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angle of attack

One of the most spectacular, visible, and satisfying end products of the military profession is the impact of well-delivered ordnance on a tactically critical target — as suggested by our cover. The value of this kind of impact is obvious. Less obvious is the fact that the results depend on much data and analysis: Which target is most critical? What ordnance will be most effective? What delivery platform is best suited for the target and ordnance required? What are the optimum delivery tactics? Who gets the mission? How do we train them? Unless these underlying factors are dealt with effectively in the planning and execution process, the results will be less than optimum.

The need to develop tactically relevant data and employment concepts is apparent to any military professional, but how does an open journal like the *Review* relate to the process? Much, after all, depends on secrecy and surprise. Such things as detailed assessments of enemy capabilities, the capabilities and limitations of our guidance systems, and employment tactics for a specific mission must be protected by security cover.

But history suggests that broad, underlying concepts — employment philosophies, weapon systems procurement strategies, and approaches to recruiting — are better developed in the open. This can complement the effect of tight security protection at critical points to produce devastating results. Past examples are not hard to find.

Despite rapid technological change and tight budgets during the '20s and '30s, the nascent Army Air Corps developed an effective military instrument and an employment doctrine to go with it using just such a two-pronged approach. Cooperation between the Air Corps and the aviation industry was close and anything but one-sided; aspects of that cooperation were highly publicized. The strong impact of civilian air racing on fighter design is one instance of many. Nor were basic doctrinal developments hidden from the public eye: General William "Billy" Mitchell's use of the *Saturday Evening Post* to propound his strategic doctrine and employment concepts was only an extreme example. Other developments, of course, were carefully shielded by tight security: the detailed mechanics of target analysis, for example, or the details of the Norden bombsight. The point is that open discussion of basic underlying issues neatly complemented the detailed developmental work done in secret.

The open side of the departmental process produced a consensus within the Army and the aviation industry — consensus in which public opinion played a crucial role — as to what the Air Corps would need to fight a war and how it would fight it. The results speak for themselves.

We are again in a period of rapid technological change and tight budgetary constraints. We face basic questions as to what type of air power we should have and how it should be employed. Our lead article on close air support attacks an important aspect of this question head on. Granted, the technological sophistication of the weaponry and the geopolitical complexities of international politics have increased by orders of magnitude — hence the need for specialized journals such as the *Review* — but the importance of open discussion is greater today than ever. As in the early days of air power, the influence of our ideas on one another will determine the impact of our ordnance, if need be, on a potential enemy tomorrow. The impact symbolized by the exploding tank on our cover may well remain within the realm of ideas, but we in the profession of arms cannot afford to assume that it will.



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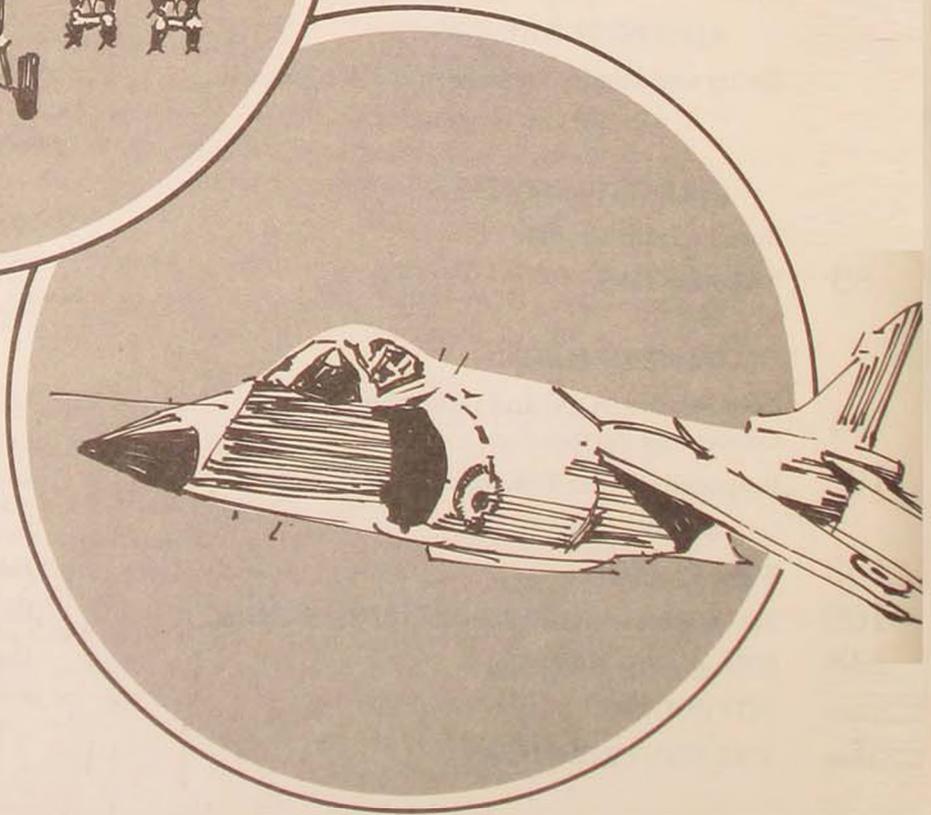
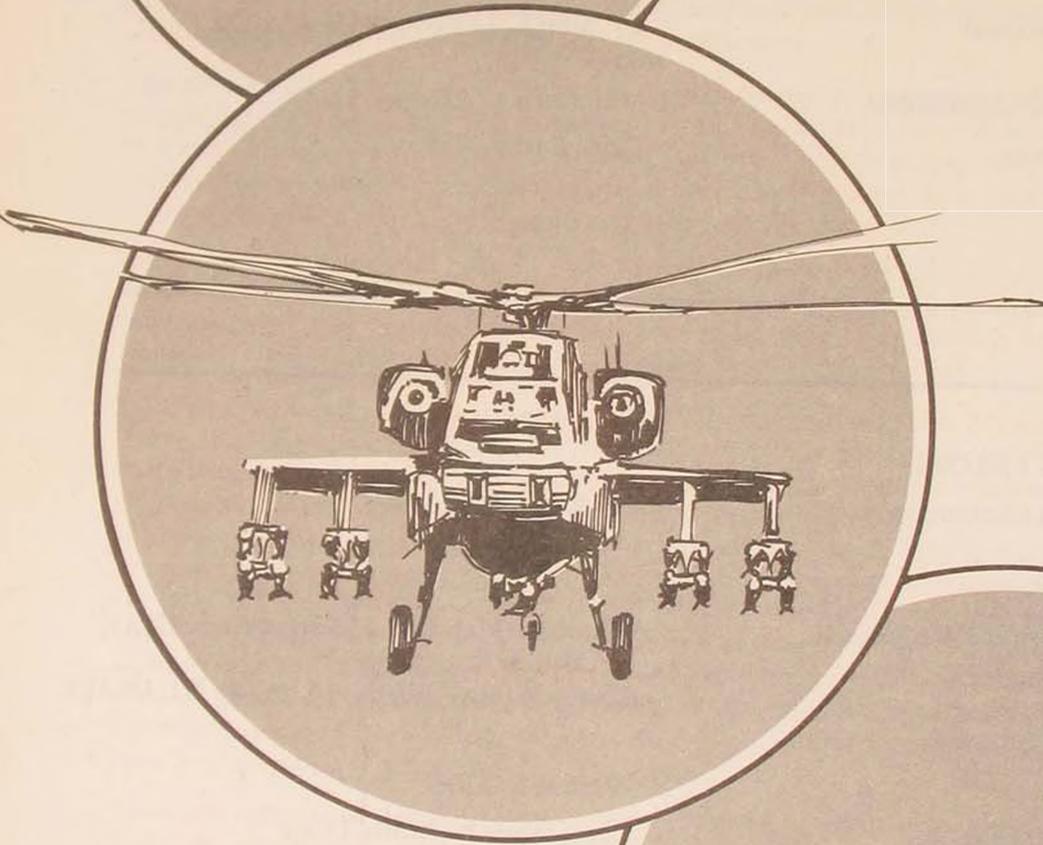
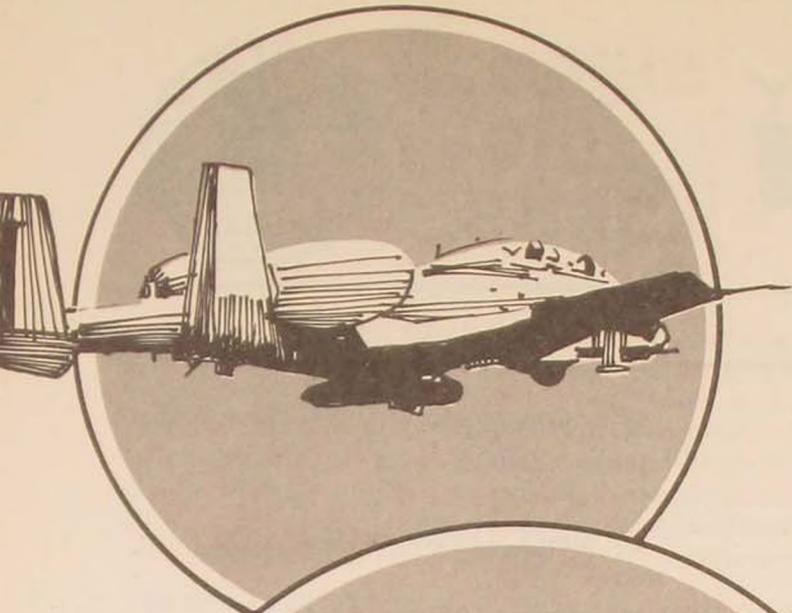
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CLOSE AIR SUPPORT IN MODERN WARFARE

WING COMMANDER JEREMY G. SAYE, RAF



FOR three decades, the NATO alliance has provided the framework for commitment of national forces to the security of Western Europe. During the same period a generation of Europeans, ignorant of war, has enjoyed economic growth and prosperity, lulled by the insidious appeal of a welfare-oriented society. Years of peaceful coexistence have mesmerized Americans and Europeans alike into believing that the Soviet military buildup, which has no parallel in peacetime since that of the Nazis in the 1930s, can be ignored in an era of détente. Thus it has not been recognized that the Soviets are buying time to reach a favorable correlation of forces, both nuclear and conventional, by concentrating simultaneously on quantitative and qualitative improvements.¹ These improvements have given the Soviets a military capability that is substantially in excess of any legitimate needs for self-defense. The purpose of this capability is quite clear: it is to force Europe either to become a hostage to Soviet intentions or to engage in outright war. This aim is entirely compatible with the view that "both in political and military terms, the Soviets regard Europe as a single geographic entity over which they feel a historical mission to exercise hegemony, if not suzerainty."²

From a NATO standpoint, there is, of course, no question of Soviet aspirations' being realized without resorting to military force. When this occurs, we must be confident that we have assessed correctly the capabilities and intentions of the Warsaw Pact forces in the European arena. This article attempts to make that assessment and suggest how NATO's tactical air forces (Tacair) should be employed in support of the air-land battle. We are not concerned here with the wider aspects of tactical air operations but only with those elements that directly relate to Tacair's primary job—to help blunt and stop the armored thrust.³ In this context close air support

(CAS) may have to play a vital role, but we cannot discuss the nature of that role without first examining how and where modern warfare is likely to be fought. A look at Soviet doctrine may help us grasp the implications of the continuing increase in Warsaw Pact warfighting capability, both nuclear and conventional. The pace, quality, and scope of these improvements are derived from fifteen years of steady annual increments in military expenditure—a trend that shows no sign of abating. Even so, it is possible to identify a number of suspect areas in the Pact's war machine. While we may be able to exploit some of these areas, they make it more difficult to divine Soviet intentions—an essential requirement if we are to understand fully the nature of the modern air-land battle.

Against this background, the requirements, characteristics, and capabilities of Tacair in the CAS role are closely examined. The most important criteria are seen to be responsiveness, effectiveness, and survivability. Related to all of these is the forward operating base (FOB) concept as exemplified by the Harrier and to a lesser extent the A-10. In the process of this examination, some cherished beliefs are challenged, and the expectations that both airmen and soldiers have of CAS forces may turn to bitter disillusionment if we do not configure, task, and train in a realistic wartime environment. These difficulties may be compounded by some fundamental differences in American and European perceptions of the concept of Tacair operations. In the context of a common NATO doctrine, we examine whether it is practicable or even desirable to reconcile these differences.

Modern Warfare Defined

Any definition of modern warfare is driven by the actual, or perceived, combat capability of the Soviets. From a doctrinal viewpoint, it is clear that they emphasize the

Glossary

AAA	antiaircraft artillery	FSCL	fire support coordination line
ALO	air liaison officer	HUD	heads up display
AAFCE	Allied Air Force, Central Europe	IR	infrared
ABCCC	airborne battlefield command and control center	JCOC	joint command operations center
AH	attack helicopter	LGB	laser-guided bomb
ASOC	air support operations center	LOH	light observation helicopter
ATAF	allied tactical air forces	MEZ	missile engagement zone
AWACS	airborne warning and control system	MOB	main operating base
BAI	battlefield air interdiction	NBC	nuclear, biological, and chemical
C ²	command and control	NOE	nap-of-the-earth
C ³	command, control, and communications	OAS	offensive air support
CAS	close air support	PGM	precision-guided munitions
CBU	cluster bomb unit	RAF	Royal Air Force
COMMJAM	communications jamming	REC	radio electronic combat
DASC	direct air support center	RPV	remotely piloted vehicle
ECM	electronic countermeasures	SAM	surface-to-air missile
EW	electronic warfare	STOL	short take off and landing
FAC	forward air controller	Tacair	tactical air forces
FLOT	front line of own troops	TACC	tactical air control center
FO	forward observer	TACS	tactical air control system
FOB	forward operating base	TAR	tactical air reconnaissance
FOL	forward operating location	VFR	visual flight rules
FRA	first run attack	V/STOL	vertical/short takeoff and landing
		VTO	vertical takeoff

primacy of the offensive, this having been well documented by other authors in this magazine. Less well documented, perhaps, and certainly often underplayed in the West, is the Soviet commitment to electronic warfare (EW).

Warsaw Pact military doctrine and capabilities

To put the Warsaw Pact capability in perspective, we should note that, according to the International Institute for Strategic

Studies, the Soviets intend to destroy 30 percent of NATO's electronic emitters by firepower and another 30 percent by jamming. There are currently 1000 ground-based radar jammers in the Soviet EW inventory intended for use against the navigation and bombing systems of intruding aircraft. In addition, the Soviets are said to have 1200 ground-based communication jammers in the high-frequency (HF)/very-high frequency (VHF)/ultra-high-frequency (UHF) range, 180 helicopters equipped for jamming communications (COMMJAM), and

250 dedicated EW aircraft.⁴ This jamming capability is supported by a substantial surveillance and tracking capability, characterized by increased density, diverse frequency range, redundancy, and mobility.

This formidable capability, together with the increased production and deployment of nuclear, biological, and chemical (NBC) systems, is certain to characterize modern warfare. The precise consequences for NATO of each of the improved Soviet capabilities remain speculative, however. Taken together, they have fundamentally altered the character of the threat and create an awesome picture.

This picture of modern warfare can be summarized quite simply. We note that Soviet capabilities are characterized by a doctrine that emphasizes offensive operations based on surprise, shock, exploitation, and combined arms. Tactical advantages would be gained by using nuclear and chemical agents for which the Soviets are well equipped and trained. The Group of Soviet Forces in (East) Germany, supported by four tactical air armies totalling some 1700 aircraft, together with the most formidable array of low-level air defenses and EW equipment seen anywhere in the world, should leave little doubt of the Pact's capability to attempt "to defeat . . . the enemy forces in West Germany, secure Rhine crossings and drive to the English Channel."⁵

Reality, however, suggests that the Soviet Bear is somewhat less than ten feet tall. The continuing loyalty of non-Soviet Warsaw Pact forces under pressure must be questioned, as must the ability of a mainly conscript army to operate without a credible NCO corps. Their exceptionally cumbersome command and control (C²) system inhibits initiative—a disadvantage that will be severely limiting in a fast-moving air-land battle. We may also reasonably doubt the combat capability of frontal aviation aircrews and the ability of their logical infrastructure (given a measure of disruption

from our own interdiction efforts) to support the anticipated advance. Of intentions we can say little beyond noting that the capability for attack most certainly exists and that any attempt to pursue it on one front only seems incompatible with their stated objectives. Their relentless drive toward a decisive military superiority has the ultimate domination of Europe in mind, but any further attempt to deduce Soviet intentions would require a clairvoyance that eluded even Sir Winston Churchill: "I cannot forecast to you the action of Russia. It is a riddle, wrapped in a mystery, inside an enigma."⁶ We can say, however, that modern warfare against the Soviets is going to require the total efforts of all the armed forces. In the context of the NATO air-land battle here defined, Tacair has a principal part to play. With a clearer idea now of the nature of modern warfare, we are able to discuss the role of CAS and examine critically its relevance to today's battlefield.

Close Air Support: Requirements and Capabilities

In 1970 Air Vice-Marshal P. de L. Le Cheminant wrote, "I believe that a great deal, indeed the major part of what has appeared in writing on this subject [CAS] during the last few years shows a lack of understanding of the real issues."⁷ This view of CAS is, perhaps, equally valid today, and we may suggest reasons ranging from ignorance of the enemy's capabilities, and hence the nature of the air-land battle (a matter this article has attempted to correct), to single service prejudices and doctrinal differences.

It is also true that the very term itself has been open to misconceptions, not only by the various services that provide CAS but also by some of those on the ground whose understanding of Tacair is limited by the concept of "keeping the enemy off our

backs." We must, therefore, start with some clear definitions of terms.

NATO's Tactical Air Doctrine Manual (ATP-33) notwithstanding, all army and air force organizations in the Central Region now recognize that the generic term for all air operations in direct support of armed forces operating on land is offensive air support (OAS). This includes CAS, battlefield air interdiction (BAI), and tactical air reconnaissance (TAR). CAS is defined as air action against hostile targets which requires detailed integration of each air mission with the fire and movement of those forces. These air missions are tasked against those enemy forces that are located between the front line of own troops (FLOT) and the fire support coordination line (FSCL). This distance will vary according to the nature of the army units' artillery, but for all practical purposes we can say 15-25 kms. Battlefield air interdiction is defined as that category of air interdiction that is flown in the battlefield area and can have a direct effect on the enemy's ability to continue operations. Battlefield air interdiction is subject to joint army/air force planning and is flown beyond the FSCL and up to the reconnaissance and interdiction planning line. This distance is 80-100 kms beyond the FSCL. We must be clear that battlefield air interdiction does not require "integration" with the ground commander's fire support and maneuver plan but does require coordination with his overall plan of operations

Any definition of modern warfare is driven by the actual, or perceived, combat capability of the Soviets.

to ensure that air interdiction is applied to the best effect. Armed recce, a traditional but sometimes misunderstood term, is not officially embraced by OAS, but for all

practical purposes BAI and armed recce are synonymous, each requiring search and destroy tactics in designated areas beyond the FSCL. The distinction applied to BAI is that it requires firmer intelligence on the battlefield situation and is thus more specific in its application. In practical terms this is pure semantics.

On balance, most NATO planners accept that airborne alert wastes scarce resources and may be an additional burden to an already overloaded C³ system.

Tactical air reconnaissance, the third type of OAS mission, is the acquisition of intelligence information employing aerial vehicles. Despite the importance and difficulty of TAR, it is, nonetheless, a complete study in itself and beyond the scope of this article. We are concerned essentially with the roles of offensive air support, i.e., CAS (and BAI). In discussing the requirements and capabilities of Tacair forces assigned to the battlefield, we consider first the requirement for CAS.

NATO Tactical Air Doctrine Manual is quite clear about the requirement: "The firepower and mobility of CAS aircraft (and helicopters) can make an immediate and direct contribution to the land battle, particularly against those targets which may be inaccessible or invulnerable to available surface-based weapons."⁸ Analysts from the United States Strategic Institute put the requirement more forcibly:

Against the numerically superior forces of the Warsaw Pact, and in the event that an offensive were launched in place, it is probable that Alliance airpower would be forced into a close support role because of the intensity with which the first echelons could be expected to attack. Heavy CAS would be indispensable to a successful defense of NATO.⁹

Both doctrinal and professional sources thus foresee a clear requirement for CAS, particularly in breakthrough and counter-attack operations. If this is true, what capabilities do we require of Tacair's forces for the CAS role?

responsiveness

When the army calls for immediate CAS missions, it needs them *now*. Too often in the past, command and control procedures have been bedeviled by poor communications and micromanagement of resources at too high a level. Despite the aspirations of ATP-33, it may be argued that there is no common, or even interoperable, NATO doctrine on CAS C². Broadly stated, United States Air Forces, Europe (USAFE) subscribes to centralized high-level C² at the tactical air control center (TACC), which assists in developing target lists, processing CAS requests, determining force requirements, and publishing the detailed tasking orders necessary for mission execution. In the chain of command, this is at the allied tactical air forces (ATAF)/army group level, below which we have the direct air support center (DASC), which initiates the planning and coordination necessary to process the CAS mission.¹⁰ To the European NATO reader these terms may appear confusing because ATP-33 refers to joint command operations centers (JCOCs) and air support operations centers (ASOCs). Of course, the various perceptions of C² go deeper than a pedantic difference in terminology—the point we are looking for is the effect of these C² differences on responsiveness. Experience suggests that the higher the C², the less the response once the initial decision of allotting CAS to the army commander has been taken by the air commander. Once assigned (for whatever period the air and army commanders agree on), the CAS units must work directly with the corps, division, or brigade ASOC. In this manner,

CAS units can achieve the direct interface essential for rapid response to battlefield requests. These requests may originate at any level of command within the supported land forces, but the ability of CAS forces to respond to such requests depends not only on command, control, and communications (C³) but also on where and how the air forces are based.

