South Korea. The Carter administration's attempt to reduce American troops in South Korea and the subsequent foreign policy debate stirred up in the United States further intensified Japan's concern.

The assassination of President Park Chung Hee in October 1979 and the following political instability in South Korea that produced a "new Park" in Chun Du Hwan presented a real threat to peace on the Korean peninsula.[1] P'yongyang's wait-and-see attitude coupled with Washington's reaffirmation of support and Seoul's surprising resiliency to national trauma have reduced somewhat Tokyo's apprehensions. Nevertheless, the cumulative impact of all these events has had an unsettling effect on Japan.

Japanese leaders of all political stripes regularly urge continued diplomatic efforts to prevent armed conflict and create an international atmosphere in which Korea might be reunified through mutual understanding. However, they do not expect peaceful reunification. In fact, the Japanese prefer the status quo of a divided Korea because it inherently weakens what otherwise could be a formidable Asian power. What the Japanese do not want under any circumstances is a war in Korea that might involve Japan directly or indirectly. Japan sees the possibility that North Korea's Kim Il Sung may seek to achieve unilateral unification by force as the greatest threat to stability in Northeast Asia. The Japanese clearly hope that normalization of U.S.-China relations may lead to superpower backing for improved North-South Korea relations. However, the Japanese are well aware of the danger that P'yongyang may feel pressed by political instability in Seoul to resort to a quick-strike military option, regardless of any foreign support, while it may remain a viable option. Seoul's vulnerability to a quick-strike/sue-for-peace maneuver by the North, Seoul's periodic political difficulties with Washington, the chance that P'yongyang may again perceive the United States as wavering in its support of South Korea, and the danger that P'yongyang may try to compel either Moscow or Beijing (Peking) to support a move against the South by alleging that Seoul made the first move—all combine to keep this option open. However, the longer P'yongyang delays using such an option, the stronger Seoul becomes militarily and economically and the greater its independent capability to deter and repel the North. As a consequence of this volatile situation in its neighborhood, Japan sees indefinite American defense commitments to the Republic of Korea, shoring up South Korea's effort to attain greater self-reliance, to guarantee Northeast Asian peace and stability.

Congressional and press debates in the United States over continued American military support for the repressive Park regime in South Korea and the fallout from the "Koreagate" scandal created additional Japanese uncertainty about the future of American security commitments to South Korea. The measures instituted by Park's successors and their impact on the nature of the relationship between Washington and Seoul will be carefully scrutinized by Tokyo in the coming months. Japanese leaders repeatedly have said that they rely on Washington's willingness to provide an effective response to military action against the South and that they expect American forces to remain in Korea for several more years. Appreciating the important political purpose served by the American troop presence in reassuring the South and restraining the North, Japan has steadily cautioned the United States against any precipitous withdrawal. Despite Washington's repeated reassurances, however, Japanese leaders remain uncertain about the manner and impact of an eventual American

troop withdrawal from Korea.

THE situation in Korea, an increased Soviet military presence in Japan's "northern territories" and in Southeast Asia, and uncertainties about the long-term direction of United States foreign policy stimulated in Japan an upsurge in defense consciousness. For the first time in the postwar period, it now is intellectually and morally respectable for the Japanese to discuss defense and security issues publicly. The Fukuda, Ohira, and Suzuki administrations have been in the thick of these deliberations. Though the outcome in terms of defense policy changes is still undetermined, clearly an attitudinal sea change is occurring in Japan.[2]

A relatively little-noticed corollary to these developments is taking place in Japan-South Korea relations. In the spring and summer of 1979, Japan and the Republic of Korea (ROK) exchanged several senior security-oriented delegations. Included in the exchange were a visit by General Kim Chong Hwan, then Chairman of the ROK Joint Chiefs of Staff, to Tokyo to meet with then Japan Defense Agency (JDA) Director General Yamashita Ganri; a *tour d'horizon* of regional security issues in South Korea by General Nagano Shigeto, Chief of Staff of the Ground Self Defense Force; and two visits to South Korea by former JDA heads to establish a Japan-ROK Parliamentarian Security Council. This series of exchanges was capped in July by a groundbreaking visit to South Korea by the head of Japan's Defense Agency. Director General Yamashita's trip was praised by the press of both countries, though with some reservations in Japan. Yamashita's talks with senior officials in Seoul produced discussions of closer Japan-ROK security cooperation but few concrete results. It nevertheless set a precedent for future cooperation.[3]

Coming in the wake of a widely publicized resurgence in Japanese popular and official interest in security affairs, this sudden spate of Japan-South Korea contacts generated much discussion about the implications. Speculation has focused on the possible scope of future contacts, ranging from the continuation of the status quo to the formation of an alliance.[4] In order to address this issue more fully, it is worthwhile examining the evolution of broader bilateral relations to date.

JAPANESE relations with South Korea are, and long will remain, tainted by the legacy of Japanese colonialism in Korea (1905-45). Post-World War II bilateral relations were hampered by Korean preoccupation with Japanese reparations and Japan's absorption with its own economic redevelopment. Not until 1965 were the two sides able to focus on each other, reconcile their major differences, and establish a semblance of normal relations. Since 1965, bilateral economic relations have blossomed, reaching very substantial proportions by 1979-80.

Bilateral political ties, nevertheless, have been less than sanguine. Hostile popular perceptions remain mutual. South Koreans admire Japan's material accomplishments and consciously strive to emulate Japan, but they distrust long-range Japanese intentions. The Japanese, until recently, have considered Koreans second-class people, to be endured but not accepted. However, Korean economic prowess—sometimes at Japan's expense—is boosting Japanese perceptions of South Koreans. In well-informed Japanese circles, a new level of respect for South Korea is palpable. Complete Japanese acceptance of South Koreans as equals seems far off, but a growing body of common interests gradually has nudged Tokyo and Seoul into a closer working relationship.

Despite the historic antipathies that inform both nations, the conservative elite in Japan and South Korea are quite congenial and work surprisingly well together. On the surface this might appear due to their similar cultural and linguistic heritages. Older Koreans' fluency in

Japanese and some common cultural nuances enable both nations to be more comfortable with each other than with any other foreigners. Beneath the surface, however, there are more tangible bonds that mesh Japan-South Korea political and economic interests.

South Koreans have been singularly active in ingratiating themselves financially with conservative factions in Japan's ruling Liberal Democratic Party. Under President Park, South Korean financial largess yielded considerable Japanese support in international forums and in trilateral relations with the United States. Kim Jong Pil, a former leading contender to replace interim President Ch'oe, was South Korea's main contact with Japan. Although Japan-ROK relations may be strained temporarily by President Chun Du Hwan's puritanical anticorruption measures that ousted Kim Jong Pil and others from the political lineup and by Seoul's ham-handed trial of South Korea's leading democratic reformer, Kim Dae Jung, there is an excellent chance for continued close ties. Equally important, these political ties established and undergird a framework for the Japanese economic aid, trade, and investment that constitute one pillar of South Korea's economic boom.

Positive Japanese responses to South Korean economic and political overtures since 1965 have not been selflessly motivated. Japanese entrepreneurs are always on the lookout for economic opportunities. The stability enforced by the autocratic Park government and prospects for ample profits readily enticed the Japanese into South Korea. Tokyo heartily backed these business measures as a means to bolster South Korea, thus adding to regional political stability. This same motivation remains today one of Tokyo's key interests in South Korean economic well-being. Japan cannot afford to have economic upheaval create political instability in its potentially volatile next-door neighbor, particularly at this critical juncture in South Korean history.

Lastly, South Korea's successful emulation of the Japanese economic model, with considerable Japanese support, increasingly binds Japan and South Korea to a set of common circumstances. Both are export-oriented and highly dependent on imported resources, particularly oil. Though these circumstances introduce considerable competition between Japan and South Korea, regional political and strategic ties tend to override competitive frictions and foster a common outlook.

THE broad range of political and economic ties between Tokyo and Seoul that have developed since 1965 reinforce Japan's vital strategic interests in Korea. Though contemporary strategic interests generally are couched in post-cold war terms, Japan's geopolitical interests have a long heritage. They were the cause of prewar Japanese expansionism and colonialism. World War II shattered the hierarchy of regional strategic relationships that had maintained stability in Northeast Asia. The United States in 1945 stepped in to fulfill Japanese strategic obligations and has borne the major responsibility for regional security ever since.

Japan and South Korea readily accepted a strong American presence. At first they had no choice, but as each nation recovered it actively welcomed a continued United States presence. From Tokyo's point of view, the U.S. defense commitment to Northeast Asia permitted Japan to get on with economic recovery and relieved Japan of onerous responsibilities in Korea. South Koreans, naturally, preferred an American armed presence as the republic's security guarantee. They had no desire to see the Japanese reassume such a role. As South Korea successfully followed in the footsteps of Japanese economic development in the 1970s, another factor was added to Seoul's desire to retain American forces in Korea. South Korea, like Japan, increasingly welcomed an American presence as a de facto support for its economic boom.

Japan's primary strategic stake in the Korean peninsula today is avoiding major power confrontations—a very high priority on Tokyo's foreign policy agenda. Any war in Korea could engulf the region. While unattractive, Tokyo probably could live with a communist-dominated peninsula as long as it is not the result of a destructive war. However, Japan likes the givens associated with the status quo. The weakness of a divided Korea makes that sometimes-fractious nation easier to cope with from Tokyo's viewpoint. Moreover, well-cultivated Japanese economic interests in South Korea almost certainly would be seriously disrupted by conflict or communist conquest in Korea. Increasingly, Japanese leaders also appear to have a genuine interest in the fate of their newly developed friends in South Korea. Finally, there is the shopworn "dagger" thesis—the threat potential posed to Japan if Korea should fall into the hands of an enemy. Though the nuclear age makes a land-based invasion of Japan via Korea almost moot, that thesis cannot cavalierly be discarded.

If the status quo could be cast in concrete in perpetuity, neither Tokyo nor Seoul would express any interest today in closer bilateral or trilateral security ties. However, contending forces within United States foreign policy that might induce a diminished American commitment to the region compel both Tokyo and Seoul reluctantly to hedge their bets by cautiously considering other options.

American doubts about the need to maintain forces in South Korea nearly thirty years after the Korean War may be temporarily reduced by Washington's fear of adding to Seoul's political problems in the midst of a lengthy succession process and by the American people's international assertiveness in the wake of events in Iran. The "lessons" of Vietnam clearly are in the hands of new revisionists. Despite this resurgence of American nationalism, the interests of the United States are shifting. Korea is relatively less important to the United States now than it was during the 1950s. Moreover, South Korea and Japan are more capable of looking after their own interests now than then. Consequently, a reduction of American forces in Korea, if not a total withdrawal, is inevitable. Continued political calm in South Korea will ease the way for an American cutback after a "decent interval." Adverse South Korean popular reaction to the emergence of another "Park" in Seoul may yet weaken popular American support for United States commitment to South Korea. Negative political developments in Seoul clearly would strengthen the voice of those who maintain Washington's commitments in Korea should have been altered years ago. In either event, the handwriting is on the wall for a large-scale American military presence in Korea.

Washington's commitments to Japan are the subject of continuing controversy also. Tokyo's increasing international power, albeit hobbled by oil vulnerability, gives the old "free ride" defense criticism of Japan considerable added credence. It is true that Japan does not get off gratis. Tokyo does contribute to the cost of maintaining American forces in Japan. Moreover, the United States clearly gains something from its security arrangements with Japan both in terms of bases vital to current commitments and Japan's unilateral contributions to regional political and economic stability. However, Tokyo undoubtedly benefits most. In exchange for some financial support and little national risk, Japan gets an American proxy force operating on Tokyo's behalf in both Japan and South Korea. Without these proxy forces, Tokyo would be compelled to make major decisions it clearly would rather avoid about Japan's vital strategic interests. Japan's economy also would feel the impact of having to fill some or all of the vacuum created by a reduced American role.

Washington's concerns about the proper role of the United States in Northeast Asia may also be influenced by the oil vulnerability of

both Japan and South Korea. Each is highly dependent on imported resources of all kinds, but oil imports put Tokyo and Seoul under serious foreign pressures. These weaknesses not only make both countries potential Achilles' heels in Washington's global system of alliances they also induce Tokyo and Seoul to adopt policies that are not always compatible with those of the United States. Although Seoul's purchases of Iranian oil in the midst of the hostage crisis did not arouse much American indignation, Tokyo's adherence to its longstanding *seikei bunri* (separate politics from economics) policy caused great resentment in Washington. Even Japan's friends were hard pressed to make excuses for Tokyo's reprehensible and shortsighted behavior. In short, the vulnerabilities of Japan and South Korea make them something less than ideal allies.

All these issues taken together raised concerns in the minds of Japanese and South Korean leaders about the durability of the status quo. In addition to enhancing their separate self-defense capabilities, to demonstrate good faith to American critics, Tokyo and Seoul felt compelled by American desires for regional cooperation to explore closer bilateral security arrangements. This yielded the flurry of contacts already cited.[5]

By creating a veneer of interest in regional security, thus helping to placate American criticism, Japan and South Korea are inching closer to what superficially appears to be genuine bilateral security cooperation. This slow incremental movement has two apparent motives. In the worst case (as seen from Tokyo and Seoul) it would lay the groundwork for actual military cooperation in the event the United States reduced or failed to meet its commitment. However, since neither side truly desires anything like full-scale security cooperation, the operative motive clearly is geared to dealing with the United States on a trilateral basis.[6] Via protracted discussions with limited objectives far short of meaningful cooperation, Tokyo and Seoul can give the appearance of planning to shoulder a proportional share of the regional security burdens. Tactical use of bureaucratic and legislative delay allows them to postpone indefinitely making any substantial changes in their contribution to regional security. The advantages for Seoul and Tokyo are evident. The longer the process takes, the longer the United States commitment will remain intact. In the interval, both Japan and South Korea will continue to benefit from the strategic and, perhaps equally important, the economic advantages of a continued American presence. Moreover, if the process of readjusting security burdens can be delayed indefinitely, changing international circumstances affecting the region may well make close bilateral security cooperation unnecessary in the long run.

Evidence of the true Tokyo and Seoul desires is not difficult to unearth. For Japan it can be found in the consultations Washington and Tokyo held to discuss the Carter administration's troop withdrawal proposals in 1978-79. It was evident that Japan wanted contrived consultations that would permit Tokyo to be informed about every decision that might affect Japan's interests but would not hint at approval by Tokyo of decisions reached by Washington and Seoul. From Tokyo's viewpoint any Japanese sanctioning of those decisions could suggest responsibility for South Korea's security. Clearly Tokyo sees even a tacit admission of responsibility as a distinct liability. Furthermore, by engaging in open consultations on this sensitive topic, Tokyo would have run the risk of Washington's saying, "If you don't like our cutbacks, why don't you take up the slack?" That is precisely the risk Tokyo seeks to avoid by using contrived consultations and delay tactics.

For their part, officials in Seoul probably could tolerate personally some Japanese role in bilateral regional defense. However, they would face tremendous domestic opposition and ridicule by P'yongyang. As a result, few people in South Korea are eager for such an

arrangement. Building a public facade of closer security ties clearly has to be handled very cautiously by both sides for domestic and international reasons. Tokyo and Seoul are out in front of their domestic public opinions on this issue, thereby incurring substantial political risks. The willingness of each to accept these risks reflects the depth of Japanese and South Korean concerns about the reliability of United States commitments to Northeast Asian security.

UNLESS conditions in Northeast Asia worsen or the United States, for domestic reasons, cannot or chooses not to meet its security commitments, there is little likelihood of Japan's and South Korea's moving toward truly significant security cooperation. Instead, Tokyo and Seoul probably will continue to emphasize the strength of their economic and political ties, placing only carefully qualified stress on closer bilateral or trilateral security cooperation with a sharp eye on Washington's reaction. To this end, both Tokyo and Seoul will do only the minimum necessary bilaterally to maintain the appearance of expanded Japan-South Korea security talks, thereby keeping American forces committed to South Korea. Without firm and direct American pressure on Japan and South Korea to implement discrete measures, nothing more is likely to emanate from Tokyo or Seoul.

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Notes

1. I addressed South Korea's contemporary problems and prospects in "'Korea, Inc.': The Political Impact of Park Chung-hee's Economic Miracle," *Orbis*, Spring 1980; and "Korea: What the Generals Want," *Worldview*, August 1980.

2. For well-rounded editorial commentary reflecting this evolution in attitudes, see *Nihon Keizai Shimbun*, January 12, 1980, p. 2; *Sankei Shimbun*, January 15, 1980, p. 10, and February 17, 1980, p. 5. For a representative article of this new genre, see Kase Hideaki, *Nihon retto no boei seimeisen* (Defense lifeline of the Japanese archipelago) in *Jiyu*, January 1979, pp. 18-25. For English language assessments of the product of evolving Japanese defense attitudes, see Edward C. Ezell, "The Japanese Self-Defense Forces, 1980," *International Defense Review*, February 1980, pp. 187-97 and "Japanese 1980 Defense Budget and Future R&D Programs," *International Defense Review*, March 1980, pp. 340-44. For a more popular treatment of the subject, see "Return of the Rising Sun," *Far Eastern Economic Review*, March 14, 1980, pp. 18-24.

3. For factual details of these exchanges, see coverage in *Foreign Broadcast Information Service (FBIS)*, various issues May-July 1980, Asia-Pacific edition. For additional views, see *Tokyo Shimbun*, May 18, 1979, p. 2; and *Asahi Shimbun*, August 18, 1979, p. 1.

4. The alliance idea attracted severe criticism from the left in Japan, North Korea, and the Soviet Union. See, for example, Kamakawa Akio, *"Posuto yonjibo to nikan gunji kankei"* (Post Fourth Defense Plan and Japan-South Korea Military Relations) in *Shakaito*, January 1977, pp. 20-29 for a Japanese socialist critique; *FBIS*, December 17, 1979, Asia-Pacific, pp. D7-8 for the views of the so-called "Voice of the Revolutionary Party for Reunifications"; and *FBIS*, December 19, 1979, Soviet Union, pp. C1-2 for Moscow's view.

5. It also yielded new Japanese willingness to participate in multilateral military exercises. See *Washington Post*, February 27, 1980, p. A16.

6. One means to this end is the creation of a joint parliamentary consultative body, which Seoul has pushed for some time. The vice-president of the former Democratic Republican Party, Yi Pyong Hui, a long-time intermediary between Seoul and Tokyo reported some initial successes in early 1980: see *FBIS*, January 23, 1980, Asia-Pacific, p. E4. The difficulty in fostering such a body is the well-founded reluctance of many American and Japanese legislators to become associated with an entity backed by the same people who brought Washington "Koreagate."

EUROPEAN WEATHER AND ROUND-THE-CLOCK AIR OPERATIONS

WING COMMANDER NIGEL B. BALDWIN, RAF

If the Russians come, they are unlikely to court suicide by choosing a bright summer's day with visibility to the horizon; they will come at night, exploiting the murkiest weather that their forecasters can predict and they will travel beneath a sophisticated and dense antiaircraft umbrella.

GENERAL JOHANNES STEINHOFF
Former Chief of Staff, West German Air Force

AT Crécy in northern France during the evening of 26 August 1346, as the French cavalry began its assault on the three English divisions, a thunderstorm swept the field. The sloping ground became a quagmire and, in one of the most decisive moments in history, the static English infantry destroyed the flower of France. Over nearby ground, nearly 600 years later, the infamous European weather was again exploited, this time by the offence. After fog, rain, and snow had prevented Allied aerial reconnaissance, the German panzer armies, achieving complete surprise, swept through the Ardennes to drive a wedge 60 miles deep between the Allies.

Throughout history, long winter nights and poor weather in the cockpit of Europe have challenged armies. There is now much evidence that the Soviet and Warsaw Pact forces are capable of taking the offensive in Europe round-the-clock, undeterred by poor weather. This article discusses the implications for NATO of this ability both now and in the 1980s and, in particular, emphasizes the difficulty of training aircrews to cope with such an offensive. Drawing lessons from my 16-year association with the Royal Air Force's Vulcan force (which, like the Strategic Air Command B-52, has a day/night, all weather, low level strike/attack role), feeling confident that, despite technological change, the night will always follow the day, and maintaining that the weather in Europe is unlikely to be mastered by man, I will highlight the problems NATO's Tornado commanders will face and suggest where training emphasis should lie if aircrews are to utilize the aircraft's expected performance to the full. I also argue that if aircrews are to fight at night and in poor weather, they will have to train in such conditions.

I consider the terms *night* and *adverse weather* to be synonymous. For the low-level aviator, one poses as many difficulties as the other.

The 24-Hour Battle

Northern Europe during the winter months is dark all the time. During the winter months Central Europe is dark for about 16 hours out of every 24 and, even during the day, poor visibility combined with a low cloud base often makes visual, low-level flying hazardous. The U.S. Army Field Manual 100-5 states: "Approximately 1 out of 3 mornings during the fall and winter, US forces [in NATO] will have less than 1 km visibility . . ."[1] The predominant weather is low overcast with rain. The summers, despite longer days, as many European and British holiday makers know to their cost, often offer little respite. One experienced RAF low-level pilot wrote recently: "The weather in Central Europe has such an effect on air operations that it might almost be considered a part of 'The Threat'."[2] To compound the problem, such weather is difficult to forecast accurately and can be hazardous enough to ground aircraft for days (and most certainly nights). This, of course, is the main reason for the avionic equipment of such aircraft as the RAF's Vulcan and

Tornado and the U.S. Air Force's B-52 and F-111.

The Soviets, with a long history of night operations (40 percent of all attacks in 1944-45, including tank attacks, were launched at night)[3] and a doctrine that emphasizes shock, have a finely developed capacity for night armoured offensive. A. A. Sidorenko in his classic *The Offensive* (A Soviet View) states that "Surprise is a basic characteristic of night operations" and "The role and importance of combat operations at night will increase sharply. . .[they] will be more frequent."[4] He emphasizes the importance of uninterrupted, day and night operations. Other analysts agree: "The initiative and penetration into the depths of the European theatre is to be accomplished mainly by tank and airborne units moving night and day."[5] Such constant progress will be necessary. According to Professor John Erickson, the Soviets are planning a 30 kilometer advance every 24 hours in order to accomplish the main objective of any theatre campaign in Europe: "The effective and early destruction of NATO's nuclear means and defence capability and. . .the sealing off of Western Europe from its US ally."[6] A recent analysis, based largely on U.S. Defense Intelligence Agency material, concluded that "Soviet ground forces possess highly sophisticated night operational equipment and that night training accounts for 40% of all individual and unit effort."[7] In sum, the night offensive is a central part of Soviet doctrine and, if the desired rate of advance is to be achieved, there will be no let up for NATO as dusk or the visibility falls.

The Implications for Both Sides

The Soviets, in the Su-19 Fencer, have deployed an F-111/Tornado equivalent. It is a two-seat, multirole, terrain-following radar (TFR)-equipped, third-generation aircraft capable of carrying 6000 pounds of munitions at low level to the United Kingdom and back. But, as will be shown later, I believe that to be effective in low-level air operations at night and in all weathers constant practice and high-skill levels are needed. There is little evidence that Soviet aircrews have mastered this role. But this limitation may not be so vital for the Soviets since their offensive can continue advancing at a rapid rate whatever the conditions. Whereas NATO commanders plan to use their tactical air power in "a fire-fighting role, designed in good part to offer a timely substitute for (nonexistent) ready reserves to block break-through attempts, the U.S.S.R. has evolved a groundforces combined arms team that should have far less desperate need for tactical air support."[8] With their dense, highly mobile, overlapping antiaircraft artillery (AAA) and surface-to-air missile (SAM) air defense systems hardly affected by night or bad weather, the Soviets may not be embarrassed by a lack of supporting tactical air effort. To NATO, however, the use of air forces to interdict the enemy second echelon and beyond is fundamental.

NATO commanders and politicians often take comfort from the knowledge that their aircrews fly more often than their Soviet counterparts, and thus there is always the implication that they are better trained. Soviet airmen fly as little as ". . .5 hours in the winter. Over a full year they fly only 60% of the hours achieved by NATO pilots."[9] Early in 1979, U.S. Defense Secretary Harold Brown stated that ". . .Soviet avionics, munitions, pilot training, and flying time do not approach U.S. standards."[10] And, as will be shown later, in the most difficult area of all flying training, low and fast at night and in adverse weather, that should make a vital difference. But, ironically, it may not be so. At present, particularly in winter, the capacity of the NATO air forces will be often severely limited. Certainly aircraft like the latest acquisition, the purpose-built close air support (CAS) aircraft, the A-10, will not solve the problem:

> The aircraft's much vaunted fire power delivery capability and survivability, vital attributes though these may be, are as naught if the aircraft is

> incapable of seeking out its target or, worse still, is grounded by inclement weather, for the A10 . . . is essentially a fair weather system.[11]

So, it must be added, on present plans is the F-16. Of all the aircraft in the NATO inventory, only the 156 F-111 E/Fs of USAFE and the 48 Vulcan B. Mk 2s of RAF Strike Command have a full night/adverse weather overland capability at low level (that is, less than 1000 feet above ground level). In the event of a surprise Warsaw Pact attack in bad weather, it is likely that, of these aircraft, only a small proportion of the F-111s, and none of the Vulcans, will be available for a theatre commander to use in a conventional role. Refined in action during Vietnam, according to General William W. Momyer, USAF, "The F-111 low level bombing system. . .was a revolutionary breakthrough in all-weather delivery."[12] Analyst William F. Scott, former U.S. air attaché in Moscow, has written that the F-111, "with its low-altitude all-weather capability, is a major Soviet concern."[13] As far as the Vulcan is concerned, despite spasmodic attempts throughout the aircraft's career to concentrate on TFR flying, it took the challenge of participation in a night Red Flag exercise in 1978 to overcome many years of hesitation and doubt and to develop satisfactory crew and equipment procedures that could be used safely in peacetime. Previous to that Red Flag exercise, the Vulcan's night/adverse weather TFR and associated equipment had been used only by day in good weather. Nevertheless, this effort has not come too late: three NATO air forces have begun to receive the Tornado, and many of the Vulcan lessons and training techniques will be relevant to that aircraft.