Rapid response or "alert" sorties may be on either ground or airborne alert. In theory, airborne alert provides greater responsiveness to the needs of the ground commander but must depend on an airborne battlefield command and control center (ABCCC) or the airborne warning and control system (AWACS), a concept that a gut-feeling for the flexible needs of CAS rejects absolutely. Airborne alert may also require the use of air refueling and secondary pre-planned targets to optimize effectiveness. On balance, most NATO planners accept that airborne alert wastes scarce resources and may be an additional burden to an already overloaded C³ system. The primacy of ground alert is therefore generally conceded as best for the rapid response of CAS aircraft, but NATO has been slow to recognize the need for forward operating bases, except for the A-10 concept of operations and the Harrier. A secondary, but nonetheless important, advantage that can be attributed to the FOB concept is that it alleviates the problems of airspace management and missile engagement zone (MEZ) coordination problems linked with the basing of aircraft to the rear.

The premise may be invalid, however, if Tacair is unable to disperse its aircraft to FOBs—and operate effectively therefrom.

The fact that RAF Harriers have successfully demonstrated this concept for the past ten years seems to be conveniently overlooked by those seeking to justify their own entrenched positions. Indeed, the widespread ignorance surrounding the contribution of vertical or short takeoff and landing

(V/STOL) is surprising considering a decade of operational experience with this aircraft. A recent study of the effectiveness of the Harrier employed at FOBs showed:

The writers view the [FOB] concept as being too fragmented to be effective . . . it requires what appears to be unnecessary redundancy of costly resources . . . the Harriers could not be individually scattered about the countryside; some method of centralization would be necessary for adequate control.¹¹

If correct, these observations completely undermine the premise that ground-based alert at FOBs is the solution to the responsive requirement of CAS in modern warfare. The authors have drawn conclusions unsupported by facts, and it is sufficient to put the record straight by referring to someone with operational experience—Air Commodore P. B. Hine, a former RAF Germany Harrier force commander.

In this vital area [referring to the FOB logistic support system], and in other areas such as mission effectiveness and the ability to survive, the RAF Germany Harrier Force has been awarded the highest possible marks by the multi-national Tactical Evaluation Teams of AAFCE.¹²

As all NATO units know, the annual tactical evaluation is a most rigorous and realistic test of that unit's ability to fight in war. Implicit in the assessments given to the Harrier force is the conclusion that the FOB concept is operationally effective. Even so, many air staff planners who have not experienced a FOB at firsthand still think that logistics are the downfall of dispersed site operations. As with main bases, FOBs depend on logistics reaching the primary airhead or logistics depot. Given this, the additional task is only that of moving supplies out to the FOB site or between sites, a procedure that with many years of experience has been refined to an art. Given the choice, the force commander would naturally ease his logistics problem by selecting a site as

close to the main airhead as survival allows (say 15 kms). Being further displaced poses additional delays inherent in surface transport. For this reason the coordinated use of heavy lift helicopters is desirable and, in the event of a rapid dispersal, essential. If the location of a FOB is compromised or if the battlefield situation requires it, a site can be vacated with all essential equipment in well under one hour, while the new location can be ready to accept aircraft within two to two-and-a-half hours.¹³ The logistic premium to guarantee a viable FOB concept is remarkably small: "A rough estimate shows that fully dispersed operations cost between ten and fifteen percent more in logistic support, communications facilities, site protection, etc."¹⁴

When this is weighed against the ability to respond rapidly and to continue operations long after conventional airfields have been rendered useless, it seems a premium worth paying.

Looked at in terms of responsiveness and survivability, the FOB concept thus seems to be essential for the employment of CAS aircraft in modern warfare. Even so, the concept does not of itself guarantee the high sortie rates that are necessary to support the ground forces. We have already identified the need for the C² system to be simple, flexible, and responsive. These principles will be negated if the system is reactive only. That is, there must be no question, in a modern war, of CAS aircraft awaiting tasking on the ground. The ferocity with which we expect the first echelons to attack is not likely to create a dearth of targets either on the FEBA or beyond it.

Unfortunately, our peacetime training in this area rarely follows our doctrine, "Train for war as a daily diet. Reliable, demanding training. Realistic exercises. Maximum combat capability."¹⁵ Our OAS exercises tend to be neatly game-planned to follow an operations order largely devoid of reality and emphasizing the primacy of flight safe-

ty. For these reasons, missions are most carefully preplanned to avoid airspace conflicts: Red forces' capability is consistently underplayed; Blue forces are restricted in height and maneuver; and C³ and tactical radar systems are largely blessed with immunity to electronic warfare. That is not to say that electronic warfare is totally ignored, but rather that it creates such chaos when it is employed that the players plead for its withdrawal. The purpose of this indictment is to focus the mind on an important area of realism and on the need to have CAS aircraft responsive in the sense of generating high sortie rates and tasking them as we would so expect in war. With this in mind, the conclusion is that the effect of Tacair will be dissipated by holding aircraft on the ground. In a target-rich environment we must hammer the enemy hard—and often.

The weather in northern and central Europe has such an effect on air operations that it might almost be considered a part of the threat.

Before discussing how we are going to achieve that, we will broaden our look at responsiveness to discuss an alternative concept—the forward operating location (FOL). General William Momyer, USAF (Ret), when Commander of Tactical Air Command defined it in the context of TAC's primary CAS aircraft, the A-10:

We would base [A-10s] further to the rear on a main operating base (MOB); and then we would have a forward operating base where we would come in periodically with a squadron and then advance as far as we thought the situation would permit. I would call it a Forward Operating Location (FOL) at which we would have a flight based, and we would then rotate through it. This will significantly re-

duce en-route time to the target . . . the expenditure of airborne alert time is not justified.¹⁶

This concept is being implemented in Europe where we note that the FOL is a combat staging and turnaround base with limited personnel and facilities—substantially different from the fully manned and supported dispersed site FOB used by the Harrier. By contrast, the USAF foresees the FOB as a forward base in West Germany to which the A-10 aircraft have deployed from their main operating base (MOB) in Great Britain. On the other hand, the Harrier dispersed-site concept of a FOB embraces a number of sites, each containing six to eight aircraft. Each site is virtually autonomous and is linked via secure communications to the force commander's headquarters and to their own and adjoining corps' ASOCs. The A-10 FOL, then, requiring a strip of some 2400 feet,¹⁷ is quite different from a Harrier FOB both in concept and in practice. They both serve the same ends, however: responsiveness to the needs of the land battle and high sortie rates. In February 1977, for example, two A-10s flew 17 sorties each during an 11-hour period. These were 120-nautical mile (nm) missions, dropping four 500-pound bombs and making 2 × 30-mm strafe passes each sortie.¹⁸ On a somewhat larger and more regular basis, Harriers, both RAF and U.S. Marine, frequently achieve high sortie rates from dispersed sites.

It is regular practice on field deployments for 30 Harriers to fly over 200 sorties per day on something like an hourly cycle: 30 minutes sortie and 30 minutes turnaround . . . the pilots remaining in the cockpit debriefing and rebriefing via a telescrumble line to Squadron Operations.¹⁹

In terms, then, of the first requirement of CAS, responsiveness, we have identified the need for a C² system that is secure, flexible, and effective and one that allows delegation down to the lowest practicable ASOC. Highly structured and automated systems would, it

was argued, work against responsiveness, particularly if micromanagement from the TACC resulted. In noting the Warsaw Pact overall capabilities, specifically in the electronic warfare environment, we appealed for realism in training to demonstrate the capability, or otherwise, of C³ systems in a wartime situation. In addition, the need for FOBs and FOLs to support the ground-based alert concept was noted. It was argued that in a target-rich environment CAS aircraft must not await tasking but must hit hard and often. For this, high sortie rates were essential, but, with the exception of the Harrier force, this capability was infrequently demonstrated. Responsiveness, then, is an important requirement in the CAS role and leads to the discussion of how such missions can be effective.

effectiveness

It is, of course, futile to be able to respond quickly if the aircraft cannot then attack and destroy the required battlefield targets. Thus four questions must be asked: What? Where? When? and How? In answering these questions, we define first the CAS profile and then consider factors that influence it: the forward air controller (FAC), target acquisition, weather, and aircraft/weapon mix. Pervading all this is the rhetorical question: Can we operate in the kind of EW/COMMJAM environment that we are certain is going to be a part of modern warfare over the battlefield?

USAF Tacair doctrine defines the CAS mission as, inter alia, the following:

Once airborne, fighters are handled by control elements of the TACS, which may include the Airborne Command and Control Center (ABCCC) and the Airborne Warning and Control System (AWACS). Pilots will be provided with radar vectoring to a rendezvous point, updated strike information, target area weather, and forward air controller call signs and frequencies.

Upon arrival at the designated holding or rendezvous point, CAS flights contact an airborne or ground FAC who will control the strike. If an airborne FAC is used, he will be in contact with friendly ground forces. . . . The FAC will also be coordinating defense suppression artillery, tactical fire, beacons, ground laser designators, and friendly air defense with the local maneuver unit commander.²⁰

Despite the clear-cut advantages of the Harrier in other aspects of the CAS mission, many observers have reservations about the payload and range of this aircraft.

The reader will at once be impressed by the smooth flow of the mission and by the almost incredible capabilities of the FAC; incredible because the doctrine assumes that the Warsaw Pact will oblige us by discontinuing radio electronic combat (REC) so that our CAS mission can follow the neat profile defined for it. Nothing could be further from the truth, and the point is so fundamental to the role of CAS in modern warfare that it is worth discussing further. It would be less than honest to say that doctrine does not recognize the importance of electronic warfare — indeed, much emphasis is placed on it.

Any commander is prone to defeat, whatever his strength in numbers and weapons, if EW denies him the means to convey orders, provide for fire support . . . EW is now a form of combat power, and battles may be won or lost by the fight in this medium.²¹

The problem arises in trying to relate doctrine to reality. Practical experience teaches us some important lessons, particularly if taken from modern conflicts. An experience from the Yom Kippur War warned us that:

Tests against captured Soviet equipment are said to indicate that . . . [tactical aircraft] would be seriously degraded by this [EW] capability and that the communications required for close air support will be denied within [5 nms of the battlefield].²²

Confirmation of this capability was brought home starkly to the Israeli pilots who found that their ground-to-air communications were jammed on all UHF/VHF frequencies within one minute of pilot-FAC coordination.²³ There can be little doubt, therefore, that not only will our battlefield C³ systems be jammed extensively but also that these systems can scarcely be integrated into a combined arms/coalition war situation.²⁴

Against this background, we must now examine what role the FAC can play in the CAS mission.

The Role of the FAC

The FAC is the direct interface between the forward tactical ground commander and the supporting CAS forces. In addition to the battlefield control and coordination functions already discussed, the FAC is responsible for briefing CAS pilots on the targets identified for attack and assisting the pilots in target acquisition. To an extent, he relies on information provided by ground-based forward observers (FOs), but it is not clear, in the electronic warfare environment we anticipate, how such information is going to be passed. In this situation, it is apparent that the ground-based FACs and air liaison officers (ALOs) are largely superfluous in their primary roles. The airborne FAC, on the other hand, having gleaned what slender information he can before takeoff, is forced to a position beyond the effective REC/SAM/AAA envelopes to communicate with his fighters. This can be broadly defined as a contact point about 10 nms back from the FLOT. Since he can neither identify nor mark the required bat-

tlefield targets from this position, we may conclude that the primary role of the airborne FAC is also defunct and that he is now relegated to the role of relaying the general battlefield situation to CAS aircraft.

This question may now be asked: What confidence do we have that Warsaw Pact radio electronic combat will not prevent air-air communications behind the FLOT or even beyond it? The capability to COMM-JAM depends primarily on three things: the output of the jammer, the proximity line of sight of the jammer to its intended "victim," and the sensitivity of the "victim's" receiver. It can be stated that current mobile Warsaw Pact jammers have a capability out to about 20 nms. They are integral to Warsaw Pact signals regiments, however, and they would expect to be deployed at a position of relative safety, say at the FSCL. Hence our conclusion that battlefield communications will be extensively jammed but that we may reasonably expect minimum interference at a contact point some 10 nms behind the FLOT.²⁵ It may further be argued from this evidence that communications beyond the FSCL will also be difficult, depending on the deployment and capability of the individual jammers. This is an important consideration for BAI, and the question has to be asked whether we can coordinate some of the proposed attack profiles with no communications. The answer to this question will involve a degree of heart-searching amongst those who have forgotten one of the basic precepts of Tacair—keep it simple.

The conclusion we draw is that the FAC is unable to fulfill the roles necessary for the success of the CAS mission and that, by inference, the success of the mission itself is questionable. It depends, ultimately, on whether we can acquire the correct target with only a possibly inaccurate brief at the contact point and without the advantage of a designator to assist in solving the major problem of the CAS attack—target acquisition.

target acquisition

Even under the most favorable conditions, target acquisition has always been a problem for fixed-wing aircraft in the close air support role. For reasons of weather, weapons effect, and survival (aspects of which are discussed in detail later), we are required to fly low and fast—the two factors that compound the difficulties of target acquisition. On this subject, analysts can prove many things with statistics. Personal experience of many years, however, is convincing proof that the chances of a successful first run attack (FRA), in the low, fast, minimum exposure, minimum steady-state flight path necessary for survival against a specific, undesignated battlefield target are extremely poor. Given a second chance or given a generous exposure time, the probability is much improved—but few will live to tell the tale. The conclusion is clear: specific targets must be clearly designated for a successful close air support attack by fixed-wing aircraft. Without this, the mission is doomed to failure. Technology, if it can be harnessed to a world of economic and operational reality, can provide some answers. Various systems, including helmet-mounted sights, beacons, and lasers, have all been used successfully. Laser designation has, of course, tremendous potential, offering pinpoint accuracies without the need for visual acquisition by the pilot. But here, as with many other designators, coordination has proved extremely difficult in a COMM-JAM environment. Individual squadrons may have some simple and flexible tactics that will prove effective, but we are a long way from reaching a solution that will be interoperable within all of the national corps areas.

In the future we may see mini-remotely piloted vehicles (RPVs) in this role.²⁶ The mini-RPV we need must be simple, rugged, mobile, and flexible. It needs to be no more than a truck-mounted rotary wing platform

with sensors for battlefield surveillance and target designation. The extension of this concept to allow the airborne FAC to fulfill the essential roles of target identification and designation from a remote position at the contact point seems to be innately costly, technologically vulnerable, and operationally suspect. We thus cannot tell whether technology will be applied realistically to the needs of close air support. For the moment we can only conclude that target acquisition remains one of the major problems for fixed-wing aircraft in this role. Moreover, the problems are compounded in poor weather and at night—aspects that we now examine in the broader context of the role of close air support in modern warfare.

all-weather, day and night capability

The weather in northern and central Europe has such an effect on air operations that it might almost be considered a part of the threat. Pilots familiar with flying in Europe hardly need reminding of the limitations that weather can impose, the subject being documented from many sources. In terms that are easily understood, it can be broadly stated that over the north German plains in winter the cloud base is less than 100 feet and the visibility less than 5 kms on one day in three; on the northern flank and over the highlands, such conditions may exist on one day in two.²⁷ It is, of course, misleading to apply ratio terms, since weather patterns do not necessarily fluctuate on such a daily basis. For example, winter weather on the northern flank can “ground” air forces for a week at a time, but this may be followed by a week of near-perfect flying conditions.

The unique problem of weather for close air support aircraft is that battlefield targets are not, for all practical purposes, radar identifiable. Thus, even if CAS aircraft can reach the battlefield with all-weather navigational aids, the pilot may still have to use the “Mk 1 eyeball” for target ac-

quisition. It is, therefore, visibility rather than cloud base that is the limiting weather factor. This observation applies also to helicopters, although their weather minima are substantially lower than those for fixed-wing aircraft. For example, attack helicopters (AHs), have a proven CAS mission effectiveness in weather conditions as low as 100 feet and 1500 meters visibility, whereas few fixed-wing aircraft can attack effectively in conditions worse than 500 feet and 2½ kms. The A-10, for example, has demonstrated a capability for visual attacks down to 1½ miles (2½ kms),²⁸ although aircraft with faster attack speeds would be lucky to acquire specific and nondesignated targets at such short range. The conclusion we draw from this is that CAS aircraft require not only all-weather, day and night penetrating aids but also special sensors for target acquisition.

The USAF tends to "damn with faint praise" the Harrier concept—often, it is felt, from a position of ignorance and prejudice.

This leads inevitably to the sophistication of aircraft such as the F-111 and the Tornado aircraft assigned primarily to the counterair and deep-interdiction roles. Alternatively, we can equip our single-seat CAS aircraft with high technology, rapid, automatic data processors to reduce pilot workload sufficiently to cope with the low-level, all-weather day and night CAS mission. This solution sounds credible in cost-effective terms: smaller, cheaper aircraft (and thus, perhaps, more of them) and reduced manpower and training costs. In real terms, however, this solution reflects a dangerous, and possibly suicidal, preoccupation with technology. 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 knots 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 close air support pilot most certainly is not!

These perceptions, however, must not lead to the conclusion that a return to the "ring and bead" sight is recommended. There is middle ground on which technology can be applied cost effectively and practically. We can identify here some minimum requirements for the daytime, poor-weather CAS mission: a digital inertial navigation and attack system, a combined moving map display, a total heads up display (HUD), a radar altimeter, and additional sensors for target acquisition, including laser. The list is probably open to endless debate, and if we extend the requirement to all-weather day and night, we must have terrain avoidance radar and a two-man crew.

We also have yet to discuss the requirements for survivability. The point we are driving at here is that, recognizing the need for CAS in support of the land battle in all weathers and at night, Tacair cannot meet that requirement with its primary single-seat, day, visual flight rules (VFR) aircraft. Indeed, it is arguable that, even given the equipment and the two cockpits, the manning ratios on frontline squadrons are woefully inadequate to support 24-hour operations over anything more than a short surge period. In short, it has to be concluded that CAS squadrons do not have all-weather day and night capability, and that if we do go to the expense of providing that capability, both in sophisticated equipment and manpower, it is going to mean fewer aircraft. Given a fixed defense budget, the problem revolves around the quality versus quantity argument. The evidence shows, unfortunately, that we do not have enough of either commodity.

aircraft and weapon capability

Thus far, we have not recognized fully the capabilities of the attack helicopter in the CAS role. The AH must first be placed in the electronic warfare environment already defined and may thus be subject to the same communications problems that we have identified for the FAC. The advantage of the AH lies in the fact that it is similar in type to the FAC's aircraft, a light observation helicopter (LOH), and that voice jammers can be overridden by achieving antennae overlap. This unique advantage allows the AH pilot and gunner to obtain the necessary target details without having to rendezvous at the contact point—a restriction that applied to fixed-wing aircraft, as has already been explained. The attack helicopter pilots, then, based close to the FLOT and thus immediately responsive to the needs of the tactical ground commander, work as part of a combined arms team on the battlefield. Even without a FAC, AHs are able to survive flying nap-of-the-earth (NOE) and to acquire their targets from a treetop hover. Limiting their exposure to the minimum necessary for missile or rocket launch, AHs can be expected to make significant contributions to stopping the armored thrust. On balance, the AH is probably the ideal airborne tank killer.²⁹ Noting also its capability in exceptionally poor weather and at night, the AH is essential to the success of the CAS mission. Regrettably, on the central and northern flanks of NATO, this capability exists in totally inadequate numbers.

In considering the mission effectiveness of fixed-wing aircraft (as distinct from their survivability aspects, which we discuss later), we can summarize by referring to the problems already identified in pilot/FAC coordination. We concluded that, without positive target identification and designation, the chances of a successful FRA would be remote. Given a solution to those problems,

the success of the attack will depend on the weapon used, being either forward firing (rockets/guns), laydown (cluster munitions/retard bombs/napalm), or precision-guided munitions (PGM). The last category includes air-surface missiles of the Maverick family and laser-guided bombs (LGB).

The scope of this article does not include a detailed assessment of each type of weapon, but it is pertinent to note some broad characteristics. Forward-firing ordnance requires at least a five-degree dive angle for weapon effectiveness. In addition, the need to clear the debris hemisphere, either vertically or horizontally, demands a minimum firing range that, when added to the minimum tracking time necessary for accuracy, extends the minimum range by which the target must be acquired for a successful attack. This, in turn, increases the exposure time. Precision-guided munitions and laser-guided bombs can be extremely effective, given the weather (or communications) necessary for successful delivery. The main reservation is that of cost and, by implication, sufficient numbers in the front line. On balance, area cluster munitions in the BL 755 family, delivered in a level laydown mode, have proved cost-effective against armor. From the pilot's viewpoint, they are preferred because weapon aiming is less critical, exposure is reduced, and a successful attack can be made from a late target acquisition. Even so, none of this is helpful to the CAS mission unless sufficient numbers of weapons can be carried to the target. The logistics aspects of this problem are not discussed here, for they are not unique to the role of CAS. Rather, we are looking at whether CAS aircraft have the capability to deliver effective weapons loads on the target. Despite the clear-cut advantages of the Harrier in other aspects of the CAS mission, many observers have reservations about the payload and range of this aircraft.

In 1972 General Momyer said, "With today's technology we have not been able to

reach a happy position where we can have a vertical takeoff and landing aircraft with a significant armament load and acceptable operating ranges."³⁰ The general emphasized the vertical takeoff (VTO) configuration, but the question has to be asked: "Why VTO?" The Harrier can lift its operational warload of six cluster bomb units plus two 30-mm cannon in under 1000 feet of any suitable road, planking, or field (such areas have, of course, already been surveyed in detail in the European theater). From its site some 50 kms behind the FLOT, the Harrier can attack well into the second-echelon divisions and be rearming again within 30 minutes. Combine this with the demonstrated capability for exceptionally high sortie rates, and it is then difficult to understand how such performance can be considered insignificant and unacceptable. The USAF tends to "damn with faint praise" the Harrier concept—often, it is felt, from a position of ignorance and prejudice. On the other hand, Europeans, possibly equally ignorant and prejudiced, have a number of reservations over the USAF Tactical Air Command's primary CAS aircraft, the A-10. Principal amongst these is the question of survivability, an aspect that we now examine in its wider context.

survivability

A responsive or an effective mission is of little use if the aircraft cannot survive, both in the air and on the ground.

Survival in the air. Many people still believe that air power will achieve air superiority over the battlefield, a myth that we attempted to dispel earlier in this article. This belief, however, leads to the assumption that our CAS aircraft will be involved in evading Warsaw Pact frontal aviation in the battlefield area. On the contrary, the Soviets have nothing to gain by placing their own aircraft at risk near the battlefield. First, their organic SAM/AAA is already

capable of controlling the air, and second, they must recognize the enormous problems of lower airspace management. How much simpler for them to assume that attack aircraft over the battlefield are hostile! Of course, this approach is too simplistic in ignoring the coordination required for their own CAS aircraft. Even so, it seems logical to argue that the Pact nations will not compound their difficulties by drawing down their interceptors into the CAS arena. The conclusion is that we are unlikely to have to worry about being "bounced" in the battlefield area, providing, of course, that we stay low. This is just as well, for we will have enough problems trying to survive against Soviet SAM/AAA.

... if the A-10 is to survive in the modern battlefield, the pilot must have more help than is available to him at present.

These systems can, of course, be destroyed, suppressed, confused, or evaded, according to mission capability. The CAS role, however, has to concentrate on the threat to the ground forces and not to air forces. Thus CAS aircraft must rely on a combination of suppression, confusion, and evasion. Technology, in the form of electronic countermeasure (ECM) pods, infrared (IR) flare and chaff dispensers, and other countermeasures, is essential to the suppression and confusion requirements, but evasion is largely a matter of tactics and pilot skill. Opinion on this is divided, but experience on Red Flag missions and elsewhere indicates conclusively that survival lies in minimum exposure and minimum steady-state flight path. Minimum exposure for AHs is NOE flight, but with fixed-wing aircraft we must fly as fast and as close to terra firma as safety allows. It is a practical

law, however, that these two requirements tend to be mutually exclusive, in that the faster we fly, the more the difficulty in remaining really low. By analogy, one can hover ten feet above the ground, but no pilot can maintain this height over uneven ground at 500 knots. A compromise has been found through many years of training and experience. Low and fast means in the order of 100-150 feet and 450-500 knots. It may be possible, in certain terrain, to go faster and lower, but if we do not train to do this in peacetime, we should not expect to be able to achieve it in war. The element of risk, however, is increased proportionally, and it is a fact of life that we simply cannot afford to lose expensive aircraft and pilots. Even so, a number of air forces remain preoccupied with unblemished flight safety records, principally because a bad record carries a stigma of failure and poor supervision (even if unjustified). This, too, is a fact of life for the commander with conflicting priorities: the survival of his forces in war or the survival of his job in peacetime.

The USAF views Tacair as a centralized reserve for delivering firepower to supplement that of the army; the Europeans view Tacair as assisting the ground force commander's scheme of maneuver.

The A-10 aircraft has been designed to absorb battle damage, and it may well survive against calibers as high as the ZSU-23-4. It is not very likely to survive a direct hit by SAMs, however, and its limited speed (say 350 knots in the attack) may make it vulnerable to future-generation IR missiles. For reasons already outlined, extra emphasis must be placed on the other components of

the survival equation. Evasion must be achieved by terrain masking and flight at minimum altitudes. In addition, maneuver is an extremely important requirement—one that is well within the capabilities of the aircraft, if not the pilot. Above all, if the A-10 is to survive in the modern battlefield, the pilot must have more help than is available to him at present. We note that the "USAF plans to equip [the A-10] with advanced threat warning receivers, jamming pods, a chaff/flare system and an inertial navigation system that will reduce its exposure to enemy fire by allowing accurate low-level navigation in a high-threat environment."³¹ Such equipment is not a requirement for the A-10 only—all CAS aircraft need it. The limitations in speed, however, indicate the additional emphasis that must be placed on the other components of the survival equation. Given the capabilities in the other important areas, the A-10 may survive better than faster, but less-well-equipped CAS aircraft.

Survival on the ground. General Richard Ellis, former commander AAFCE, identified both the problem and the solution: "The vulnerability of NATO's airfields, especially runways, is becoming one of the major problems facing the Alliance today. The solution is to develop a new generation of V/STOL aircraft. . . ."³² A Strategic Institute report argues that ". . . it is likely that many of NATO's tactical aircraft would be destroyed on the ground during the opening stages of the conflict. Of those which escaped preemption, a large number would not be able to take off because of enemy interdiction of airfields."³³ Therefore, to survive on the ground—and to continue operations—Tacair must disperse, but without at least STOL-capable aircraft, we can identify a fatal flaw in NATO's capability.³⁴ We can summarize quite simply: the role of CAS in modern warfare (if indeed we foresee any role) will be severely degraded unless aircraft assigned to that role can disperse for-

ward to, and operate from, FOBs/FOLs. Apart from AHs, the only STOL aircraft following this concept are Harriers and A-10s (assuming that one can truly define the A-10 as STOL). It would be less than fair not to mention the dispersal capability of the Swedish Air Force, one of the most efficient and operationally capable in Europe. Unfortunately, it is not clear how their aircraft will contribute CAS to the air-land battle defined for the scope of this article.

Thus far, then, we have examined the need for "responsiveness, effectiveness, and survivability" in the CAS role in modern warfare. There exist, however, some fundamental differences in American (4ATAF) and European (2ATAF) perceptions of how Tacair forces should be employed. Since both ATAFs subscribe to a common NATO tactical air doctrine in manual ATP-33, it is important to identify these differing perceptions.

employment

The major difference between European and American perceptions of the role of Tacair centers around the nature of warfare in Europe. The USAF views Tacair as a centralized reserve for delivering firepower to supplement that of the army; the Europeans view Tacair as assisting the ground force commander's scheme of maneuver. These differences in style, driven in part by cost and technology, have led to different views on C³, operations, and munitions.

The Europeans view the American approach, with its emphasis on electronic warfare, sophisticated C³, and composite forces, as costly, inflexible, technologically vulnerable, and thus operationally suspect. A common perception in Europe is that, "The nature of the Vietnam experience may have led the USAF into techniques and approaches inappropriate for Europe . . . the USAF has erroneously accepted the plausible conclusion that the greater tempo of

armored warfare could be matched by the even greater speed of modern data processing machinery."³⁵ Europeans believe that:

In a benign environment, current surveillance, communications, and data processing technologies are just sufficient to allow elaborate systems to work. When that environment changes from benign and static to hostile and adaptively dynamic, the assumption that the technology will work properly becomes questionable.³⁶

These differing perceptions have led to fundamental opposites in concepts of operation. Whereas the Americans tend to emphasize PGMs, medium-level flight (above 10,000 feet), and real-time surveillance and C² for diverting in-flight aircraft, the Europeans emphasize area submunitions cluster bomb unit (CBU), on-the-deck altitudes, and autonomous operations. In the wider application of Tacair, the USAF would consider using composite forces—raids of some 20 aircraft of which only some 12 would be "attackers," the remainder being employed in the defense suppression, escort, and ECM roles. Europeans, perhaps guilty of making a virtue out of economic necessity, reject both the American tactical air control system (TACS) with its reliance on jammable radar control and the composite force concept, which requires a high degree of aircrew and unit specialization with commensurate high costs. In the European view, flexibility is not gained by diverting airborne aircraft under a suspect and vulnerable AWACS but by generating high sortie rates from FOBs with "2-ship" on-the-deck autonomous operations. Survival relies more on evasion and minimum exposure than on defense suppression, confusion, or destruction. Americans, on the other hand, question the qualitative advantages that Europeans tend to assume for their own operations and consider that European reluctance to get more involved in ECM is a fundamental error.

These general observations should not,

however, be universally applied to the CAS role. USAFE A-10 CAS operations, for example, are now much closer to the European concept, although USAFE doctrine could still consider using strategic bombers (B-52) in the CAS role, if circumstances demanded. From a historical perspective, Americans would argue that all-weather beacon bombing, as close as 3000 meters to the FLOT, saved the garrison at Khe Sanh toward the end of the Vietnam conflict. Europeans, on the other hand, find it difficult to reconcile their own concept with the use of strategic bombers in the CAS role. Thus fundamental differences remain, and the opposing concepts of operations make interoperability difficult, if not impossible. Nonetheless, for NATO the present diversity in doctrine and tactics is not altogether bad. The alternative options present a longer term fall-back capability should one or the other be foreclosed. Further, the two approaches have a synergistic effect in forcing the enemy to second-guess NATO's tactics and thus dissipate his defenses against the full spectrum of attack options. Although it would, therefore, be a mistake for AAFCE to try to impose a standardized concept of operations on both ATAFs, it would also be a mistake not to recognize that basic differences exist and that these differences may have a significant impact on the role of CAS in modern warfare.

Since we have covered much ground here, it would seem useful to summarize the problems that have been identified.

problems

The first requirement of aircraft assigned to the support of the battlefield in the CAS is responsiveness. This requirement can satisfactorily be met only by ground-based alert aircraft dispersed forward at an FOB site or an FOL, a fact which, in itself, is not a panacea unless high sortie rates can be maintained. Unfortunately, NATO has been slow

to recognize the advantages of STOL and short takeoff and vertical land-capable aircraft and has thus immensely complicated, if not defeated, its dispersal options. It can be stated that only attack helicopters, Harriers, and A-10s meet this requirement, but they are so thinly spread along the front line as to be of only marginal effect against the numerically superior Warsaw Pact forces.

NATO has been slow to recognize the advantages of STOL and short takeoff and vertical land-capable aircraft and has thus immensely complicated, if not defeated, its dispersal options.

An effective attack, however, must be more than responsive; it must be successful in the face of an intensive electronic warfare threat, COMMJAM, and the most formidable array of battlefield air defenses in the history of warfare. It is generally accepted that the FAC or ALO is essential to the CAS mission, but he can neither communicate nor survive in the battlefield area. As a FAC, then, his role is defunct, and so, by implication, is the role of CAS. Other major problems include those of target identification and acquisition, and even modern sensors such as lasers may be defeated if communications to coordinate the attack are denied.

It must further be argued that the tempo of modern warfare will not slacken in bad weather or at night. It may also be argued that NATO's primary CAS aircraft (which are day VFR only) will contribute nothing to the war under these conditions. Assuming that the other problems can be solved, NATO's all-weather aircraft may be employed in the CAS role but at the expense of their primary counterair and interdiction roles. The immediately attractive answer of

procuring all-weather-capable CAS aircraft has always been defeated by the quantity versus quality argument. The problem is that we do not have enough of either.

Further problems exist for the survivability of CAS aircraft. In the face of Warsaw Pact SAM and AAA, they must carry advanced threat-warning receivers coupled to automatic active jamming pods. Chaff and IR decoys are essential, and CAS aircraft must have the flexibility to incorporate the latest technology electronic warfare systems. European air forces have been particularly slow to so equip their aircraft, relying instead on evasion and minimum exposure rather than on defense suppression. Survival in modern warfare is going to require the synergistic advantage of all three capabilities. Nonetheless, it still seems clear that CAS aircraft will be forced into minimum altitude, high speed, and maximum maneuver profiles for survival. The problems of training safely in peacetime to guarantee survival in war have never been more real.

On the ground, survival and the ability to continue operations when conventional airfields have been subjected to heavy and continuous attack depend absolutely on the ability to disperse. Harriers and AHs are the only forces with a proven capability in this area.

Taken separately, each problem might have been subject to an optimistic assessment of the role of CAS in modern warfare. Taken collectively, however, the problems for fixed-wing aircraft appear insurmountable. Only the AH seems capable of making an effective contribution to the CAS role, particularly in poor weather and at night. If this is so, how then can we employ CAS aircraft whose primary role is now defunct?

solutions

To find a solution, we must return to basics and ask whether we accept the premise that it is necessary for Tacair to "destroy in the

first echelons" or "disrupt in the second echelons." If we accept the plausible conclusion that we cannot do the former, we must examine whether a solution can be found in the latter. Relating these concepts to roles, it becomes a question of CAS or BAI. Air Commodore P. B. Hine, a former Harrier force commander in 2ATAF, commented: "BAI is a role that can be sustained in a confused situation where communications have broken down. The interdiction of enemy armor of the second tactical and successive echelons is perhaps the [Harrier's] most effective contribution to the land battle."³⁷ A similar view, reflecting the lessons of the Yom Kippur War, was expressed by General Chaim Herzog:

The proliferation of light, portable missile launchers in the front line means that close support will be the exception of the rule in future, with the air force being obliged to concentrate on isolating the field of battle, maintaining supremacy of the air, and destroying the forces in and near the battlefield.³⁸

... survival and the ability to continue operations when conventional airfields have been subjected to heavy and continuous attack depend absolutely on the ability to disperse.

Countering the inevitable riposte of making a virtue out of necessity is the view of Terrell E. Greene, a director of Tactical Studies at Rand, "If Tacair can survive and penetrate, it can hurt [through BAI] the follow-on echelons of a Pact invasion enough to slow and disrupt the attack to the point where NATO ground forces can hold against assault divisions."³⁹

The primacy of BAI in the author's experience, lies in the fact that:

- Battlefield air interdiction is flown beyond the FSCL, thus there is no need for a FAC. Nonetheless, the FAC, or some other agency out of COMMJAM range behind the FLOT, remains desirable, but not essential, to update fighters on battlefield intelligence and likely target areas beyond the FSCL.

- Battlefield air interdiction does not need to be integrated with the fire and movement of ground forces—a solution that greatly eases the problems of the tactical ground commander in the “fog of war.”

- Battlefield airspace management is immensely simplified. Except for our own attack aircraft transiting down safe corridors (at least one hopes they are safe), all fixed-wing aircraft may be assumed to be hostile and engaged by our own SAM and AAA.

- The identification of specific battlefield targets is not required. Targets beyond the FSCL are, by definition, hostile. There will be no shortage of them, and attack aircraft, working in their assigned areas, can follow maximum-effectiveness and minimum-risk profiles.

Battlefield air interdiction can solve many, if not all, of the problems we identified for CAS.

- Battlefield air interdiction can be flown in a COMMJAM environment. Even in the worst case, where BAI missions have not been able to contact a FAC or ground control agency, attack aircraft should have adequate intelligence from preceding missions to fly a successful sortie.

In my opinion, BAI can solve many, if not all, of the problems we identified for

CAS. Implicit in this solution is the ability of BAI-role aircraft to meet the requirements stated in terms of responsiveness, effectiveness, and survivability. Also implicit in this solution is the unproven (and probably unprovable) premise that BAI can fulfill the same role as CAS—to help blunt and stop the armored thrust. Differing doctrinal perceptions on this point are irrelevant if the CAS mission is based on a concept of operations totally unsuited to modern warfare.

If this assessment of modern warfare is accepted, it is clear that the role of CAS requires a fundamental reassessment. It has become increasingly evident that CAS aircraft cannot achieve an “effective” mission in the COMMJAM/SAM/AAA environment that characterizes today's battlefield. At best, Tacair's fixed-wing aircraft would seem to have only a marginal capability in the CAS role. However, our thinking must not be constrained by prejudices and semantic definitions. We must recognize the capabilities of attack helicopters for the CAS role and must assign fixed-wing aircraft to the battlefield air interdiction role—a role offering simplicity, flexibility, and potential rewards in the target-rich second echelon area. It is here that Tacair can make its most effective contribution to the land battle.

A last observation is that air power in support of the battlefield is not an end in itself—but merely a means to an end. The final criterion by which history will judge its effectiveness is whether it prevented the enemy from occupying our lands and taking our capital cities. If he has achieved this, pedantic argument about the outcome of the air war will be of no avail. It is in this context that the role of CAS in modern warfare must be judged.

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Those who do not learn to fight the enemy in peacetime are destined to be defeated in war.

Col. I. A. Grudinin
The Time Factor in Modern War (1966)

A STRUCTURED FRAMEWORK FOR SALT DECISION-MAKING

JOHN M. COLLINS

SALT II is so complicated and such an emotional matter that salient issues consistently get lost in the shuffle. Still, the task confronting our Senate is straightforward, when defined in the following terms: Should the pact signed by Presidents Carter and Brezhnev be approved in its present form because it is better than nothing?

objectivity is the objective

There are many different ways to fill out the accompanying chart, depending on personal persuasion. Paul Warnke would postulate one set of problems, responses, and implications. Paul Nitze another. All sorts of shades are possible in between.

Strategic Nuclear Problems (Present or Impending)	Potential Responses	SALT I, II Treaty Influence			
		Helps	Hinders	Neutral	Unknown
U.S. Problems					
Intercontinental ballistic missiles					
Practical problem					
Prelaunch vulnerability	Limit Soviet hard target capabilities	II			
	Verify those limits	II			
	Deploy mobile ICBMs				II
	Deploy ABM		I	II	
Perceptual problem					
Superior Soviet countersilo capability	Equality in ICBM silos		II		
	Deploy MX in silos			II	
	Deploy mobile MX				II
Heavy bombers					
B-52 postlaunch vulnerability	Deploy sufficient cruise missiles and/or bomber replacements for B-52			II	
Submarine-launched ballistic missiles					
None serious	Planned improvements			II	
CONUS defense					
No protection for U.S. population, production base, or second-strike systems	Improve air defenses			II	
	Improve civil defense			II	
	Press ABM/ASW R&D			I, II	
	Deploy ABM		I	II	
Problems of U.S. allies					
U.S. nuclear umbrella leaks	Improve CONUS defense		I	II	
Deterrent value of TAC nukes declines	Improve CONUS defense		I	II	
Backfire bombers	Restrain deployment Improve allied air defense		II	II	
Soviet IRBMs/MRBMs	Restrain deployment Deploy U.S. or allied IRBMs/MRBMs Deploy GLCMs		II	II	
	Deploy allied ABM		I	II	

This assessment, which sticks strictly to military considerations, simply demonstrates a structural framework for decision-making. In the process, it shows how severe critics, even cynics, just possibly could arrive at unexpected conclusions if they consciously battle their own built-in biases.

Intercontinental Ballistic Missiles

SALT II is shot full of problems. The most pressing pertain to intercontinental ballistic missiles (ICBMs).

practical problem

Problem one is practical. Its cause is no secret. U.S. strategists stress a Principle of War called Economy of Force. The Soviet side stresses Mass. Those incompatible principles, applied to ICBMs, have spawned diametrically different policies over the past two decades.

We chose quality instead of quantity. The Soviets chose both. We chose missile accuracy instead of size. The Soviets chose both. SALT II institutionalizes consequent U.S. inferiority in fixed-site ICBMs, especially "heavy" models with many large multiple independently targetable reentry vehicles (MIRVs) that will soon be a Soviet specialty.

The payoff was predictable. Most students of the subject seem to agree that a Soviet first strike could smother America's Minutemen by the mid-1980s. No SALT proposal over the past seven years would have prevented that predicament.

So what is the prognosis? Follow the chart from top to bottom and left to right to trace the present pact's influence.

SALT II, to start with, leaves us in the lurch but is better than nothing because it limits the level of Soviet launchers and the stock of Soviet warheads with single-shot hard target "kill" potential. *Conservatives,*

using long-time *liberal* arguments, say those constraints are close to inconsequential. The Kremlin would not increase its holdings even if SALT were scuttled, since present programs are ample. That position, however, presumes that *we* know what is enough from the Soviet Union and that they would take no steps to counter U.S. improvements in the absence of a SALT II pact. Put a check in the "SALT Helps" column.

U.S. abilities to verify the quantities and characteristics of Soviet ICBMs have always been imperfect at best, even with Iranian listening posts in place. SALT II, however, improves our prospects because it prohibits deliberate interference with national technical means. It also simplifies surveillance, by insisting that some telemetry remain "in the clear," and so on. Chalk up a second plus for SALT.

Prelaunch survival for U.S. ICBMs would be better if we substituted mobile models for missiles in silos. The SALT II protocol forbids flight-testing from mobile platforms before 1982, but lead times to produce components will take at least that long, so it does not make much difference.

The Soviets, however, may yet contend that U.S. systems under study, including "shell games" and trenches, are incompatible with the pact because they depend on deliberate concealment for success. Acceptance of the treaty consequently should be contingent on public reconciliation of Soviet reservations. Otherwise, all bets should be off. Meanwhile, the chart lists SALT II influence as a murky "Unknown."

Active defense plays almost no part in this country's deterrent plans. Second-strike U.S. ICBMs depend entirely on silos for protection. That exposed posture, coupled with comparatively low U.S. force levels, makes Soviet missiles most dangerous.

SALT II, however, permits us to change our policy. SALT I is the only barrier to ballistic missile defense.

perceptual problem

Problem two suggests that U.S. steps to duplicate Soviet countersilo capabilities, in conformance with our quest for "essential equivalence," might shore up perceptions of this country's strength but would poorly serve practical purposes.

Disciples of that school concede that SALT in no way would keep the United States from installing large MX ICBMs in silos. Mobile missiles with the same wallop may also prove acceptable. Still, U.S. powers would by no means match Moscow's, even if our force equaled theirs exactly in quantities and characteristics.

This country, you see, is committed to a *second-strike* strategy. Cosmetic abilities to crack Soviet silos would lack much meaning if Soviet *first-strike* missiles took flight before SAC's force arrived.

Countersilo inequities, caused by Soviet SS-18s and SS-19s for which we have no counterparts, are consecrated by SALT. That shortcoming can be condoned, provided the administration swaps Minutemen in silos for some mobile model—not necessarily a semimobile system like multiple shelters, the so-called "racetrack," or miles of trench.

Bonus effects could be considerable because masses of Soviet MIRVs serve an important purpose *only* as long as U.S. ICBMs present static targets. Moscow's missiles would lose much of their practical punch if we went mobile. Real force reductions conceivably could result in the long run, since relatively few Soviet warheads would be required to cover U.S. cities and other countervalue targets.

Heavy Bombers

So much for the land-based ballistic missile leg of the beleaguered U.S. triad. What about heavy bombers?

Something like 75 B-52Ds were delivered

to SAC in 1957. The last B-52H models entered service in 1962. Those aging aircraft suffer from fatigue, and penetration probabilities are hard-pressed to keep pace with improvements in Soviet air defense.

Two possible solutions, singly or in combination, are most often posed.

We could deploy air-launched cruise missiles (ALCMs) in sufficient quantities to saturate Soviet air space. The most restrictive SALT II limit would allow 2400 ALCMs on 120 bombers, which so equipped could cover many more targets than 300-odd B-52s in their present configuration. SAC could strike with well over twice that quantity on a combination of cruise missile carriers as long as American ballistic missiles with MIRVs remain at present levels, which are well below allowable limits.