The Training Challenge in the '80s

The most commonly understood reason for the paucity of night/adverse weather aircraft is that few nations can afford or have the technological skill to develop the necessary avionics. But there is more to it than that. If the Tornado is to be used to its fullest, other factors will have to be considered. Few would disagree that if the aircraft is to fly in its destined role, both crew members will be fully occupied.

night low-level training

Recently, one RAF Harrier pilot wrote:

> The most important link in the chain is the pilot. It is he who must have blind faith, on a dark and stormy night flying at 600 kts and 200 feet, that his equipment will be not only totally capable but also totally reliable. The Aerospace Industry may be convinced of this capability, but the single-seat CAS pilot most certainly is not.[14]

Despite the aircraft's life-long, 24-hour role, most Vulcan low-level flying training has been done by day under visual flight rules (VFR), essentially 3 nautical miles visibility and 1000 feet clear of cloud. Of my nearly 3000 flying hours on Vulcans, only 16 percent has been at night and this despite the fact that there are only 8 hours of "daylight" every 24 hours of an English winter. Over the Vulcan's life, as the RAF has been slimmed down and social change has hit society, many factors have pressured commanders and influenced the way in which, and particularly the time of day and night, their aircraft can be flown. In the United Kingdom, low-level flying areas and routes are usually closed late at night, facilities such as bombing ranges and early warning (EW) training ranges are equally restricted, and very few military airfields are sufficiently manned for peacetime, 24-hour operations. Squadrons have also been slimmed down: supporting personnel have been reduced in number, and commanders have become more conscious than ever of the need to keep overtime and working weekends to a minimum. As a result, night flying on Friday evenings is rare and on weekends denied (the low-level routes and areas are usually closed); thus, any night low-level training must be done between Monday and Thursday. When this shortening of the useful week is compounded by the vagaries of European weather and the

need for good visibility for such training, it will be recognized that the commander who dedicates himself to increasing, or even completing, night training is an optimist. In addition, the nature of the European weather for long periods, especially in winter, is such that a suitable window for flying training often appears, if at all, only around midday for 3 to 6 hours. It is little wonder, then, that even winter flying training takes place during the day. So, paradoxically, the training that most needs continuity—that of night/adverse weather— is most hidebound by European weather, lack of daylight hours, and lack of facilities. Thus, it is no surprise that, in the Vulcan's case, for example, it took more than 10 years before the straitjacket of TFR, day-only training could be broken. The impetus for that change was the challenge of a night Red Flag exercise.

night Red Flag training

The RAF Vulcan participation in Red Flag 79/2 in 1978 was ". . .of the greatest value. [Amongst other things]. . .it reinforced the crews' confidence in their ability to operate safely, at night, lower than they had ever done before."[15] But, for the RAF at least, Red Flag training can only reach a small number of crews, and thus of greater value in the long term was the training programme that had to be devised and the techniques that had to be developed before Nevada's mountains could be challenged. Previous to Red Flag training, the crews had used the aircraft's TFR in day VFR only. Whenever the equipment failed, pilots had always been able to see where they were going, and thus the rest of the crew had been reassured. As soon as night training began, it was noticeable that equipment malfunctions took on a much more serious aspect. The pilots' sudden blindness was quickly communicated to the rest of the crew and tension and apprehension rapidly mounted. And this was particularly so when, for the first time, use was made of the RAF Strike Command low-level routes in Labrador for night low-level training. Previous night flying had been done over the European land mass with its sprawling, well-illuminated metropolitan areas. But when crews left the Goose Bay airfield lights, they found they could fly for hundreds of miles over featureless, uninhabited country, in pitch darkness. Flying below a layer of cloud, they received little help from the moon. No motorway lights, TV aerials, or isolated farmhouses told the pilots whether or not they could see, and, with less than perfect airborne radar fixing over such confusing and inhospitable terrain, they found the experience to be both eery and unnerving. Often, unwittingly, they flew into cloud, and it was only on breaking out that they realized they had done so. As a result, Goose Bay night and, by default, adverse weather, low-level training became a landmark in the Vulcan's life story. The lesson and the capacity of Labrador for such RAF training has fortunately not been lost, and the breakthrough may have come just in time.

training in Canada

The difficulty NATO commanders have in training their aircrews at low level in Europe is common knowledge. According to *Flight International*, "NATO air forces are already worried by the restrictions placed on low flying in Germany," and there is "mounting pressure on the RAF to curb low flying."[16] A British government minister recently discussed the possibility of increasing the RAF's use of Goose Bay with the Canadian government, and on 8 December 1979, it was reported that "Canada has no objection."[17]

But expanding low flying training in Canada for the RAF, and perhaps other Tornado users, would have disadvantages. Not only is Goose Bay in the wrong direction as far as Tornado's potential area of operations is concerned, but the inhospitality of the Canadian terrain might be thought to limit its usefulness. To duplicate, for example, the extensive de-

fensive systems and electronic threats of the Red Flag ranges in the barren, often subarctic wasteland of Labrador would be a major and expensive undertaking. But, overall, the lack of realistic targets and EW threats does not completely negate the importance of the area for Tornado training. Of far greater importance is the opportunity for crews to operate for long distances, unhindered by air traffic or peacetime noise-abatement procedures, over typically wartime terrain, at high speed concentrating solely on TFR and navigation. This is what will be unique and so valuable. Such training is more likely to breed possibly the most elusive characteristic of the capable night/adverse weather crew: confidence.

the approach to be used

In the same way that instrument flying is taught, there are several steps to be taken both on the ground and in the air before a crew can achieve any confidence and skill. The flight simulator is an obvious starting point. If the experience of Vulcan crews is to be capitalized on, when Tornado crews are trained the flight simulator must not be seen as a substitute for flying training in the more difficult areas. Rather it must be an adjunct. It must be used to give initial confidence and to teach procedures and crew cooperation. But the aircrew must train in the air if their confidence is ever to be more than illusory. That training should, of course, be done in steps: flying by day, then at dusk, then at night; flying in good visibility, then poor, then blind. (And, for the unconvinced who believe that high speed, close to the ground in cloud or in fog is not possible in peacetime, a study of U.S. Air Force Tactical Air Command F-111D experience would be worthwhile).

training over the sea

If the barren wastes of Labrador and the busy airspace of overland Europe are denied at night or in adverse weather to the less experienced crews, the sea is not. Low-level night flying over the sea should not be dismissed as too simple—as it was for many years in the Vulcan force. It is safe, it is ideally suited for learning evasive manoeuvring techniques, it can be challenging for the navigator, and, perhaps most important of all, it is relevant to all Tornado crews that will have to contend with coastal penetration of enemy defences. It is as good a starting point for a crew's night low-level/adverse weather training as could be devised and far, far better than flying by day and *pretending* it is night. But there is another problem for the Tornado commander to overcome first.

the lure of competitive flying

Until participation in Red Flag, the major regular pressure to raise aircrew skills and equipment performance in the low-level Vulcan force derived from the twice-yearly involvement in bombing and navigation competitions—usually with SAC B-52s and FB-111s as company. Not surprisingly, such competitions concentrate on a low-level strike aircraft's raison d'être: the accuracy of the bombing attack. Little attention is paid to getting to the target. Good weather, for day photography of targets, is necessary, and, if radar bomb scoring is to be used, final attack heights above targets are artificially high. All these requirements work against a commander developing night and adverse weather flying skills. And, after all, it is difficult to judge a competition on these latter skills. It is much easier to tabulate bomb scores and, perhaps subconsciously, assume that that is a true judge of ability. But, as Red Flag training has shown time and time again, if the attacking aircraft does not reach the target, the finest bombing technique in the world will be of little use. Although attempts are being made to include en route threat assessment and avoidance in such competitions, it is likely that artificialities will remain, and thus Red Flag training, with its emphasis on survival rather than competition, will stay as the

major forum for the development of operational techniques.

the flight safety implications

Despite Red Flag's reputation for high aircraft accident rates, there is no reason to believe that night and adverse weather training need be dangerous also. Indeed, the reverse may well be true. Throughout this article, the thread of crew cooperation and confidence has been dominant, and it is my view that, paradoxically, it is because night and adverse weather training is so challenging and difficult that it is likely to be safer. It is more likely that the avionics of the Tornado will perform to specification if the equipment is used regularly and in earnest. (It is no mere coincidence that Vulcan TFR serviceability doubled almost overnight when Red Flag training began in 1978. On Red Flag 79/2 it performed perfectly more than 90 percent of the time, and this experience has been reflected since across the whole fleet.) Aircrews are less likely to make mistakes if they are well trained, well briefed, and confident in their equipment and themselves. Because darkness and/or poor visibility concentrate the minds of the crews so much more than "normal" flying, aircrews are less likely to overreach themselves or be caught napping. The major challenge confronting Tornado commanders will be to see that all their crews develop the skill and confidence to cope with such conditions. They will need the courage of their convictions and considerable support. If both are forthcoming, the aircrews could soon be flying their aircraft in weather conditions and in a manner previously undreamed of in RAF history.

IT IS significant that General Steinhoff's statement at the beginning of this article of Soviet intentions was made as he watched a demonstration of NATO's latest CAS aircraft, the A-10. There is considerable evidence to suggest that Soviet and Warsaw Pact forces will not expect to let up their advance when night arrives or the visibility falls. Rather, to obtain shock and surprise, they are very likely to exploit Europe's notorious weather and long winter nights. Because of the combined arms concept, with its integral air defense umbrella, any limitations on Soviet air power in such conditions will not be too important. To NATO, however, such a limitation—especially as it will, at present, prevent its air forces' slowing down the second Soviet echelons and carrying out effective counterair operations—may be conclusive.

As three major NATO air forces, the British, Italian, and West German, begin to deploy the Tornado—which along with the USAF F-111 is NATO's best hope to bring air power to bear at night or in adverse weather—many lessons can be drawn from experience gained developing low-level night and adverse weather skills amongst RAF Vulcan crews (and, by implication, USAF SAC and TAC F-111 crews).

Tornado commanders will face the same pressures as present-day air force commanders: public dislike of low flying training, limited available flying hours, limited ground facilities. There will be a temptation to leave the most difficult exercises to the last or to postpone them, as very nearly happened with the Vulcan B. Mk 2. But latter day Vulcan experience, culled from the training required to cope with night Red Flag exercises, has shown that if crew confidence, which is vital for the night/adverse weather role, is to grow, the procedures and techniques must be practised in the air and not just in the flight simulator. The familiar territory of Europe is too unrepresentative and constrained by air traffic and noise abatement restrictions. However, the RAF Strike Command low-level routes in Labrador are almost ideal for such training, and that area is the best hope for realistic low-level training in the future.

Unless emphasis is placed on night and poor-weather flying from the beginning of an

aircraft's life and an aircrew's operational training, the Tornado's avionic equipment will be incapable of performing its task when needed and the aircrew's skill and confidence will be insufficiently developed. That confidence is the key. It must be built up in stages: first by day, then at dusk; over the sea and then over empty terrain. We should expect NATO's Tornado crews to fly at low level regularly at night and in adverse weather in peacetime with confidence. There will be no time to learn this most elusive of aviation skills if the most formidable army the world has ever seen begins a rapid advance under a leaden, darkening European sky.

Air Command and Staff College

Notes

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3. John Erickson, "Soviet Combined Arms: Theory and Practice," University of Edinburgh Monograph, September 1979, Part 1, p. 51.
4. A. A. Sidorenko, *The Offensive* (A Soviet View) (Washington: Government Printing Office, 1974), p. 200.
5. Kenneth R. Whiting, "Soviet Theater Doctrine and Strategy," *Air War College Associate Programs*, vol. 1, chapter 8, p. 19.
6. John Erickson, "The Ground Forces in Soviet Military Policy," *Strategic Review*, Winter 1978, p. 68.
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10. Harold Brown, *Defense Posture Statement to Congress*, 25 January 1979, p. 90.
11. "The Fairchild Can-opener," *Air International*, June 1979, p. 267.
12. General William W. Momyer, USAF, *Air Power in Three Wars*, Department of the Air Force, 1978, p. 181.
13. William F. Scott, "Soviet Perceptions of US Strategy," *Air Force*, March 1979, p. 73.
14. Saye, p. 35.
15. Squadron Leader C. G. Jefford, RAF, "Red Flag at Night-Vulcan's Delight," *Air Clues*, April 1979, p. 128.
16. "RAF Looks at Canada for Low-flying Training," *Flight International*, 27 October 1979, p. 1339.
17. "Tracer," *Flight International*, 8 December 1979, p. 1897.

Soviet strategists seem to distinguish between a NATO-type war and a "local war." There is growing evidence that in the case of a NATO-type war the Soviets recognize an escalation boundary between theater nuclear conflict and an intercontinental nuclear exchange between the superpowers. This view contrasts importantly with the assumption by many U.S. advocates of a minimum deterrence doctrine that *any* use of nuclear weapons will automatically flare into a massive, catastrophic exchange between the superpower homelands.

Captain Robert C. Powers, USN
Strategic Review, Winter 1981

air force review

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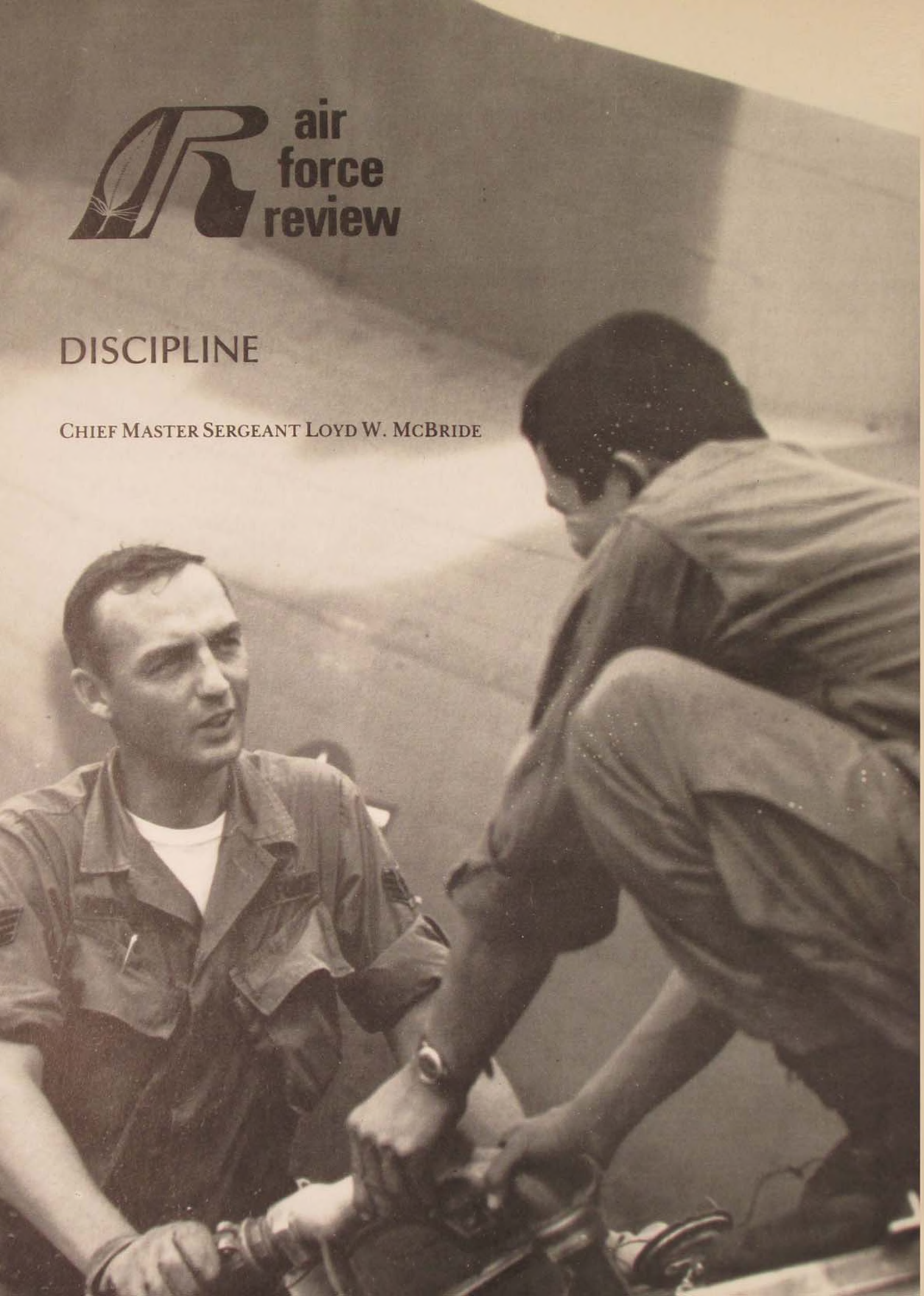

UNDER the Uniform Code of Military Justice, the noncommissioned officer (NCO) does not have the same authority as the commissioned officer. Principally, noncommissioned officers do not have authority to punish personnel under their supervision. Punishment is administered only through the use of Article 15 or courts-martial. Since NCOs have no punitive authority, what actions can they take to ensure discipline among their people? These questions will be answered as we consider the need for discipline in the military.

I will focus on the NCO's role in dealing with discipline problems. If preventive techniques fail, NCOs should be aware of methods available to them for correcting subordinates when their behavior impairs mission accomplishment. Indeed, the NCO plays an important role in influencing punishment when it is necessary in achieving mission readiness.

Discipline can best be defined as "a state of training, resulting in orderly conduct." This "state of training" must be achieved and maintained during peacetime so that our forces will be prepared for wartime contingencies. It is too late to prepare for war once war has started, which is sometimes a difficult concept for lesser experienced NCOs to accept. Often the feeling is, "We are a technical force; technicians do not need the same state of disciplined readiness as combat soldiers." This feeling perhaps fosters a false assumption that Air Force members will not be expected to fight during wartime; instead, we will maintain a support role (i.e., aircraft maintenance, supply, personnel, etc.). The questions then become "Is it necessary for Air Force people to maintain a high state of readiness? Is it really necessary to be disciplined for war?" These questions must be answered by all NCOs who are ultimately responsible for achieving success in peacetime readiness as well as in actual warfare. History shows us that we cannot leave this state of readiness to pure chance; we must prepare for any emergency.

Discipline, of course, is vital. Rudyard Kipling recognized this need for discipline when he had one of his Tommy Atkinses explain:

> We was rotten 'for we started—
> we was never disciplined:
> We made it out a favor—
> if an order was obeyed.
> Yes, every little drummer 'ad 'is rights
> and wrongs to mind,
> So we had to pay for teaching—
> an' we paid!

General George Patton, a strong disciplinarian who was equally as adamant about preparedness, told his commanders if they did not enforce and maintain perfect discipline, they were potential murderers. He went on to say ". . . that is a blunt way of putting it, but war is blunt, and war is what we must all prepare for." General Robert E. Lee, one of the greatest military leaders of all time, was equally firm when it came to discipline. He wanted his soldiers to understand that, in addition to efficiency, discipline guaranteed a soldier's safety; that if his forces did not prepare themselves for war when they had a chance, they would pay dearly.

The Air Force, recognizing the need for discipline, published AFR 30-1, *Air Force Standards,* in which four types of discipline are identified: *task, group, imposed,* and *self.*

Task discipline is defined as how well we meet the challenges of the job. First, we must recognize that the job is important, and how well we perform will influence the effectiveness of our work section and our unit. Task discipline requires a strong sense of responsibility in performing our jobs to the best of our abilities, volunteering for the tough jobs, and working overtime, if necessary, to accomplish our mission as it relates to the Air Force mission.

Group discipline means teamwork. Since most Air Force jobs require that several people work effectively as a team, group discipline is very important. Just as we must have a sense of responsibility to our job, we should also have a sense of group responsibility and effective team membership. We must "pull our own weight," and at times we may have to deny some personal

preferences for the good of our work section, unit, or group.

Imposed discipline is known as enforced obedience to legal orders and regulations. It is absolutely essential in combat or in emergencies when there is no time to explain or discuss an order. Most Air Force training teaches us to carry out orders quickly and efficiently. During peacetime, a continuation of this type of discipline provides the structure and good order necessary throughout the organization to accomplish the mission or a task, regardless of the situation.

Self-discipline is a willing and instinctive sense of responsibility that leads us to do whatever needs to be done. Getting to work on time, knowing all aspects of the job, setting priorities, and denying some personal preferences for more important values or duties are all measures of self-discipline. Far above our acceptance of imposed discipline, self-discipline reflects our personal commitment and sense of duty.[1]

Often we emphasize one type of discipline at the expense of another. For instance, we allow ourselves to become so task disciplined that we fail to recognize the necessity for discipline of other types. The ultimate solution for the NCO is to create an environment where the necessity for imposed discipline is minimized or eliminated, but this is not always possible. Therefore, we must understand how to impose discipline when it is clearly indicated.

THREE general approaches can be taken in dealing with discipline: the *preventive* approach, the *corrective* approach, and the *punitive* approach.[2] Initial consideration should be given to the preventive approach because it is logically first and is positive and constructive in its development. The preventive approach includes understanding human behavior, using good management and leadership techniques, setting the examples, and enforcing the standards. These are not all-inclusive; however, they represent the majority of preventive techniques to discipline problems. There are numerous lessons in dealing with preventive techniques, and most of our NCOs fully understand these techniques for preventing discipline problems. Organizations usually have a few people who do not respond to preventive techniques, which leads us to the next approach in dealing with discipline problems: correcting the individual who has not responded to the preventive techniques.

The NCO supervisor is limited in his use of preventive and corrective approaches, since only officer commanders can use the punitive approach. This fact alone creates the undeniable necessity for NCOs to understand and employ fully the corrective actions available to them.

The first action available to NCOs for correcting individuals who have not responded to preventive techniques is the *verbal reprimand.* Verbal reprimands should be given only for performance or conduct and should never leave an individual feeling personally attacked. In other words, individuals should be reprimanded for unacceptable behavior not personality. A memorandum for record should be kept to be used for later action, if necessary.

The second corrective action is the *documented counseling.* The documented counseling does not have to follow any prescribed format; in fact, most major air commands have their own forms. Individuals reviewing subsequent case files will have a better understanding of the situation if they include the following items: a statement of the problem, a discussion of the problem, a joint solution to the problem, and personal observations. This documented counseling should be filed in a general correspondence folder, marked specifically with the action included in the folder (i.e., disciplinary action).

The third corrective action NCOs can take is the *letter of admonishment/reprimand.* Administrative reprimands and admonitions are management tools available to commanders, supervisors, and other superiors to instruct and reprove subordinates for departing from acceptable norms of performance, conduct, or

bearing. There is no prescribed format for writing this letter. A reprimand is more severe than an admonition and carries a strong implication of official censure. The letter of admonition should be written when no unfavorable information file (UIF) is necessary, although either the letter of admonition or reprimand can be placed in the individual's UIF. The letter of admonition may also be filed in the same manner as the documented counseling. However, since the letter of reprimand is more severe than a letter of admonition, it should be forwarded through the individual's commander to the consolidated base personnel office (CBPO) for inclusion in the individual's UIF. Supervisors can write a letter of reprimand, but only commanders can forward it to the CBPO for placement in the UIF.[3]

NOW that we have looked at some of the preventive and corrective approaches NCOs can use in dealing with discipline problems, let us look at our role in affecting the punitive action either through Article 15s or courts-martial.

When corrective approaches have failed or when breaches of discipline are so severe that punishment is necessary to maintain morale and ensure discipline among subordinates, then Article 15 action becomes appropriate. Since the NCO's role in punishment is somewhat limited (i.e., generating the statement of facts and then recommending action to the commander), it should be evident that the quality of these actions will determine whether the outcome is satisfactory to the enlisted manager. Matching the punishment to the offense is essential if true rehabilitation is the goal. More important, there is a relationship among the types of offenses and the punishments that will best correct the behavior. Therefore, the more effective NCOs employ this relationship in their influencing of commanders.

Breaches of standards can most often be divided into three broad, convenient types: *liberty*, *status*, and *property*. A look at the nature of the violation and the matching punishment for each is in order.

Liberty in the military environment is the right to act in a manner of one's own choosing within the restraints of regulation and good order and discipline. We are free privately to do "our own thing" as long as we never lose our sense of duty. Failure to go, absent without leave (AWOL), or continued tardiness are examples of violations by individuals who do not understand the full meaning of personal liberty. What punishments match these offenses? Extra duty, restriction, and correctional custody all punish as well as psychologically teach the value of liberty to the individual.