Alternatively, or in addition to ALCMs, we could develop and deploy superior manned penetrating bombers as a substitute for B-52s. The overall SALT II ceiling on launchers is the only control, and it would not stop us. Budgetary limits are more likely.

Submarine-Launched Ballistic Missiles

U.S. ballistic missile submarines face no serious problems in the foreseeable future, with or without SALT II. Their survival at sea still seems assured. Our stock of 40-kiloton range Poseidon warheads is sufficient to cover 200 Soviet cities, with many remaining for "soft" military targets.

That part of the Soviet population and production base in blast shelters would probably survive if we struck, but surface installations would suffer severely from submarine-launched ballistic missiles (SLBMs) until Soviet active and passive protective measures degrade U.S. retaliatory powers more drastically than they do at present.

Higher SALT levels would do less to

counter possible progress in Soviet civil defense than hard target capabilities for our SLBMs, a course that is technologically feasible and is not SALT constrained.

CONUS Defense

No consideration of SALT would be complete without a look at strategic defense, a forgotten quantity in U.S. deterrent equations.

The Continental United States (CONUS) at this stage is almost completely vulnerable to nuclear attack. There is little protection of any kind for second-strike U.S. systems, the American people, or our production base. Collateral casualties and damage could be colossal, even in a carefully controlled counterforce war with the Soviets.

SALT II places *no* prohibitions on any steps to improve U.S. active or passive defense posture.

The SALT I Antiballistic Missile (ABM) Treaty of 1972, with its subsequent protocol, would permit U.S. scientists and technologists to push research in that field to the fullest extent possible, confined solely by the state of our art. It *does*, however, exclude development of exotic systems and deployment, which is pay dirt. SALT I, consequently, shows as a culprit.

CONUS Defense: A Dilemma for U.S. Allies

The absence of CONUS defense also creates dilemmas for this country's friends overseas. The so-called "nuclear umbrella," which U.S. leaders still promise to allies, has leaked like a sieve since we lost nuclear superiority during the last decade. Massive retaliation against the Soviet Union would no longer be a rational response for this unprotected nation if Moscow tried to seize NATO territory or struck U.S. consorts in other countries. That fact of life also

dilutes deterrent powers of U.S. tactical nuclear weapons because we cannot control escalation by threatening to strike the Soviet homeland with our Sunday punch.

No changes in SALT II ceilings to ensure "equality" could cure that situation. The crucial requirement is for CONUS defense, which is constrained by SALT I, not SALT II.

Soviet Medium-Range Bombers and Missiles

Some critics fault SALT II for failing to control theater nuclear systems, but not everyone considers those findings well-founded.

Sophisticated Soviet Backfire bombers are basically problems for our allies and associates along the Soviet periphery, not the United States, according to the U.S. intelligence community. So are SS-20 intermediate-range ballistic missiles (IRBMs) with MIRV warheads. Our arms controllers have struggled unsuccessfully to limit such "theater" systems since 1965, when we seriously started to pursue mutual and balanced force reductions (MBFR) in Europe. SALT II conferees struck the same stone wall, partly because of complications caused by U.S. forward-based fighter aircraft, which we have not considered negotiable for SALT purposes.

SALT II, however, does not restrain U.S. and allied strategists from creating comparable capabilities by installing medium-range ballistic missiles (MRBMs) and more medium bombers (such as FB-111s) on allied soil. Intermediate-range ground-launched cruise missiles (GLCMs) would also be acceptable once the protocol expires in December 1981, provided development is complete.

The question, therefore, is not whether we *can* station new nuclear systems in Western Europe with the express purpose of striking the Soviet Union. The question is

whether we *should*. Brezhnev says we would be "playing with fire," and some respected U.S. analysts believe him. Return strikes conceivably could incinerate targets in the United States, instead of Western Europe.

Finally, better air defenses for U.S. allies are perfectly permissible as a means of balancing the Backfire menace. An ABM shield for friends remains beyond reach because SALT I restrictions forbid us to pass them present or future technology in that field.

THE FOREGOING summary of SALT implications culminates with seven conclusions concerning this country's nuclear strategy and force requirements, if the illustrative input suits your fancy and you accept the procedures:

- SALT II, in and of itself, does very little to enhance or undercut U.S. security. Almost every notation says "Neutral."
- Serious U.S. problems prevail, with or without the proposed pact, but all can be solved without scrapping SALT.
- SALT II constraints on the Soviets, however slight, would help curtail future

U.S. force requirements and conserve costs.

- SALT II verification clauses, however incomplete, would simplify intelligence estimates of Soviet strength.
- Some form of mobile ICBM is essential to a U.S. triad with three dependable legs.
- Allied problems are not soluble by SALT at this stage.
- SALT I ABM restrictions should be re-considered.

We should therefore approve the SALT II pact in its present form, provided a mobile ICBM system of our choice is admissible and the administration takes immediate steps to install it.

The foregoing assessment is, of course, incomplete. Many other military matters might be mentioned. Economic and political linkage, if you like, is missing.

No attempt has been made to sell SALT or scuttle it. The purpose simply was to demonstrate a decision-making technique which shows that calculations concerning SALT can lead to sound conclusions only in context with strategies. Playing a simple "numbers game" is simply not enough.

Alexandria, Virginia

The security of the American people begins with the realization that all human beings on earth are in the same lifeboat and that we are not benefiting ourselves or anyone else by demonstrating that we can drill larger holes in our end of the boat than the Russians can drill in theirs.

N(orman) C(ousins)
 "The Selling of SALT II"
Saturday Review, August 4, 1979

"There has been a growing feeling in some quarters that military participation in international relations is an unwarranted incursion that can only lead to the militarization of U.S. foreign policy."



THE MILITARY ROLE IN INTERNATIONAL NEGOTIATIONS

DR. JOHN E. LAWYER, JR.

MILITARY participation in major international negotiations, whether bilateral talks or large international conferences, has been steadily increasing over the past few years. In the 1950s and '60s, apart from such directly combat-related diplomatic activity as the Panmunjom armistice talks or the periodic crises over access to West Berlin, military officers seldom ventured further into international diplomacy than to conduct base rights negotiations or work out a military assistance package. The 1970s, by contrast, have seen the military assume active roles in such major international negotiations as the Strategic Arms Limitation Talks (SALT) and the Law of the Sea Conference. Base rights negotiations have become major political events in their own right, as in the case of the recent treaties with Spain, Panama, and the ongoing talks over the status of Micronesia.

These changes have pushed the military professional into a new and difficult role. A great deal has been written about the soldier-statesman, but much less notice has been given to the soldier-negotiator, aside from accounts of the diplomatic experiences of such atypical figures as General George C. Marshall or Walter Bedell Smith. Military participation at the staff level as a normal element in the diplomatic process is a relatively new phenomenon, and one that deserves closer attention than it has yet received.

The question is how best to integrate the specialized expertise of the military officer, with his own bureaucratic and professional concerns, into the complex and delicate process of international negotiations. The subject is of interest because all the usual questions of civil-military relations recur with new complications introduced by the diplomatic environment.

The inclusion of military staff officers as a significant part of a negotiating team did not come about by accident. In SALT I it

was recognized from the first that the professional expertise of the military was essential. Despite the Strangelovian overtones of some of the analyses, such matters as weapons effects or the balance of strategic forces could not be left out of account.¹ Similarly, the military took the lead in U.S. oceans policy; U.S. Navy and Air Force concern over shrinking operating rights heavily flavored the American position in the early sessions of the Law of the Sea negotiations.²

The intrusion of the military into affairs normally left to civilian policymakers grew out of the realization that if the legitimate though specialized concerns of the military were excluded from the policy process, the result would inevitably be bad policy—just as if marine biologists were excluded from involvement when drawing up a position on fisheries regulation. The real danger, however, was not that flawed positions might result but that the nonspecialists would not realize that they were flawed. A delegation could thus easily find itself committed to a seemingly plausible position which was in fact unrealistic, or which might work against the national interest, despite the best intentions of its sponsors.

Military participation in international negotiations has therefore generally been accepted as a requirement of the situation, though with varying degrees of enthusiasm on both sides of the civil-military divide. The hard questions have been about how the military should proceed to fill the new role. Recent experience has raised many new problems for both sets of participants.

the problems involved

The first difficulty encountered is that when dealing with experts of whatever persuasion, once one has intruded on the specialist's domain, the expert tends to take over. While critics exaggerate the degree to which military participation in policymaking automatically leads to military dominance of policy, there is some basis for their concern,

as was shown by the early prominence of military factors in shaping the American law of the seas positions previously cited, or by the U.S. willingness to subordinate concern for human rights to the need for military alliances and foreign bases.

The layman faces much the same problem when dealing with a doctor, a plumber, or any other specialist. This is not necessarily a bad arrangement—few advocate do-it-yourself brain surgery—but a note of skepticism remains a necessary part of the policymaker's equipment. As the old adage has it, you don't ask the barber whether you need a haircut.

The problem is highlighted by a necessary distinction between direct and indirect influence on policy. Direct military influence on policy flows through formal and explicit recommendations or derives from control over operations. Indirect influence stems from the military's ability to shape the premises and provide the critical information on which civilian decisions are made. Direct military influence on policy has declined since its peak during World War II, when the military virtually ran U.S. foreign policy. Paradoxically, indirect influence has tended to grow over the same period. Military factors largely defined the Cold War environment, giving military experts significant policy leverage, even though civilians were making the final decisions.³

The situation brings to mind C. P. Snow's warnings about the danger of placing scientists in sensitive political positions. While modern governments cannot afford to do without senior scientific advisors, a respected scientist speaking from a policy position can introduce an aura of bogus infallibility to the decision-making process. It is worth repeating Lord Snow's point that the problem exists independently of the professional ability of the individual in question. In fact, the higher his professional reputation, the more difficult it becomes to argue effectively against his policy recom-

mendations.⁴ As former Secretary of State Dean Rusk commented in the context of SALT, the "problem for the policy officer is to know whether a scientist is speaking as a scientist or a politician."⁵ It is a distinction which one suspects even the scientist is often hard-pressed to make.

A second difficulty the military staff has to resolve when functioning as part of a diplomatic mission is that of conflicting loyalties. The sense of responsibilities to the individual military service or bureaucratic agency is often more concrete than the concept of the national interest, especially when the latter is still being formulated. The main task of the negotiating team, however, is often precisely to determine just what the national interest is or requires in a particular diplomatic context. The temptation is thus to define national interest largely in terms of subordinate bureaucratic interests.

The desire to defend service autonomy can even be justified by reference to the principle of civilian control of the military. From the military perspective, civilian control is often interpreted along the lines of an old-fashioned division of spheres of influence. While usually content to let civilians make their own choices, the military is almost universally resentful of any perceived nonreciprocity, i.e., civilians telling them how to run their show.⁶

A corollary to this outlook, which is common to all parts of the bureaucracy and not just the military, is that U.S. military participants in diplomatic negotiations occasionally find themselves in the uncomfortable position of having more in common with, say, British or even Soviet military counterparts than with their own civilian representatives. On issues such as narrow territorial waters or a freer hand to test new strategic weapons, higher political authorities in London, Moscow, and Washington may all be leaning in one direction, while their respective military staffs incline

toward the other. This is simply one aspect of the growing importance of transnational relations, not particularly different from the international confraternity of central bankers, who have for decades made common cause against the free-spending ways of their respective higher authorities.⁷

The third problem that military staffs encountered as they began operating in the diplomatic arena stems from the fact that defining the rules of the game is not the same as playing it. While player involvement may be helpful when making the rules, the players must function in radically different fashion when doing so than when battling it out on the field. Although it would be going too far to say that all diplomatic activity is of a rule-setting nature, the major diplomatic negotiations of the recent past have certainly had a large element of this about them. The Law of the Sea negotiations are an effort to draw up a constitution for the world's ocean space and the air space above it. The 1976 base rights negotiations with Spain resulted in a complex treaty which, with its supplements and annexes, frames the whole range of U.S.-Spanish bilateral relations. The SALT agreements are likewise efforts to set the terms and outer limits of allowable strategic competition between the two major powers.

The problem of defining limits is complicated by the fact that it is never neutral to the outcome of the game. Expanding or contracting the arena invariably favors one player over another.⁸ The essence of the limit-setting debate is political, though all sides use the technical issues to shore up their political and strategic biases.⁹ This was the reason why SALT could not be left to the technicians, though that was the initial impulse. The magnitude of the task exceeded the competence of a bureaucracy split among specialized interests; and what is true of SALT applies to other negotiations as well.

Beyond these three general issues—relating experts to the policy process, bureaucratic parochialism, and the special constraints of international negotiations as limit-setting exercises—certain attitudes that may have some survival value in the Pentagon produce less positive results when carried over to a diplomatic delegation. The tendency of any bureaucracy is to hedge against those irrational or unpredictable elements that cannot be satisfactorily handled by its standard routines. In the case of the military, this is most often done by overconservative force estimates and worst-case analysis, neither of which is particularly helpful, for example, when engaged in realistic arms limitations negotiations. Moreover, within the bureaucracy “facts” often derive their salience from their usefulness in advancing one's case. SALT I showed that military staffs are not above an advocacy that relies on occasional rigging of the assumptions or manipulation of data to favor the case that one believes correct, usually from the best of motives. This is not so much a matter of duplicity as a reflection of the truth of one observer's lament: “Advocacy, alas, often relies on a stiff dose of self-deception.”¹⁰

Finally, the military component of a U.S. delegation is likely to feel that its main job is to keep civilian policymakers from formulating agreements whose net effect would be to diminish military control over factors in the international environment which the military considers important. The closer these factors impinge on actual military operations, the more inclined the military is to veto changes. This was particularly evident in the Law of the Sea meetings, where freedom of transit over the high seas, through international air space, and across international straits were major agenda items.

The net result of these attitudes tends to be a conservative drag on policy innovation. Samuel P. Huntington has dubbed the dis-

tinctive outlook of the military profession in international politics as "conservative realism," though heads of delegations have been known to come up with more colorful phrases to describe it.¹¹ Tactically, senior civilian officials faced with this dislike of new departures tend to react by retaining all the important decisions in their own hands, sometimes not even informing lower level officials of significant changes in policy. Or they may resort to an equally unfortunate tendency to overcontrol, the senior civilian officials taking sweeping personal charge; the military come to feel their role has been preempted by amateurs at the higher reaches of power.¹² Neither approach particularly enhances the conduct of American diplomacy.

the lessons of experience

Before attempting to evaluate recent experience in this field, one should note that the changing role military officers play in diplomatic negotiations reflects wider changes in the nature of international relations. According to the earlier, realist school of thought, international politics were characterized by three broad assumptions: (1) states act as coherent units and are the chief figures in world politics; (2) international relations are in essence a series of power struggles, in which force or the threat of force is the policy instrument of ultimate effect; and (3) international political issues fall into a natural hierarchy, with the quest for military security dominating questions of economic or social adjustments between societies.¹³

Increasingly, however, U.S. policymakers find themselves confronting a different environment today. In the present international situation, multiple channels connect governments, usually complementing though sometimes competing with the single, senior "official" channel, as in the multifaceted Law of the Sea negotiations. Second, the U.S. Government is committed to

many important relationships in which the threat of military force is *not* a significant element through our numerous bilateral ties to friends, allies, and trading partners abroad. Third, contemporary international agenda are more comprehensive in the range of issues covered and more characterized by the lack of clear priorities than in the past. Even the broad strategic balance defined in SALT I and II is only a part of a larger U.S.-Soviet dialogue that includes such diverse matters as patent and copyright arrangements, joint space ventures, and long-term wheat sales.

This does not mean that force has ceased to matter in international relations, by any means. Drastic changes in economic or political conditions could once again lead to major or minor war. As Soviet activities in the Horn of Africa and Cuban incursions in Angola and Zaire remind us, military leverage remains a popular way to seek political ends short of war. But the changed role of force in contemporary international relations does complicate the integration of military and political considerations, for both the substance of policy and the process by which it is formulated.

The field of international relations has grown looser, broader, and more diffuse than it used to be. Traditional points of contact between nations have become centers of multiple informal networks. Less than a fifth of American officials in diplomatic posts abroad are State Department representatives, according to one estimate; the other 80 percent are scattered among several dozen U.S. Government agencies.¹⁴ Almost every major Washington department or agency has developed "miniature foreign offices," usually headed by an Assistant Secretary for International Affairs (or variously, International Security Affairs, International Labor Affairs, etc.), to handle its particular interests in the international arena. There are no less than six separate staffs in the Pentagon directly

concerned with foreign policy, with a combined budget and manpower exceeding that of the State Department itself.¹⁵

Like the expanded scope of international negotiations, the proliferation of intergovernmental organizations since World War II has speeded the erosion of traditional "single-channel" bilateral diplomacy. As a current survey concludes, we need to think of international relations less in terms of institutions and more as "clusters of intergovernmental and transgovernmental networks associated with the formal institutions."¹⁶

One of the chief lessons that can be gleaned from our experience with military participation in international affairs to date is that in this new environment the professional military officer has moved far beyond the role of a simple "manager of violence." As force loses its relative preeminence, so does the direct importance of the military manager of force; but as force retains its absolute importance, the military professional cannot afford to ignore those political factors that condition its use and likely results.¹⁷

There has been a growing feeling in some quarters that military participation in international relations is an unwarranted incursion that can only lead to the militarization of U.S. foreign policy. As one writer recently put it, "The most important institutional step that can now be taken to reestablish a proper balance between military and nonmilitary considerations in foreign policy would be to substantially reduce the role of military men in the policy formulation process."¹⁸ The argument that it is not up to the military to integrate nonmilitary factors into policy recommendations, however, is something of an oversimplification. In most instances the distinction between military and nonmilitary factors, like the boundaries between policy and policy advice, is not so clear-cut as to permit that neat a separation.

Nor will it suffice to invoke the spectre of a militarized foreign policy, since senior military advisors are not demonstrably more hawkish than their civilian counterparts. A recent survey of all major Cold War decisions in which the use of force was considered concluded that "The stereotype of a belligerent chorus of generals and admirals intimidating a pacific civilian establishment" is simply not supported by the evidence.¹⁹

The theoretical basis advanced for excluding the military from sensitive foreign policy matters is that civilian officials are more accountable to the people, through the democratic process. Whatever the validity of this as a general proposition, another of the lessons to emerge from recent experience is that bureaucrats are bureaucrats whether in uniform or out, and all follow their own bureaucratic bent. There is little difference in accountability between the usual civilian and military participants in any major international negotiation. Though the channels of accountability may show minor variations, a ranking foreign service officer is hardly more subject to higher authority than an army colonel, and an ambassador is not less accountable than the head of a unified command; nor is there any real difference in accountability at the senior levels, say as between the Secretary of State, the Secretary of Defense, or the Chairman of the Joint Chiefs of Staff.

The feeling against military participation in international negotiations is not confined to civilians. Some military officers still believe they can safely ignore what the "striped pants set" is up to, though few display such indifference when the international community begins to impose restraints on their activities. Often those restraints are indeed unsafe, unwise, and motivated chiefly by extraneous political concerns that make little real sense to anyone. Yet simple impatience on the part of the military is a shortsighted reaction. Whether

the development is welcome or not, more and more matters of concern to military operations are coming under the purview of international agreements—the impact of the Law of the Sea negotiations on shrinking international air space and seaways is only one of the more pressing examples.²⁰ A more constructive approach on the part of the military is to accept the need for continued involvement in the diplomatic process through which the new consensus is hammered out.

IN highly institutionalized societies, defining the relationship of civilian leaders to senior military professionals is often a complicated problem. Though only a variant on the old conundrum of how to integrate the generalist and the specialist, in the case of civil-military relations, as Huntington points out, the integration acquires a special urgency from the vital nature of the common task (ultimately, assuring national survival) and from the prominent influence the military wields in most modern governments. He suggests that the correct formula is to maintain the differences between the military profession and the civilian society around it, while minimizing the distance between the two.²¹

To accomplish this linkage in the specific context of international negotiations requires chiefly that both sets of parties accept the need for it. Continued educational opportunities for career officers in programs and institutions that will acquaint them in depth with the full range of international policy issues is thus a clear necessity, especially as they move toward the higher ranks.²² But education alone is only half the story; the other vital means by which Huntington's difference/distance formula

can effectively be implemented is for military officers to continue to share in the policy formulation process, both in Washington and at the scene of international negotiations.

This is not to argue that military considerations should dominate the foreign policy process; they should not. But neither should they be excluded. This means in practice that U.S. participation in international negotiations must remain structured so as to include the military professional's active input, as there is little likelihood that the civilian officials would be denied a seat at the conference table.

What is required, then, is informed participation by both civilian and military policy professionals, each sensitive to the contributions of the other to the ongoing policy process. The precise balance of influence will vary from situation to situation. Keeping military experts on tap but not on top, to use Lord Snow's phrase, is a difficult process that must be lived with, not a problem that is solved once and for all; but if the military is denied a role in international negotiations, the experts will not even be meaningfully on tap.

In this as in other aspects, the civil-military relationship must remain an open equilibrium, maintained by mutual trust and respect. Both parties must freely accept the legitimacy, importance, and necessity of their own role and of that of their counterpart. Given the increasingly transnational character of international politics, active military participation in foreign affairs should be recognized as the healthy evolutionary development it is, not misread as a danger sign that the military is getting out of control.

Saint Paul, Minnesota

Notes

1. John Newhouse, *Cold Dawn* (New York: Holt, Rinehart and Winston, 1973), p. 13.

2. Ambassador John R. Stevenson, Statement before Plenary Session of Third U.N. Conference on the Law of the Sea, *Department of*

State Bulletin, LXXI No. 1832, August 5, 1974, pp. 232-36; John E. Lawyer, Jr., "International Straits and the Law of the Sea Conference," *Air University Review*, September-October 1974, pp. 36-42.

3. Richard K. Betts, *Soldiers, Statesmen, and Cold War Crises* (Cambridge: Harvard University Press, 1977), pp. 5-6. The SALT negotiations revealed that the civil-military polarization is far more extreme within the Soviet hierarchy; Soviet civilians have been kept from even the most elemental military information, such as the relative size of Soviet and U.S. missiles. Newhouse, pp. 55-56.

4. C. P. Snow, *Science and Government* (New York: New American Library, 1962), pp. 118-19.

5. Newhouse, p. 34.

6. Betts, pp. 12-13. In this philosophy civilians are closer to the framers of the Constitution than is generally recognized. In providing for civilian control of the military, the founding fathers were not so much concerned with preventing military takeovers as with ensuring that none of the hotly contending political factions could seize and use the military for partisan ends. See, also, Samuel P. Huntington, *The Soldier and the State* (Cambridge: Harvard University Press, 1967), pp. 168-69.

7. Robert O. Keohane and Joseph S. Nye, *Power and Interdependence* (Boston: Little, Brown and Company, 1977), pp. 109-12.

8. Elmer E. Schattschneider, *The Semi-Sovereign People* (New York: Holt, Rinehart and Winston, 1960), pp. 2-18.

9. Newhouse, pp. 5, 13.

10. *Ibid.*, pp. 33-34.

11. Andrew J. Goodpaster and Samuel P. Huntington, *Civil-Military Relations* (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1977), p. 6.

12. Paul H. Nitze, "Inside SALT I and II," *Aviation Week &*

Space Technology, February 17, 1975, p. 40, and February 24, 1975, p. 63ff.; Newhouse, pp. 51-52.

13. Hans J. Morgenthau, *Politics Among Nations: The Struggle for Power and Peace*, 5th ed. rev. (New York: Alfred A. Knopf, 1978), pp. 4-15; Keohane and Nye, pp. 23-29.

14. Cecil V. Crabb, Jr., *American Foreign Policy in the Nuclear Age*, 3d ed. (New York: Harper and Row, 1972), p. 66; Keohane and Nye, pp. 240-41.

15. Thomas H. Etzold, *The Conduct of American Foreign Relations* (New York: Franklin Watts/New Viewpoints, 1977), pp. 80-81.

16. Keohane and Nye, pp. 236-42.

17. For an extended discussion of these roles, see Arthur Larson, "Military Professionalism and Civil Control: A Comparative Analysis of Two Interpretations," in *World Perspectives in the Sociology of the Military*, George A. Kourvetaris and Betty A. Dobratz, editors (New Brunswick, New Jersey: Transaction Books, 1977), pp. 47-62.

18. Jerome Slater, "Apolitical Warrior or Soldier-Statesman," *Armed Forces and Society*, Fall 1977, pp. 101-18.

19. Though in an important qualification to this judgment, the survey also demonstrated that once a decision had been made to use force the military was generally more committed to staying with that option. Betts, pp. 4-5, 216.

20. See, for instance, P. M. Dadant, "Shrinking International Airspace as a Problem for Future Air Movements," Rand report R-2178-AF (Santa Monica, California: Rand Corporation, 1978), pp. 1-22.

21. Goodpaster and Huntington, pp. 5-7, 26-27.

22. *Ibid.*, pp. 34-36; Sam C. Sarkesian and William J. Taylor, Jr., "The Case for Civilian Graduate Education for Professional Officers," *Armed Forces and Society*, February 1975, pp. 251-62.

coming. . .

in our March-April issue:

- Spain and NATO
 - A-10 basing
 - The professional revolutionary
 - British and German air doctrine, 1919-39
 - Job enrichment
 - Defense without strategy
-

SINCE the celebrated oil crisis of 1973-74, there have been an increasing number of studies, analyses, and articles published dealing with the controversial subject of energy shortages and their consequences; energy seems to be the new bandwagon of public policy much as the Great Society was during the mid-1960s. Yet in the intervening five years since the oil embargo, the fundamental issues of resource shortages, the potential for conflict, and the impact on military capabilities have only been tangentially alluded to if at all. Former Secretary of State Henry A. Kissinger warned the oil-producing nations in 1974 that cutting off oil supplies was "economic strangulation" and the U.S. would react "appropriately."¹ In 1978, Under Secretary of State for Economic Affairs Richard N. Cooper warned that failing to prepare for the coming oil shortage threatens "... the prosperity and cohesion of the western industrialized nations . . . putting in jeopardy our own security and ultimately our way of life."²

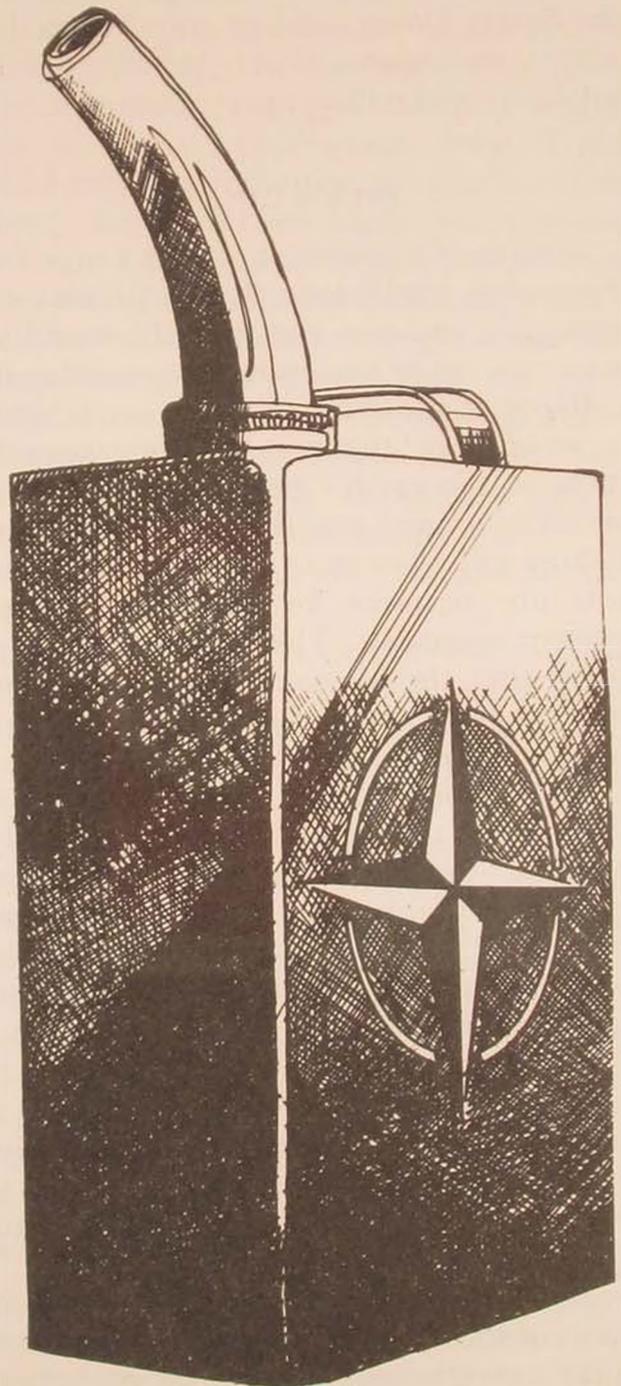
Even though history shows that resource shortages have frequently been a major source of international conflict—even war—and have adversely affected military preparation for conflict, why do we ignore these central issues? Indeed, unless the possibilities are identified and explored, there may be little hope of avoiding the apparent consequences. That such a potential for conflict and diminished deterrent capability still exists in Western Europe, a geographical area of major importance to the U.S., is the thrust of this article. At worst, impending oil shortages within the next ten years could be the source of conflicts within the North Atlantic Treaty Organization countries, between NATO countries and the United States, and between NATO countries and the Soviet Union and/or Eastern Europe; at best, oil shortages may

The views expressed in this article are those of the author and do not represent the official view of the Department of the Air Force, the Department of Defense, or other U.S. Government agencies.

NATO AND OIL

conflict and capabilities

MAJOR CHRIS L. JEFFERIES



adversely affect the military preparedness of the alliance. These possibilities thus have major policy implications relating to NATO political solidarity as well as to economic issues affecting its ability to adequately perform its alliance function of meeting external military threats. This study explores the issues of conflict and capability by addressing the broad question of oil shortages, examining the question in terms of Western Europe, looking at the energy situation in the Soviet Union, and attempting to draw some conclusions about NATO political solidarity and military preparedness.

An Oil Crisis?

Studies of resource shortages range from doomsday predictions that if present consumption patterns continue the world will soon run out of key resources, resulting in a collapse of the economic and social system as we know it,³ to more optimistic views that most of the earth's essential resources are virtually infinite and that advances in technology will allow us to exploit them, substitute one resource for another, or recycle present materials. Then there is the argument that the oil companies and governments have conspired to contrive shortages in order to force up prices.⁴

On the other hand, it is argued in the literal sense that there is no crisis but only a problem: people can still buy as much energy as they wish even though the price may be high. Thus, the shortages are a problem of distribution rather than a matter of supply. Indeed, the shortages are nothing more than a manifestation of a normal economic phenomenon: the decreased supply and increased cost of a commodity are reflections of an impending scarcity. Addressing the problem now might avoid a true future crisis.

From the confusing, often competing views of the nature of the resource problem, there nevertheless seems to be emerging a

consensus that some natural resources—oil in particular—are finite. Concerning oil, most differences exist over the timing of exhaustion rather than the question, with the timing of oil depletion appearing to be a function of several factors: consumption demand, conservation measures, and the substitutability of other resources for oil.

the international outlook

Several recent studies indicate that despite the warning inherent in the 1973-74 oil embargo, world demand for oil as an energy source continues to increase in spite of efforts to reduce consumption.⁵ The increasing demand appears to come from several sources: a lack of awareness or acceptance of the fact that shortages are imminent; a lack of commitment to conserve;⁶ pressure on governments to stimulate economic growth in order to reduce unemployment and compensate for unfavorable trade balances* (many as a result of buying oil); and the increasing delay rates in finding suitable substitutes for oil as an energy source.

The substitution problem is particularly acute. In most industrialized countries, for example, hydroelectric sources are presently developed almost to capacity. Nuclear energy has not become the panacea it was first thought to be because of technical problems and environmental concerns. Technology to use coal more efficiently or oil shale as a source is at least a decade away, as is the economic use of solar energy.⁷ This is not to imply that substitutes will not be found, but only to emphasize the point that the delay in doing so means that demand for oil as the primary energy source will continue to in-

*Several studies have correlated annual changes in gross national product with annual changes in energy consumption and found a direct relationship: an increase in GNP of 1 percent generally leads to an increase in energy consumption of 1 percent, although the past few years have indicated that a break to this link is possible. ("Major Oil Shortages Seen by 1985," *Washington Post*, June 6, 1978, pp. A-1, A-7) When GNP was overlaid by oil consumption rates, they, too, followed in lockstep with GNP (William D. Wiard, *Energy Section of the Systems Acquisition Study*, Andrews AFB, Maryland: Headquarters Air Force Systems Command, 27 October 1977).

crease significantly through the 1980s until suitable substitution begins to have an impact in the 1990s.

Thus, even with major energy savings forecast as a result of conservation and slower economic growth (savings estimated to be 10 to 15 percent in the U.S. and 5 to 10 percent in Japan and Western Europe),⁸ the total demand of the industrialized nations is conservatively estimated to increase to 15 percent of the 1976 consumption by 1980 and to 40 percent or to about 100 million barrels per day (mb/d) energy equivalent by 1985.⁹ These figures do not include Soviet/Eastern European demand nor that of the developing nations.

Demand forecast figures obviously have meaning only in relation to projected supply forecast figures for the same period. Between now and 1980, industrialized country energy production is expected to expand at the rate of about 4 percent per year, reflecting significant increases in oil production from the North Sea and the opening of the Alaskan pipeline. Beginning in 1980, however, production growth is expected to slow significantly, perhaps to as low as 1 percent annually.¹⁰ This means that by 1985, the industrialized countries will be producing only 63 to 66 mb/d oil equivalent,* or about two-thirds of the projected demand.¹¹ The gap will thus have to be filled by imports from external sources—the nations of the Organization of Petroleum Exporting Countries (OPEC)—during this period as significant substitutes for oil as a major energy source are unlikely to be available until the early 1990s.

Turning to the OPEC nations to supply oil, however, assumes that they will be both willing and able to fill the supply gap. Several studies indicate that aside from the issue of willingness, OPEC nations may be unable to provide the necessary oil required

by the industrialized nations.¹² By 1985, total world demand for OPEC oil, including that of nonindustrialized and communist countries, is likely to be from 47 to 51 mb/d.¹³ Yet maximum production capacity—even if expanded significantly by Saudi Arabia, the only producer with reserves sufficient to support production at this level—will fall short of these figures by from 4 to 12 mb/d, or about 16 percent of total world demand.¹⁴

As the Saudis are the key to the severity of the shortages in the mid-1980s, some mention needs to be made of their willingness to expand production. Even if they could expand production to meet world demand, they would very likely resist pressures to do so because the required production rates would risk rapid resource depletion as well as create overwhelming capital surpluses—at present prices (and the prices would almost certainly rise with increased demand) about \$128 billion per year. Such surpluses would have important international economic consequences since the Saudis would be unable to absorb that much per year.¹⁵

In summary, several studies indicate that beginning in the early 1980s, world oil demand will exceed total production capacity by significant amounts. The point is this: as substitutability of other energy sources is unlikely to be possible before the 1990s, when worldwide oil depletion will be occurring at rapid rates,¹⁶ the 1980s promise to be a decade of increasing and intensive competition among the industrialized nations for the available limited supply of oil. Since we are particularly concerned with an impact on NATO, an analysis of the projected oil situation in Western Europe will be useful.

the European outlook

The pressures on the industrialized nations as a whole leading to increased demands for oil are presently no less severe in Europe

*A term describing the total energy from various sources (such as coal, nuclear-generated electricity, natural gas) equated to their equivalent energy output in barrels of oil.

than in the rest of the industrialized world. Europe, too, is sensitive to the need to increase industrial growth in order to offset imports and reduce unemployment; it is also having technological and cooperative problems with substitutions,¹⁷ and is having problems in conservation due to a general lack of consensus over the severity of the need.

Europe differs slightly from the rest of the industrialized world in that demand will remain relatively constant at 25 to 27 mb/d oil equivalent through 1980 and then increase gradually to about 33 mb/d oil equivalent by 1985. In terms of oil demands, this translates to about 14 mb/d through 1980 and about 17 mb/d in 1985.¹⁸ (The figures include a saving of 3 mb/d oil equivalent because of slower capital investment and economic growth rates than most of the rest of the industrialized world over the period.)

Western Europe is unique among the Western industrialized nations in that it alone has major energy sources that can be developed between now and the mid-1980s to satisfy a major portion of its increasing demand for energy: North Sea oil and gas. Indeed, projections indicate that Western European energy production will almost double by 1985 (from 11 mb/d oil equivalent in 1976 to between 19 and 21 mb/d oil equivalent), largely as a result of oil and natural gas production from the North Sea oil fields.¹⁹ Apart from North Sea resources, however, nuclear energy is the only alternative source that can be exploited before the mid-1990s, and technological and environmental problems will limit its contribution to energy supplies to about 2 mb/d oil equivalent by 1985.²⁰

Although North Sea oil has great potential for British and Norwegian energy needs, it is not the panacea for the West European energy demand it was hoped to be. Indeed, the most optimistic production figures of from 4 to 5 mb/d of oil and 5 to 6 mb/d oil

equivalent of natural gas by 1985 will supply only about one-third of the West European total energy demand and only about one-fourth of its oil needs. Far from being an oil exporter in 1985, for example, Britain will only be energy self-sufficient. More important, however, the mid- to late-1980s is the period in which North Sea oil production is expected to peak and gradually begin to fall off, again making Great Britain a major oil importer by the early 1990s.²¹

Thus, the prospect of Western Europe's being able to double its energy production by the mid-1980s cannot mask the problem it has in common with the rest of the industrialized world: a significant gap between total energy demand and supply—some 12 to 13 mb/d oil equivalent by 1985. Even though Western European countries can expect to lower the amount of its total energy needs contributed by external sources,²² either by using North Sea oil and gas or substituting nuclear energy, dependence on imported oil from the Middle East will continue.

the Soviet outlook

Even though our focus is on NATO, oil, and the potential for conflict, it is not a problem that can be considered in isolation. Just as it was necessary to review briefly the world's oil supply and demand situation to put the NATO issue in perspective, it is also necessary to review the Soviet oil supply and demand situation since it has direct bearing on the question of NATO.

Like the Western industrialized nations, the Soviets also have a problem with a projected gap between energy demand and supply. Unlike the West, however, it appears that the Soviet problem is driven more by future production limitations than by a rapidly escalating demand for energy. Nevertheless, increasing demand is clearly a major factor in the Soviet Union as well.

The Soviets currently produce more oil

than they use and export about one-fourth of their production.²³ However, their exports are a major source of a projected demand increase since more than half of their exported oil furnishes almost three-fourths of the oil required by the communist countries of Eastern Europe. Inasmuch as supplying oil obviously provides significant influence in Eastern European affairs, it seems likely to be a relationship that the Soviets would like to continue. With the countries of Eastern Europe as anxious to expand their economy as the rest of Europe, rapidly increasing demand in Eastern Europe thus means increasing demand on Soviet resources. In addition, exports of oil provide a major source of foreign exchange, the hard currency needed to buy Western technology and equipment, much of it for the more efficient exploitation of its own petroleum reserves. The Soviets also need hard currency to buy Western goods and technology to continue expansion and modernization of its own industry, the expansion of which will also contribute to an increasing energy demand.

In addition to increasing Eastern European demand and the need for foreign exchange, several other factors will also contribute: the introduction of a rapidly growing number of trucks and cars; increased efforts to mechanize agricultural production; and efforts to shift industrial growth and production into an energy-intensive consumer goods sector. In summary, the Soviets' energy consumption demand is increasing at an annual rate greater than their annual production increase.

Oil production appears to be the major problem area contributing to the projected Soviet demand-supply gap. The nature of the problem is twofold: new Soviet deposits will not be found rapidly enough to ensure acceptable reserves-to-production ratios; the Soviet Union is experiencing severe difficulties in production.²⁴ As a result Soviet oil production is expected to peak by the

early 1980s and then decline sharply. The problems apparently derive from the Soviet approach to developing their oil resources, identified as a "forced draft approach":²⁵ short-term production goals are floors rather than ceilings; rewards for exceeding goals are given without regard to productivity over the long-term. The consequences are emphasis on development drilling rather than new exploration and overproduction of existing fields using low productivity techniques that reduce the total amount of recoverable oil.²⁶

Several other factors also contribute to the projected decline in Soviet oil production. First, while substitutability of other resources for oil will be possible in the long run—mainly using coal, natural gas, and hydroelectric and nuclear power—delays are likely to last for many years because of the large capital investments required and the technical problems of long-distance power transmission.²⁷ Second, since Western Soviet oil fields are beginning to become depleted, the Soviets must turn to reserves located in primitive areas east of the Urals and in the northern half of West Siberia. The inaccessibility of these areas makes development very costly and difficult. In swamp areas, for example, road construction costs exceed 500,000 rubles per kilometer (roughly \$1,642,000 per mile).^{*} Great numbers of tractors and heavy equipment are lost in the marsh areas each year, and each well requires a man-made island which takes years to construct. In northern West Siberia and most of East Siberia, road construction costs are reportedly 1.1-1.6 million rubles per kilometer (roughly \$3,000,000 per mile).²⁸

Third, Soviet energy production and transportation consume a significant amount of the product, thus reducing the net energy available to meet demand. Fourteen percent of the energy produced

^{*}Official exchange rate: 1 ruble = \$1.33.

from oil is consumed in refining and field operation; 100 kilowatt-hours of electricity is expended per ton of oil produced; for every 1000 kilometers (625 miles), gas pipelines consume 6 to 7 percent of the gas carried; 15 percent of the gross electrical consumption is accounted for by line losses and station usage.²⁹

The Soviets are, of course, aware of their own problems of declining production and the impending demand-supply gap. An indication of their awareness can be inferred from two sources: (1) reluctance to make long-term Soviet commitments to sell oil, apparent in their response to Japanese efforts to buy Soviet oil and their refusal to commit more than 200,000 b/d to the U.S. in grain bargaining;³⁰ and (2) intense Soviet efforts to purchase Western oil equipment, much of it designed to increase extraction productivity. From 1971-76, Soviet orders for Western oil and gas equipment have totaled about \$3.1 billion.³¹ Imported equipment of greater efficiency and productivity, however, will probably only slow the rate of production decline since the decline is based on a more fundamental cause: poor oil exploitation and extraction techniques that have caused widespread damage to their major oil reserves.

The point is clear. Whether due more to the low productivity of their oil extraction techniques, exceedingly high costs of developing oil reserves in inaccessible and inhospitable areas, lengthy delays in developing alternative energy sources, or low net-energy production (or more probably from a combination of all), the result is the same. The Soviets will also be experiencing an increasing gap between rising energy demands and decreasing oil production through the 1980s, the period in which the Western industrialized nations (as summarized above), will be doing likewise. By 1985, the Soviets will change from net exporters to net importers of oil at the rate of 3.5 to 4.5 million barrels per day³² and will thus become

competitors with the West for limited Middle East oil.

The "Worst" Case: Conflict

The foregoing analysis of the probability of a major world oil shortage by 1985 is to serve as background for the thesis of this study. At worst, the impending oil shortage will be the source of potential competition and conflicts among NATO countries; at best, it will be the cause of a lack of training and readiness, which will adversely affect NATO military capability.

conflict among NATO European countries

Conflict potential is high in three areas: among Western European members of NATO, Western European members and the United States, and NATO European nations and Eastern Europe or the Soviet Union.

The nature of potential conflict among NATO European countries is twofold: (a) over individual nations' efforts to secure oil sources from the Middle East and (b) over distribution of the available energy resources within Europe. The clearest indication of the potential for conflict over supply from the Middle East is the experience which grew out of the "artificial" oil shortages created by the 1973 oil embargo. While the experience ultimately resulted in cooperative measures, such as the establishment of the International Energy Agency,³³ a comparison of the circumstances that surrounded the 1973 shortages and those likely to occur in a future shortage indicates that the end result may be quite different.