Status very often is discussed in terms relative to a high standing or prestige; with rank so goes not only a certain amount of privilege but also a responsibility for ever-increasing professionalism. Disrespect of a superior, insubordination, or failure to perform in a manner commensurate with rank, position, or skill level are examples of status violations. These individuals have not yet become able to accept the responsibility inherent in their position. The obvious punishment is to change the status. A reduction in rank, the vacating of NCO status, or any of the various reductions treat the cause of this problem. If the rehabilitation phase is successful, one can be assured that not only the offender but all other personnel in the unit will get the message on the importance of understanding AFR 39-6, *The Enlisted Force Organization*.

Property in today's environment of tight funds must be protected vigorously. However, the kicked-in door, torn pool table top, or willfully broken piece of equipment still occurs in the Air Force. The individuals involved in such incidents do not value property. The form of punishment taken should be addressed by forfeiture of pay. Not only does this reinforce the value of government property but it gets the replacement impact in hard currency right down to the individual's level. Some might say

a property-type offense is often a violation of status, and they are often correct. Some overlap in the categories exist, but forfeiture best suits the violation in this case.

Forfeitures as a catchall punishment are punishments frequently misused because of their relative ease of administration. The paperwork is prepared at unit level when the Article 15 action is completed and then passed on to finance. The computer does the rest automatically and invisibly. This ease unfortunately often leads to the use of forfeiture when it is not the most applicable course of action. If the logic of matching the punishment to the offense is sound, commanders should be advised by their senior NCOs not to overuse or mismatch forfeitures. The influencing role of the NCO in Article 15 action at the unit level cannot be overemphasized.

The *court-martial,* more severe in nature, is used when an individual refuses the Article 15 or when the commander determines that the breach of discipline is so severe that the Article 15 is inappropriate for punishment. The NCO's role in the imposition of punishment by court-martial is essentially the same as in Article 15 actions. Also, an NCO may be used as a witness or on a court-martial when enlisted personnel are being tried.

The last and final action is *administrative discharge action* under the provisions of AFR 39-10 or AFM 39-12. These procedures are too complex to address in this article. However, it should be pointed out that if all the preceding preventive, corrective, and punitive actions have not disciplined the individual, then discharge is the next step. The documentation contained in the discharge action will be essentially the same (documented counseling, letters of admonishment) that the NCO supervisor created during the corrective approach to discipline. The recommendation of the discharge board will be based primarily on how well used the preventive, corrective, and punitive approaches to discipline were. The role of the NCO cannot be taken lightly.

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Notes

1. AFR 30-1, *Air Force Standards,* Section D, 30 September 1977, pp. 37-39.
2. *Military Law,* Chapter 3, Air University, Air Force ROTC, May 1978, p. 11.
3. AFR 35-32, *Unfavorable Information Files (UIFs), Control Rosters, Administrative Reprimands and Admonitions,* Section C, 22 September 1975, pp. 6-11.

commentary

To encourage reflection and debate on articles appearing in the *Review*, the Editor welcomes replies offering timely, cogent comment to be presented in this department from time to time. Although content will tend to affect length and format of responses, they should be kept as brief as possible, ideally within a maximum 500 words. The *Review* reserves the prerogative to edit or reject all submissions and to extend to the author the opportunity to respond.

MX DEPLOYMENT RECONSIDERED

Dr. Richard L. Garwin

THE MX controversy is still with us, and it may be useful to clear up some misconceptions and errors about it in recent articles by Dr. Donald M. Snow and Dr. Lawrence J. Korb.*

Dr. Sidney D. Drell and I have studied Minuteman survivability, MX-basing alternatives, and small-submarine options for the Department of Defense and have long advocated in congressional testimony that the encapsulated MX missile be deployed two or four to a small submarine, carried horizontally alongside. Dr. Snow, however, writes as follows:

> There is a potential threat to SUM [shallow underwater missile] survivability. The system, according to Edgar Ulsamer, "... would be highly vulnerable to tidal waves, known as the Van Dorn effect, that could be induced by a Soviet barrage bombing of the continental shelf area. This tidal wave in shallow water would crush any sub in its path." This vulnerability, contested by SUM advocates, reduces the survivability enhancement of SUM to that of MPS [multiple protective shelter]: if the Soviets are willing to invest the number of warheads necessary to induce the Van Dorn effect, SUM could possibly be overpowered in the same way as MPS. (p. 21)

Dr. Snow can hardly be faulted in criticizing shallow underwater missiles (SUM) for vulnerability due to the Van Dorn effect, because both Department of Defense and Air Force spokesmen have so charged.

In fact, Dr. Drell and I have confirmed in dialogue with DOD research and engineering experts William Perry and Seymour Zeiberg that they recognize no such vulnerability of our proposed SUM deployment, and we have repeatedly noted this agreement in our congressional testimony. The Van Dorn or surf-zone effect is a phenomenon in which a wave from a massive nuclear explosion, or a coordinated series of explosions, in deep water steepens and increases in height as it reaches the shallow waters of the continental shelf off the East Coast of the United States. The turbulence created by such a wave could tumble and destroy submarines in such shallow waters where the depth to the ocean floor is about 400 feet. We do not advocate deploying the entire SUM

*Dr. Lawrence J. Korb, "The Case for the MX," and Dr. Donald M. Snow, "The MX-Basing Mode Muddle: Issues and Alternatives," *Air University Review*, July-August 1980, pp. 2-25.

force in such shallow waters. Our proposal calls for deploying this force in coastal strips at least 200-miles wide in order to distribute the minisubs over broad enough ocean area so the force cannot be barraged at any depth. There is no surf-zone problem (Van Dorn effect) for the survival of the SUM force although a fraction of the submarines in transit or in port might be destroyed. This fraction—as well as all submarines, including Poseidon and Trident boats, in port—should be considered as potentially vulnerable and not included in the survivable deployment.

Vulnerability to the Van Dorn effect could exist in 20 percent of the originally proposed deployment area of 200-mile-wide bands off the continental U.S. coast lines. By moving the East Coast deployment further offshore by as much as 100 miles, this concern is totally removed. In these deeper waters, the submarines would still patrol only 200 to 300 feet below the surface so that they would be less vulnerable to attack by nuclear weapons, which for greatest capability against submarines should be exploded deep in the water. We therefore assert that there exists no vulnerability of the proposed SUM deployment to tidal effects and that on this point there is no disagreement between us and the top responsible and knowledgeable defense officials.

In Dr. Snow's table (p. 24) comparing various approaches to MX basing, he does not include SUM. Had he done so, he would have found that it was equal to the best in all *three* categories—survivability, force asymmetry, and verifiability—and is indeed the system of choice. A substantial System Planning Corporation study in May 1980, SPC 554, concludes that both SUM and Trident are less costly than the MX/MPS System. Work done by Dr. Drell, myself, and others last summer solved some of the problems left unsettled by SPC 554 and showed that the ten-year system cost of SUM is likely to be about half that of the MX/MPS system. Furthermore, MX/MPS is *vulnerable* to improved accuracy and fractionation. We can hardly deny that the Soviet Union by 1985 could halve its present circular error probable, since that is agreed between ourselves and top Defense Department officials as a capability which we could readily obtain by then for MX on submarines, for Minuteman III, or for other missiles, via on-board processing of ground beacon signals (GBS) from transmitters in view of the ICBMs during boost phase.

Dr. Snow's downgrading of SUM results entirely from the witting misstatements of Air Force and Defense spokesmen.

Dr. Korb's article cries out for a response, not only in regard to his criticisms of alternatives to the MX/MPS but in his treatment of the system itself. For instance, he states

> Taking the existing 550 Minuteman III missiles from their fixed silos and making them mobile would be only 10 percent cheaper than MX if one wished to ensure that 1000 warheads survived a Soviet preemptive strike. (p. 4)

This argument is a chestnut that intentionally or unintentionally misleads Congress, the public, and readers of the *Review*. In the following excerpt of my testimony of 7 February 1980 to the House Public Lands Subcommittee, I refer to Under Secretary of Defense William J. Perry's letter of 12 October 1979, replying for President Carter to Representative John Seiberling's letter of 10 September 1979:

> "Redeploying Minuteman to a shelter system such as we are planning would require about 12,000 shelters instead of 4600 to have the same number of surviving ICBM warheads." The Defense Department could have done much better than that by slightly modifying the system assumed for the Minuteman. Of course, the number of surviving warheads against a given threat depends not only on the number of shelters but also on the number of missiles deployed. For instance, if the MX system is planned to have 200 missiles with 10 warheads each (2000 warheads initially) and survives to a certain level against a certain Soviet threat in a basing system of 4600 shelters, then *no* number of shelters for [550] Minuteman III (MM III) will guarantee the same surviving number of MM-III warheads if the number of MX warheads surviving were demanded to be 1700. Evidently against no Soviet threat at

all, for which the proposed MX system would guarantee 2000 surviving MX warheads, one could by deploying 667 MM-III missiles (instead of the 550 now occupying silos, but there are more available) guarantee that same survival of 2000 warheads against that "same Soviet threat" with only 667 shelters. That example is included only for illustration, since it is far from the design threat.

The fact is that if we deployed 667 Minuteman IIIs in 4600 silos (for an initial number of MM III warheads of 2000—the same as those in the assumed MX force), *precisely* 4600 shelters would be required. Furthermore, these could be smaller shelters and cheaper than for the MX, and the transporter and road system could be cheaper as well. . . . More Minuteman III missiles have been manufactured and are available than the 550, so this might indeed be a significant possibility.

An alternative and equally illuminating approach would be to consider an MX system in which only 165 missiles were deployed, for an initial number of MX warheads of 1650. Again, precisely 4600 MM-III shelters would be required to have (for any level of threat) the same number of MM-III warheads surviving as from this (not very much reduced in magnitude!) MX force. I presume these simple calculations are familiar to the Department of Defense, but I do believe they illuminate the problem more than the gee-whiz comparison of 12,000 shelters versus 4600.

Thus, if Dr. Korb had insisted on preserving 1650 warheads, MM/MPS would have been infinitely more costly than MX/MPS. Fortunately, we could redeploy 700 Minuteman IIIs, or even more if we wanted.

As to cost, Dr. Korb misstates the numbers. He says, "Over a 15-year period, the total costs of SUM would be about four times higher than those of MX." I know of no one who has made such a charge. In fact, as indicated earlier, SPC 554 finds the cost of SUM somewhat less than that of MX/MPS, and our further work has provided better approaches, made the system more concrete, and reduced the cost. For example, a system including 72 submarines with 144 missiles is conservatively estimated at $26 million, including all R&D, procurement, and 10 years of full-scale operation. Since the Soviets have no antisubmarine warfare (ASW) capability for threatening SUM, and there are many alternatives to avoiding or countering Soviet ASW near our shores without building additional ASW forces, it is premature to burden SUM with such costs.

Furthermore, Dr. Korb misunderstands the system. We have from the first proposed SUM as a system for basing the encapsulated MX missile. Senator Mark Hatfield would like to use the proposal for rebasing Minuteman III and it would be feasible, but all our costs, schedules, effectiveness, and accuracies are based on MX. It is a "bum rap," further, to state that "Since SUM is a SLBM, it probably will not have the same accuracy as an ICBM on land." From the first we have planned to use Navigation System Using Timing and Ranging (NAVSTAR) guidance to the MX during boost phase and ground beacons if NAVSTAR is destroyed. There is no doubt that the SUM-MX will have as good accuracy as the MX/MPS, and this too is borne out by SPC 554 and by specific agreement of defense officials.

In addition, Dr. Korb criticizes the airmobile mode for basing MX missiles as follows: "... placing MX on airplanes would degrade its accuracy, reliability, and explosive power significantly and would increase the risk of a disastrous nuclear accident." The NAVSTAR or ground beacon system we propose for SUM would work perfectly well for MX launched from airplanes and would provide accuracy at least as good as projections for the MX/MPS. In fact the MX missile launched from airplanes could be unchanged from the ground-launched configuration, but a missile of that gross weight designed for air-launch would have *more* explosive power, not less. Although I prefer SUM to air-launch, air-launch does not deserve that criticism. And since the aircraft would take off only on warning of Soviet nuclear attack, the image of hundreds of nuclear warheads constantly airborne is misleading.

In regard to the *need* for the MX, Dr. Korb maintains that it will increase our "hard-target kill potential by 300 percent." He claims that the Soviets now have an advantage of "60 per-

cent in hard-target kill potential." Actually, because of its superior accuracy to the MX, the air-launched cruise missile (ALCM), which will be fully deployed long before the MX, will have much greater hard-target kill potential. We cannot ignore this in our calculations. Furthermore, if it is a time-urgent hard-target kill potential that Dr. Korb wishes, there is no reason to wait until 1990. He can have it with Minuteman III by 1984 or surely by 1985, and with Trident I as well, by fitting those missiles with receivers/computers to use NAVSTAR or GBS systems during boost phase, thus providing an early and major augmentation to our hard-target kill capability. Can the lack of support for improving our hard-target kill capability stem from a reluctance to concede that there are other, cheaper, and earlier approaches than to build the MX?

Dr. Korb claims that the Soviet Union, "expanding to 23,000 warheads would cost them $93 billion." If their purpose is to obtain 23,000 MIRVed warheads capable of killing MX shelters, it certainly should not cost the Soviet Union more than $1 million each, because the least-cost approach is to improve the accuracy of their missiles by ground-beacon assist during boost phase and to increase the fractionation of their warheads by fitting more smaller warheads. No new missiles; no new silos; no $93 billion!

In his Table IV, Dr. Korb assigns a vertical shelter MPS system with 4300 shelters and 200 missiles a cost of $27 billion, and an identical horizontal shelter system costing $50 billion. The Department of Defense and Air Force deny that there is substantial additional cost in the horizontal basing mode, but they argue now that the reason for the horizontal system is the more rapid insertion of the missile into the shelter and a reduced time to "shuffle" in case of suspected compromise of Position Location Uncertainty. Certainly, I do not accept that it must take an hour or more to emplace an encapsulated missile in a vertical shelter, when the same may be done in a minute or two in a horizontal shelter. If $23 billion (or $2 billion) cost differential arises from this assumption, let's get to work on solving that problem.

Yorktown Heights, New York

Dr. Garwin is an IBM Fellow at the Thomas J. Watson Research Center, Yorktown Heights, New York, and Professor of Public Policy, Kennedy School of Government, Harvard University.

A RESPONSE

Dr. Lawrence J. Korb

I find it amazing that Dr. Garwin should reference the SPC study* since it weakens his own case. This can be shown by citing just two sections of the study:

- The SPC study concludes that the SUM is too small. They found that the 1000 ton/12-man/2-missile cannot support the mission. SPC argues that the minimum practical size is a 3700 ton/45-man/4-missile configuration. This is a scaled-down attack submarine not a small inexpensive bottom-sitter.
- The SPC 554 puts the average SUM 10-year acquisition/O&M cost at $45-46 billion, about $7 billion or 18 percent more than MX. Moreover, the SPC cost figures for SUM are opti-

*Much of Dr. Richard Garwin's evidence is based on the System Planning Corporation study (SPC 554), which was completed after I wrote my article.

mistic since they assume 100 percent survivability.

To reply to all of Dr. Garwin's other misleading claims would require writing another article. However, I believe that those two sections show the context into which Garwin's statement should be placed.

Washington, D.C.

Dr. Lawrence J. Korb is Assistant Secretary of Defense, Office of Manpower, Reserve Affairs and Logistics.

A RESPONSE

Dr. Donald M. Snow

Dr. Garwin is quite correct in his criticism regarding the difficulties the so-called Van Dorn effect would create for surface-to-underwater missile (SUM): clearly the issue was raised as a red herring to draw attention away from a system that, I would agree, offers at least a partial solution to the Minuteman vulnerability problem. I would not, however, concur with his conclusion that SUM is *the* answer to the problem of survivable forces. Problems remain with the system (which I have discussed elsewhere, notably in "Arms Control and Alternatives to MX-MPS" in the December 1980 issue of *Arms Control Today*) that, to my knowledge, Drs. Garwin and Drell have not addressed completely.

Essentially, there are three remaining objections to SUM. The first is that deployment of the system as a substitute for land-based forces effectively reduces American strategic forces to a "dyad" of two launching media: aircraft and submarines. Since submarines are our most invulnerable force element, reduction of forces to a dyad would make breakthroughs in antisubmarine warfare (ASW) more grave than they are now. Moreover, I suspect that the diesel-powered submarines proposed for SUM (especially if they are deployed relatively far off the coast) will become vulnerable to antisubmarine warfare much more rapidly than Trident.

Second, there are still unresolved technical problems with SUM. Although Drs. Garwin and Drell pass these off as "mere" engineering difficulties, they could be more serious than that. For instance, the stability of the boats during and immediately after firing is a continuing concern. Presumably the Office of Technology Assessment study on MX basing will resolve some of these technical problems.

Third, and in my judgment most formidably, is the jurisdictional problem. Although MX is an Air Force missile, its placement aboard SUM submarines would put it under the effective jurisdiction of the Navy, just as are our SLBMs (although, of course, technically SAC maintains jurisdiction for targeting and fire control purposes over all strategic forces). Loss of the land-based forces would rob the Air Force of one of its basic missions (involving thousands of career officers and enlisted men) and can be expected to be opposed for that reason alone. The Navy may have its own air force, but it is not imaginable that the Navy will allow the Air Force to have its own navy. SUM opens a bureaucratic Pandora's box that is simply naïve to ignore but which will, in my judgment, ensure defeat of the SUM proposal.

Dr. Garwin's assertion that SUM would rate as the superior system on all three criteria of survivability, force asymmetry, and verifiability also requires qualification. In the short run, he may be right, but in the longer run, I am not so

sure. One of the most obvious effects of moving land-based forces to sea would be to make Soviet ASW research and development extraordinarily high priority business, since breakthroughs could render most of U.S. strategic forces vulnerable. Not having to worry about land-based forces would allow much more Soviet emphasis on ASW and would, in all likelihood, hasten the arrival of effective ASW techniques. If so, SUM could be a short-run improvement that would leave us worse off in the long run.

All this is not to say that SUM does not have merit as a *part* of the solution to force vulnerability. In my article cited earlier, in fact, I suggested force diversification, including SUM, ABM-protected, siloed MX missiles, and road-mobile missiles, each deployed in modest numbers, as possibly the best way to solve the problem. Doing so in addition to retaining the SLBM and air-breathing forces would present the Soviets with the overwhelming problem of trying to attack *five* force elements simultaneously and should maximally dissuade them from any notion they could gain from an attack.

FINALLY, I would like to offer a qualifying remark to a statement made by Dr. Garwin about Dr. Korb's article. Dr. Garwin states that ALCMs "will have much greater hard-target kill capability" than MX. The statement is true if one is referring to *non-time-sensitive* hard targets that can be attacked at any time during an exchange. It is false in reference to *time-sensitive* hard targets like missile silos and other retaliatory forces: ALCMs simply cannot reach their targets rapidly enough to be effective against time-sensitive objectives. To the extent the comparison is intended to disparage MX on this ground, it is misleading.

In summary, the SUM system does offer a partial antidote to the menace in which advanced Soviet missile capabilities have placed our forces. It does not, however, offer the palliative that Drs. Garwin and Drell and Senator Mark O. Hatfield suggest, unless there is more to the system than they have so far shared with us.

Tuscaloosa, Alabama

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STATISTICS VERSUS ACTUALITY IN VIETNAM

Lieutenant Colonel W. Hays Parks, USMCR

IT was with considerable interest that I read the Fire Counter Fire exchange in the January-February 1981 issue entitled "Professionalism versus Managerialism in Vietnam." As one who served as a Marine infantry officer and judge advocate during the Vietnam War, my interest was piqued by Professor Richard A. Gabriel's attempt to assess the combat performance of the Marine Corps in Vietnam based on certain limited statistics. Having served as the chief trial counsel (i.e., senior prosecutor) for the Second Marine Division (1967-68) and the First Marine Division (1968-69), I regret to say that the cases tried do not support his reading of the statistics and the effect on Marine combat performance he suggests.

Certainly, as Professor Gabriel argues, the Marines placed greater emphasis on maintaining a disciplined military force than did the Army. Thus, while the Army had five to six judge

advocates per Vietnam division, the Marines had as many as eighteen prior to the August 1969 revision of the Manual for Courts-Martial, more after that date, most of whom concentrated on military justice. In fairness to the Army, Army judge advocates handled the claims program for all of Vietnam, thus permitting the Marines to concentrate on military justice.

Other factors impacted on Marine performance. With a shorter logistics tail (dependent on the Navy and Army), problems were few except when units "stood down," a classic case of idle hands making mischief. I Corps towns and villages were off limits to Marines, thus limiting Marine accessibility to drugs and the temptation of in-country AWOL and desertion—it simply was not that easy. Moreover, the withdrawal of Marine units began in late 1969, and the last Marine ground units were out by July 1971, or about the time the Army's problems with fragging and mutiny reached their zenith. Thus the Marines did not suffer as the Army did, in part because they were not there.

There is a serious error on Professor Gabriel's part in his conclusion (p. 78) that "Marine Corps units suffered problems equal to or even greater than those found in Army units" with respect to certain offenses. The two services had different philosophies regarding disposition of offenses. The Marine Corps took even the slightest infraction to trial, whereas the Army very early in the war began referring most of its offenses to nonjudicial punishment or Chapter 10 (administrative) separation. Professor Gabriel seems to acknowledge this with his comments (pp. 83-84) on the rigid disciplinary system of the Marines but neglects it in his conclusion regarding the similarity of offense rates.

One example may serve to show the disparity of attitude toward prosecution between the two services. In 1968 I tried three Marines who deserted from Khe Sanh at the height of the siege. They made their way to Saigon, where they became part of a 50-man (3 Marine, 47 Army) blackmarket ring dealing in postal money orders. All 50 were deserters. I tried the three Marines before general courts-martial and gained sentences in excess of ten years for each. Although the soldiers were susceptible to the same charges, they were allowed to plead guilty to lesser offenses before special courts-martial or accept administrative separation because of the shortage of Army judge advocates. Figures alone simply do not convey a complete picture.

In considering desertion/AWOL offenses, Professor Gabriel wrongly infers that desertion/AWOL occurred in combat units. Nothing could be further from the fact. The "desertion per thousand" rate cited by Professor Gabriel was for the Marine Corps as a whole, not for the Marine Corps in Vietnam exclusively. Most cases (more than 99 percent) occurred in stateside units or among individuals assigned to Camp Pendleton, California, for transfer to Vietnam. These stateside desertions were of the administrative type (that is, absence in excess of thirty days) rather than desertion in the face of combat. In the First Marine Division in Vietnam during 1968-69 (the height of Marine Corps involvement in Vietnam), fewer than a dozen Marines were tried for desertion; the Third Marine Division rate was even less (a Marine Division in combat exceeded 25,000 strength). Hence Professor Gabriel errs in using stateside statistics to compare "Marine and Army *battlefield* performance."

Two other points immediately come to mind regarding the danger of citing conviction statistics as an indicator of failure or success of combat performance.

- Three factors had an impact on the Marine Corps desertion rate:

—the thirteen-month Vietnam tour, with its resultant personnel turmoil throughout the Marine Corps;

—the failure to mobilize the Marine Corps Reserve, and

—the failure to raise strength levels to fight the war in Vietnam while continuing to dis-

charge other responsibilities.

At the Second Marine Division (headquartered at Camp Lejeune, North Carolina), three of its nine infantry battalions were deployed at any given time: one to the Mediterranean, one to the Caribbean, and one at Guantánamo. You either had just returned, were about to go, or were gone and were returning from or going to a tour in Vietnam. One young Marine returned from his tour in Vietnam, married, reported to the Second Marine Division, deployed to the Mediterranean for six months, and was immediately redeployed with a Caribbean-bound battalion because he was in a critical skill. While deployed he learned that he would be returning to Vietnam soon, having now completed his "family" tour at Camp Lejeune. Before the division commander could intervene on his behalf, the Marine deserted. His absence was typical of that of many Vietnam returnees who were treated unfairly or who simply burned out at "playing Marine" due to our overextended obligations during that era.

• I tried several Marines at the Second Marine Division during 1968 who had returned voluntarily from lengthy desertions (one of more than four years) in order that they could serve in Vietnam and redeem themselves (each was convicted but given a suspended sentence). These men showed up as desertion convictions, but their acts of desertion had nothing to do with leadership/management during the Vietnam era, much less battlefield performance.

Professor Gabriel does some phenomenal "extrapolating" to arrive at certain conclusions regarding drug use among Marines in Vietnam. Once again, he errs in applying Marine Corps figures across the board and assuming that Marine combat units took their proportionate share. While drug use was of serious concern stateside, it never reached the proportions (28 percent) in-country he suggests. If the rate exceeded 5 percent, I would be very much surprised, and the use that did occur came as units stood down rather than while out on an operation. Again, Marine inaccessibility to towns and villages also limited their accessibility to drugs. Also, while Marine drug use increased from zero to the 5 percent I have suggested over the course of Marine Corps participation in the ground war, it never reached the serious proportions the Army experienced because the Marines were continuously involved in aggressive, offensive operations (*stand down* was a relative term), while the Army remained to the bitter end, waging in those final two years what was essentially a defensive campaign not of its own choosing.

Moreover, there was substantial difference in Army and Marine characterization of drugs or drug use, which does not appear in the analysis. Possession or use of even the slightest trace of marijuana was a court-martial drug offense in the Marine Corps for most of the Vietnam War, while the Army took only the heavy dealers or hard drug users to trial. Hard drug use was virtually unknown in Marine units in Vietnam. Similarly, the statement of Lieutenant General W. K. Jones has been misinterpreted if Professor Gabriel is suggesting that drug use occurred at the levels cited in combat units. General Jones's figures reflect the consternation of the Marine Corps leadership with the inequitably applied draft system that swept drug users off the streets while more qualified individuals escaped through the myriad loopholes of that system. But the greatest impact of this problem did not affect the Marine Corps until after 1970 and certainly had little effect on combat operations in Vietnam. These same individuals—those with prior drug experience—made up many of the desertion cases tried at Camp Pendleton. They were not the product of poor leadership in the Marine Corps but of recruiting standards imposed on the services by civilian leadership.

Professor Gabriel goes from murder or attempted murder to fragging to assassination of unit leaders with an ease that boggles the mind and certainly conflicts with my experience. His conclusions are based on the erroneous assumption that the victim inevitably was a

superior whose authority was being challenged. It would be stretching it to say that even 20 percent of the cases cited involved a challenge to a superior. Twenty-seven Marines were convicted for murder of Vietnamese nationals, for example; at least an equal number of Marines killed fellow Marines of the same or lesser rank in the inevitable barracks quarrels, which unfortunately took place in an armed environment. I tried a case in which four black Marines were accused of murdering a white Marine. The victim was their superior in rank (by one grade) but from another unit. The incident was clearly a racial incident characteristic of those times, both within and outside the military, and certainly was not intended as a challenge to authority. All had been drinking, and the victim simply was in the wrong place at the wrong time. In another case, two close friends jostled one another in celebration of concluding their last patrol before rotating back to the United States. Their antics dislodged a hand grenade with a loosened pin one Marine had hooked on his web gear (contrary to regulations), and the grenade exploded, killing one of the two. The incident was erroneously reported as "fragging" and, I suspect, is one of the 47 incidents Professor Gabriel read in the First Marine Division statistics. (p. 79)

Mutiny within Marine combat units was even lower than the figures Professor Gabriel suggests. Of the 26 offenses reported, more than half occurred during the Da Nang brig riot in August 1968 and involved incarcerated Marines previously convicted of other offenses. Combat refusals were few and far between and were dealt with swiftly.

Professor Gabriel has tried to explain Marine Corps battlefield performance in terms of the traditional Marine reliance on highly qualified NCOs and junior officers. While this is a valid assumption, there were errors in the system. At the outset of the Vietnam War, the Marine Corps provided temporary commissions to 5500 of its noncommissioned officers in order to meet a serious junior officer shortfall. This offered diffusion rather than solution of the problem as a shortage now existed in both the officer and NCO ranks. (I commanded a company in a battalion in the Second Marine Division in 1967 that deployed as the Caribbean Ready Force with one officer per company—no executive officer, no platoon leaders. The platoon sergeants were E-5 sergeants with less than three years in the Marine Corps.) This led to its own set of problems, a point commented on by Lieutenant Colonel Steven Wolfgram. (p. 90)

In fairness to both the Army and the Marine Corps, disciplinary rates in each service related directly to the caliber of the individuals being taken into the services. Peacetime draft deferments remained essentially unchanged, enabling the more qualified individuals in Mental Groups I and II to remain out of the service if they so desired. The *minimum* percentage rate of Category IV accessions the armed forces were required to take as part of the "guns and butter" program exceeded the preceding peacetime *maximum*. Many recruiters succumbed to the pressure and began to accept the "forced volunteer." Recruiters thus found their salvation through the well-intentioned but service-damaging practices of some civilian judiciary and law enforcement officials who urged offenders to enlist in the military in lieu of trial or punishment by the civilian authorities. Statistics kept by the First Marine Division during 1968-69 revealed that the average offender had less than ten years of formal education, was mentally below average, the product of a broken home, with a record of previous civilian misconduct. Many were Project 100,000 accessions. I suspect that the Army, depending more on the draft, fared worse.

THERE are two lessons here other than the basic one that cold statistics seldom provide an accurate picture. First, we cannot bring in the unqualified only, then fault the uniformed leadership *exclusively* for any resultant failure, as I believe Professor Gabriel is suggesting.

Finally, short of commencement of an equitable draft in which all may be called, we are liable to repeat the errors of Vietnam. Certainly the program of the past four years, in which the military services (and particularly the Army) were used as a social outlet to hire the chronically unemployed disadvantaged youth (creating, in the words of Jim Webb, an "economic draft"), does not augur well for acceptance of those hard-learned lessons from Vietnam. And that is where future discussion should be focused.

Alexandria, Virginia

SPAIN, NATO, AND GIBRALTAR

Comment by Miguel Garcia de Lomas, Capitán de Fragata, Spanish Navy

Translated and edited by
DR. JAMES C. HASDORFF

IN the March-April 1980 issue of *Air University Review*, Colonel F. R. Stevens, Jr., USA, addressed the subject of "Spain and NATO: Problems and Prospects"; and although the article touches on many of the points relative to Spain's entry into NATO, a key issue, particularly to the Spanish, was overlooked. This salient point is the British 276-year occupation of Gibraltar. Capitán de Fragata Miguel Garcia de Lomas of the Spanish *Escuela de Guerra Naval* (Naval War College) recently posed four questions in a letter to the editor regarding Spain's past, present, and future feelings on this matter.

- Is it possible to talk about the entry of Spain into NATO without taking into account that such an entry would recognize a de facto ally who retains, unilaterally, part of the other's sovereign territory?
- Does not such an entry presuppose an implicit acknowledgment of legality of this usurpation?
- Is it possible for Spain to share responsibilities, obligations, and duties in general with another country that persists in humiliating it?
- Is it possible to forget that the very idea of an alliance between two sovereign states is absolutely incompatible with the fact that one of them holds territory of the other in colonial subjection?[1]

Capitán Garcia de Lomas's views typify Spanish feelings, and the Gibraltar matter penetrates the very psyche of the country. As Lord St. Oswald stated in an address before the House of Lords in 1968,

> We have continually underrated, undervalued and underestimated the depth and sensitivity of Spanish feeling about Gibraltar. The greatest disservice that anyone can do to the interests of British Gibraltar and the Gibraltarians is to suppose or pretend, as it is often supposed and pretended, that this is no more than a political stratagem by an ephemeral regime. There is nothing ephemeral about it. The present form of British possession of Gibraltar is a wound in the pride of every Spaniard under whatever government or regime he lives. This fact has been consistently ignored, and we can continue to ignore it to-day only at the direct cost of the Gibraltarians.[2]

That these feelings continue to persist is evidenced in the Spanish newspaper *ABC*, which

quoted the Minister of Foreign Affairs, Marcelino Oreja, as saying in regard to Gibraltar, that "the present situation cannot continue," and that it "is a colony of the British Crown, established by force and maintained contrary to the principles and resolutions of the United Nations."[3]

The preceding examples should illustrate that the Gibraltar question is an important one and cannot be overlooked if Spain and Great Britain are expected to work together effectively as NATO allies.

Escuela de Guerra Naval, Madrid

The views expressed here reflect the personal opinions of the author stated in his capacity as a private Spanish citizen. They should in no way be construed as representing the policy of the Spanish government, the Spanish Navy, or the Escuela de Guerra Naval.

Notes

1. Letter of Capitán de Fragata Miguel Garcia de Lomas to Lieutenant Colonel John F. Guilmartin, Jr., 4 November 1980, Madrid, Spain.
2. Great Britain, Parliamentary Debates (Lords), 15 February 1968, vol. 289, no. 41, p. 297.
3. "Oreja Señala La Necesidad de Una Negociacion Sobre Gibraltar," *ABC* (Madrid), 7 December 1979, p. 15.

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in my opinion

AN AIR FORCE RESEARCH AND DEVELOPMENT CORPS

Do we need it?

MAJOR LAUREN K. VAUGHN

A MANNING crisis in any particular Air Force career area inevitably leads to a suggestion, at least at the grassroots level, to create a specialty corps. A specialty corps is a group of officers who wear the military uniform but who are handled separately from line officers. In my view, the best example is probably the medical corps. Observation of the career aspects of medical corps duty, specifically as they apply to physicians, leads me to the common perception that the corps concept has three major benefits: rapid advancement in rank, absence of up-or-out competition for promotion, and monetary bonuses. Before examining these perceived benefits, one might ask how this relates to research and development (R&D).

The Problem and Its Causes

R&D manning problems have not yet reached crisis proportions, but the trends are in that direction. General Alton D. Slay, Commander, Air Force Systems Command, has noted that the scientific and engineering career fields are seriously undermanned and the situation is getting worse.[1] (Admittedly, there is a difference between the terms *scientific* and *engineering* and *research* and *development*, but, in the context of this discussion, they are considered interchangeable terms since most statistics pertain to the scientific and engineering category.) Statistics provided by the Air Force Manpower and Personnel Center support General Slay's remark. The scientific career area (26xx) is 88 percent manned in the grades of second lieutenant through lieutenant colonel, and the engineering area (28xx less test pilots) stands at 86 percent.[2] The accompanying table shows approximate retention rates for R&D officers with 4 through 11 years of service:[3]

26xx:	FY77 = 37%	28xx:	FY77 = 40%
	FY78 = 33%		FY78 = 37%
	FY79 = 29%		FY79 = 33%

The Air Force Recruiting Service may be able to stop-gap the crisis with large numbers of second lieutenants, but the recruiting news is not good either. Despite an FY79 goal of 698 scientists and engineers, only 422 entered active duty.[4] The goal for FY80 was 864, and recruiting service faces an even tighter market.

The market for engineers is a special problem. In the last 20 years, production of engineers in the United States has ranged from approximately 40,000 to 50,000 per year,[5] but the U.S. economy now generates a need for approximately 55,000 new engineers each year.[6] Consequently, it is not surprising that engineers received the highest average salaries among recent recipients of bachelor's degrees.[7] Lieutenant General Andrew P. Iosue, Deputy Chief of Staff for Manpower and Personnel, told the *Air Force Times:* "We pay a 2Lt about $12,000, whereas industry usually starts a graduate at $20,000."[8] General Slay described the problem in these remarks:

> It's a matter of supply and demand. High demand because our society is getting more and more technical, and low supply because our schools aren't turning out enough of the skills we need. An even lower supply [is] available to the Air Force because we can't adequately compete with industry in terms of pay and benefits.[9]

Admittedly, the R&D career area faces a serious manning problem, but any proposed solution should address the causes of the problem rather than the symptoms.

Researchers have conducted surveys to determine the factors that cause scientists and engineers to leave the Air Force. Interestingly, the survey responses varied when the questions were phrased positively and negatively. When the question was, "What would motivate you to stay in the Air Force?" the answers included job satisfaction, fair performance evaluations, family values, etc.[10] But when a Hq USAF survey asked the question both ways ("What would motivate you to *stay?*" and "What would motivate you to *separate?*"), the answer to the first question was job satisfaction, while the answer to the second question was pay.[11]

The lure of higher pay is a powerful motivator and may be the key to recruiting and retention efforts. Major Gerald Winchell noted significant improvement in recruiting during the 1950s, when Congress implemented a combination of rank and pay incentives to attract physicians to military service, but there was no comparable improvement when rank only was used as an incentive for lawyers.[12] Many people who have studied the current manning situation conclude that pay is the key problem. Former Secretary of Defense Melvin R. Laird blames the "deplorable state of military pay and benefits for the recruiting and retention problems in all US military services." Representative Paul S. Trible, Jr., (R-Va.) states, "In the past few years, the military has lost increasingly great numbers of . . . engineers . . . who are vital to our national defense. And I believe our

military compensation system is the most important reason. . . ." Representative Marjorie S. Holt (R-Md.) and former Secretary of Defense Harold Brown both state that pay is the key issue in our retention problems.[13]

Another problem commonly discussed among R&D officers is forced attrition caused by the promotion process, more commonly known as "up or out." This problem includes two issues: the strength of the career irritant manifested in the threat of up or out and the actual losses caused by the process. Richard J. Mosbach and Thomas J. Scanlan specifically tested for the importance of the threat of up or out as a career irritant and found that it is insignificant.[14] I experienced several difficulties in trying to find reliable statistics regarding actual losses. For one thing, the separation process underwent a radical change a few years ago. Normally, the Air Force eliminates officers twice deferred for promotion. During a few promotion cycles in the post-Vietnam drawdown, however, Reserve officers once deferred to temporary major were separated unless they applied for one-year extensions to be eligible for another chance at promotion. Most of the applications for extension were approved. Thus, are once-deferred Reserve officers considered as forced out if they separate? And it is difficult to define a career R&D officer in computer language. For example, a permanently grounded pilot may have worked in R&D for one and a half years at the time of promotion deferral. To what extent was the deferral based on performance in rated versus R&D duties? In any event, forced attrition has apparently played a very minor part in R&D manning. With an authorized strength of 5540 R&D officers (26xx and 28xx excluding test pilots), only 80 officers with a primary Air Force specialty code (AFSC) of 26xx or 28xx were separated because they were not selected for promotion in FY78 and FY79 combined.[15] Nevertheless, anyone who has participated in career motivation conferences or has read the letters to the editor of the *Air Force Times* is aware that up or out is a highly emotional issue of great concern to at least a vocal minority.

Many causes could be listed for R&D manning problems, but they would be less significant. While no one proposes corps formation as a cure for job dissatisfaction, family values, etc., some people view the corps concept as a way of resolving these two major issues, pay and up or out. However, an examination of the corps concept in terms of its three perceived benefits (rapid attainment of rank, elimination of up or out, and monetary bonuses) shows that it does not actually address the causes of the problem.

Advantages and Disadvantages of a Specialty Corps

One should consider two aspects in the rapid attainment of rank, both highlighted by the medical corps: higher than the usual rank awarded at commissioning and more rapid advancement to promotion phase points. The purpose of commissioning a physician in a grade higher than second lieutenant is to bring the individual in line with his or her age group.[16] For example, a physician who completes five years of medical school and internship enters active duty as a captain, the same grade attained by an undergraduate contemporary after five years on active duty. As a rule, this policy would not help scientists and engineers because they generally enter the Air Force with bachelor degrees. Another aspect of the rank issue, promotion phase points, involves the very complex officer promotion process, an area involving the temporary and permanent systems, regular and reserve commissions, public law, and Air Force policy. But, simply stated, there is no direct cause-and-effect relationship between promotion phase points and the corps concepts. The corps is simply a much smaller group that may have different characteristics from the line and, hence, may precipitate a different promotion situation.

Second, the formation of a specialty corps

does not guarantee avoidance of the up-or-out promotion system. Although boards with an authorized maximum quota of 100 percent have recently promoted scarce physicians to major, they remained under the up-or-out system. No matter what the quota, an officer is not promoted unless fully qualified for the next grade. Two successive deferrals in the permanent promotion system would result in mandatory separation or retirement, as appropriate.[17] But the very separateness of the corps concept offers a potential promotion advantage. Since each corps can promote its people independently of the line officers, it has the theoretical ability to promote up to 100 percent of its eligible officers when the situation permits. Of course, line officers can also be promoted up to 100 percent if the situation permits, but that possibility is not as likely in the vast line as in a much smaller corps.

Third, there is no need to create a corps merely to facilitate bonuses. Fliers (line officers) have received aviation career incentive pay (flight pay) for some time, and serious proposals are currently under consideration at high levels for an engineering bonus without a concomitant corps.[18]

Thus, one might conclude that the three main benefits are not really as significant as they at first appear and discard the corps concept out of hand. But there are persuasive arguments favoring a corps. For one thing, the corps concept is a logical career management alternative for certain specialties. For example, physicians are so highly trained and specialized that they would rarely, if ever, be used in other career fields. It just does not make sense to require medical officers to compete with, say, aircraft maintenance officers for promotion. Furthermore, scientists and engineers are similar to physicians in several respects. In the first place, both career areas rank among the top four occupations in terms of the intelligence quotients of their practitioners.[19] Both professions spend much time in reading highly technical journals to keep abreast of new developments within their respective fields. And one expects such professionals to be highly competent in their fields. This relationship for R&D officers is stated quite clearly in AFR 80-3, *Management of Air Force In-House Research and Development Laboratories:* "Laboratory Directors will be the best qualified persons available in their fields," and they will be "appointed partly on the basis of their technical qualifications. . . ."[20]

However, before accepting these arguments, one should examine the disadvantages of a corps. One disadvantage that comes quickly to mind is the separation of weapon system planners from the mainstream of Air Force operations. To avoid this phenomenon, the corps could be limited to pure R&D.

An exclusive R&D corps would include only officers who work in or manage laboratory research and development in the scientific and engineering career fields. It would not include officers in program management, acquisition program management, or experimental test pilot fields. Nor would it include officers in the scientific and engineering fields when they are assigned to operational commands or work in stages of the system acquisition process beyond pure R&D.

Two unique factors make the pure R&D corps an important concept. First, it precludes isolation of weapon system planners from the mainstream of Air Force operations. Some sources are concerned that thinkers and users are already too widely separated. Richard W. Haffner noted that there is no substitute for the "coupling function" provided by scientific/engineering officers between Air Force and civilian contractors.[21] And, on the same theme, General Slay recently commented: "The need is very great for engineers who understand the various disciplines; who can ride herd on contractors."[22] Obviously, the "couplers" or "herders" must have a feeling for Air Force needs, and they could not develop this feeling in an R&D laboratory. Second, a pure R&D corps concept conforms with overall Air Force

policy on manpower utilization. This policy defines three basic kinds of functions—combat, direct combat support, and indirect combat support—and indicates that persons in the last category need not be military.[23] Therefore, if R&D is defined as indirect combat support, one might ask whether R&D positions could be civilianized. Obadiah Dugan studied that question in depth and concluded with a qualified yes.[24] Although one may disagree with Dugan's arguments, it does seem clear that if a case can be made for civilianization, a case can also be made for a corps.

This concept for an R&D corps, however, implies a number of unique problems. For one thing, it might mean that line officers and corps officers with the same skills would perform in adjacent areas. This would surely create confusion, requests for changes from line to corps and vice versa, and a general sense of unfairness in the promotion process. Another problem would be the reduction in management prerogatives in the selection of future leaders. A primary element of the corps concept is that the command authority of officers designated to perform specialized functions is generally limited to this function.[25] Still another problem would be reduced crossflow opportunity caused by fragmenting the career paths of officers qualified in R&D. Finally, the corps concept represents another step toward management by specialty. Management by specialty works well for enlisted personnel because, theoretically, they are technicians. But officers are leaders, and Air Force policy is to select the best leaders available for rank/command regardless of their specialties.

AN R&D corps would provide a possible advantage in promotion rates and a practical career path for R&D officers, but it would create several unique problems. These problems are more numerous and more concrete than the advantages. Furthermore, establishment of a corps would do nothing to ameliorate the key problem in the career field: the military/civilian pay differential. Therefore, to return to the question, Do we need an Air Force research and development corps? The answer is no.

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Notes

1. General Alton D. Slay, transcript of a panel discussion on "Air Force Graduate Education in the 1980 s," Air Force Institute of Technology, 16 November 1979.

2. Telephone conversation with Major Dennis A. Bernia, Hq AFMPC/MPCROS5, 12 December 1979.

3. Telephone conversation with Major Mike Tinney, Hq AFMPC/MPCF, 14 March 1980. These figures are "normalized" to show early separations as though they had occurred at the end of the scheduled tour of active duty. Note also that the figures are projections of retention rates in years 4-11 should current separation rates continue.

4. Major Jack Desmond, Hq AFMPC/MPCMOA, letter, 30 November 1979.

5. *Standard Education Almanac, 1978-79*, eleventh edition (Chicago: Marquis Academic Media, 1978), p. 42.

6. Bureau of Labor Statistics, *Occupational Outlook Handbook, 1978-79*, U.S. Department of Labor, p. 332.

7. *Standard Education Almanac*, p. 18.

8. M.L. Craver, "Iosue: Hike Opportunities Look Good," *Air Force Times*, 29 October 1979, p. 18.

9. Slay, p. 7.

10. For examples of these studies, see Captain Roger M. Vrooman, "An Analysis of Factors Associated with the Job Satisfaction and Career Intent of Air Force Personnel with Less than Six Years of Service," Master's thesis, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, December 1976; and Captain Logan M. Lewis, "Expectancy Theory as a Predictive Model of Career Intent, Job Satisfaction, and Institution-Occupation Orientation among Air Force Officer Scientists and Engineers," Master's thesis, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, September 1978.

11. M.L. Craver, "Survey Finds Pay Biggest Gripe," *Air Force Times*, 10 December 1979, p. 18.

12. Major Gerald J. Winchell, "How Can the Retention Rate of Scientific and Development Engineering Officers Be Increased?" Maxwell AFB, Alabama: Air Command and Staff College, June 1965, pp. 25-30.

13. "Pay Held Responsible for Retention Problem," *Air Force Times*, 4 February 1980, p. 4; Andy Plattner, "Price Wants Boost in Pay and Benefits," *Air Force Times*, 10 March 1980, p. 14; Richard C. Barnard, "Carter Tells DOD: Stop Complaining about Pay," *Air Force Times*, 17 March 1980, p. 16.

14. Major Richard J. Mosbach and Captain Thomas J. Scanlan, Jr., "An Investigation of the Factors which Affect the Career

Intentions of Air Force Systems Command Company Grade Officers," Master's thesis, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, December 1979, Executive Summary, p. 9.

15. Captain R. D. Alexander, Hq AFMPC/MPCAKO2, letter, 4 January 1980.

16. *United States Code Congressional and Administrative News*, vol. 2 (St. Paul, Minnesota: West Publishing Company, 1956), pp.2453-55.

17. *U.S. Code*, 1976 edition, Title 10, Section 8303.

18. Slay, p. 15.

19. Irving Lorge and Raphael D. Blau, "Broad Occupational Grouping by Intelligence Levels," *Occupations*, March 1942, p. 421.

20. Air Force Regulation 80-3, 18 February 1971, p. 5.

21. Captain Richard W. Haffner, "A Qualitative and Quantitative Analysis of Air Force Systems Command Scientific and Development Engineering Officers," Research Study (Maxwell AFB, Alabama: Air Command and Staff College, Air University, June 1965), p. 122.

22. Slay, p. 12.

23. *The USAF Manpower and Personnel Plan, Volume 7* (Washington: Department of the Air Force, 3 August 1979), p. 2-1.

24. Major Obadiah A. Dugan, "Is Civil Service the Answer to the US Air Force's Scientific and Engineering Shortage?" Research Study (Maxwell AFB, Alabama: Air Command and Staff College, Air University, May 1963).

25. *U.S. Code*, 1976 edition, Title 10, Section 8579.

PROFESSIONALISM IN THE AIR FORCE

MAJOR PRICE T. BINGHAM

IN *The Soldier and the State*, Samuel Huntington characterizes a military professional as one who has expertise, responsibility for the military security of society, and a sense of corporateness. He further states that "officership is strongest and most effective when it most closely approaches the professional ideal; it is weakest and most defective when it falls short of that ideal."[1]

In my opinion the officer corps of the United States Air Force falls seriously short of the ideal in all three areas identified by Huntington. One major reason for this development is the failure of the Air Force to require, or even encourage, the study of military history.

Unfortunately, for many history is a turn off. The mere mention of the word reminds them of hours spent memorizing seemingly meaningless, dry facts required by an ignorant or unimaginative teacher. But history properly taught is not boring and can be of unlimited value. The serious study of military history shows how, while weapons have evolved through the ages, man has not. By learning how man has adapted to his military environment, the student comes to appreciate how this adaptation is really professionalism, which leads directly to successful doctrine and strategy. Equally important is the lesson that adaptations copied out of context, without understanding, often result in disaster.

Because the value of military history is unappreciated and the lessons ignored, the professional expertise of much of the officer corps has experienced serious erosion. Evidence of this erosion accumulates. One such indicator of degraded professionalism is the low retention of pilots, clear proof of a declining sense of corporateness. Or again, consider the belief, held by too many junior officers, that senior officers lack integrity. These manifestations of a lack of dedicated professionalism raise serious doubts as to the ability of the Air Force to carry out its national security responsibilities.

The responsibility of the military professional for the nation's military security is his most obvious function. Without sufficient numbers of adequately trained personnel, the military, and specifically the Air Force, would be unable to perform this vital function. The current retention problem as it relates to rated personnel is a clear threat to the Air Force's ability to perform this responsibility and has concerned

Air Force leadership. General Lew Allen, Air Force Chief of Staff, stated to a congressional committee, that the primary "people problem" in the Air Force is retention. He further stated that the Air Force would be short more than 2100 pilots by the end of FY 1980. General Allen forecasts that if current retention rates persist, for every 100 pilots beginning their sixth year of service, only 25 will remain by their eleventh year.[2]

I believe much of the current retention problem is primarily due to the failure of the Air Force to instill, teach, and nurture true professionalism and corporateness in its officer corps; not, as some seem to feel, inadequate pay. According to Huntington, society should offer sufficient pay to its officers; however, financial remuneration cannot be the primary incentive of the military professional. The desire to serve and devotion to skill should be his primary motivations.[3]

Consecutive administrations with the acquiescence of Congress have failed to maintain the quality of life (QOL) of military personnel comparable to that of the civilian sector. Only recently, when the military leadership could point to declining retention and a considerable decline in QOL indicators, did personnel programs become politically popular. Unfortunately, in order to draw the appropriate political attention to QOL problems, the Air Force appeared to stress purely materialistic motivations for their officers. This emphasis has muddied the waters, insofar as the motivations of Air Force officers are determined, creating a red herring. The more the Air Force stressed the materialistic motivations of civilian society, the less it was able to maintain the proper climate that encouraged the growth of true professionalism. The fact that various polls show more and more officers concerned about declining pay and benefits does not mean that the best or only way to solve the retention problem is to provide increased pay. Fiscal realities make it obvious that the state can never provide enough money to compensate fully those who experience the dangers and hardships of military service. Therefore, instead of concentrating on increased pay, the leadership of the Air Force should regard the retention problem as an indication that more and more Air Force officers have not sufficiently developed the sense of corporateness of a professional and thus the professional motivations of service and devotion to his skill. When the retention problem is approached from the perspective of improper motivation, a new insight is provided and is further evidence of the low state of Air Force professionalism.