The 1973 oil embargo was, first, an artificially induced shortage based on a political issue that linked the embargo to support of Israel. Second, the impact of the shortage was ameliorated significantly by the freedom with which multinational oil corporations were able to redirect, transship, and

redistribute the large amounts of oil in transit from and to countries not involved in the embargo. Third, U.S. success in negotiating an Arab-Israeli disengagement and further efforts to bring an overall settlement to the area effectively led to the end of the embargo. Indeed, it was only after it became clear that the embargo would not last long and that its effects would not be as severe as feared that the highly competitive unilateral efforts of West European countries to obtain secure Middle East oil ended (efforts which were leading to conflict), and the cooperation began which resulted in the formation of the International Energy Agency.

The nature of future shortages, however, may be different. They may well not be "artificial" in the sense that oil will be withheld; they may be based on actual shortages growing out of a declining supply. While the multinational oil companies may be able to balance the distribution somewhat, if they have the freedom to do so,³⁴ they will be working with a dwindling resource. The United States, far from being the ameliorator, will be a competitor. Under these conditions, it seems as likely (if not more more likely) that the competition and conflict in Europe over individual nations' oil security and the unilateral arrangements for supply which typified the beginning of the 1973 embargo will intensify, perhaps being the rule rather than the exception. Are we perhaps naïve if we assume cooperation? Indeed, history suggests more evidence for conflict than for cooperation over such competition.

The potential for conflict heightens when we link competition for supply of Middle East oil to inequities in the distribution of available oil resources within Western Europe. North Sea oil, for example, will allow greater self-sufficiency within Britain and Norway (and also West Germany, which claims a small part of the North Sea), but it adds nothing to the self-sufficiency

of France, Belgium, and Italy, countries within the alliance unable to supply even 25 percent of their own energy needs. Further, Europe's large, exploitable coal reserves are concentrated largely in Great Britain and West Germany. The Netherlands has large reserves of natural gas; other continental countries have none.

Overlaying competition for Middle East oil and distribution inequities over the fact of differing national energy interests and goals heighten the potential even further. For example, Great Britain would not allow itself to be represented by the European Community during the 1975 North-South conference on energy and raw materials; it insisted on a separate seat. Second, in the management of the North Sea resources, Norway is determined to be conservative in the development of its sector since it is less dependent on foreign sources than the rest of Europe; Great Britain intends to develop its sector as rapidly as possible. Third, even though European continental refining capacity is not fully utilized and Britain's is overtaxed, Britain has decreed that all oil produced in the British sector be landed there and that two-thirds of it be refined in British refineries.³⁵

In summary, it is the presence of such factors of conflict within Western Europe — which have manifested themselves in even a period of relative abundance — that have resulted in the following two warnings of the high potential for intra-European NATO conflicts:

Both NATO . . . and the European community . . . weakened under the pressure of the oil embargo and the consequent political malaise. . . . Alliances are temporary coalitions. Crises expose differences and can lead to fragmentation. . . . Economic interests could fracture an alliance that, in the minds of many citizens, has seen the threat evaporate.³⁶

This inattention to the IEA is disheartening. The organization is perhaps the abso-

lutely critical tool the western world has for coping with its fundamental energy dilemmas. Without it, the western allies could find themselves angry rivals in a battle for scarce and very expensive oil a decade from now.³⁷

Disagreement and conflict within NATO are not new. Yet clearly the potential for intra-European conflict over oil is real and has significant implications for NATO solidarity. While these factors of potential conflict now cause only inconveniences, they could erupt into intense competition and noncooperation—perhaps even hostilities—under the pressures of future debilitating petroleum shortages. Indeed, even if the shortages do not cause the disintegration of NATO, they will unquestionably be the source of continuing disputes and conflicts within NATO Europe, which in themselves could nullify the effectiveness of the alliance.

*conflict between NATO Europe
and the United States*

Historically, conflict between the United States and NATO Europe is also nothing new. But the potential for conflict between the U.S. and NATO Europe over oil shortages is as high if not higher than that among NATO European countries. Over the years there has always been an implied and sometimes stated fear within NATO that the United States might sacrifice European interests for the “broader world interest” of détente and “world peace”; that out of fear of Soviet nuclear retaliation the U.S. would not really come to the aid of Europe if Warsaw Pact troops invaded. While these fears have never been tested and differences over the interests and roles of Europe NATO and the U.S. have been reconciled, it has been done within the context of relative resource abundance and mutual interests. If abundance is lacking and interests over acquiring oil diverge, then the conflict potential between the U.S. and Europe would be high.

As in the case of potential conflicts within Europe, the 1973-74 oil embargo also gives an indication of the potential for conflict between NATO Europe and the U.S. in future shortages. The 1973-74 embargo and resulting political and economic pressures intensified the fundamental and long-standing differences between U.S. and NATO European perceptions of power relationships, domestic problems, and national objectives. The U.S. proposal for a comprehensive consultation and collaboration program, for example, was viewed by many in Europe as another attempt by the U.S. to assert even greater influence over European affairs. The French viewed U.S. policy as a design to undermine European efforts to establish a “special relationship” with oil-producing states for oil supplies.³⁸

Europeans were resentful that the United States acted in the crisis without consulting them, even though the issue clearly had an impact on West European economic life. It heightened the continuing fear that the U.S., after all, did have competing interests and might have promoted a settlement serving U.S. interests but sacrificing European interests—such as a U.S.-Soviet agreement to stabilize the status quo in the Middle East without ending the embargo. Again, it was only because the oil embargo was temporary and of short duration that these basic differences did not develop into significant conflicts at the time.

In future oil shortages, might NATO European fears of competing U.S.-European interests be well-founded? During the 1973-74 embargo, the U.S. agreed that if Europe would join in a consultation scheme to present a “united” front to the oil producers (rather than negotiate unilaterally) that the U.S. would aid them with oil supplies. It did so, largely by relying on the oil multinational corporations to redistribute the supply. In future shortages, however, there could be a severely limited supply: the emergency standby capacity of U.S.

wells is only about 350,000 barrels per day, well below even U.S. needs in a shortage. Thus, the U.S. could be a strong competitor for the limited Middle East oil rather than a partner in supply.

In addition, the Western industrialized country that figures most prominently in plans to reduce consumption in order to forestall shortages—a goal of the International Energy Agency—is the United States, which consumes half of the oil used by the 19 IEA countries. Yet in four years since the oil embargo, U.S. consumption rates have increased more rapidly than those in Western Europe. To the Europeans, then, their efforts at conservation have benefitted the United States, not Europe. Again, the United States is a competitor (who seems to be winning) rather than a partner.

Further, while Europe is making some progress toward less dependence on Middle East oil, it will still be dependent on the Middle East for at least 40 percent of its oil needs. On the other hand, the U.S., with its more abundant energy alternatives, has the prospect of becoming less dependent on the Middle East, even though in total consumption the U.S. is likely to import more oil in the future than the more dependent Europe. More oil for the U.S. means less oil for Europe.

These factors suggest two points: first, the United States will become a competitor with Western Europe over the same limited supply of Middle East oil. Intensified European efforts to secure oil for its needs—a greater percentage of which must come from the Middle East than will be the case with the United States—will be increased by the European perception that the U.S. is using more than its share. Second, as a competitor for a declining amount of oil, is it unthinkable that the U.S. might enter into an agreement with the Middle East to secure its supply over the interests of the other industrialized nations—including Europe? In the oil-short environment of the mid-1980s,

these differences will become more apparent as they overlay and reinforce the historical differences between the United States and NATO Europe.

conflict between NATO Europe and Eastern Europe and the U.S.S.R.

While our analysis of potential conflict based on oil shortages has thus far focused on intra-NATO conflicts, a final area of potential conflict concerns competition between NATO Europe and the U.S.S.R. or the East European countries of the Warsaw Pact. Indeed, in a highly competitive resource environment, it is a conclusion that should not be too surprising, given the history of overt competition and hostilities of the past three decades. While the potential for conflict is certain, however, the direction of conflict is less so.

As outlined above, the Soviets are quite likely to become competitors for the scarce and limited supply of Middle East oil by 1985, competing for about 4 million of the 4 to 12 million barrels per day shortfall anticipated then.³⁹ Again, a major reason for Soviet dependency on Middle East oil will be its desire to supply Eastern Europe with oil. If, given its own needs, the Soviets determine that Eastern Europe must find its own supplies, then Eastern Europe becomes a major competitor with NATO Europe for oil. Coupled to major ideological, historical, and political differences, potential Eastern Europe competition for oil with NATO Europe could progress from economic sanctions to outright hostilities; perhaps even to military disputes over North Sea oil.

If, on the other hand, the Soviet Union decides that its shortages of oil are severe enough to react by moving into the Middle East or Persian Gulf region (i.e., Iraq, Oman, Yemen, Libya), then Eastern Europe could continue its oil dependence on the Soviet Union. More important, the

Western European countries could decide in this case that ideology and a remote military threat are less important than economic security (which depends on oil) and also seek supplies from the Soviets, which they are now doing at the rate of more than 1.5 million barrels per day.⁴⁰ Indeed, Soviet controlled Middle East oil supplies could provide a more reliable source than the remaining "free market" Middle East oil would provide.

Paradoxically, the oil shortage could also serve to unify NATO Europe if it were coupled to an external threat. If Western Europe became a competitor with Eastern Europe (Eastern Europe being forced to obtain its own oil), then the ensuing potential for hostilities might be so high that it could lead to the desired greater NATO solidarity.

While much of this analysis is speculative, it is nonetheless based on emerging trends and possibilities. Whatever the scenario, the fact of oil shortages in the 1985 time period clearly points to an increasing potential for conflict involving NATO: among NATO European countries; between NATO Europe and the U.S.; and between NATO Europe and the Warsaw Pact countries of Eastern Europe. Such high potential has major implications for U.S. policy in the near future.

The "Best" Case: Capabilities

Since the potential for conflict over oil shortages in the mid-1980s seems so high, we have addressed at length the "worst case" issue of conflict involving NATO. However, it may be possible that conflict could be avoided by anticipating the problem of oil shortages and working out multinational cooperative programs to share, redistribute, and substitute for oil. If a more cooperative scenario occurs, then what will be the most likely effect of oil shortages on NATO?

Unless it is coupled with an increased external threat—a possibility already ad-

ressed—the NATO Europe countries will probably weigh a remote military threat against an immediate economic threat directly affecting their prosperity and decide in favor of the latter. In such a case, the pattern has already been established in other periods of scarce resources: attempts to constrain military costs by reducing military commitments and force readiness. This was indeed the pattern in the U.S. following the 1973-74 oil shortages. During that period, the U.S. Navy decreased the time its ships spend at sea by 20 percent, and the Air Force reduced flying time by 33 percent.⁴¹ The reductions were caused by two problems: first, the military services experienced increasing difficulty in procuring sufficient fuel to support air and ground missions and, second, the cost of fuel increased dramatically and thus required a greater share of limited defense budgets.

A similar pattern was experienced in NATO. By December of 1973, the fuel shortage was beginning to have an effect on NATO's day-to-day operations. Even though NATO was using just under 4 percent of Europe's fuel stocks, force sharing among NATO countries had already begun—Dutch air and ground forces had to be refueled at U.S. bases in Germany and Great Britain. Training exercises were cut back and priority lists were worked out for various types of unit exercises that consumed fuel. The shortage had a significant effect on training exercises which involved mass transportation of men and equipment and seriously impacted NATO war reserves.⁴²

The important point is that even though the shortage was temporary, its effect on defense was immediate and significant. In the face of prolonged and severe oil shortages, as they are likely to be in the 1980s, the prospect of ill-trained and supply-short NATO forces is even more serious. Pilots who fly only one or two sorties per month and train largely in simulators are much less combat ready than those who fly training

exercises frequently; ground combat training requires large amounts of fuel to transport troops and power tanks. The choice in the 1980s may thus be between depleting war fuel reserves for the sake of training or maintaining the reserves at the expense of training. Indeed, countries may even be unwilling or unable to commit and leave in such an unproductive state the large and expensive petroleum reserves required for mobilization.

In addition, the rapidly increasing cost of petroleum in continuous short supply means that less of the already limited defense budget will be available for force modernization—including efforts to develop more fuel-efficient weapon systems—already lagging behind in many NATO countries.

Even if the governments are willing to commit the required petroleum to training and war reserves, public sentiment may limit their ability to do so as is sometimes illustrated graphically by public criticism of the high cost of military exercises. At best, the “best” case is thus very likely to have severe and serious consequences for NATO military capabilities in the 1980s resulting in an effective degradation of NATO’s deterrent potential.

THE impending oil shortage is a fact that is becoming increasingly recognized and commented on in terms of possible consequences. Surely the purpose of the speculation, even though it may at times reach tenuous conclusions, is to identify current emerging

trends that might have serious results if not recognized and addressed before they become too fixed to change. So it is with the issue of oil shortages and its impact on defense policy—in this instance on NATO.

Little has been written and published that addresses the sensitive subject of oil shortages, conflict, and their impact on military capabilities and preparation. Yet current trends and patterns of relationships clearly indicate that there is a high potential for conflict and/or reduced capabilities, and this study identifies trends involving the U.S. and NATO. The 1973-74 oil embargo suggested patterns of conflict among the West European members of NATO and between NATO Europe and the United States which could be the rule in future shortages rather than the exception they were in 1973-74; the 1973-74 embargo was of short duration and based on a political issue, whereas future shortages will be of long-term and increasing severity based on a depleting resource. Overlaying traditional and longstanding national differences within the alliance, these emerging patterns of conflict could at worst lead to the disintegration of NATO or at best severely limit the deterrent capability of the alliance. Obviously, the extent to which they do or do not depends on steps taken by members now to prevent their occurrence. If the issue is not addressed, however, it is unlikely that any steps will be taken.

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Notes

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5. *Washington Post*, June 6, 1978, pp. A-1, A-7.

6. Cooper, p. 26. Several newspaper articles also address the issue: *New York Times*, January 8, 1978, p. 20, column 5; January 17, 1978, p. 1, column 5; January 18, 1978, p. 16, column 1. Also arguing against conservation is the fact that if by reducing oil consumption we reduce our oil imports, domestic production will continue unreduced to meet the demand. The net result is that our re-

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8. *The International Energy Situation: Outlook to 1985*, Washington, D.C.: Central Intelligence Agency, Study ER 77-10240U, April 1977.

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11. *Ibid.*

12. *Ibid.*, pp. 15-18. See also Ragaei El Mallakh, "OPEC: Issues of Supply and Demand," *Current History*, March 1978, pp. 126-27.

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15. *The Absorptive Capacity of OPEC Countries*, U.S. Department of the Treasury, September 5, 1975. See also *The International Energy Situation*, p. 18.

16. William D. Wiard, *Energy Section of the Systems Acquisition Strategy* (Andrews AFB, Maryland: Headquarters Air Force Systems Command, 27 October 1977).

17. Louis Turner, "European and Japanese Energy Policies," *Current History*, March 1978, p. 129. See also Guy De Carmoy, *Energy for Europe* (Washington, D.C.: American Enterprise Institute, 1977), pp. 92-93.

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19. *Ibid.*, p. 10.

20. *Ibid.*

21. Paul S. Basile, "The United Kingdom," in *Energy Demand Studies*, edited by Paul Basile (Cambridge, Massachusetts: M.I.T. Press, 1976), p. 455.

22. Turner, p. 108.

23. Wiard.

24. *Prospects for Soviet Oil Production*, Central Intelligence

Agency, Study ER 77-10270, April 1977, p. 9.

25. *Ibid.*, p. 1.

26. For example, the Soviets inject large amounts of water into fields in which oil pressure drops to increase pressure and thus stimulate increased oil flow. However, although flow is increased for a time, the water finds a channel of least resistance and breaks through to the producing well leaving much oil behind in the less permeable portions of the formation.

27. *Prospects for Soviet Oil Production*, pp. 8-9.

28. Leslie Dienes, "Soviet Energy Resources and Prospects," *Current History*, March 1978, p. 120.

29. *Ibid.*, p. 118.

30. Stewart W. Johnson, *Petroleum and National Security*, Air War College, Air University Report No. 5958, April 1976, p. 47.

31. *Prospects for Soviet Oil Production: A Supplemental Analysis*, Central Intelligence Agency, Study ER 77-10425, July 1977, p. 1.

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DEFENDING EUROPE AGAINST A CONVENTIONAL ATTACK

*The Increasing Gap between
the Army's Capabilities and
NATO Commitments and
What to Do about It*

DR. KENNETH J. COFFEY

THE inability of the U.S. Army to meet its manpower mobilization needs for the conventional defense of Central Europe has been a progressively worsening problem during the All-Volunteer Force (AVF) years.

In the draft era, there were large active forces and selected reserve units (reserve and national guard), large surpluses of trained, unassigned reservists, and a func-

tioning Selective Service system. By the end of 1979, however, strength reductions in both the active and reserve forces, massive declines in the strength levels of the individual reserve pools, and a conscription system in "deep standby" portended gravely on the ability of the army to meet the requirements of the "worst case" contingency.

A Warsaw Pact attack on NATO forces



in Central Europe would put a premium on the well-trained U.S. forces already in Europe and on those units in the U.S. that could be rapidly moved overseas. There could also be a requirement for later-deploying reinforcements and a sustained war capability, and it is in this area that the greatest uncertainties remain.

If the army is to have the resources to wage an extended NATO-Pact conventional conflict, the American people will have to strengthen their support, either by increased service in the armed forces or higher tax payments. Whether such actions are desirable or necessary is still open to question.

Thus this article analyzes the significance of the changes that have occurred during the AVF years, particularly regarding the ability of the army to provide massive reinforcements on a continuing basis in the event of a major land war in Europe.

manpower problems

The extent of the manpower-related problems that have developed in the AVF years can perhaps best be indicated by comparing the strengths and capabilities of the army at the end of fiscal year 1964 with those at the end of fiscal year 1979. As 1964 was the

last year of stable peacetime force levels prior to the buildup for Vietnam, its use as a benchmark for comparisons can be justified.

During these 15 years, whereas the strength of the active army, army national guard and army reserve was reduced by about 22 percent, while the primary pool of filler personnel and replacements, the individual ready reserve (IRR), was reduced by 58 percent. As Table I illustrates, the army total force of almost 2.3 million in 1964 had been reduced by almost 800,000 personnel by 1979.

At mobilization, not all members of the national guard, reserve, IRR, and standby reserve would be expected to report due to personal or family problems, employment in critical occupations, and, for the IRR and standby reserve members, determinations that their skills would not be of value in the mobilization effort. Accordingly, the Department of Defense has developed "yield" rates for each category of manpower resource.¹ When these rates are applied, the manpower resources that would have been available on mobilization become clearer. As Table II shows, the army total force on mobilization would have been some 602,000 fewer in 1979 than in 1964.

Table I. Force level contrasts—FY 1964-FY 1978—Army total force

Component	End FY 1964 force level	End FY 1979 force level	Size of reduction	Percentage of reduction
active army	972,000	759,000	-213,000	22 percent
national guard	382,000	344,000	- 38,000	10 percent
reserve	269,000	188,000	- 81,000	30 percent
IRR	461,000	194,000	-267,000	58 percent
standby reserve	208,000	30,000	-178,000	86 percent
	<u>2,292,000</u>	<u>1,515,000</u>	<u>-777,000</u>	<u>34 percent</u>

Component	End FY 1964 mobilization force level	End FY 1979 mobilization force level	Size of reduction	Percentage of reduction
active army (100 percent)	972,000	759,000	-213,000	22 percent
national guard (95 percent)	363,000	327,000	- 36,000	10 percent
reserve (95 percent)	256,000	179,000	- 77,000	30 percent
IRR (70 percent)	323,000	136,000	-187,000	59 percent
standby reserve (50 percent)	104,000	15,000	- 89,000	90 percent
	2,018,000	1,416,000	-602,000	30 percent

Table II. Mobilization contrasts—FY 1964-FY 1978—Army total force

On mobilization, the army's need for pre-trained manpower would increase to 1.725 million, the number of personnel necessary to bring all units of the active army, national guard, and reserve to combat readiness and provide casualty replacements for the three to four months after mobilization before an increased flow of newly trained recruits could begin.² Yet, as Table III illustrates, the capability which the army possessed in 1964 to meet these requirements

has been seriously eroded.³ Had mobilization occurred in late 1979, many units would have had unfilled medical billets; there would have been grave shortages of combat engineers, among other skilled personnel; and most important, there would have been a significant shortage of personnel trained in the combat arms.

In addition to the 1.725 million trained personnel needed shortly after mobilization, army war plans also identify a need for

Table III. Mobilization manpower requirements/resources—1964-1978 contrasts

Components	Requirements	Resources	Surplus/shortfall
		<i>End FY 1964</i>	
active army, mobilized national guard, reserve, IRR, and standby reserve	1,725,000	2,018,000*	293,000 surplus
		<i>End FY 1979</i>	
active army, mobilized national guard, reserve, IRR, and standby reserve	1,725,000	1,416,000*	309,000 shortfall

*assumes that the army at M-Day had stopped all losses of trained personnel

new recruits to enter training, commencing within 30 days of the mobilization decision.⁴ Because of training delays, these men and women would not be available for assignment to operating units for at least three to four months after their entry into active duty. Thereafter, however, they would be available for use as casualty replacements and formation of new units. In addition, if the manpower shortfalls in trained reservists are not eliminated, the newly trained conscripts or volunteers could be used to fill units of the existing force structure.

During the years of peace prior to the Vietnam War, the functioning Selective Service system provided a guarantee that such large numbers of new recruits could be provided. Since the AVF, however, the conscription agency has been allowed to stop all activities other than contingency planning, a move prompted in large measure by the judgment of Pentagon officials in 1975-76 that any possible conflict would more than likely be terminated before newly trained personnel could be utilized.⁵ Consequently, by the end of 1979, the capability of Selective Service for meeting sudden emergency demands for conscripts had fallen to a negligible level.