One reason fewer officers are motivated by service and devotion to their skill is leadership or, more properly, the failure of leadership. To be fair, it must be realized that in today's society all authority is under attack. No longer is authority accepted without question; more than at any time in our history, those in positions of leadership must continually demonstrate their right to command. So it is unrealistic to expect the junior ranks of the officer corps to develop and maintain the motivations of professionalism without worthy models. Members of a military organization must have complete trust in the ability and integrity of their leadership. Without confidence in its leadership, a unit will have a low morale and in battle face disaster. Unfortunately, there are disquieting signs that Air Force leadership has lost the trust of many of its junior officers.

A survey of Squadron Officer School (SOS) Class 74D found a significant lack of faith in the integrity of Air Force leadership. Sixty-one percent of the officers surveyed felt they were required to sacrifice their integrity in order to satisfy job requirements. Specific complaints were the requirement to document training that was never accomplished and overlook apparent abuse of privileges by senior officers. These junior officers felt that senior officers and the "system" were the cause of our ethical problems.[4]

A more recent example is from an Air Force survey of pilots leaving the service, who ex-

pressed "a strong undercurrent of concern about degradation of mission capability, a concern which these pilots feel is not shared by Air Force senior officers." The survey found that a growing number of Air Force officers "view senior officers as self-centered individuals more concerned with promotion and looking good than with mission essential items of force readiness."[5] The fact that this perception seems to exist among so many junior officers has grave implications concerning the state of and trust in Air Force leadership.

Unfortunately, the present promotion system reinforces this perception. The up-or-out system forces an officer to gain rank in order to continue to serve in the military. According to Air Force Pamphlet 36-26, "Evaluator's Handbook," an evaluator's impression of the ratee, not actual job performance, is the important determinant in reaching a rating decision of promotion potential. Since promotion potential is determined by senior officers rating their subordinates, too many officers may take action (or inaction as the case may be), motivated primarily by the knowledge of how such action will look to his superior, with little or no regard for how his subordinates will react. This type of behavior too frequently results in the methods of management criticized in the SOS survey, namely that characterized by emphasis on personal loyalty to an officer's supervisor rather than on the honesty and integrity required for good leadership.

In an article, "Are Professionalism and Integrity Only a Myth?" Lieutenant Colonel Raymond F. Hamel mentions how a commander at Air University's Leadership and Management Development Center candidly remarked, "Commanders are not martyrs. We did not make it this far by telling it like it really is."[6] This devastating remark indicates that there is a reason for concern about the level of Air Force professionalism.

In his book *Soldiers, Statesmen, and Cold War Crises,* Richard K. Betts extensively documents how careerism often triumphed over professionalism and caused faulty intelligence and thus serious misperceptions in Vietnam.[7] According to Betts, promotion is the principal careerist incentive. He documents sobering examples of those who told disappointing truths to their superiors and were rewarded with personal ruin. It is unreasonable to expect men to remain dedicated to a profession that may require them to forfeit their lives when they feel that their superiors are unwilling to risk their careers by telling it like it is.

The evidence from the war in Southeast Asia concerning statistics, such as body and sortie counts and the covering up of bomb shortages, only reinforces the perception of the lack of integrity at high levels. One wonders why realistic dissimilar air-to-air training was not standard in Tactical Air Command units until the last days of a war that saw frequent air-to-air combat.

General Richard B. Ellis, in recent testimony before the House Armed Services Investigating Subcommittee, suggested that beginning in the sixties a "fuzziness" developed in the line between those who make national security policy and those who carry out that policy.[8] It is in this area that integrity is often questioned, perhaps unfairly. Concerning integrity, General T. R. Milton states that "a standing on principle will sometimes be at odds with expedience, and thus be an unpopular position. It may result in disfavor with the politicians and hence in a shortened military career, but it is the single most essential quality we must have in our military leaders."[9] Besides unquestioned integrity, General Milton also finds a requirement for high intellectual capacity in military leadership. He believes the military requires such a capacity in order to be persuasive as well as to avoid the disastrous results of military stupidity.[10]

I feel that the Air Force has done too little to develop this high intellectual capacity or, as Huntington labeled it, expertise. Specialized skills such as flying ability alone do not make an officer a military professional. Huntington

states, "The direction, operation and control of a human organization whose primary function is the application of violence, is the peculiar skill of the officer."[11] He emphasizes the requirement for a broad background in general knowledge, stressing the history of war and military affairs.[12] Unfortunately, the Air Force has done very little to increase an officer's knowledge of military affairs and history.

BEGINNING at the United States Air Force Academy, the Air Force exhibits a surprising disregard for the importance of history. The core curriculum there involves only five military history courses (only one of them required) out of 394 courses offered.[13] The ratio barely improves in follow-on "professional military education" programs where political science and management are in preponderance. Base education courses and advanced degree programs, such as the Air Force Institute of Technology, do not allow for the study of military history. In rebuttal to this fact, a member of the Air Staff stated that such courses ". . . are predicated on the needs of the Air Force and the personal interest of the airmen involved; fields which many believe are pertinent to AF careers."[14] Obviously, to this individual and the Air Force at large there is little need for or interest in the study of military history as a vital part of professional education. Further, this individual states that "common sense dictates the majority of graduate education be in science/technical degrees or management-related (MBA)."[15] It is difficult for me to understand how the Air Force can learn lessons from previous conflicts if it fails to study those conflicts. General Douglas MacArthur felt that,

> More than most professions, the military is forced to depend on intelligent interpretation of the past for signposts charting the future. Devoid of opportunity, in peace, for self-instruction through actual practice in his profession, the soldier makes maximum use of the historical record in assuring the readiness of himself and his command to function efficiently in emergency. The facts derived from historical analysis he applies to conditions of the present and the proximate future, thus developing a synthesis of appropriate method, organization, and doctrine.[16]

General S. L. A. Marshall stated that "realistic training derives only from the continued study of what has happened in war." He discussed this fact when pointing out to a commander that an exercise the commander was conducting had unrealistic objectives if the men were engaged in actual combat. General Marshall then noted that "it is out of such plans and exercises in peacetime that we create our own myths about our potential, and that when war comes the men who discovered the bitter truth the hard way are all gone. Voila, we've got to learn all over again."[17]

Napoleon emphasized the importance of the ability of a commander to see the situation through the eyes of the enemy, "seeing the other side of the hill."[18] The Soviet military, which has borrowed extensively from the German General Staff system, gives the study of history strong emphasis, as compared to the U.S. military. Therefore, if only to understand the Soviet commander's thinking, it is vital for the U.S. military leadership to study history, and especially Soviet military history. A military professional aspiring to high command should have more than a passing acquaintance with all aspects of warfare: naval, land, and air. Unless his background is broad, his limited perspective and parochial viewpoint would make him ineffective and dangerously ignorant. A member of the Air Staff who scoffed at the importance of the knowledge of history for senior officers asked "whatever happened to military experience and leadership qualities accumulated over time."[19] An appropriate answer to such an opinion was expressed by Prince Otto von Bismarck, the "Iron Chancellor," who said that "Fools say that they learn by experience. I prefer to profit by others' experience."[20] B. H. Liddell Hart noted that even in the most active career, "the scope and possibilities of direct experience are extremely limited." He

added that direct experience is inherently too limited to form an adequate foundation either for theory or for application.[21]

THE final ingredient for the development of Huntington's military professional is a sense of corporateness. The liberal character of America, which believes in the ability to change human nature, remains ignorant of the demands of the military profession and has done much to limit the hierarchy of rank. Unfortunately, the Air Force has done little to counteract this tendency of liberalism. The Air Force must nurture the consciousness of the military officer corps as a group apart. More emphasis on military history would aid in this shared sense of organic unity as would a greater emphasis on tradition. Only with a thorough comprehension of the differences of his profession from all others can a military officer begin to understand the need for the spirit of sacrifice and responsibility that makes the military a unique part of society.

Up to this point, reasons for the decline of professionalism in the Air Force have been emphasized. As a start, I would recommend that education is needed. Once the nature of professionalism is fully understood by the Air Force, the emphasis in recruitment and training would be radically altered. The Air Force would stress the unique nature of the military profession and attempt to eliminate any comparisons to civilian occupations. Following recruitment, throughout initial training and for the remainder of his time in the military, each officer would be steeped in professionalism. One method would require periodic, perhaps twice a month, unit seminars led by unit commanders. Using prepared texts, professional books and articles, and videotapes of speeches from the nation's resident military schools, the commander could inspire his officers into further comprehension of the unique nature of the art of military science. By the study of military history, officers could better understand the nature of elements such as morale, comradeship, tradition, initiative, courage, fear, integrity, and most important, leadership.

The present promotion systems should be revamped to eliminate the up-or-out concept. Allowing officers to remain in the military as long as they are effective would reduce the present tendency toward careerism. It would also have significant economic benefits for the individual and the nation through its effect on the current retirement system. The present system, in which the majority of officers are forced to retire in their forties or early fifties, wastes precious talents. In addition, these individuals are now forced to find a new way to support their families, often just when faced with new financial burdens such as college tuition for their children. Since few industries are eager to hire these individuals, it is difficult for many retired officers to find a position that has the same prestige, responsibilities, and income as their recent military duties. I believe that some of the current retention problems may, in part, be due to officers who are otherwise satisfied with the Air Force choosing to leave while they still are young enough to be acceptable to civilian industry (e.g., airlines). With a little imagination, it would be possible to reorganize positions to better utilize the talents of older officers. One solution would be to rotate older pilots from combat to airlift, refueling, and training units and the various wing staff jobs, such as training and scheduling.

Unit integrity must receive new emphasis, also. Continuity and increased emphasis on tradition would aid in the development of a sense of corporateness in the officer corps. Unit reunions should be officially encouraged. Through radical change to the personnel assignment and promotion process, a two-track system could be developed. Only selected officers, identified by capability and inclination, would receive a broad range of assignments and education leading to high staff and command positions. Other officers would be al-

lowed to specialize and would not normally receive career-broadening assignments. As a result, unit experience and continuity would receive a major boost, resulting in a valuable increase in combat cohesiveness and effectiveness. Overseas responsibilities would be covered by unit rotation, causing fewer individual permanent changes of station. By this action, individuals and families could establish more permanent local roots and eliminate a major source of friction between family and military. Other advantages would be the savings in moving expenses. Also, by having increased continuity, units could conduct more elaborate training. Deploying to overseas locations would allow more units to exercise fully their mobility capabilities while familiarizing themselves with the locations in which they may be assigned wartime responsibilities. In addition, such actions would reduce the number of dependents located in possible zones of conflict. While I realize that rotations in the past caused many problems, the changing situation demands its renewed study. Perhaps only the most forward and exposed areas would be covered by rotation, and then by squadrons rather than an entire wing. The present overseas system, characterized by rapid personnel turnover, high training requirements, and a resulting low unit level of experience and cohesiveness, demands that rotations be reexamined as a possible method for increasing readiness and professionalism.

Finally, to develop professionalism fully, the leadership of the Air Force must scrupulously avoid any actions that could cause doubt as to their integrity. Any officer discovered abusing his position and trust must be promptly and severely disciplined to avoid the immense damage to trust such actions can cause. The importance of loyalty down as well as up must be recognized and practiced. Those in command positions must recognize that the perceptions of those being led are extremely important; therefore, to be an effective leader, one must continually strive to ensure that the perceptions of his leadership are in agreement with reality.

To prevent the abuse of position and aid the elimination of careerism, a three-tier evaluation could be developed as a tool in the selection of those for higher levels of command. In addition to superiors rating subordinates, carefully selected peer and subordinate personnel would rate officers in command positions. Although not given the same weight as the superior's evaluation, these additional evaluations would provide another perspective. Officers continuously receiving poor grades from peers and subordinates might be subjected to more intense scrutiny before being raised to higher levels of command.

THE Air Force is a demanding profession that requires tremendous dedication. In the past, it has attracted many highly capable individuals, often motivated by a well-developed sense of idealism and service. Yet in a few years, these same individuals have left the service, often due to their disappointment with the realities of the Air Force. This accumulating evidence of a weakened officership, combined with an increasing international threat, demands that the Air Force move immediately to encourage the development of true professionalism. The idealism and integrity of the officer corps must not be allowed to be choked out by the weeds of ignorance and careerism.

Hq USAF

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21. Ibid.

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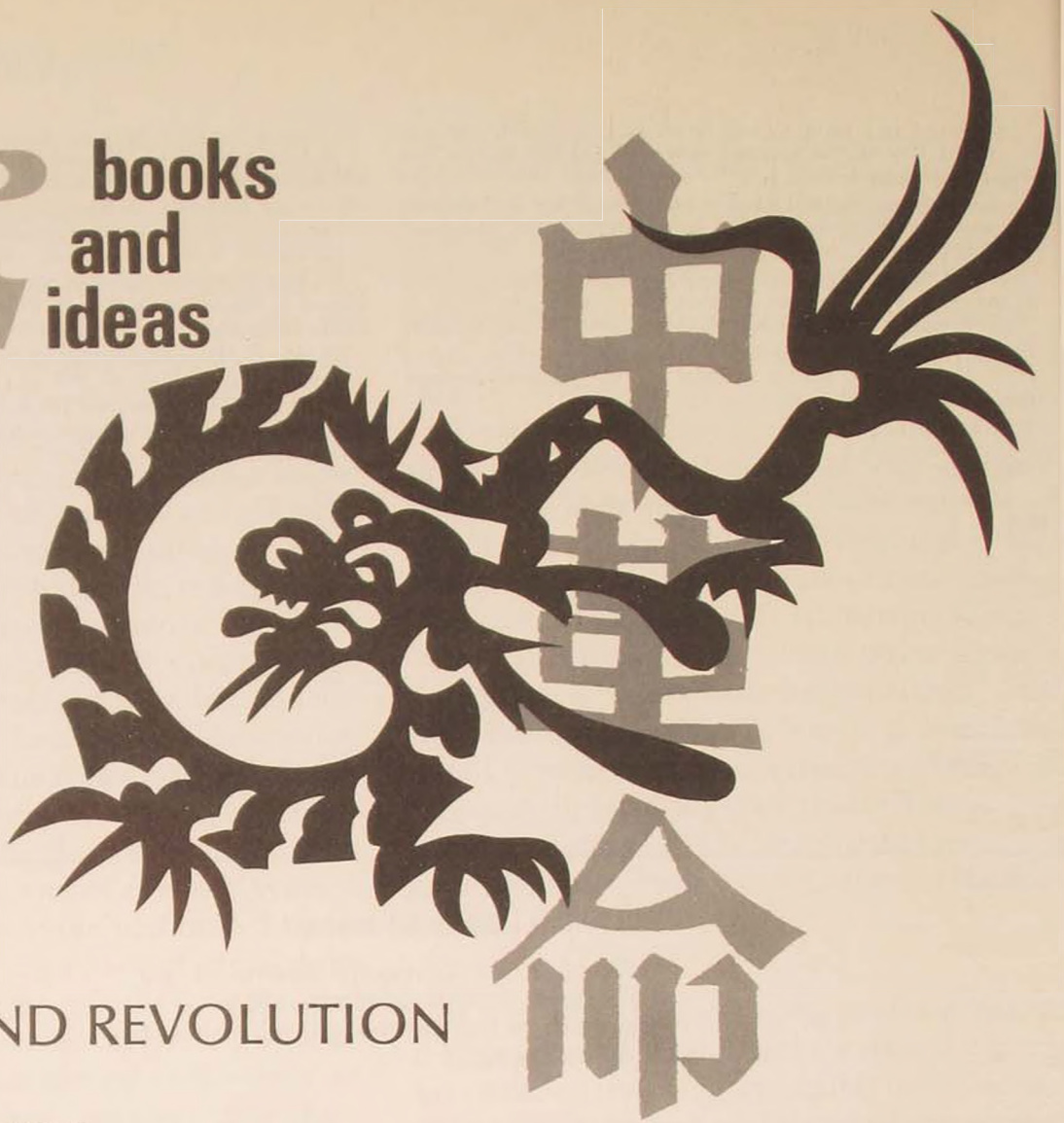

CHINA AND REVOLUTION

DR. PAUL H. B. GODWIN

FOR the past one hundred years and more, the quest for a modernized and powerful China has been at the root of Chinese politics. Within the ranks of those seeking a new China, opinions ran the gamut from total rejection of the Middle Kingdom's Confucian past to preservation of what was uniquely Chinese while adapting those values and technologies from the West that would once again permit China to stand among the world's most powerful nations. Thus nationalism came to embrace a divergent set of beliefs, and, like all simple explanations, the concept has become practically useless in explaining the contemporary history of China. From Mao Tse-tung, who sought to apply "the universal truths of Marxism-Leninism to the concrete practices of the Chinese revolution," to Chiang Kai-shek, who sought to build a modern China on the basis of reverence for the traditional and Confucian values, the form and content of what the new China should be have been a crucial issue in Chinese politics. With the victory of the Chinese Communist Party (CCP) in 1949, the basic conflict continued even though the boundaries of the dispute narrowed. In his

A Note on Romanization
Even though the official romanization of Chinese words in the United States and the People's Republic of China uses the *Han pinyin* system, this review retains the more traditional Wade-Giles method. This choice was made to avoid confusing the potential reader because only one of the six books under review uses the *pinyin* system.

Great Proletarian Cultural Revolution, Mao Tse-tung hoped to settle once and for all the shape of the new and communist China, but the anarchy and turmoil created by Mao's final mass campaign led not to a nation led by "Mao Tse tung Thought" but to a new leadership dominated by economic and political pragmatists whose concern is catching mice rather than the color of the cat. The books before this reviewer are remarkable in their diversity, but given the complexity of describing China's quest and the forces that drive it, such diversity reflects the complexity of the search for modernity within a traditional society.

The diversity of these volumes derives not only from the variety of "cuts" they take out of the phenomenon we call China but also from the readership they seek. Professor John K. Fairbank's classic work, *The United States and China,* now in its fourth edition, was written for the general reader, rather than the specialist in Chinese affairs. The collection of 15 essays edited by Ross Terrill under the title *The China Difference* seeks the same audience. However, the reader looking at China for the first time would be well advised to pick up the Fairbank volume first in order to obtain the broad historical background necessary for a thorough reading of the Terrill collection, whose essayists' narrower analyses are the result of both academic research and recent visits to the mainland. The four additional volumes are designed primarily for the specialist. The biographies of Li Tsung-jen and Liang Shuming are both fascinating and illuminating reading for those whose search to understand modern China leads them to look for the intricate detail and personal evaluations such biographies provide. The Crooks' *Ten Mile Inn* takes the reader into a northern Chinese community to observe the social, political, and economic foci of communist land reform campaigns in the late 1940s, while the Joint Economic Committee's (JEC) fourth in a series of sponsored essay collections on contemporary China's economy provides the latest in academic and governmental analyses of China's progress toward economic self-sufficiency and modernization.

For the general reader, Fairbank's *The United States and China,*† seeks to "explain China to Americans so they could live in peace and friendship." (p. xv) Professor Fairbank rightfully holds the status of Dean of China studies in the United States, and since the first edition of this work was published in 1948, he has watched his students make their contribution to the field, observing that it is their work as much as his that led to subsequent revisions of *The United States and China* in 1958, 1971, and 1979. The second edition was published five years after the conclusion of a bitter war with China on the Korean peninsula; the third as normalization of relations with China was under way, but the United States remained deeply involved in a war on China's southwestern border; and the fourth after the establishment of diplomatic relations with the People's Republic.

The thirty years of postwar relations with China have seen the American link move from war, to proxy war, to friendship and the exchange of senior military delegations as well as negotiations over the sale of military-related technologies. It is this latest change in the historical pattern of Sino-American relations that recommends this classic work once again, for as the United States and China reestablish more cordial relations, so the need for the professional soldier to understand China and the way in which the Chinese view themselves and the West is increased. One can argue that in

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†John K. Fairbank, *The United States and China*, fourth edition (Cambridge, Massachusetts: Harvard University Press, 1979, $18.50, $6.95 paper), 606 pages.

war it is necessary to understand the enemy, but when conflict is high, current events and the immediacy of the conflict make understanding difficult. In the absence of war and when relations are cordial, it is easier to focus on the larger patterns of human behavior and understanding. John King Fairbank's careful and witty writing, discrete analyses, and absolute command of the sweep of Chinese politics and culture make this perhaps *the* book for Americans to begin their understanding of Sino-American relations.

MORE difficult to assess is Ross Terrill's *The China Difference.*† Although clearly designed for the general reader, its essays are frequently highly specialized. They do not necessarily lend themselves to easy reading, and a working acquaintanceship with Fairbank's volume would be a definite advantage. What the authors do address from a variety of approaches and attitudes is in one sense a basic question: What has a foreign political, social, and economic philosophy—Marxism-Leninism—brought to China through the policies of the Chinese Communist Party? Perhaps equally important, the essays by Donald J. Munro, John K. Fairbank, and Harriet Mills raise the issue of what aspects of China's traditional culture have influenced the social, economic, and political systems developed by the CCP. Answers to these questions do not provide a full understanding of contemporary China, for, as the authors so frequently state, the China of Hua Kuo-feng and Teng Hsiao-p'ing is diverging quite radically from the China sought by Mao Tse-tung. Thus change in China is not restricted to traditional versus communist but also to Mao and post-Mao. A volume that presents carefully constructed essays in fields and areas as divergent as philosophy, law, the theater, factory life, student life, popular religion, and political participation is perhaps presenting too complex an image of contemporary Chinese society for the general reader, but a modernizing society deeply rooted in a traditional culture is a complex phenomenon to grasp. At the very least, these essays should prompt the thoughtful reader to rethink his or her views not only of contemporary Chinese society but also of their own, for ultimately the difference the authors seek to explain is the difference between the United States and China.

WHERE the reader will delve deeper into the CCP's political techniques is in reading *Ten Mile Inn: Mass Movement in a Chinese Village* by David and Isabel Crook.†† The Crooks themselves are fascinating. David Crook was born in England and educated at Cheltenham College, Columbia University, and the School of Oriental and African Studies of London University. Isabel was born in Chengtu, China, of Canadian missionaries and received her education at the University of Toronto. David went to China in 1938 while Isabel returned to Tibet and west China to conduct anthropological field work. Both went to CCP-controlled areas to observe land reform programs in 1947 and 1948, and from there they went to Peking where they now teach in the Foreign Languages Institute.

This volume is the result of direct observation of the implementation of the Agrarian Law between 26 February and 15 April 1948. For the student of the political techniques of a

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†Ross Terrill, editor, *The China Difference: A Portrait of Life Today inside the Country of One Billion* (New York: Harper and Row, 1979, $12.95), 355 pages.

††Isabel and David Crook, *Ten Mile Inn: Mass Movement in a Chinese Village* (New York: Pantheon Books, 1979, $15.95, $6.95 paper), 291 pages.

CCP mass movement campaign, this book is invaluable. Central to the CCP's methods of political mobilization is the "mass line," and the details of the Crooks' description bring the discrete sociopolitical processes involved into clear light. For the general reader, this volume provides insights into life in a Chinese village and the manner in which CCP cadres used the economic and social structures of a village to press forward with their political as well as economic programs. Perhaps it may even persuade the reader to look at the Crooks' earlier study of Ten Mile Inn[1] and William Hinton's *Fanshen*.[2] In a nation of peasants the village became the focus of the basic work of the Chinese Communist Party. To understand the success of the CCP in the 1930s and 1940s, it is essential to have a good grasp of the political techniques the communists applied in rural China.

IF the political, social, and economic philosophies of Marx and Lenin came to dominate China, there remains yet another question: Why Marxism-Leninism? The simple answer is that Chiang Kai-shek and the Kuomintang (KMT) lost the civil war. Here we can look at the oral biography of Li Tsung-jen for an insider's view of the military aspects of the Chinese revolution.† Autobiographies are, of course, dangerous, for they are frequently self-justifying and self-inflating while being designed to prove that those who opposed them were wrong on all counts. Columbia University Press, the sponsor of the memoirs, has commissioned sixteen autobiographies but has sought to control the elements of narcissism by making them oral histories under the direction of trained historians. Li was interviewed in the early 1960s, and this volume is a condensed version of the original Chinese text. The Columbia University series, therefore, is a skillful combination of scholarly research and participant memory.

If the path of the Chinese revolution was the result of the interaction between soldier, peasant-activist, and scholar-intellectual, as I believe it was, then *The Memoirs of Li Tsung-jen* should tell us much about the soldiers' view—and from a soldier who not only fought for the KMT and Chiang Kai-shek but who also served as the acting president of the Republic of China in 1949 as it crumbled before the Chinese People's Liberation Army. Born in southwest China in 1891 and graduating from the Kwangsi Military Elementary School in 1913, Li obviously has far more to offer the professional soldier than simply his interpretation of the failure of the KMT to prevail in a civil war, but he phrases the question properly: With an army of "several millions" trained and equipped by the United States, the KMT "was beaten and overthrown on the mainland by the Communists, who had begun as nothing more than a band of drifting bandits. Was this not a strange thing?" (p. 433) Li's answer to this question came more than 200 pages earlier when he stated that after Chiang Kai-shek's defeat in the battle of Hsü-chou in 1927, he was convinced that Chiang "was neither an acceptable field commander nor a qualified strategist. He did not know how to command troops or plan a war." (p. 220) Major General David Goodwin Barr, head of the American Advisory Group to China, would agree.

There is clearly much more to these memoirs than Li's evaluation of Chiang as a military leader, and for the professional soldier interested in the Chinese revolution, they provide a wealth of information on the emergence of a modern military system from the warlord armies that dominated China in the early years of the twentieth century.

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†Te-kong Tong and Li Tsung-jen, *The Memoirs of Li Tsung-jen* (Boulder, Colorado: Westview Press, 1979, $30.00), 642 pages.

JUST as soldiers played their role in the revolution, so did the scholars. In Liang Shu-ming's biography, Professor Alitto provides not only a diligently researched and sympathetic analysis of the man he refers to as *The Last Confucian* but he does so with such skill that his work is as fascinating to read as a novel.† Liang was born in Peking in 1893, but his family home was Kweilin in the province of Kwangsi, and it was his association with Kwangsi that brought about his connection with Li Tsung-jen.

In the late 1930s Liang advised General Li on mass mobilization techniques, arguing, as did Mao Tse-tung, that the war with Japan could be won only with a mass mobilization of the peasants through social reform and education. In his friendship with Mao, Liang completes the pattern of the Chinese revolution where soldier, scholar, and peasant-activist all provide the critical core of ingredients. The differences between Liang and Mao, debated through long nights in the Communist headquarters in Yenan, were not so much a function of the differences between a Marxist-Leninist and a Confucian but of differences that were formed by Liang's background as a scholar and an intellectual, both in his own training and in his family tradition, and Mao's background as a peasant-activist from rural China whose concerns were based as much in a need for political pragmatism as they were in philosophy and ideology. In the words of Guy Alitto, both men "shared a bone-deep Chineseness." (p. 285) For Liang, it was the destructive conflict he saw between the CCP and the KMT that led him into political activism. Liang saw his role in the 1930s as one of leading a third force composed of uncommitted intellectuals that would keep the United Front between the CCP and the Nationalists from breaking apart. In this role and in his concern for building a new China, Liang came to see himself as China's new sage and saviour. As it was, the peasant-activist assumed this mantle, not the Confucian scholar. It is perhaps ironic, as Professor Alitto suggests, that Liang Shu-ming should live long enough to see Mao, who ultimately turned against him, rejected by the economic pragmatists who succeeded him. Liang may even have gained secret satisfaction from these events, for Mao's vicious attack on Liang in the middle 1950s makes no sense except in the most Byzantine analysis of Chinese politics.

IN any modernizing revolution, economics plays a central role. By far the best collection of analyses available for any library is the compendium of papers collected and released by the Joint Economic Committee (JEC) of the United States Congress: *An Economic Profile of Mainland China* (1967); *People's Republic of China: An Economic Assessment* (1972); *China: A Reassessment of the Economy* (1975); and most recently *Chinese Economy Post-Mao.*†† This latest volume of twenty-six essays carries on the tradition of presenting both broad interpretive analyses of the economy as a whole and of major issues in Chinese economic development as well as tight empirical analyses of specialized sectors of the economy. The 37 contributors to this publication are specialists in various departments of the United States

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†Guy S. Alitto, *The Last Confucian: Liang Shu-ming and the Chinese Dilemma of Modernity* (Berkeley: University of California Press, 1979, $17.50), 396 pages.

††Joint Economic Committee, Congress of the United States, *Chinese Economy Post-Mao,* a Compendium of Papers, vol. I, Policy and Performance (Washington: U.S. Government Printing Office, 9 November 1978, $7.00), 880 pages.

government, private research institutions, and universities in the United States, the United Kingdom, Sweden, and Canada. Thus, their analyses and interpretations do not represent any particular institutional bias. The essays are grouped into five sections: Policy Perspectives, Manufacturing and Extractive Industries, Population and Labor Utilization, Agriculture, and Foreign Economic Relations. It is regrettable, however, that the 1978 volume does not contain an update of the defense sector of the economy. To some extent this omission is alleviated by a publication from the Central Intelligence Agency's National Foreign Assessment Center, *Chinese Defense Spending,* 1965-1979 (SR80 10091, July 1980), itself an update of an earlier work by Ronald G. Mitchell and Edward R. Parris.[3] Mitchell and Parris's focus, however, is much narrower than the defense sector as a whole; thus, it is hoped that the next collection published will contain a review of the defense industries and the defense sector of the economy. Nonetheless, this volume as well as its predecessors belongs on the library shelf of anyone seriously interested in the People's Republic of China.

THIS diverse collection of volumes presents in a very real way problems involved in understanding a modernizing revolutionary movement. That the communists were the victors in a civil war does not permit any facile explanation of what drove the revolutionary movement or any simple predictions of what the revolutionaries would do once they came to power. To obtain a firm grasp of what drove the revolutionaries, it is necessary not only to review the history of the revolution but also to gain an understanding of the revolutionaries themselves—the soldiers like Li Tsung-jen, the scholar intellectuals such as Liang Shu-ming, and the peasant-activists such as Mao Tse-tung. For an agrarian society, it is essential to understand what the revolution meant to the peasants themselves and how they were viewed by the revolutionary elite. Once the communists came to power, a new set of questions arose as the CCP sought rapid, radical change in China's social, economic, and political systems. The authors reviewed here have made significant contributions to the ability of the professional soldier to understand what contemporary China means to the Chinese, and to understand that helps us understand what the future relationship between the United States and China is very likely to be.

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Notes

1. David and Isabel Crook, *Ten Mile Inn: Revolution in a Chinese Village* (London: Routledge and Kegan Paul, 1966).
2. William Hinton, *Fanshen* (New York: Vintage Books, 1966).
3. Ronald G. Mitchell and Edward R. Parris, "Chinese Defense Spending, 1965-1978," in *Allocation of Resources in the Soviet Union and China—1979* (Washington: Government Printing Office, 1979).

A TIME OF ADJUSTMENT: AMERICA AND EAST ASIA

DR. JOE P. DUNN

MAJOR changes have taken place in East Asia during the last few years. These include the end of the Vietnam era, new regimes and continuing crises in Southeast Asia, the deaths of Mao, Chou En-lai, Park Chung Hee, United States recognition of the People's Republic of China (PRC), a growing economic and possibly military relationship between the PRC and the U.S., a new status for Taiwan, talk of American military disengagement from South Korea, and strained United States-Japanese economic relations. These changes require adjustments in American policy. American foreign policy tends to be Eurocentric, and Asia has long been considered a troublesome peripheral area. When drawn into involvement in Asia—in World War II, Korea, and Vietnam—Americans wished to extricate themselves as quickly as possible and ignore the region. Assigning Asia a low priority is no longer possible. East Asia is central to America's economic and strategic future.

The three books reviewed here address the new U.S. situation in the Far East. Two are collections of essays; one is an intensive treatise. Two focus on Sino-American relations; the other on the United States-Japanese Pacific partnership. All three are selections from distinguished scholarly series, and one is a major academic contribution; the other two are of some interest but lesser import.

AT the moment of publication, *Two Chinese States*, a collection of essays that urge a gradualist approach toward normalization of relations with the People's Republic, was dated, maybe outdated.† In the introduction, Robert A. Scalapino, one of America's foremost Asia scholars, outlines three approaches to U.S.-East Asian relations: (1) a withdrawal or isolationist posture, (2) a united front against the Soviet Union (with a PRC-U.S.-Japanese alliance at its heart), or (3) an equilibrium strategy—a gradualist, balance-of-power orientation. Scalapino and the other authors in the collection favor the latter approach. The authors do not advocate a two China policy nor do they oppose normalization; they do counsel that the United States should proceed with caution and patience in its relations with the People's Republic. They advocate the negotiation of bilateral pacts with China which guarantee the security of Taiwan and maintain the balance of power in the area. The United States should reject any PRC demands that are disadvantageous to Taiwan.

In the essays, William W. Whitson details the military and diplomatic implications of normalization. Economist Norma Schroder points out the economic importance of Taiwanese trade to the United States and argues that it is possible to cultivate increased commerce with both Chinas. C. Martin Wilbur explains that the burgeoning economic, social welfare, and democratic political development in Taiwan should not be jeopardized by precipitous U.S. action. Editor Ramon H. Myers's concluding essay elaborates on the demands and procedures for conducting the desired equilibrium

†Ramon H. Myers, editor, *Two Chinese States: U.S. Foreign Policy and Interests* (Stanford, California: Hoover Institution Press, 1978, $5.95), 84 pages.

strategy. The collection is interesting but not particularly significant now.

AMERICAN concern about China extends beyond the issue of diplomatic recognition. Monumental changes have occurred in China since the death of Mao. The power struggles and internal maneuverings continue; the outcome and future of the country are still in doubt. Journalists, travelers, diplomats, and a few Asia scholars have attempted to explain these events. Possibly the best effort is by the noted Australian expert on China, Harry G. Gelber, whose study of the socioeconomic impact of China's quest for modernity during the 1975-78 time period focuses on China's economic growth, technical development, defense needs and problems, and the political controversies in all of these areas.† Gelber details the problems of industrial growth, fiscal and resource allocation, capital accumulation, planning and management, and other aspects of decision-making. China must overcome many obstacles to achieve her economic aspirations. She needs capital, an educational infrastructure, technical capabilities and personnel, research capacity, communication with the outside technical and scholarly community, midlevel administrative specialists, and managers at every level. These needs cannot be met overnight. Gelber predicts that definitive conclusions about China's modernization effort cannot be drawn until after the turn of the century.

Gelber also explains the political dangers inherent in China's current activities. The transformation from an ideological society to a technical-pragmatic state is fraught with controversies. The new class of technicians challenges the traditionalists whose standing and power are grounded in the old order. The followers of Hua Kuo-feng and Teng Hsiao-p'ing—Gelber still uses the Wade-Giles system of transliteration—vie with each other for authority. Serious conflict exists over resource allocation, urban versus rural development, regional priorities, and local autonomy versus central planning. At the moment, consensus prevails on the goal of modernization, but a backlash could erupt if the program brings about major disruptions or is less than successful.

Finally, Gelber turns to China's military development. Making forecasts in this realm is as difficult as predicting China's economic future. Although a regional force, China's ability to project power, either strategically or regionally, is limited. Her military forces dwarf those of Taiwan, but her capacity to deliver that power against the island is minimal. China poses little strategic threat to the great powers in the near future. Nevertheless, she is not impotent, and in some respects her vulnerabilities can be translated into political strengths. As Gelber explains:

> . . . China will continue to play from weakness, albeit sometimes brilliantly, in an arena of global power adjustments. For all the new elements of technology, energy, and resource politics, it will be a familiar and classic game, a balance of power in which there are no permanent friends or permanent enemies. (p. 196)

This is an important book. It is one of the best and most intensive surveys of the Chinese economy and China's prospects for future development. It is not light reading; Gelber's prose is often ponderous. Although the layman reader can gain from the book, it is written for specialists. It will be quickly dated, but in the meantime, it is quite significant.

IN the final book we turn from China to Japan. *Encounter at Shimoda* is a record of the Fourth Shimoda Conference on

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†Harry G. Gelber, *Technology, Defense, and External Relations in China* (Boulder, Colorado: Westview Press, 1979, $18.50), 236 pages.

U.S.-Japanese relations, which was held in September 1977.† The city of Shimoda historically has been associated with U.S.-Japanese relations. It was near this city that Commodore Matthew Perry landed in the early 1850s to open Japan to the West. America's first consulate in Japan was established there. The first Shimoda conference was held in 1967. At this fourth conference, 45 Japanese and 34 American participants—legislators, government officials, businessmen, labor leaders, journalists, and academics—discussed trade, Asian development, energy policy, and security issues. The editors, two American scholars, collected thirteen presentations to represent the activity of the conference. Most of the included selections were written by political figures rather than academics. Examples by American politicians include essays by Senator John Glenn, Congressmen Barber B. Conable, Jr., and Stephen J. Solarz, and John Sawhill of the Energy Department. The thirteen essays are divided into five topical categories: the future of U.S.-Japanese relations, security in Northeast Asia, political and economic development in Southeast Asia, Japan in international politics, and Japan and the world economy.

For the most part, the articles are not profound. Scholars will consider them superficial; but they are well written, generally interesting, and of some value to the layman reader. They do address important issues and set the outlines of the debates involved. The book is useful if marginal.

IN the early fifties, Douglas MacArthur attempted to turn American attention to Asia. His motivations and his methods may have been flawed, but his projection that Asia was the continent of the future proved astute. His admonition not to ignore Asia is still legitimate. Viable economic relations with the East Asian powers and a stable military balance in the region are imperative today. Understanding, appreciation, flexibility, and policy adjustments are the demands of the present time.

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†Herbert Passin and Akira Iriye, editors, *Encounter at Shimoda: Search for a New Pacific Partnership* (Boulder, Colorado: Westview Press, 1979, $20.00), 257 pages.

SINCE 1802: TRANSITION AT THE ACADEMIES

CAPTAIN PHILLIP S. MEILINGER

IN the preface to his book *Ivory Fortress,* Dr. Richard C. U'Ren notes that much of the literature regarding West Point is useless, "unless one has a taste for boys' adventure stories." He has a point. In the past few years several authors, including U'Ren himself, have tried to redress this deficiency. Unfortunately, most of these efforts—*The Brass Factories* by Arthur Heise, *West Point: America's Power Fraternity* by K. Bruce Galloway and Robert Bowie Johnson, Jr., U'Ren's book, and a recent novel, *Dress Gray,* by Lucian K. Truscott IV—are largely anti-service academy polemics and of little merit. A more balanced work is *School for Soldiers* by

Joseph Ellis and Robert Moore, but it deals only with West Point. There is a need for a balanced look at all the military academies, how they operate and where they are headed.

John P. Lovell, a political scientist at Indiana University, has attempted to fill this void with *Neither Athens Nor Sparta? The American Service Academies in Transition.*† He maintains that the four military academies in this country are in serious trouble and need to be transformed. After summarizing the histories of the academies, he argues that changes in American society since World War II have forced a search for new directions in the service schools. These new directions resulted in a clash between those who emphasized military training and discipline (the Spartans) and those who pushed for an increasingly academic environment (the Athenians). Because of this clash and its destructive nature, the academies have failed in their primary mission of graduating quality military leaders. This failure is evidenced by high dropout rates and recurring "honor scandals." Lovell contends that radical new solutions are required and offers four options in his concluding chapter.

The author's insights into academy operation and politics and cadet attitudes and motivations are often excellent and thought-provoking. Deficiencies in Lovell's research, however, diminish the overall impact and importance of the book.

Lovell begins by sketching histories of the Army, Navy, Air Force, and Coast Guard academies. The oldest of these, West Point (1802), was based on what he terms the seminary-academy model. In this model, the cadet received a sound education in engineering and mathematics from officer-instructors who enforced strict discipline and required daily recitation in the classroom. This environment placed a premium on what Lovell terms the Spartan values of duty, loyalty, and courage. In the nineteenth century such an education proved adequate for training officers to fight Indians and the Civil War. Thus, the Naval Academy (1845), and the Coast Guard Academy (1876) adopted similar programs.

Lovell claims that the academies continued with these century-old methods until after World War II. That conflict showed some political and military leaders that the seminary-academy model was no longer viable because of the increased complexity of modern warfare. Nuclear technology, systems analysis, occupation duty, and enormous mass armies demanded new techniques of leadership and command. The obvious place to begin such change seemed to be in the military academies, but academy officials, as well as many high-ranking graduates throughout the services, were reluctant to break with tradition. Even when the Air Force Academy was founded in 1954, the obsolescent West Point model was extensively copied. The values of culture and learning, the Athenian values, were given secondary importance to the Spartan. As a result, the new institution began with a flawed orientation. Fortunately, a young and dynamic dean, Brigadier General Robert F. McDermott instigated sweeping reforms that modernized the curriculum, diminished the Spartan influence, and strengthened the Athenian. McDermott's unusual innovations—validation and transfer credit, academic majors, and follow-on graduate school—evoked immediate resistance and disapproval from the older, more conservative academies. Over the next decade, however, these changes gained considerable publicity, and eventually many were adopted, albeit reluctantly, by the sister schools.

But these new departures proved to be insufficient. A cheating scandal which swept West Point in 1951 was duplicated at Colorado

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†John P. Lovell, *Neither Athens Nor Sparta? The American Service Academies in Transition* (Bloomington: Indiana University Press, 1979, $17.50), 362 pages.

Springs in 1965. Other cheating scandals flared in 1967 and 1972 at the Air Force Academy and in 1976 at West Point. Lovell implies that when General McDermott retired in 1968 a major force for reform and innovation at the academies was retired as well. Subsequently, the schools have sunk into a period of reaction and retrenchment from which they have not yet emerged, except for a recent major alteration forced upon them from without: the admission of women.

Lovell feels it is time to pick up the reins of leadership dropped over a decade ago. The schools have failed to keep pace with the changes in society, and unless enlightened leadership is discovered, the academies will continue to suffer from high rates of attrition and periodic honor scandals that are symptomatic of deep-rooted institutional ills.

To remedy these ills, Lovell presents four scenarios: a combined service academy, mixed civilian-military collegiate experience, the academies as postgraduate institutions, and continued gradual incrementalism. None of these proposals are really new; rather they are ideas previously advanced by various sociologists, psychologists, and political scientists. Significantly, all options would result in a marked turn toward the Athenian ideal and also a continued "civilianization" (Lovell's term) of the academies.

These proposals are of some interest and deserve serious thought and discussion. American society, as well as the American military establishment, has undergone great change in the past three decades. It would seem reasonable to expect change in the academies as well. The schools do have problems; they have had them for some time and no doubt will continue to have them in the future. It is important that men like Lovell, himself a West Point graduate, illuminate these problems and offer solutions. No doubt some will disagree with the extent of the problems described by Lovell and contest his proposed remedies. But it would be unwise for anyone to dismiss his observations and proposals out of hand as unnecessary or unjustified. They deserve consideration.

However, I think the author skirts a central issue in his analysis. What is the mission of a military academy? That question, though posed, is never really answered in this book. Unfortunately, that may be because the academies themselves are unsure of the answer. Nevertheless, resolving this question is the first essential step to understanding the schools.

First, it is necessary to state what is *not* the mission of a military academy. In my opinion, it is not to graduate top scholars or engineers. These specialists are an absolute necessity in the military today, but they can normally be recruited from the civilian sector. Nor is it the mission of an academy to produce athletes. Teaching military studies is another highly desirable but nonessential function. Such topics can be learned in summer camp or an ROTC classroom at considerably less expense to the taxpayer. Not even a combination of these functions comprises the total mission of the academies. All are important, even necessary to an officer, but by themselves they are meaningless.

The real mission of military academies would seem to be of the spirit. They should engender an attitude, a feeling, a sense of responsibility and duty to country. Academics, athletics, and military studies are merely tools that the dedicated leader can employ. Without the proper devotion and inborn sense of commitment, such tools are useless. As Lovell points out, all the curriculum changes in the world will not increase devotion to duty; such things are not learned from books. Rather, the academies should serve as leadership laboratories to train people to obey and command, to take care of subordinates, to react under pressure, to do what is right even though it is unpopular, and to develop a toughness of the mind as well as the body. One attempt to achieve these unquantifiable and somewhat nebulous goals is through a close and continuous association between

cadets/midshipmen and officers. Hence, the academies emphasize military faculties, small classes, frequent counseling sessions, and, perhaps most important, participation by all staff members, and their families, in the cadet environment. The Air Force Academy places particular emphasis on the latter idea.

Desirable leadership traits are also fostered by what the author somewhat sarcastically refers to as "saga building." In order to instill pride and esprit, students are told of heroic exploits performed by previous graduates (The Long Gray Line approach). Buildings, auditoriums and dormitories bear the names of famous predecessors. Uniforms, customs, and ceremonies recall previous eras—tradition is continuously emphasized and fostered. Although such influences may be smiled at by some, one only need read, or better yet hear, the Duty, Honor, Country address of General MacArthur at West Point in 1962 to understand the powerful hold such ideas do generate. The academies hope that a sense of history and fraternal relationship between staff and student will plant seeds of inner commitment that will bloom at a later date. This inner commitment when coupled with an excellent education, athletic prowess, and military studies will produce a quality officer and leader.

A second crucial question is whether the academies are in fact producing a suitable product. To me, the criteria of too many "honor scandals" and excessive attrition rates seem inadequate for this purpose. As has been pointed out by academy officials, discovering and punishing those guilty of cheating is not a scandal, but failure to move against violators is. Even so, the number of students who leave the academies as a result of honor violations is small and has decreased appreciably in recent years. This is not to imply that men and women are necessarily more honorable now than previously, but it does indicate that the academies have heard the criticisms and are taking a closer look at their honor codes and how they are administered. (The Air Force Academy is currently carrying out a major revision of its honor system. The degree and impact of this change is not yet known.)

The use of attrition figures can also be misleading. There is no demonstrable correlation between attrition rates and the degree of strictness or laxity at the academies (in Lovell's jargon, whether the Spartan or Athenian influence is ascendant). The reasons cadets give for resigning are varied and defy neat, categorical analysis. Moreover, I think it is important to realize it is not desirable that all cadets/midshipmen graduate. Some individuals are not suited for the military life although they may have unusual or exceptional talents in other areas. To take steps to ensure that the majority of cadets/midshipmen graduate and obtain a commission would not be in the nation's best interest. Any program so easy or agreeable that it takes no effort or causes no hardship will not produce the kinds of leaders necessary in the stress of combat. It will always be difficult to measure the effectiveness of a military academy. But attempting to derive cost-effectiveness figures based on the cost of educating each cadet/midshipman and such factors as attrition rates before and after graduation, GRE scores, numbers of scholarships and the like are a contrivance. They will not determine the outcome of the next conflict and should be treated only as a reference, not as a standard.

THE problems with this book, however, lie more with its research than its conclusions and proposals. As a graduate and former instructor at the Air Force Academy, I will comment primarily on the author's historical account of that school.

Lovell's research is based largely on newspaper and magazine articles, official histories, and oral interviews. Primary documents in the Academy files and archives were largely ignored. For example, Lovell contends there were athletic recruiting violations in 1955 and

1965 at the Air Force Academy. He maintains, based on an interview he conducted with a former dean, General McDermott, that preadmission evaluation scores were changed in the Registrar's office to allow academically deficient athletes to qualify and enter the Academy. But there is no evidence to support this explosive claim. The proof for this allegation, if it exists, would probably be in the Registrar's files or Academy archives; which apparently Lovell did not examine. He also maintains that the uncovering of these violations in 1965 resulted in an investigation launched by Lieutenant General William S. Stone, a former superintendent who was then in the Pentagon. This investigation supposedly resulted in the removal from office of the incumbent superintendent and commandant. However, there is no mention of such an investigation in Academy records, and none of the key participants involved were contacted by Lovell to confirm or deny the allegation. In an oral history interview conducted in 1979, General Robert W. Strong, Jr., the Commandant involved, maintained that the story was a fabrication.

Another incident discussed by the author that merits further investigation is the 1965 honor incident at the Academy. Lovell's account relies heavily on information provided him by a former dean; the superintendent and commandant were not contacted for their accounts. This omission is of importance because an oral history interview conducted with that commandant by the Air Force Academy Department of History in 1979 differs substantially, not only in the believed causes of the incident but also how it was discovered, investigated, and, most important, how and why it was terminated. Another interview conducted with the director of athletics involved gives yet another perspective. In short, the last word on the 1965 "scandal" is yet to be written; the author's lopsided account does little but muddy already murky waters.

This incident points up another of the book's flaws, the interviews (or lack of them) conducted by the author. Although he purports to be presenting a balanced view of the academies, it is in fact one-sided. He briefly spoke to only one superintendent. Although he blithely comments that the role of the commandant "can be important," he did not interview any of the ten men who have held that position. He also charges recruiting violations concerning athletes and overemphasis on football, but he did not contact any of the six former athletic directors. The result of this inexcusable deficiency—most of the men neglected are still available for comment—is a continued skewing toward the academic, or "Athenian," point of view.

THERE are also many minor factual errors in the book that indicate careless research and editing. Basically, however, the book's main flaw is that its scope is too ambitious. Lovell has attempted to summarize the histories and experiences of four institutions that are geographically, chronologically, and ideologically separated. He then attempts to draw analogies and conclusions from these scattered histories. In the best of circumstances this would be a difficult and demanding task. But this problem is compounded because there are no adequate general histories of the academies that Lovell could draw upon. A book of this kind needs a strong foundation already extant that can be expanded and improved. Since this foundation does not exist, Lovell's first step was to build it himself; his efforts have been only partially successful.