There also are a myriad of other issues and problems. Foremost among these is the uncertainty of the yield rates used by the army to predict mobilization gains. Whereas the loss of 5 percent from the selected reserve can be supported by both historical experience and various mobilization exercises in the late 1970s, the loss factors for the other manpower groups are less certain. In fact, the true availability of these mobilization resources cannot be determined. On the one hand, in total, there are enough pretrained personnel in the various personnel categories to meet the army's needs, if the resources of the Retired Reserve are included. On the other hand, if estimated losses from these sources on mobilization are understated, the army's problems would

be even greater than 1979 projections.

A variety of factors influences the validity of the army's "yield" rates. For example, the willingness of Americans to serve would vary considerably between a politically inspired mobilization in response to an insurgency in a Third World oil-producing country and a call-up in response to a major Warsaw Pact attack. In addition, there would certainly be a different response rate from personnel of different grades, skills, ages, and obligations for recall. Yet the army is expecting the same responses from nonobligated, non-combat arms field grade officers as from young, obligated combat arms enlistees.

Another major problem concerns matching of the army's specific needs with available mobilization personnel. The army estimates that some 70 percent of the IRR would report on mobilization, but little attention has been paid to whether these personnel could perform useful functions. For example, approximately 75 percent of the army's filler and replacement needs would be in combat arms or medical, combat engineer, and direct support fields; only about 25 percent of the IRR personnel possessed these skills in 1979. An overabundance of officers in the IRR compounds this problem.

A serious question also arises as to whether the manpower available on mobilization would be ready in time to play a useful role in the critical early weeks. The army has concentrated on developing new programs aimed at increasing the strength levels of the national guard, reserve, and the IRR, but it has generally ignored deployment-related problems. Yet the manpower requirements of the army at mobilization do not increase steadily; most of the personnel needed to boost the force to peak level are needed in the first few weeks. During this period, units of the active and reserve forces would be filled to their wartime quotas. Thereafter, replacements would be needed, but their numbers would be smaller than those needed in the initial weeks.

Nor would personnel from supplementary pools be immediately available for deployment. Initial ordering, administrative processing, and prereporting leave would take time. Many personnel would require refresher training before they were able to resume old specialties. And those assigned to new specialties would require even longer periods of training. Thus, although supplementary sources of manpower might eliminate peak manpower shortfalls, they would probably not satisfy needs immediately after mobilization, when trained personnel would be needed to fill deploying units.

Finally, even if the army manages to resolve its projected shortfall problems, the deployed forces would be far less combat ready than the forces of the pre-Vietnam years. This conclusion is based on the fact that active army personnel are readier than those of the selected reserve and that men and women in both these groups are readier than members of the individual reserve pools or retirees or veterans. Although the army possibly could field a mobilized force as large as that of 1964, it would not have as many trained active and selected reserve personnel.

army reinforcement plans

The military strategic goals of the United States for a conventional conflict in Central Europe between NATO and Warsaw Pact forces have not changed since the advent of the AVF. By maintaining a strong on-site force and a rapid, though limited, immediate reinforcement capability and in concert with the forces of European NATO members, the U.S. hopes to deter aggressive action. Failing this, the readily available active force units, together with the available forces of other NATO members, would be expected to contain any Pact advances within West German territory long enough to equalize the balance of forces through reinforcement and to prevent the conflict

from escalating into a tactical or general nuclear exchange.

In a military emergency, American forces would be rapidly augmented by dual-based units that serve in both Europe and the United States, and by other units that have stockpiles of equipment and supplies in West Germany. In 1979 such stockpiles were sufficient for an augmented force of about 2.3 divisions, the personnel of which would be airlifted to Europe in case of potential or actual conflict. These initial reinforcements would be supplemented by other airlifted or sealifted divisions and support troops, including active army units (augmented by reserve fillers), and army national guard and army reserve combat and support units. Secretary of Defense James Schlesinger noted in 1975 that some 12 or 13 divisions would be deployed, but indications since then, such as the planned conversion of the Second Infantry Division to a NATO-oriented mechanized infantry division, are that even more divisions would be committed to the conflict.⁶

Because the deployment schedule would allow little time to send crucial reinforcements, most of the early transported units would be from the active army, with national guard and army reserve forces serving as a first echelon of reinforcements and as replacements for active army units involved in initial combat. No doubt, however, most of the army national guard units, as well as the vast majority of combat support units in the army reserve, would be deployed to Europe for an extended conflict. Under current planning decisions, the first reserve units to deploy would be those maneuver battalions needed to round out active army divisions. Such units would depart within thirty days of the mobilization decision. At the same time certain support elements needed to augment supply and maintenance functions in Europe also would be deployed. Shortly thereafter, additional reserve combat units and support elements

would embark. Finally, the eight national guard divisions would be committed. In total, planners expect that the full deployment of designated active army, army national guard, and army reserve units could be completed in somewhat more than a hundred days, though the Pentagon has established a deployment goal for all of the forces of ninety days or less.⁷

strategic mobility limitations

The availability of trained reinforcements in the United States is but one of several conditions which must be met before U.S. forces can meet their strategic commitments in the defense of Central Europe. Another key factor is the availability of adequate air and sealift resources. If we cannot get the troops to Europe quickly, their availability will add little to NATO defensive efforts.

In 1979 the U.S. military air fleet was the world's best.⁸ Although government policies had supported its development since the early 1960s, U.S. strategic air transport still has its shortcomings. The 304 aircraft in the U.S. military fleet plus the resources of Civil Reserve Air Fleet (CRAF) constitute an imposing resource. But at any given moment many aircraft may be grounded for maintenance and service, and the combined capacity of all available aircraft would be sufficient to transport only a small portion of the massive reinforcements needed for a conventional conflict in Europe. For example, estimates are that it would take about ten days to transport the first reinforcing division, if most of the unit's heavy equipment were already stockpiled in West Germany.⁹ Transporting the 2.3 division equivalents that have stockpiled equipment waiting for them would therefore take three to four weeks.

If the Pentagon has its way, improvements will be made in the strategic airlift over the next decade to double the capacity of the 1979 fleet. This program would in-

clude modification of C-5s, lengthening the fuselage of C-141s, buying new midair refueling tankers (DC-10s), and modifying civilian airliners better to handle military cargo. In total, the program would cost about \$4 billion. For this reason, and because of congressional opposition to providing funds to the civilian airlines, the full amount of funds requested for the program has not been appropriated. Consequently, unless there is a major change in attitude in the Congress, a vastly increased strategic airlift capacity cannot be expected.

If the total force elements designated for transport to Europe are to be delivered there on schedule, then, a major share of the burden will have to be assumed by sealift resources. Yet the capability of the U.S. sealift also is seriously deficient. For example, the Military Sealift Command in 1978 maintained only 27 dry cargo ships and 30 tankers, a fleet capable of moving not much more than one division.¹⁰ Another 145 inactive "mothballed" dry cargo ships are controlled by the Maritime Administration; of these, eight are in the so-called ready reserve fleet and could be made available in five to ten days. It would take many weeks, however, to activate the remaining 137 ships. To a large extent, then, the U.S. would have to rely on 291 flag dry cargo ships or on the cargo ships of the European allies.¹¹ Although almost two hundred NATO ships have been identified for use in a NATO reinforcing effort, these ships and the U.S. flag dry cargo ships would be poorly suited for military use or not readily available.

The success of limited U.S. transport resources also would depend on preserving reception facilities in Europe. Many of these facilities are quite close to the East German border and militarily vulnerable. Indeed, if Pact forces should manage to penetrate West German territory to any significant degree (and certainly if they should reach the Rhine in two to seven days, as some ob-

servers predict), airfields in West Germany that receive and unload the large American jet transports would be in enemy hands or under hostile fire.¹² The seaports where ships unload U.S. reinforcements and supplies (such as those in Belgium and the Netherlands, as well as the main port, Bremerhaven, in north Germany) also would be vulnerable, as would the 250-mile line of communication between the ports and Seventh Army units in southern Germany, although the line of communication to the U.S. brigade in northern Germany would be more secure.

*equipment stockpiles
and war reserve limitations*

The size and comprehensiveness of equipment stockpiles and war reserves in Europe also would impact on U.S. capabilities. If well-trained units of the total force can be transported to Europe but cannot be fully equipped on arrival or sustained with ammunition, food, fuel, and other supplies, their availability on the battlefield would add little to the NATO defense.

The usefulness of early reinforcements in Germany following mobilization would depend on the status of the pre-positioned equipment stockpiles. (The army's phrase for this equipment is POMCUS, an acronym for "pre-positioning of material configured to unit sets.")¹³ As noted earlier, some 2 $\frac{1}{3}$ divisional sets of equipment are maintained.

In the army's view, the limitations inherent in a reinforcement plan that requires the quick movement of men and materiel to Europe are such that European stockpiles should be enlarged, and in a major departure from previous policy, the Pentagon decided in 1977 to support a short-term goal of stockpiling three additional divisional sets of equipment by FY 1983.

The short-term goal was endorsed by the NATO ministers at their spring 1978 meeting. If all goes according to plan, the first

additional set will be largely in place by the end of FY 1980.

Such improvements in equipping airlifted U.S. reinforcements with POMCUS would be of little value, however, unless war reserve stocks also were improved. These stocks are combat-essential items stockpiled for use as replacements for losses.¹⁴

In the mid-1970s the United States, alone among NATO allies, doubled its requirements.¹⁵ This decision was based primarily on the very early but heavy losses of ammunition and other materiel in the 1973 Middle East war as well as on the increasing weight of opinion that a war in Europe would be fought largely with the materiel on hand.

Ammunition supplies are among the critical shortfall items, and this problem is compounded by a shortage of ammunition storage areas, port facilities with ammunition handling capabilities, and U.S. production limits. The army's ammunition stock objective for Europe is 1.3 million tons, but this goal will not be reached until the early 1980s. During 1978 some 210,000 tons were added to European stocks, bringing the total to about 700,000 tons or slightly more than half the desired level.¹⁶ If hostilities were to occur before completion of the war reserve stockpiling program, about one-fourth of the surface cargo heading for Europe would need to be ammunition. Despite these and other problems, however, there were more U.S. war reserve stocks in Europe in 1978 than at any other time in history.¹⁷

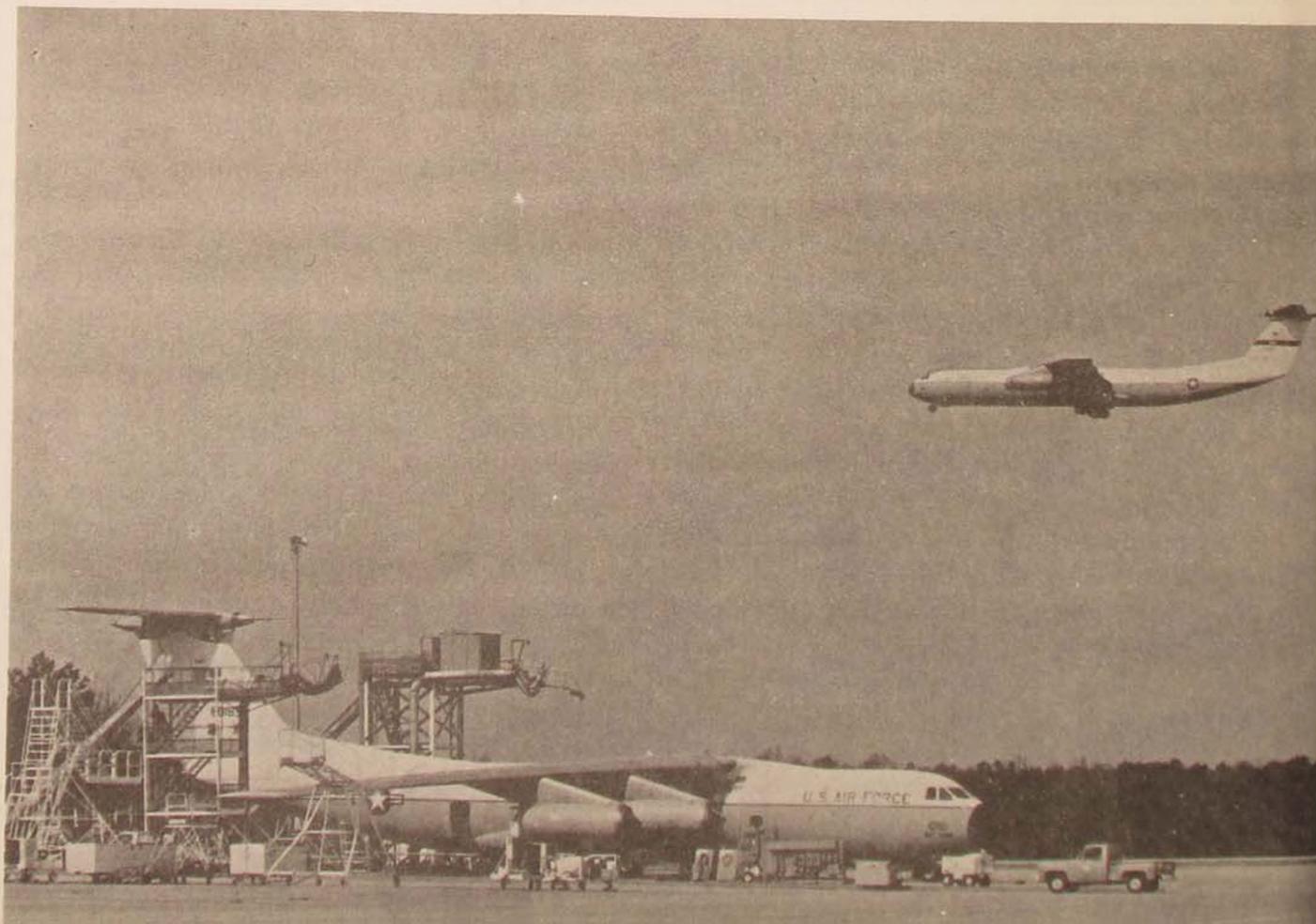
European NATO members also have made some increases in their reserves, and their efforts during 1980 and later years will be directed toward bringing their depleted stocks up to programmed levels. Indeed, much of the additional monies pledged for NATO improvements in 1977-78 will be used for this purpose. Despite these gains, however, the capabilities of the European NATO members will remain well below

the capabilities of the U.S. forces; this fact was attested to by a special subcommittee of the Committee on Armed Services of the House of Representatives, which concluded in early 1979 that the European nations would begin to run out of equipment and ammunition in a matter of days rather than weeks or months.¹⁸ If this assessment is correct, the building of larger U.S. war reserve stocks becomes an even more critical issue, for the U.S. would most likely provide support to its NATO allies in the event their reserves become exhausted in a protracted conflict.

the army's long-war strategy

The army has not publicly stated its planning goals, but indications—such as stockpiling targets for equipment and ammunition—are that army plans are based on preparedness to fight for ninety days or more.¹⁹ Obviously, such planning goals contain a hedge against uncertainty as well as a warning to the Soviets that the U.S. is serious about defending Central Europe for an extended period. This assumption, which is key to U.S. strategy for the defense of Central Europe, has been maintained regardless of the fact that the European NATO forces

Although the U.S. military air transport fleet was the world's finest in the '70s, it does have shortcomings. Despite its size—more than 300 planes plus those of the Civil Reserve Air Fleet—it would take three to four weeks to transport the 2.3 divisions for which equipment is stockpiled in Europe. For the '80s, increasing fleet capacity includes modification of the C-141 StarLifter (below), "stretching" its fuselage by 23½ feet, and making maximum use of the C-5's cavernous hold to accommodate the string of Army vehicles (facing page) and more.



appear to be oriented toward a much shorter war. While exact figures are classified, various observers have estimated that the European NATO members are not planning for a conventional ground war of much more than thirty days.²⁰ The commitments of these nations for greater defense expenditures in 1979 and beyond are very likely to result in an extension of the thirty-day planning goal, but it is doubtful that the European NATO members will match the U.S. commitment.

The European NATO forces would not completely withdraw from combat when

their equipment and manpower resources were depleted; nevertheless, despite the provision of equipment and ammunition from U.S. sources, their full involvement in an extended NATO defensive effort would by necessity be limited. It therefore seems likely that a conventional conflict extending much beyond the supply limits of the European NATO members would become a struggle primarily between U.S. and Warsaw Pact forces. In this case, disparity between the NATO and Pact forces would be so great that the conventional phase of the conflict would probably not last very long, a



view supported by many observers who believe—regardless of the capabilities of the two forces—that the conflict would be settled either by negotiation within thirty days or escalate into a nuclear exchange.²¹

Among all the estimates, official and unofficial, of the probable length of a NATO-Warsaw Pact conventional conflict in Central Europe, only the United States appears to believe in the possibility of a longer war—and makes it the basis for strategic planning. In fact, the weight of evidence supports the likelihood of a shorter war. Thus, there appears to be a reasonable basis for questioning the validity of the army's long-war strategy and asking whether the national security would be better served by the abandonment of the current strategy in favor of a short-war concept.

The potential benefits to be gained from adopting a short-war strategy would be great. For in terms of strategic capabilities, a formal short-war strategy would make available added resources to develop and equip a more effective short-war force. Furthermore, it would avoid the societal disruptions and additional costs that might be caused by the need to forge a national consensus on restoring the army's strategic capabilities to their former levels. Nevertheless, there can be no certainty that a conventional conflict in Central Europe would end in a few weeks, for, as Neville Brown has pointed out, military planning is not a mechanical science that lends itself to exact quantification.²² Thus, if the U.S. were to endorse a short-war strategy, it might also run the risk of increasing the probability of aggression, though the U.S. nuclear inventory would continue to make such aggression a very remote possibility.

Despite such assurances, the relationship between force structures and capabilities and the deterrence of aggression is highly uncertain. Military and civilian leaders repeatedly assess this relationship, but, as Morton H. Halperin has noted, NATO does

not know exactly what the Soviet evaluation of forces on the central front is or how it would be affected by possible changes in war-sustaining capabilities.²³ Thus the impact on the deterrent value of the armed forces of adopting a short-war strategy cannot be predicted with any certainty.

the total force concept

During the Vietnam War years, just before the adoption of the total force policy, army reserve forces were treated as a second-rate military resource while the active forces received most of the attention and funding. In addition, since the President was unwilling to call major units to active service, the role of the guard and reserve was ill-defined. Their effectiveness was marginal to poor because most of their modern equipment had been sent to Vietnam and their units were staffed with many young men who had enlisted in order to avoid the draft and Vietnam combat assignments.

Since the adoption of the total force policy, however, noticeable improvements have been made in national guard and army reserve units. The policy has reinstated a clear sense of mission among reservists; equipment inventories are being replenished and modernized; training is being intensified; and the draft-motivated enlistees of the Vietnam era are being replaced by volunteers. Nonetheless, as the adoption of the total force policy shifted a major portion of the army's war-fighting responsibilities to the reserves, the problems that emerged during the AVF years have compounded what was an initial weakening of the army's combat capabilities. This questionable ability to sustain extended combat operations in Europe has many implications.

First, the on-site units of the Seventh Army, and other units of the active army that could be quickly flown to Europe, together with the forces of the European NATO allies, may not be strong enough to

deter aggression by Soviet and other Pact forces or to avoid military defeat in the critical early weeks of the war.

Second, a conventional conflict would be much more likely to escalate into a nuclear exchange or be ended through negotiation.

Third, if negotiations were to occur between NATO and Pact leaders, before the outbreak of hostilities, during the initial stages of the conflict, or later, the absence of a strong U.S. war-sustaining capability would greatly reduce NATO's bargaining power.

These conclusions are based, of course, on the assumptions that it would not be in NATO's interest to initiate tactical or general nuclear war or to end a conflict through negotiation and that it would be in the interest of the Pact to pursue an extended conflict with NATO forces. If NATO leaders are willing to use nuclear weapons, particularly tactical attacks on troops, staging areas, and supply depots, the availability of an extended war capability becomes somewhat of a moot point. Indeed, if the Pact perceives that NATO would rely on nuclear weapons, its forces would be unlikely to initiate any attack, save one for limited objectives which could be achieved quickly before the exhaustion of on-site NATO forces or a decision by NATO to use nuclear weapons.

IN ALL likelihood, if a conflict occurred in Europe between the forces of NATO and the Warsaw Pact, reinforcing units from the United States would be required. While one cannot guarantee this situation, the ability of the army to provide reinforcements would provide a major bargaining asset in negotiations during times of crisis, an added deterrent to those forces already in Europe, and an actual military capability in times of armed aggression. Yet, as noted earlier, the capability of the army to meet its reinforcing commitments has diminished during the 1970s. The argu-

ments for corrective action, therefore, are strong.

Nonetheless, before a less-than-popular action is taken, several decisions which impact on the seriousness of the manpower-related problems deserve critical scrutiny. One such decision that merits examination and validation concerns the judgment of wartime requirements.

Determinations of wartime needs are far from objective decisions: rather, they are subjective judgments which reflect a myriad of assumptions and value judgments. In addition, the requirements have frequently been changed, reflecting the judgment of military planners at that time and the then-current assessments of a multitude of related factors. Though a mobilization shortfall in training individuals and new recruits would have occurred at the end of FY 1979, future adjustments in the requirements will either reduce the shortfalls or make them worse.

In evaluating the seriousness of the problem, one should remember that the requirements are determined on a "worst case" basis and that the chances of such occurring are considerably less than 100 percent. Such a scenario, of course, could occur, and for this reason the "worst case" planning process is a valid tool. Conversely, however, such emphasis on the most remote possibility creates an exaggerated sense of the magnitude of the problems. It is not the purpose of this article to question the use of the "worst case" planning process. Suffice to say that most or all of the mobilization manpower shortfalls and other problems would be eliminated if the United States adopted a "more likely" scenario as the basis for determining needs.

Another uncertain requirement concerns the need of the army completely to fill all its units prior to the availability of newly trained volunteers or conscripts. Particularly in light of the limitations noted earlier in strategic mobility, equipment, and sup-

ply resources, the army should be made to justify its stated manpower-fill requirements. For if the army can trade off some or all its requirements for filler personnel and casualty replacements, many of the army's mobilization problems could be resolved by restoring the emergency induction capability of Selective Service.

It is doubtful, however, that a revalidation of the army's force structure and manpower-fill requirements would completely eliminate mobilization problems. Accordingly, the nation may be left with several less-than-satisfactory choices.