Thus, the book falls short of the mark even though his issues are timely and important. The mission and operation of the service academies do need to be examined in detail; problems do exist and have for some time, but this book does not provide the solutions. The research necessary to write a quality book simply was not done. Consequently, the definitive work on the American military academies has yet to be written.

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POTPOURRI

The Origins of the Turbojet Revolution by Edward W. Constant II. Baltimore: The Johns Hopkins University Press, 1980, xiv + 311 pages, $22.50.

The operational reality of the turbojet has been with us for almost as long as most readers of this review have been alive, yet only with the appearance of this book has a sound published analysis of its conception and development been available.

In part, this is a problem of the historian's craft. Engineers, who understand technology, tend to write only for each other. Most historians write in language that the rest of us can understand, but few historians understand technology. Products of a discipline that demands high standards in manipulating words and ideas, historians naturally gravitate to the study of men of words and ideas: religious and political leaders, intellectuals and scientists—not engineers. Author Edward Constant alludes to the problem in a particularly pungent and apropos footnote (p. 8, n. 21); there is indeed a reluctance among historians "sully their discipline with gritty details of what engineers . . . do."

The Origins of the Turbojet Revolution is a splendid exception. Constant begins by carefully differentiating the study of technology from that of science. He then traces development of the turbojet from its distant hydraulic antecedents to its realization as a feasible propulsive system in the 1930s, concluding with a useful discussion of the development and operational use of jet aircraft during World War II. The central focus of the study is the process by which aerodynamic and propulsive theory and practice fused, in the minds of a handful of brilliant engineers, with a growing awareness of impending limitations to further development along orthodox lines to produce the turbojet. The heroes of the story are engineers: Frank Whittle in England, Hans von Ohain, Herbert Wagner, and Helmut Schelp in Germany. The story of their intellectual and engineering breakthroughs, and their frustrations, trials, and tribulations in convincing an orthodox establishment of the validity of their insights forms a strong central thread in the narrative.

The finely crafted text is many-faceted: the summation of the development of piston aero engines is as good as any I have seen; the key role of supporting technologies—aircraft structures, hydraulics, electrical systems, and wind tunnels to name a few—is skillfully handled. Constant's reflections on national patterns in the pursuit and application of scientific knowledge are thought provoking. Analysis of the failure of the commercially oriented, economically driven American research and development establishment to see the potential of jet propulsion early on is cogent and pointed. The contrast with the amazing rapidity by which American industry subsequently caught up is stark. There is much raw material here for serious reflection among professional airmen, students of history, and engineers alike.

This is an important book, one that will appeal to different categories of readers for different and equally valid reasons. Practical airmen and technologists may benefit from the central chapters on aerodynamics and technological development without heavy involvement in the introductory chapters. Historians, conversely, will find the initial methodological chapter particularly significant. The author's effective organization and clear style lend themselves to selective reading of this type.

Constant has broken fresh ground in the study of the history of technology. His concept of presumptive anomaly is novel, comprehensible, and analytically powerful. His demonstrated ability to grapple successfully with the practical realities of developing technology sets him apart as a scholar of unusual promise and ability.

J.F.G.

War and the Liberal Conscience by Michael Howard. New Brunswick, New Jersey: Rutgers University Press, 1978, 143 pages, $8.00.

Really somewhat more a philosophical inquiry than a history, this very provocative book consists of revisions of Michael Howard's lectures in the George Macaulay Trevelyan series for 1977 at Cambridge University. After a fruitless though valiant struggle, I find myself unable to offer critical analysis and instead present a synopsis.

"'Conscience' implies not simply a belief or an attitude but also an inner compulsion to act . . . [and] 'liberals' mean[s] in general all those thinkers who believe the world to be profoundly other than it should be, and who have faith in the power of human reason and human action so to change it . . . ." (p. ll) Persons of a liberal conscience through history have given thought to the possibility and desirability of eliminating war. Armed conflict may have been a necessary evil before it ceased to be necessary for survival and when, therefore, warrior elites were protectors who could not be done away with, but for some 400 years now the possibility of doing away with war has been alluring.

Humanitarian thinkers beginning with Erasmus—whose emotional approach gave way to the more reasoned thinking

of later liberals—began to penetrate the veil of warfare's apparent necessity or inevitability. Liberals are not pacifists; indeed, wars sometimes do need to be fought—they must be fought if they are just, and they must be fought humanely (e.g., to result in as little damage and bloodshed as possible, concomitant with creating conditions postbellum that are more desirable than those of antebellum. Alas for humanity, just wars are all too rare; the dominating warrior class produces international misunderstandings. "War might well be the consequence of social organisation. . . ." (p. 21) Change the organization of society, take government out of the hands of the war-making class, and "in a new world governed by reason and morality, diplomacy [and hence war also] would . . . be unnecessary." (p. 28)

To do this, popular interests must truly be represented in democratic reality. This prompted liberals to acquiesce in numerous wars through the end of the eighteenth century, but the belief began to grow that public opinion needed to be molded into the pattern of enlightened self-interest, so the first peace movements came into being. Still, certain wars of the nineteenth century suggested an uneasiness in liberal thought: What if the people freely chose war? Could an entire society be affected with "aristocratic vices"? No, "peace and democracy do not go hand in hand . . . public opinion is not an infallible specific against war. . . ." (p. 46)

The late nineteenth and early twentieth centuries witnessed a new strain of effort and hope, peace through international arbitration and reasoned discourse. But the unresolved crux of the issue that has plagued liberals remains: "What if the people you are dealing with are not, by your standards, civilised?" (p. 54) Is war desirable in order to infuse civilization into another society? What if your own society is itself unreasonably or selfishly bellicose?

"To most European liberals, . . . the First World War appeared at its outset to be . . . profoundly just. . . ." (p. 73) But while Germany had to be fought, the desirable goal of the war should be for the future "a world organisation which will tend to prevent war by forcing its members to use peaceable means first. . . ." (p. 76) The United States, however, forced the victory to be on its terms. "Wilson took the Americans into the war in the crusading spirit of the French Revolution." (p. 81)

But in the period between the world wars, the unanticipated result became increasingly clear that conditions had been created that were quite conducive to the gestation and growth of fascism, a movement that "took both liberals and socialists by surprise." (p. 100) How could movements be both populist and authoritarian? Now the stage began to be set for "the most just of all conceivable wars: a war on war itself." (p. 101) But that was precisely what the preceding generation thought it had struggled for in the first global conflict! Unable to resolve this dilemma, again "the liberal conscience endorsed a national struggle as a just war." (p. 108)

The potency of the United States during and after World War II forced the muddled thinking of its leaders to endorse conditions that proved conducive to the growth of communism. The Soviet Union had not been perceived by Washington "as being likely to cause the greatest difficulties after the war . . . the real obstacle . . . was seen . . . to lie in Britain, with her economic zone . . . Machiavellian skill . . . colonial empire holding millions of the coloured races in subjection . . . smooth, accomplished diplomats and well-prepared staff-officers. . . ." (p. 118) And the inevitably resulting Korean War produced a militarized United States.

The Truman doctrine quite naturally grew by extension into America's policy toward Vietnam. "Vietnam in short was depicted as the hole in the dike which held back the floodwaters of Communism. . . ." (p. 127) "The war in Vietnam, . . . revealed what a hideous gap separated rhetoric from reality. Whatever was being defended in South Vietnam, it was not democracy as Americans understood it." (p. 129)

And so, Howard asks, what conclusions can we draw? The liberal conscience produced persistent efforts to abolish war and only succeeded "thereby in making it more terrible." (p. 130) While "war is an inherent element in a system of sovereign states which lacks any supreme and acknowledged arbiter, the answer cannot lie, . . . in the dissolution of the sovereign state. . . ." (pp. 132-33) Still there is hope; the long and patient work of the liberal conscience has produced the delicate system in which the absence of war is possible. Peace must be established, as Kant correctly asserted, but "this is a task which has to be tackled afresh every day of our lives." (p. 135)

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Air Force Colors, Vol. 1, 1926-1942, and Vol. 2, ETO & MTO 1942-45 by Dana Bell. Carrollton, Texas: Squadron/Signal Publications, 1979 and 1980 respectively, 96 pages per volume, $7.95.

These first two volumes of what is to be a full treatment of the subject far transcend their purpose as definitive references on the external finishes, camouflage schemes, insignia, and markings of aircraft of the Army Air Corps and U.S. Army Air Forces. Although aimed primarily at the aviation buff, historical researcher, and scale model builder, these volumes will appeal to a much wider audience.

Bell's work *is* definitive. Based on meticulous documentary research, painstaking analysis of color standards, the reproductive characteristics of various types of photographic film, and an exhaustive search of photographic archives, *Air Force Colors* is complete. From the yellow wings, blue fuselages, and vivid insignia of the peacetime Air

Corps to the widely surrealistic water-soluble "war games" schemes of the late 1930s; from the functional dark olive drab, medium green, and neutral gray of the midwar years to the exuberant polished aluminum and polychrome recognition markings of 1945, it is all here, beautifully laid out in dozens of well-executed artist's color renderings and sketches, numerous explanatory diagrams, and hundreds of well-chosen black and white photographs, most of them never before published.

The photographs not only tell the story of camouflage and markings, they form a remarkably complete pictorial record of Air Force history. Photos of famous events (the "Question Mark" flight, the first Ploesti raid), famous aircraft *(Yankee Doodle, Memphis Belle)*, and famous people (Major Curtis LeMay before a B-17 of the South American Goodwill flight in 1938, General "Hap" Arnold in an L-4 in Italy in late 1943) are used with effect.

The text, comprehensive, smoothly written, and meticulously documented, stands on its own as an authoritative monograph. Development of the central theme, the evolution of aircraft finishes and markings, again and again sheds new light on important operational, developmental, and economic issues.

Bell's thoroughness converts what might easily have been a narrow, technical treatise into a valuable historical analysis. Consider the story of the temporary, water-based camouflage paints on the 1920s and '30 s: the basic idea was good—paints that could be quickly applied and washed away as necessary to reflect local conditions. But despite extensive developmental efforts, they came a cropper: they washed off when they were supposed to stay on, then baked into a permanent finish when they were supposed to wash off. Finally, an exasperated General Arnold overruled the Materiel Division and standardized on permanent dark olive drab, medium green, and neutral gray just in time for World War II. Bell's skillful recounting of the frustrating saga will convey a sense of déjà vu to many Air Force readers.

The books are not flawless. Several minor errors with artwork arose in production: an early B-17E (Vol. 2, p. 22) is incorrectly depicted with a ball turret instead of a remotely controlled belly turret; group colors are left off the right halves of the horizontal stabilizers of the 49th Bomb Wing's B-24s (Vol. 2, p. 69), but these are nitpicks. *Air Force Colors* will be read, enjoyed, and retained for reference by nostalgia seekers, aircraft buffs, and serious students of air power alike.

J.F.G.

Germany in World Politics edited by Viola Herms Drath and George Schwab. New York: Cyrco Press, 1978, 273 pages + index, $12.95.

This collection of essays by scholars and diplomats from Germany and the United States will disappoint readers expecting a treatment of Germany's place in twentieth-century international relations because it offers both more and less than its title suggests. More in that nine of its fifteen pieces deal with sociocultural topics—Germany's schools, its churches, its literature and theater, and the status of women. Less in that the nation's position in contemporary world politics is not systematically explored, nor are the domestic subjects related in meaningful fashion to diplomatic issues.

While two essays (Catherine McArdle Kelleher's study of West Germany and NATO and Peter Ludz's examination of FRG-GDR relations) are well-argued, thoughtful analyses, the remaining studies of diplomatic topics tend to be overviews. This anthology may be helpful as an introduction to postwar German society and culture, and perhaps it is unfair to quibble over a title. Still, as an examination of "Germany in World Politics," this volume has limited usefulness.

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Numbers, Predictions and War: Using History to Evaluate Combat Factors and Predict the Outcome of Battles by T.N. Dupuy. Indianapolis/New York: Bobbs-Merrill Co., Inc., 1979, 244 pages, $13.95.

Military historians will have to heed this volume when dealing with combat analysis. Retired Army Colonel T.N. Dupuy, along with numerous associates, has applied quantification via formulas to combat history. This group of specialists analyzed best-available data from military battles to develop the Quantified Judgment Model (QJM), resulting from the Quantified Judgment Method of Analysis (QJMA), for the formula. According to Dupuy:

> It (QJM) is the only known model that reliably represents real-life combat over the course of history, particularly very recent history. Thus it is the only model that provides a basis for confidence that it can extrapolate realistically to the future, permitting reliable probes within ranges of future possibilities.

This is a demanding book, requiring attention to detail, to the formulas and symbols, and also to a ready calculator. Dupuy's traditional clarity is evident, but this volume still demands unswerving attention and perseverance.

There are faults. Available data led to a concentration of analyses in the European Theater of Operations (ETO) of World War II. Granted, statistics were readily available, but how would the formula look after application to the conditions in Burma, New Guinea, Tarawa, or Iwo Jima?

How does the formula assist in analyses of Cowpens, Missionary Ridge, and Belleau Wood? How does the formula apply to the elite forces such as the paratroopers/rangers, the Fleet Marine Force, the Commandos, or the Hermann Goering Division?

Another shortcoming is that Colonel Dupuy and his associates devised their formula by pioneering analysis and then discussed it with an operations analyst. With an obvious self-serving pat on the back, the author announces a strong correlation between his effort and the analyst's procedures. The question immediately arises: "Why were there no operations analysts called in at the initiation of the effort?" It could have saved much floundering.

Two minor items for censure. No one needs to hear more about the old, faithful, crusty, wise, and humble sergeants. Also, there is no such thing as a "national characteristic."

Regardless of these enumerations, *Numbers* is an outstanding book. The work has established a firm foundation. More work is needed, yet future military historians will have to build on this base. Although Colonel Dupuy has produced many important works in military history, this book may well be his most important contribution.

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The Secret Betrayal 1944-47 by Nikolai Tolstoy. New York: Charles Scribner's Sons, 1977, 503 pages, $14.95.

Even in free, Western societies there are shameful moments. England and the United States are certainly not exceptions. Nikolai Tolstoy, English-born son of a refugee from Bolshevism and a historian, has written about the horrors of forced repatriation. He vilifies the secret 1944 Allied pact by which England and the United States agreed that all Russians in Allied-controlled Europe would be returned to Russia.

Tolstoy attacks the cavalier manner with which Churchill, Eden, and others in the British Foreign Office surrendered more than two million Russians who had served in the German armies and been captured by the Allies. They were POWs freed from German camps, and some were even offspring of White Russians who had fled Bolshevism between 1917 and the outbreak of World War II. Neither the will of the Russians nor concern for the harsh punishment that inevitably awaited them was considered. Tolstoy is somewhat less critical of the United States, crediting many American military officers with resisting the forced return of unwilling Russians and in some instances even facilitating the escape of fearful Russians.

Tolstoy's research is based solidly on recently declassified government documents and interviews with policymakers, military men, and survivors of Russian retribution. He makes no pretense at objective analysis and is bitter in his indictment of what he views as an Allied sellout of innocent Russians.

This book is essential to those who make or implement refugee policy in peace or war and who wish to avoid the grievous errors of the recent past.

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Guns in the Sky: The Air Gunners of World War Two by Chaz Bowyer. New York: Charles Scribner's Sons, 1979, 182 pages, $14.95.

Guns in the Sky, the seventeenth book about air combat written or edited by Chaz Bowyer, is a stirring tribute to the skill, courage, and ingenuity of air gunners, whose function in air war culminated during the Second World War.

The book is illustrated profusely from the author's private collection of photographs and from other sources, such as the Imperial War Museum (London) and the United States Air Force. It regales the reader with stories of adventure, success, and death, concentrating on the experiences of British, American, Canadian, and Australian air gunners. A brief preliminary section reviews the history of air gunnery from its beginnings in 1912, little more than eight years after the birth of powered flight.

Guns in the Sky grips the attention of the reader, an expert blending of entertainment and nostalgia. Perhaps wistfully, Bowyer ends his account with the speculation that, not inconceivably, air gunnery will enjoy a rebirth of sorts in star wars of the future.

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Securing the Seas: The Soviet Naval Challenge and Western Alliance Options by Paul H. Nitze and Leonard Sullivan, Jr., and the Atlantic Council Working Group on Securing the Seas. Boulder, Colorado: Westview Press, 1979, 464 pages, $24.00, $12.00 paper.

Admiral Sergei Gorshkov, Commander-in-Chief of the Soviet Fleet, in his definition of *seapower* includes merchant shipping, fishing, oceanographic research and, of course, the navy. (p. 147) *Securing the Seas* attempts to address all of these aspects of seapower and many more. The report is a major attempt at reviewing and assessing the various naval and maritime capabilities and deficiencies of the United States, the Soviet Union, and their respective allies.

It comes to grips with an all-too-often emotionally presented subject in relatively objective terms and makes 21 sets of recommendations of how to redress specific deficiencies identified in the report.

Securing the Seas is a group effort sponsored by the Atlantic Council. The group was chaired by the eminently qualified Paul H. Nitze, former Secretary of the Navy and Deputy Secretary of Defense, and directed by Leonard Sullivan, Jr., former Assistant Secretary of Defense for Program Analysis and Evaluation.

The evolution and status of U.S. and Soviet fleets are presented in some detail as are operational concepts in peace and war, respective missions, force composition and disposition, capabilities, and limitations. Western and Soviet maritime interests and their implications are skillfully interwoven throughout the book.

The discussion then turns to the obvious interdependence of naval and maritime forces, the demands they make on each other, leading to the specific problem for the West of sealane defenses—with its truly significant demands on Western naval power. *Securing the Seas* makes some very specific and most interesting points that lend it authority and perspective. For instance, it addresses Soviet naval power in a refreshing perspective, not as an overpowering and ever-growing menace but as a force that reflects a Soviet interest in the oceans which is relatively minor "when compared with the enormous economic, political, and security considerations ashore." (p. 119) The Soviet fleet is viewed as having to face up to the same problems of block obsolescence (pp. 55, 222) experienced in the past, especially by the U.S. Navy. The fact that the Soviet Navy has only limited war-fighting capabilities over the full spectrum of warfare is repeatedly identified, and their fleets, beset by the age-old problems of an unkind geography, are essentially tailored to support strategic objectives to blunt the naval striking power of the alliance and provide support to their ground forces. (pp. 176, 388)

The key aspect of the book though does *not* deal with U.S. and Soviet naval and maritime power today but concerns itself with the future financing of the U.S. Navy and, in that respect, its relationship to its sister services. It makes the commonly expressed but nevertheless unimaginative point that there are few problems associated with the naval balance that could not be fixed by increasing the U.S. Navy budget. (p. 319) It then concludes that the Navy could not be expected to derive significantly increased procurement funding from within (p. 327) and, therefore, the appropriate manner of halting the decline in naval forces would be to hold Army and Air Force modernization constant while any future increases in defense spending be allocated to the Navy. (p. 326) A strong minority position goes so far as insisting on trading off "obsolete and largely useless army infantry units for more naval spending." (p. 445) The discussion of the Navy budget then turns out to be the heart of the report, and its relatively parochial approach unfortunately serves to detract from the overall quality of the effort.

Securing the Seas, in addition to the problem just discussed, suffers from a number of deficiencies that detract from its overall quality. In form it suffers from much repetition (probably a by-product of group effort) and numerous introductory and qualifying comments. The nearly 500-page, well-illustrated report, which its authors claim resisted repeated efforts at compression, would benefit from the pencil of a ruthless editor. In substance it comes to grips only superficially with such issues as technology, the relationship of the Soviet Navy to competing internal political and military requirements, and the to be expected future development of the Soviet Navy. Although the last aspect is couched in unusually circumspect terms, there is no lack for a strong position of U.S. naval development, which one, however, would expect to be at least partially reflective of future threat development.

Although easily readable, the textbook-like style makes too many demands on the busy professional to glean the fine nuggets that make it worthwhile reading. It is recommended for professional officers of all services who have a little time to spare—or a long bus ride to the Pentagon.

Lieutenant Colonel Wolfgang Samuel, USAF
Hq USAF

Socialism, Politics, and Equality by Walter D. Connor. New York: Columbia University Press, 1979, 389 pages, $20.00.

Connor's book is for those who want a view of Eastern Europe in socioeconomic terms. Primarily, it is a second-hand account of an equality of life-style amongst those distant countries. The research data, plentiful in amount, support the comparative focus of the text. The book is not for everyone; however, those with a sociological bent could find the reading quite valuable. Others interested in the political implications of socialism could also benefit, except to a lesser extent.

Lieutenant Colonel Richard A. Slowik, USAF
Robins Air Force Base, Georgia

Fighter Aces of the USA by Raymond F. Toliver and Trevor J. Constable. Fallbrook, California: Aero Publishers, Inc., 1979, 400 pages + index, $24.95.

Modern warfare has become massively impersonal. Despite the faceless nature of contemporary war, some mili-

tary warriors remain especially suited for hero worship. Lionization of airmen began in World War I when fighter pilots were compared to the knights of centuries past. Those with a special talent for shooting enemy aircraft out of the air were singled out for national honors. The legendary fighter "ace" was born.

Raymond F. Toliver and Trevor Constable trace the story of U.S. fighter aces from these World War I beginnings through the Vietnam War. They provide valuable insights into reasons why some pilots became aces and others did not. Certainly luck played a part, but the aces seemed to share a common heritage of competitiveness. It also appears they simply had a special knack for serial combat. Only 3 percent of all U.S. pilots became aces, yet they accounted for 40 percent of all enemy aircraft shot down by fighters (p. 31).

Besides the interesting recounting of dogfight stories from four wars, the book serves as an excellent reference work. Lists of all U.S. fighter aces, as well as leading aces of other nations, are provided. There is also an interesting chapter on the top aces of Germany and Japan.

Lieutenant Colonel Pat O. Clifton, USAF
Kelly AFB, Texas

Air Power in the Next Generation edited by E. J. Feuchtwanger and R. A. Mason. London: Macmillan Press Ltd., 1979, 151 pages.

Dr. Feuchtwanger and Group Captain Mason have compiled and edited ten papers from a 1977 RAF air power symposium. They have chosen well, presenting in this small volume political, economic, and technological constraints on doctrine on the one hand and rich, operational lessons affecting doctrine from Israel and Vietnam on the other. From this information, the reader can second-guess the problems arising in this decade.

In all the factors considered by the editors, there is evident an undercurrent of doctrinal/strategic reality that says, among other things, that a 10 percent increase in economic outlay is irrelevant if doctrinal lessons have not been learned and good strategies have not been adopted. The lesson taught in the 1930s by the French, who spent more francs on defense but worshipped false doctrinal idols and thus developed a weak strategy, is the usual example cited to urge correct interpretations of the last war.

However, I found that the real theme of this book lies in the statement "the shorter one is of money, the more one must think ahead." In reality, when one functions with public funds, it should be no other way. The bottom line is cost-effective air defense and offensively superior air attack weapon systems that can outwit an enemy's air defense. The proper blend of doctrinal evaluation, strategic purpose, and budgetary commitment will ensure a valid bottom line. From that line, then, it is "uphill all the way" in determining air power roles, and that is what this little book wants us to understand.

Air Vice-Marshal J.A. Gilbert of the RAF air staff closes the book with a call to doctrinal deviation. He asks all airmen to give serious thought to multirole aircraft, especially in light of a blurry future for air power in a European war. In the '80s, air power must deter adventurism as well as provide traditional defense. Gilbert encourages a move in airspace thinking away from the more traditional doctrinal roles to those that are now hazy and ill-defined conceptual problems. In that realm are the decisions which will face us in the '80s.

Air Power in the Next Generation is a clarion call to doctrinal evaluation, summation, and rejection. We are not yet ready to move past the evaluation stage, but airmen will be somewhat better prepared after reading this tome. Kudos to the RAF.

T.M.K.

The Tibbets Story by Paul W. Tibbets, Jr. New York: Stein & Day, 1978, 316 pages, $9.95.

Unlike numerous autobiographies written to capitalize on an individual's fleeting moment of fame or notoriety, *The Tibbets Story* was obviously written after many years of thoughtful and careful reflection. Also, unlike many autobiographies, it does not present its author as a larger than life hero but as a human being who "tells it like it is"—or was.

Paul Tibbets's motive in writing this book was to put into proper perspective his role in the missions against Hiroshima and Nagasaki that not only shortened the war in the Pacific but also saved millions of American and Japanese lives. His secondary goal was to dispel many of the leftist and often unpatriotic myths that have been spread about this first use of the atomic bomb in warfare.

The work goes beyond the author's original objectives and provides some interesting insights on military life in general and military leadership in particular. "The point should be made, however, that advancement in the military, as in politics, has often been based upon such qualities as charisma rather than on competence as a soldier or statesman." General Tibbets further states that

> In war, the military operates with a single purpose: to defeat an enemy who is clearly defined. When peace comes, an army doesn't stop fighting. Its officers compete furiously for personal advantage and sometimes employ the same questionable tactics

against their colleagues that are considered quite fair against a foreign enemy. (p. 244)

Concerning nuclear warfare, General Tibbets concludes:

It is a sobering thought that our two bombs, feeble by today's standards, were the curtainraiser on what many view as the supreme human tragedy. Mankind's best hope is that the prologue was so frightening that the main show will be cancelled. (p. 310)

The Tibbets Story is well written, interesting, and, because of the author's unique insights, well worth reading.

Major Robert J. Scauzillo, USAF
Mountain Home AFB, Idaho

The Brethren by Bob Woodward and Scott Armstrong. New York: Simon and Schuster, 1979, 467 pages, $13.95.

We know little of the inner workings of the most sacred of United States judicial institutions, and after a dose of Armstrong and Woodward's investigative journalese, perhaps we are the better off for not knowing. The energetic activist court of the Earl Warren days is gone, and as was the aftermath to the precedent-setting Marshall Court in the nineteenth century; the new court appears slow and lethargic. Whether this lethargy is due to political connivance or judicial backlash is moot because Roger B. Taney, after Chief Justice John Marshall, grew into the job and finally was strong enough to reverse the Missouri Compromise and bring the Civil War out of the closet. Warren Burger has time on his side.

Nevertheless, this volume is journalism—not history. The clerks of the court have tattled on the big guys. The frailties, irrationalities, and weaknesses that we all have are in plain view in the Court, and the authors want us to see them. They have succeeded. This is smooth, easy reading, and if you want to know the backroom gossip about the present version of Roosevelt's "Nine Old Men," this is for you. However, if you desire a scholarly, analytical discourse on the Court and its monumental decisions on busing, capital punishment, and pornography, this volume will not do.

T. M. K.

The Secretary: Martin Bormann: The Man Who Manipulated Hitler by Jochen von Lang. New York: Random House, 1979, $15.95.

Where is Martin Bormann? Ladislas Farago found him alive and well in Argentina. Reinhard Gehlen located him in Moscow. Other authors located him in Spain, Paraguay, Equador, or even Australia. Jochen von Lang, however, in *The Secretary,* places Bormann in no place so exotic: Bormann, he writes, is still in Germany. In fact, "For the time being . . . the Secretary to the Fuehrer reposes in a cardboard box in the vault of the Frankfurt Public Prosecutor's Office."

Lang has provided a real historical bonanza for students of the Third Reich. *The Secretary* contains much fascinating new material. Along with almost overwhelming proof of Bormann's death, Lang provides an engrossing examination of this phantom who lurked behind Hitler's throne. Bormann, the former clerk, ruthlessly eliminated his rivals in Hitler's entourage through skilled in-fighting, using a mixture of "slimy sincerity and cold viciousness." Meanwhile, he "made himself Hitler's boot-licking slave." So fawning was he, that even other top Nazis were sickened. In one vignette, Lang describes Hitler complaining of the glare spoiling the panoramic view from his mountain chalet. At huge expense, Bormann had an enormous tree uprooted and trucked up mountain roads and replanted to shade his Fuehrer's eyes against the glare. Bormann was no mere lackey, however. He was also a maker of Nazi policy who can be blamed for the murderous Nazi euthanasia program and for ruthlessly persecuting the Catholic Church in Germany.

Lang's book, authoritative and rich in personality, is well worth reading. In exhuming and reburying Martin Bormann, Lang has done a real service to history.

Captain N. D. Harmon, USAF
U.S. Air Force Academy, Colorado

Tactical Nuclear Weapons: European Perspectives by the Stockholm International Peace Research Institute. London: Taylor & Francis Ltd. and New York: Crane, Russak & Company, Inc., 1978, 341 pages, with bibliography and index, $24.95.

In October 1976, the Stockholm International Peace Research Institute (SIPRI) conducted a meeting analyzing the use of tactical nuclear weapons, which led to the publication of this book. It begins with the assertion that "reason demands the elimination of nuclear weapons not only from Europe, but from the world's arsenals." Seven of the eight chapters on tactical nuclear weapons call for removal of these weapons from Europe, and a bias in favor of arms control and against the vital contributions nuclear weapons make is evident throughout.

Although a more balanced look at the advantages and disadvantages of tactical nuclear weapons would

have been better, this book is still recommended to those interested in theater nuclear weapons since it offers extensive coverage of the issues involved. The first half of the SIPRI volume reviews the definition, history, and current deployment of tactical nuclear weapons in Europe. The appendixes contain an abundance of information on the different types of tactical nuclear systems for both NATO and the Warsaw Pact. The various strategies and problems with these weapons are introduced in a clear and concise manner, and anyone desiring a publication to provide extensive background on tactical nuclear weapons should be quite satisfied with this part of the volume.

The second half of the book focuses on issues involved with theater nuclear weapons, primarily as they relate to arms control. Several interesting topics are covered, such as the chapters on the implications of "mini-nukes" on nonaligned nations and J. Coffey's more balanced account of tactical nuclear weapons and arms control impact on European security. H. Afheldt, one of the Federal Republic of Germany's leading military writers, outlines an extensive series of arguments that reject tactical nuclear weapons in favor of a commando-type defense with precision-guided munitions—a popular defense alternative today. The antinuclear flavor of the book dominates, with the exception of the last chapter: "The new nuclear force" by R. Shreffler. His proposal for a nuclear defense based on small nuclear weapons in a limited role is fascinating but uncomfortably out of place in this volume.

Tactical Nuclear Weapons: European Perspectives is a somewhat misleading title. The issues are not examined in terms of how different European nations view these weapons but rather how SIPRI sees tactical nuclear weapons fitting into arms control and disarmament schemes. Perhaps a better title would be "Tactical Nuclear Weapons: Arms Control Perspectives."

Cadet First Class R. A. Miller
U.S. Air Force Academy, Colorado

Corsair: The F4U in World War II and Korea by Barrett Tillman. Annapolis: Naval Institute Press, 1979, 219 pages, $15.95.

The Vought F4U Corsair was the first true fighter-bomber flown by the U.S. Navy. Built with a distinctive bent-wing design, the Corsair was utilized as a day fighter, night fighter, dive bomber, and reconnaissance plane. Its operational life spanned more than thirty-eight years in both land-based and carrier operations.

Barrett Tillman, who has written several books on World War II Navy planes, relates the story of the Vought Corsair from its initial development through its combat history to the museum pieces still existing today.

The F4U first saw combat over the Solomon Islands in 1943 and played a crucial role in fighter operations throughout the remainder of the war. Back in action in Korea, the Corsair scored some MiG-15 kills and continued in service with the French over Dien Bien Phu and later with the air forces of some smaller nations.

Tillman provides not only a fast-moving account of the F4U's war exploits but also examines the initial problems of design, testing, and employment. A sound, technical comparison with the Grumman F6F Hellcat and several Japanese fighters provides a true appreciation for its abilities and weaknesses. The story of Major Greg Boyington's "Black Sheep" squadron is drawn into perspective with the numerous units that flew the plane in combat.

The author uses excessive detail in his accounts of air battles over the Solomons, listing nearly every airplane downed by the Corsair. Otherwise, the book is well written, illustrated, and indexed. It has ample unit details for the researcher and several helpful appendices.

Corsair provides a worthwhile look at the development and evolution of a fighter aircraft as well as a useful understanding of the fighter-bomber concept.

Captain Don Rightmyer, USAF
Office of Air Force History
Washington, D.C.

New Worlds: Discoveries from Our Solar System by Wernher von Braun and Frederick I. Ordway. New York: Anchor Press, 1979, 265 pages + index, $24.95.

Beginning with a brief explanation about current theories on the origin of the solar system, this last work by noted space scientist Wernher von Braun takes the reader on an imagined journey, stopping along the way at each interesting cosmic scenic spot. Using imagery and data derived mainly from National Aeronautics and Space Administration (NASA) probes that went through most of these areas, the book is a comprehensive summary of what man has learned in space from civilian space programs. The persistent theme is man's outward reach, inspired by von Braun. Repeatedly the point is made that no matter how much we find out, there always remains more—we are just beginning. Other recurrent themes are the technical impact of budget cuts and the lack of Apollo follow-on programs.

For space enthusiasts, either well versed in the subject or just beginning, this is the best current summary of the past 25 years of space activity. It concentrates on NASA discoveries in Viking, Pioneer, Mariner, Landsat, Skylab, Apollo, etc. Thus, it reveals little new about space for those well acquainted with the subject, mainly providing them with a lavishly illustrated and well-laid-out synopsis. Designed more for the space novice, it can, nonetheless, provide an exciting look at space. However, by the nature

of the programs von Braun spearheaded, the sections on Jupiter and Saturn are already out of date as a result of recent planetary fly-bys.

If there is a flaw, it is the absence of pioneering military space efforts. While Russian Venera spacecraft are mentioned, discussion of such things as the space weather sensors aboard the Defense Meteorological Satellites is missing. Thus, for the interested military reader, the book has little to offer, especially in comparison to von Braun and Ordway's previous collaboration in the classic *History of Rocketry and Space Travel*. Though not essential reading for military leaders, von Braun's last book is the best single volume for those interested in a historical summary of space discovery.

Captain L. Parker Temple, USAF
Luke AFB, Arizona

Man O'War: The Fighting Ship in History by Richard Hough. New York: Charles Scribner's Sons, 1979, 239 pages, $14.95.

Richard Hough, a widely published author of naval histories, has based this book on 15 ships from five countries. He provides "an abbreviated history of the man o'war and her battles over 400 years by singling out chronological examples" that he considers significant and interesting. (p. 7) He is, of course, vulnerable here. First, on the matter of definition of man-of-war, Hough limits his range by selecting two-thirds of his entries from ships of the line, battleships, or battle cruisers. Yet a few frigates, one cruiser, one destroyer, and one aircraft carrier are included; however, no submarines appear. Second, despite his definition, Hough could be criticized for the particular ships he selected or failed to select. For example, the exclusion of the U.S.S. *Constitution* and any Japanese warship from World War II is just inexcusable.

While Hough has written a fast-paced book and has certainly lived up to his promise to the reader to be interesting, he has not done as well in highlighting the significance of the warships. The book is concerned with interesting episodes in the operational life of the particular warship more than with the ship itself. Only brief mention is made of design features of ships and how the design and operations reflected the past or the future of naval warfare. The result is a hodgepodge. Good illustrations and some interesting stories are presented, but nothing is presented in depth. Because of the sparse, anecdotal text, the slick paper, and many illustrations, it would appear that this volume was intended to be a coffee-table book. It is produced as a normal-size book, however, no doubt a victim of inflation.

Since the book is neither big enough to impress guests nor detailed or structured enough to aid students, one is tempted to ask: What is the value of this effort? I can only surmise that as a gift, especially to a school-age child, the book could be recommended. In view of Hough's demonstrated abilities and some glimmerings in the brief text, however, and certainly in view of the excellent illustrations, the reader is ill-served. The idea is fine, the pictures are great, the stories are interesting, but that is not quite enough, somehow.

Dr. Kenneth P. Werrell
Radford, Virginia

Nuclear Policies: Fuel without the Bomb by Albert Wohlstetter, Victor Gilinsky, Robert Gillette, and Roberta Wohlstetter. Cambridge, Massachusetts: Ballinger Publishing Co., 1979, 120 pages, $16.50.

This compendium of essays developed by the California Seminar on Arms Control and Foreign Policy addresses technical, political, and economic aspects of nonproliferation of certain nuclear materials. Unfortunately, the volume appears to be a crusade against plutonium, breeder reactors, and current international controls of nuclear materials by the Wohlstetters sandwiched between informative articles by Gillette and Gilinsky.

Gillette's lead article provides a good background for the discussion of the subject by providing a simple description of nuclear materials and nuclear power technology. Additionally, he explains nuclear reprocessing and the characteristics of various types of reactors. This article is followed by Albert and Roberta Wohlstetter articles that approach a paranoid view of the future of commerce in plutonium. These articles provide a detailed list of the reasons for the termination of the use of plutonium and enriched uranium, and the reasons are well supported. The articles lose their objectivity, however, when the other side of the issue is not adequately evaluated. The possible advantages and political benefits of plutonium as a fuel are skimmed over so lightly that they are almost lost. Finally, a review of India's transition from a nuclear power user to a nuclear weapons producer is used to support the Wohlstetters' position.

The saving grace of the book is Victor Gilinsky (a commissioner of the Nuclear Regulatory Agency) and his two concluding articles. He presents balanced, objective, factual information on historical and current U.S. nuclear policy. He sees problems similar to the Wohlstetters and proposes a new scheme for international control. Additionally, he explains the Nuclear Nonproliferation Act of 1978 and discusses other international controls of nuclear material.

The book presents one side of an important current issue. A person just entering this arena, however, would be well advised to read about the other side of the issue.

The recent report on energy policy sponsored by the Ford Foundation should provide such a balance.

Major Frederic E. McCoy, USAF
The Brookings Institution
Washington, D.C.

The Deadly Element: The Story of Uranium by Lennard Bickel, New York: Stein and Day, 1979, 312 pages, $12.95.

The story of uranium begins in 1780 when Martin Heinrich Klaproth first isolated it. The tale continues with the patient, step-by-step work that led to modern nuclear capability and the discovery of uranium-related technology. It ends with the Soviet detonation of a 50-megaton device in 1961.

Lennard Bickel, who has written several other science-related works, here produces a light history that contains a minimum of technical talk, barely enough to understand something of the problems the discoverers faced. Working on the fringes of knowledge, they took existing technology and added to it, bit by bit, gradually extending the frontier. Brainpower and sweat were required in abundance, and the reader becomes less inclined to take technology for granted.

The giants of scientific research are here, but it is the lesser known researchers who are the more interesting. We find Kenneth Bainbridge, head of the Manhattan project, feeling relief, as the Trinity bomb exploded, that he would not have to inspect a hangfire. Scientists are people, too. They invented a homemade code in which neptunium was "silver," plutonium "copper," and copper "honest-to-God copper."

The story is sometimes funny, sometimes tragic, often astounding, and always entertaining. Readers with non-technical backgrounds will gain a better understanding of how technology comes to exist. Others will enjoy following the trail leading to this particular bit of technology.

Captain Julius F. Sanks, USAF
Los Angeles Air Force Station, California

Eggnog Riot: The Christmas Mutiny at West Point by James B. Agnew. San Rafael, California: Presidio Press, 1979, 211 pages, $12.95.

Student rioting is not a phenomenon limited to the United States in the recent past. To learn that the United States Military Academy shared in this tradition came as a surprise. On Christmas Eve in 1826 eggnog parties degenerated into widespread disobedience, vandalism, and attacks on tactical officers patrolling the north barracks. About 5:00 A.M. on Christmas morning Cadet Lieutenant John Stocker ran through the barracks drunkenly shouting: "Turn out to defend the barracks. The Bombardiers are coming." The Second Artillery was not on the march, but a riot ensued nonetheless. This incident is the subject of a historical novel by Colonel James B. Agnew called *Eggnog Riot.*

Agnew, a former member of the history department at West Point and director of the U.S. Army Military History Institute at Carlisle Barracks, Pennsylvania, prior to his retirement, has written an interesting, at times gripping, but ultimately flawed account of the mutiny and trials that followed. *Eggnog Riot* opens and closes with a historical essay. The first essay outlines the origins and early history of the United States Military Academy, while the epilogue sketches the subsequent careers of the participants and the institution. These essays are very well done.

Agnew possesses the ability to write lucid, often insightful prose that succinctly describes complex situations. The first portion of the novel, which should grip the reader's attention, however, often is flat, a series of disconnected tableaux. The chapters on the riot provide the dramatic highlight of the book, as Agnew captures the excitement and absurdity of these incidents. The most impressive portion of the book is Agnew's account of the trials. He draws on his military experience to make vivid what could have been a dull and anticlimactic account.

Agnew explains that he decided to present this work as a novel rather than as a historical monograph because of his desire to give freer expression to ". . . the abundance of color and human interest inherent in the affair. . . ." He hopes to illuminate better the character of some important men during a crisis in the history of a key national institution. His use of a montage technique (a device which readers of the works of the late Cornelius Ryan will find familiar) vitiates his purpose. A montage is well designed to describe externals but not to elucidate character. Another literary device also proves ineffective. The characters speak in the dialect of the period, but when, rather infrequently, Agnew wishes to make the reader privy to their thoughts, he presents them in the third person and twentieth-century idiom. This builds an emotional barrier between the reader and the characters, which hampers the development of empathy and makes it difficult for the characters to become distinct personalities.

Too often Agnew writes as a historian in order for *Eggnog Riot* to be a historical novel of the first rank. "I have taken great pains," he announces in the foreword, "to avoid imputing undesirable or degrading characteristics to any character." (p. x) This may be admirable for the historian but is less praiseworthy for the novelist who strives to depict human beings. Scrupulous sifting of the evidence makes for very good history but not so good fiction.

Colonel Agnew writes clear and interesting prose. He

demonstrates intellectual honesty in handling obscure and contradictory evidence. The strongest portions of the book are those for which he has located the most evidence. He gives every indication of being a first-rate historian.

Eggnog Riot, part history and part novel, is a book that readers may find both entertaining and thought-provoking. Agnew raises questions about how best to administer service academies and about the nature of riots. If officials must send for the bombardiers, the latter had better know their business. Otherwise their presence will only add to the problem rather than alleviate it.

Dr. Edgar F. Raines, Jr.
Office of Air Force History
Bolling AFB, D.C.

The Falcon and the Snowman by Robert Lindsey. New York: Simon & Schuster, 1979, 359 pages, $12.95.

New York Times reporter Robert Lindsey writes about two young men from an affluent Los Angeles suburb: one, Christopher Boyce, a good student and devout Catholic; the other, Daulton Lee, a frustrated dropout who could not fulfill the expectations of his adopted parents. These two privileged American boys seal their friendship through the art of falconry and then become embroiled in a strange tale of narcotics and espionage.

How, you may ask, could two such youngsters so disappoint their families and betray their country? *The Falcon and the Snowman* answers that question with wide-ranging detail about their growing up, their coming together in high school, their mutual interests, their motivations, their spontaneous and imaginative excesses, their sexual encounters, their too-much-too-soon lives.

Boyce, bright and idealistically religious; Lee, small, ambitious, enterprising, become disenchanted and disillusioned by the time they reach manhood, the era of assassinations, the Vietnam War, the explosion of standards, and Watergate.

Boyce's father, a former FBI agent, uses the "good ol' boy" network, helping son Chris get a job at an aerospace company. Within months he has complete clearance, is handling top secret satellite information, is earning $150 a week, and is only 21 years old.

Under the influence of cocaine, hostile to the world and their roles in it, the two young men devise a plan that takes Lee to the Soviet Embassy in Mexico City carrying Boyce's computerized codes. Thus, they become Russian spies, and their lives, never again secure, become increasingly complex, frightening, and tragic.

Military personnel should read this account as a warning: take *nothing* for granted in security situations. Another among many notions that become increasingly clear throughout this perplexing and bizarre tale: the politics in covert operations can be just as dangerous as the physical hazards.

Filled with all the old-fashioned international espionage paraphernalia—clandestine meetings, brutal interrogations, miniature cameras, hidden documents, murder plots, blackmail—this too-true story is mainly a sad commentary on what an affluent society can produce: people unable to handle privilege.

The Falcon and the Snowman is an exciting, suspenseful, informative, perplexing read and highly recommended.

Dr. Porter J. Crow
Center for Leadership Development
Washington, D.C.

Space Weapons—Space War by John W. MacVey. New York: Stein and Day, 1979, 245 pages, $9.95.

A first glimpse at the title of this book prepares the reader for a discussion of killer satellites and manned space stations at war, but closer examination reveals that it is a serious prediction of how we may wage war with alien beings in the future.

Following previous books on interstellar travel and the possibility of other life in the universe, John MacVey here offers his view of how the star wars of the future may actually be fought. Based on his assumption that alien civilizations are numerous throughout the universe, he looks at the possibility of future conflicts in the areas of threat, intelligence, logistics, defense, weapons, tactics, and our current situation.

Despite a misleading start in the first chapter with a rehash of H. G. Well's *War of the Worlds*, MacVey proceeds by relying on established physical laws and scientific hypotheses with only occasional mention of science fiction scenarios to illustrate a point. This approach adds considerable credibility to the points being made. The explanations of possible weapons such as lasers, heat rays, stellatomic warheads, force fields, and others are written for the general reader's understanding. In his proposal of the nature and likelihood of stellar conflict, he can only apply recognized human drives toward aggression such as diminishing resources, search for power, scientific exploration, or a simple desire to subjugate another group of people.

The most serious defect in the book is MacVey's frequent use of star categories without explanation until chapter 18. As a result, the uninitiated reader may fail to appreciate many of the points he makes based on the temperature, stability, and atmosphere of planets.

One may wish to dismiss the book as futuristic and speculative, but MacVey feels the "absence of evidence (concerning alien life) should not be construed as evidence of absence." The stellar wars of the future could

come sooner than we think. This book will definitely widen one's realm of thinking.

Captain Don Rightmyer, USAF
Fort Washington, Maryland

Legionnaire: My Five Years in the French Foreign Legion by Simon Murray. New York: Times Books, 1978, 314 pages, $9.95.

Alas, *The Last Remake of Beau Geste* was not the last account of the French Foreign Legion after all. In this collection of diary entries about his brief career in the Foreign Legion, Simon Murray provides a modern-day, true-life version of the Beau Geste story. He presents a free-flowing, altogether-readable account of his experiences in the Legion from 1960 to 1965 as a Legion paratrooper from basic trainee to corporal. Murray recalls his encounters with the Legion way of life, the Algerian struggle for independence from France, and "the end for the Legion in Algeria after more than 130 years."

Many readers will find Murray's book worthwhile reading. It should appeal to a wide range of interests: military, historical, sociological, and psychological, to name a few.

While some sensitive readers may be disturbed by the brutality and dehumanizing treatment in the descriptions of Legion discipline and humor, the book remains a worthwhile exploration of the human spirit under stress. One example of Legion discipline has a superior hitting a subordinate (guilty of an infraction of the rules) with a "rifle butt across the side of the head as cold-bloodedly as a man chopping wood with an axe" and proceeding to rain kicks and oaths on the semiconscious man. Legion humor includes the secret dumping of a recently obtained enemy head into soup offered and consumed by a fellow legionnaire. However, in telling these sometimes horrifying episodes, Murray gives insightful comments on fear, loneliness, bravery, camaraderie, and love, as well as on callousness and hate. For example, Murray says, "There is no disgrace in fear. Some overcome it and some don't, but the actual decision that governs an action in front of fear is probably made in the fraction of a single moment, and for the rest of our lives we may have to live with that moment. . . ."

For those interested in close perspectives of historical events and personal glimpses of human nature, reading this book will be time well spent.

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The Flying White House: The Story of Air Force One by J.F. terHorst and Colonel Ralph Albertazzie. New York: Coward, McCann & Geoghegan, 1979, 350 pages, $11.95.

This book provides an easy to read and frequently amusing history of presidential air travel and the aircraft which have become a familiar part of American diplomacy and politics. Not a rigorous historical study, the book seems at times a fitting shelfmate for the flood of Watergate-inspired books. This is not surprising considering the authors' backgrounds—Colonel Albertazzie as Nixon's pilot and terHorst as Ford's press secretary.

Readers whose factual curiosity about the events surrounding Watergate has not been satiated may find some of the airborne details intriguing. For example, at 1203, the moment Gerald Ford took the oath of office as President, Colonel Albertazzie changed the call sign of the Boeing 707 carrying the Nixons to California from "Air Force One" to "SAM 2700" (here SAM is an acronym for special air missions unit). For true trivia fanatics, the inertial navigation system geographical coordinates are also reported.

The book is at its best in tracing the development of presidential air travel, starting with FDR's 1943 flight to Casablanca aboard the *Dixie Clipper*, a Pan American Boeing 314. The authors cover presidential aircraft and the increasing use made of them as successive administrations learned the tremendous potential of modern airplanes to expand a busy president's reach. An interesting aspect of this development was a skirmish between Air Force Vice Chief of Staff Curtis LeMay and Military Air Transport Service (MATS) Commander General William Tunner over who would fly the new jet Boeing 707s that were to replace the piston driven aircraft in the presidential fleet. LeMay forcefully argued that "his" Strategic Air Command (SAC) pilots with their jet bomber and tanker experience should get the job in preference to MATS pilots who had not at that time joined the jet age in large numbers. Ultimately, a compromise was reached by transferring some SAC instructors to the Presidential Support Wing at Andrews AFB to aid in the transition of MATS pilots to the new jets.

Detracting from the book's strengths are numerous minor technical and typographical errors. The book also suffers from occasional lapses into a dime novel style of writing, which most readers will find distracting. Finally, serious students will be disappointed by the lack of footnotes and haphazard identification of sources, which makes further research difficult.

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AWARD

The Air University Review Awards Committee has selected "The Grammar and Logic of Conflict" by Colonel Thomas A. Fabyanic, USAF, as the outstanding article in the March-April 1981 issue of the *Review*.

attention

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Address manuscripts to Editor, *Air University Review*, Bldg. 1211, Maxwell AFB, AL 36112. *Review* telephone listings are AUTOVON 875-2773 and commercial 205-293-2773. Printed by Government Printing Office. Address subscriptions to Superintendent of Documents, GPO, Washington DC 20402; yearly $13.00 domestic, $16.25 foreign; single copy $2.25 domestic, $2.85 foreign, Air Force Recurring Publication 50-2. Authority to publish this periodical automatically expires on 30 January 1982 unless its continuance is authorized by the approving authority prior to that date. Distribution: reader-per-copy ratio is one to every ten USAF personnel, military or civilian.

The Professional Journal of the United States Air Force