For example, it could be agreed that we will accept the shortages. If the need for reinforcements does not materialize or if it occurs early enough before the outbreak of hostilities, the effect of the reserve force shortfalls would be minimal. Also, if there is little or no warning of the outbreak of war, the reserves would have little impact on the critical first weeks of fighting in Europe. Thereafter, however, if combat continued, a serious shortfall would jeopardize the army's capabilities for sustained conventional combat and lower the nuclear threshold accordingly, but U.S. strategic nuclear forces would not be affected.

It also could be agreed that a war in Europe would develop only after a period of warning longer than that now anticipated by Pentagon planners. If this decision were made and proved to be valid, it would allow a longer period for reserve retraining, the reconstruction of Selective Service induction machinery, and the training of greater numbers of new conscripts and volunteers.

Finally, and most sensibly, the nation could agree that U.S. strategic policy for the

defense of Western Europe must be reconciled with the changed capabilities of the AVF. For within the context of a continuing commitment to a long war-sustaining capability, it is an unfortunate paradox that the AVF has fostered both the total force policy and the progressively worsening ability of the army to meet the obligations of that policy.

Perhaps, then, the total force policy and the commitment to maintain a long war-sustaining capability are an anachronism of a past era when a large mass army was the order of the day. In any event, in an era of volunteerism, the willingness of the American people to support the armed forces and participate therein should determine the level of strategic commitments.

At least for the foreseeable future, therefore, the nation's commitments should be reduced in order to reflect the level of capabilities possible under the AVF system and steady-state funding levels. In particular, the commitment to maintain a long war-sustaining capability should be replaced by a more realistic short-war policy, allowing the concentration of available resources in on-site combat power and readily available, fully manned, trained, and equipped reinforcements.

Such compromising actions should not be taken lightly. Certain risks would accrue. Yet in an era when there are inadequate personnel and funding resources to support both a short-war and a long-war capability, the continuation of such commitments will only perpetuate the inability of the army to perform either mission fully—a condition that could contribute to a breakdown in détente or a change in the world order.

Washington, D. C.

Notes

1. Planners in the Pentagon have estimated reporting percentages from the various categories. These were based on evaluations of the mobilizations of 1940, 1950, 1961, and 1968, with allowances for

better management and control. Despite the fact that standby and retired reserves have never been activated and that the U.S. has not fully mobilized since 1940, the Pentagon estimates that 95 percent of the selected reserve unit members, 70 percent of the IRR, and 50

percent of the standby reserve would respond to a mobilization call. Both the percentages for the selected reserve and IRR are higher than historical precedents. See Secretary of Defense, *The Guard and Reserve in the Total Force*, unclassified portions of Secret document (Washington: Department of Defense, 1975), p. 11.

2. Office of the Secretary of Defense, *A Report to Congress on U.S. Conventional Reinforcements for NATO* (Washington: Department of Defense, 1976), p. IX-3.

3. Although the requirements for the mobilized force structure have not changed significantly since 1964, increases have been made in the estimated combat replacement needs primarily because of the high casualty rates of the 1973 Middle East war. Consequently, if a mobilization had occurred in 1964, the manpower surpluses would have been even greater than indicated.

4. Statement of Dr. John P. White, Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics), *Hearings before the Task Force on National Security*, House Budget Committee, 13 July 1977, Tab R-5, "Standby Draft."

5. Statement of William K. Brehm, Assistant Secretary of Defense (Manpower and Reserve Affairs), *Hearings on the Selective Service System*, House Committee on Armed Services, 27-29 January, 2-3 February 1976.

6. U.S. Congress, House of Representatives, Appropriations Committee, *Department of Defense Appropriations for 1976* (Washington: Government Printing Office, 1975), Part I, p. 105.

7. *Fiscal Year 1978 Authorization for Military Procurement, Research and Development, and Active Duty, Selected Reserve, and Civilian Personnel Strengths*, Hearings before the Senate Committee on Armed Services, March-April 1977, p. 2436.

8. According to Secretary of Defense Harold Brown, the airlift capacity is largely provided by 70 C-5 and 234 C-141 jet transports of the Military Airlift Command, and 227 commercial jet airliners which could be made available in an emergency through the Civil Reserve Air Fleet (CRAF). See Statement before the Committee on Armed Services, House of Representatives, *Hearings on Military Posture and H.R. 10929*, 2 February 1978, p. 179.

9. Estimate made by Secretary of Defense Harold Brown, as quoted in "U.S. Ground Forces: Inappropriate Objectives, Unacceptable Costs," *Defense Monitor*, November 1978, p. 5. A more detailed analysis of the U.S. airlift capability was provided by the U.S. Army to the Library of Congress and is cited in *United States/Soviet Military Balance: A Frame of Reference for Congress*, p. 30. The army estimate stated that the planned move of the 82d Airborne Division to the Middle East in 1973 would have required one week if alert times had permitted prior preparation, longer if not. This move would have involved a somewhat smaller than normal U.S. division (about eleven thousand men), a basic load of ammunition and five days' supply of rations and fuel. The one-week time estimate for moving the first reinforcing division to Europe is repeated by authors of other works. See, for example, Leon Sloss, *NATO Reform: Prospects and Priorities*, Washington Papers of the Center for Strategic and International Studies (Beverly Hills: Sage, 1975), p. 40.

10. Statement of Secretary of Defense Harold Brown, op. cit., p. 179. In 1970 the number of dry cargo ships totaled more than 190, or some seven times the 1978 totals. See John M. Collins, *Imbalance of Power* (San Rafael, California: Presidio Press, 1978), p. 207.

11. Sealifted reinforcements could begin to arrive in Europe about three weeks after mobilization. With certain improvements in the contingency planning and preparation phase, however, the Pentagon believes that up to four divisions could be sealifted to Europe within thirty days. See Department of Defense, *Navy Accelerated Sealift Study: Project Sea Express*, 25 July 1974, p. 43.

12. The main airfield reception area for C-5 transports in West Germany has been Frankfurt's Rhein-Main airport, which is only 178 miles from the East German border.

13. The POMCUS equipment and supplies are located at eight sites, all east of the Rhine River and reasonably close to major airfields (and to the border with East Germany). Equipment is maintained in controlled humidity warehouses, covered storage, and some open storage facilities.

14. Pre-positioned war reserve stocks are a separate category of equipment from POMCUS, though many of the same items are contained in each. POMCUS equips dual-based units; war reserve stocks replace items such as ammunition and tanks that are likely to be expended once a conflict begins.

15. Richard Burt reported in 1978 that the United States' Five-Year Defense Plan calls for the provision of war reserve stocks for a ninety-day conflict. See "U.S. Analysis Doubts There Can Be Victor in Major Atomic War," *New York Times*, 6 January 1978, pp. A-1, A-4.

16. Eric C. Ludvigsen, "Huskier NATO Heads '79 Defense Priorities," *Army*, March 1978, p. 16.

17. Congressional Budget Office, *U.S. Air and Ground Conventional Forces for NATO: Mobility and Logistics Issues* (Washington: U.S. Congress, 1978), p. 4.

18. *NATO Standardization, Interoperability and Readiness, Report of the Special Subcommittee on NATO Standardization, Interoperability and Readiness*, Committee on Armed Services, House of Representatives (Washington: Government Printing Office, 1979), p. 2.

18. A concern about the need for an even longer "sustaining" capability was expressed by a leading Defense Department official in 1976. Testifying before the Senate Armed Services Committee, the Assistant Secretary of Defense (Manpower and Reserve Affairs) spoke at length about the army's manpower shortfall problems in Europe for the first seven months following a mobilization. See statement of William K. Brehm before the Subcommittee on Manpower and Personnel, Senate Committee on Armed Services, 6 February 1976.

20. A special congressional subcommittee determined in 1979 that the European NATO countries lack the capability to fight for thirty days and that plans do not provide for achieving such a capability until 1983. See *Report of the Special Subcommittee on NATO Standardization, Interoperability and Readiness*, p. 2. Also see Sloss, *NATO Reform*, p. 34.

21. See, for example, Sir Bernard Burrows and Christopher Irwin, *The Security of Western Europe* (London: Charles Knight, 1972), pp. 63-64; and Edward L. King, *The Death of an Army: A Pre-Mortem* (New York: Saturday Review Press, 1972), pp. 140-43.

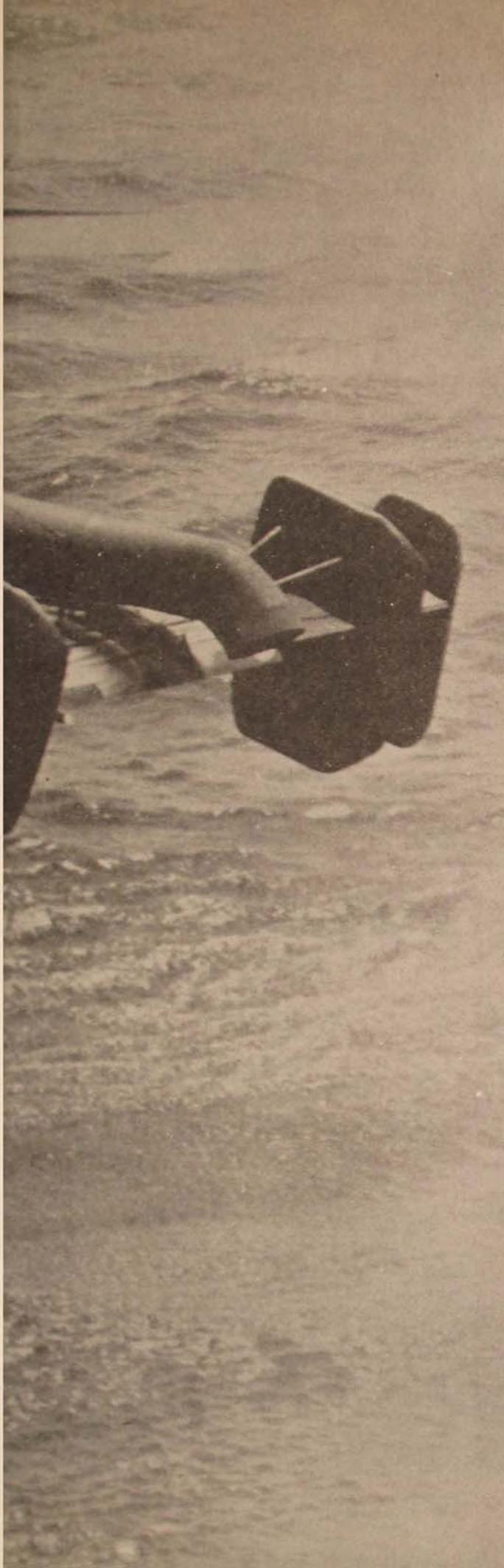
22. Neville Brown, *Strategic Mobility* (New York: Praeger, 1964), p. 199.

23. Morton H. Halperin, *National Security Policy-Making* (Lexington, Massachusetts: D.C. Heath, 1975), p. 162.

SEARCH AND RESCUE IN SOUTHEAST ASIA, 1961-1975

CAPTAIN EARL H. TILFORD, JR.





THE United States Air Force involvement in the wars of Southeast Asia (SEA) spanned a decade and a half, exacting a toll of 2254 USAF aircraft destroyed in combat and other operations. Aircrew members killed, captured, or missing totaled 1763. During that war the Aerospace Rescue and Recovery Service (ARRS) became the greatest combat aircrew recovery force in the history of aerial warfare, saving 3883 lives.¹ For those flyers who went down, whether in combat or by accident, the best hope for survival was in quick recovery by air-sea rescue forces. The effectiveness of the Air Force rescue effort depended on many factors, including when and where the shutdown occurred, geography, the time of day, enemy defenses, and the technological state of the art in aircrew recovery.

In 1964 when the first units of the Air Rescue Service* reached Southeast Asia with Kaman HH-43B helicopters, they were not prepared for the unique challenges of combat aircrew recovery in the jungles and mountains of Vietnam and Laos. This state of affairs can be traced to the reduction in forces and equipment that occurred after the Korean War. In the late 1950s, because of the concept of massive retaliation, the military generally neglected conventional forces suitable for limited warfare. Accordingly, Air Rescue Service doctrine focused on providing peacetime search and rescue (SAR) for the continental United States, coverage along the overseas' air and sea lanes, and recovery of astronauts and space equipment.² In 1960, as North Vietnam began directing the communist insurgency in South Vietnam, the only aircrew recovery capability of the Air Rescue Service was a handful of Grumman SA-16 Albatross amphibians.

In October 1961, the Air Rescue Service

*On 8 January 1966 the Air Rescue Service was redesignated the Aerospace Rescue and Recovery Service (ARRS).

integrated 70 local base rescue units into its structure, acquiring 69 H-43Bs, 17 older, piston-driven H-43As, 58 obsolete Sikorsky H-19Bs, and four even less useful Piasecki SH-21Bs.³ The Kaman H-43s, meant to augment the base fire and crash rescue capability, had no armor, no weapons, and a mere 75-mile radius of action. Still, they were destined to form the nucleus of the early aircrew recovery force in Southeast Asia.⁴

Detachment 3, Pacific Air Rescue Center, was organized at Tan Son Nhut Airfield outside Saigon on 1 April 1962, but it provided only a coordinating function. Having no rescue aircraft of its own, Detachment 3 was often hard-pressed to find Army or Marine Corps helicopters to make aircrew recoveries. Enemy fire in those early years, even though consisting mostly of small arms and heavy machine guns, took its toll of aircraft. These less sophisticated weapons proved more successful than anyone had anticipated. Nevertheless, in 1962 and 1963 geography and weather presented the most formidable challenges to Detachment 3.

The triple canopy on jungle trees rising 200 feet above the tangled bush, karst,* mountains, and swamps, as well as the Gulf of Tonkin all required specific rescue tactics and specialized equipment that, in those early years, had yet to be developed. It is to the credit of men in rescue that the innovative methods they devised, prompted by the needs of the situation, led to early solutions of these problems. The forest penetrator, for instance, a plumbbob-like device that carried the hoist cable through the thick foliage to reach and then extract the downed aircrewmembers below, came into the inventory in early 1965.⁵

Rescue technology advanced rapidly from that point. With the introduction of the first Sikorsky CH-3C helicopters in July 1965, on

loan from the Tactical Air Command, Air Rescue Service had a combat aircrew recovery force able to make pickups deep inside enemy territory.⁶ Toward the end of 1965, when the rescue-modified Sikorsky HH-3C/Es began reaching Southeast Asia units, rescue technology took the upper hand for the first time in the battle with man and the elements. (These choppers, painted with green camouflage, were dubbed "Jolly Green Giants.")

Terrain became a useful ally rather than a troublesome hindrance to combat rescue units with the proper equipment. The improved performance of the HH-3E and the HH-53, introduced in late 1967, enabled chopper pilots to use mountains, karst, and jungle canopy to their advantage. Enemy anti-aircraft (AA) guns, which grew in number and caliber throughout the war, were limited by the same jungle that concealed them. Ground gunners could track their targets only within the confining limits of geographic features. Chopper pilots, using mountain ridges, karst outcroppings, and jungle trees were able to minimize the effectiveness of enemy gunners.

After the introduction of helicopters with better hovering characteristics and the forest penetrator, downed airmen could use jungle bush and foliage to conceal themselves while awaiting the arrival of rescue forces. If a pilot could fly his crippled craft to an isolated mountainous jungle region, or if he could head out over the Gulf of Tonkin, his chances for rescue increased. Some isolated jungle areas, called SAFE areas (Selected Area for Evasion) were better than those infested with enemy troops, like the Ho Chi Minh Trail. Still, heavy underbrush could and often did provide concealment even in the midst of heavy troop concentrations. Lieutenant Woody Bergeron evaded enemy troops in December 1969 for several days near Tchepone, Laos, an enemy transshipment point on the Ho Chi Minh Trail. During the days and nights

*A limestone region marked by sinks, abrupt ridges, irregular protuberant rocks, caverns, and underground streams.

The rescue effort in Southeast Asia initially depended on aircraft not designed for combat. The HU-16 (right) was deployed to Southeast Asia primarily for control operations, but on several occasions landed close inshore under fire from North Vietnamese guns to achieve some of the most spectacular rescues of the war. . . . The HH-43B "Pedro" (below) assumes the role for which it was designed, local base rescue carrying an 1100-pound fire suppression kit for use by two on-board firefighters.



he spent on the ground, Bergeron hid in the dense underbrush from the Pathet Lao and North Vietnamese troops looking for him as they rushed supplies toward South Vietnam. After a massive SAR effort of several days, a task force managed to rescue the lieutenant.⁷

Although technological advances in rescue helped ARRS overcome some of the problems of geography and terrain, enemy defenses, which proliferated as they increased in sophistication, remained troublesome. These defenses shifted with the air war from North Vietnam to Laos and, to a lesser extent, to South Vietnam. They ranged from MiG interceptors and SA-2 missiles in North Vietnam, to an array of AA guns along the Ho Chi Minh Trail, to lighter AA weapons in the South, and, toward the end of the conflict, even to hand-held, heat-seeking SA-7s. These enemy weapons accounted for 35 rescue aircraft lost in combat. Although most losses were attributed to smaller caliber AA guns and automatic weapons, MiGs posed a threat over North Vietnam and the eastern areas of northern Laos. In January 1970, an HH-53 was shot down by a MiG during a recovery mission in Laos.⁸ Furthermore, the SA-2 missile, which first appeared in North Vietnam in April 1965, forced the slow and relatively vulnerable HH-3 and HH-53 helicopters to fly low—well within range of deadly anti-aircraft guns of all calibers.⁹

Tactics evolved to meet changing enemy defenses. Perhaps the greatest innovation in rescue during the war was the search and rescue task force (SARTF). The origins of the SARTF can be found in World War II when Luftwaffe Messerschmitt-110 (Me-110) twin-engine fighters escorted Heinkel-59 (He-59) biplane amphibians on aircrew recovery missions in the English Channel.¹⁰ During the Korean War, P-51s sometimes shepherded H-5 and H-19 helicopters on rescue missions behind enemy lines.¹¹ However, it was in Southeast Asia that the com-

plex, coordinated search and rescue task force came into prominence. There, in the midst of war, many elements and units worked together to save lives.

BASICALLY, the SARTF included a control aircraft, a fighter-bomber escort, and at least two choppers. Depending on the constantly changing factors involved in aircrew recoveries, forward air controllers, fighter escort for MiG combat air patrol (MIGCAP) and, toward the end of the war, even AC-130 gunships might be used. The kinds of aircraft in the SARTF changed as better airframes and improved equipment became available. Tactics used by the task force remained flexible to meet the variations of enemy defenses.

The airborne mission control aircraft was the nerve center of the SARTF. Originally, HU-16 amphibians, packed with communications gear, were used to control rescue operations. The HC-54, with greater range and altitude capabilities, replaced the HU-16 in this role in June 1965. Only an interim vehicle, the HC-54 was replaced within six months by the Lockheed HC-130 Hercules. A better equipped HC-130P airborne control platform introduced in late 1967, became a refueler for the HH-3E and later the HH-53s. As airborne mission controller, the rescue coordinator aboard the HC-130 (called "Crown" and later "King") assembled the SARTF and directed the rescue force to the general location of the survivor.¹² Rescue escort aircraft, like the A-1 and, after November 1972, the A-7, made possible the recovery of airmen downed deep inside enemy territory.

The origins of rescue escort in Southeast Asia can be traced to August 1964 when President Lyndon B. Johnson ordered Air America civilian pilots in T-28s to escort rescue choppers on aircrew recovery missions in Laos.¹³ In August 1965, Air Force A-1 Skyraiders took over

this mission. The firepower, durability, slow speed, and excellent loiter capabilities made the Skyraider the finest rescue escort aircraft of the war. As a result of the Vietnamization program, the last A-1s left the inventory in late 1972 to be replaced by the A-7 single-engine jet. The A-7, faster than the A-1, could reach the survivor with protective firepower much sooner. However, this advantage was offset by its greater rate of fuel consumption and higher stall speed. Most chopper pilots felt that only another A-1 could replace the venerable Skyraider.¹⁴

As is well known, the rescue helicopter formed the heart of the SARTF in Southeast Asia. In late 1964 the HH-43F, a beefed-up version of the HH-43B, began arriving there. The HH-43F was only an interim rescue chopper and was replaced in the aircrew recovery role with the Sikorsky HH-3s beginning in mid-1965. The arrival of the HH-3E at Udorn Royal Thai Air Force Base in November 1965 meant that rescue forces had at last acquired a real combat aircrew recovery capability able to fly to the very heart of North Vietnam, if necessary, to make a pickup. Air refueling by the HC-130P extended the range and endurance of the SARTF.¹⁵

The first Sikorsky HH-53Bs, which reached SEA on 15 September 1967, continued the upgrading process. This chopper gave the SARTF greater speed, survivability and, with three miniguns on-board, firepower. Known as the Super Jolly Green Giant or Big Ugly Friendly Fellow (BUFF),* the HH-53 became the ultimate aircrew recovery helicopter. The air-refuelable HH-53 could fly as much as 18 hours at 140 knots and, if necessary, dash at nearly 200 knots. Armor plate protected the crew and all vital parts, making it practically invulnerable to light automatic weapon fire and also highly resistant to heavy machine guns. Communi-

cations included an array of UHF, VHF, HF, and FM radios. Electronic components, added as they became available, included low-light-level television to give the SARTF a limited nighttime rescue capability. Toward the end of the war, radar homing and warning (RHAW) gear was installed.¹⁶

Traveling in pairs, with plenty of on-board firepower, these advanced aircrew recovery helicopters were able to make their own breaks in ticklish rescue situations after 1967. Close coordination with other members of the SARTF, flexibility in tactics, use of firepower, and great courage enabled the SARTF to perform aircrew recoveries that would have been impossible for a helicopter flying alone. Nevertheless, warfare is a perpetual contest between offense and defense, and as enemy defenses intensified and became technologically more sophisticated, the SARTF found there were areas in which it could not operate.

Enemy opposition varied according to the period of the war and location. Overall, the intensity of antiaircraft fire was directly proportional to the number of aircraft shot down and inversely proportional to the number of aircrews recovered. The enemy, of course, concentrated their defenses around cities, airfields, and important military targets.

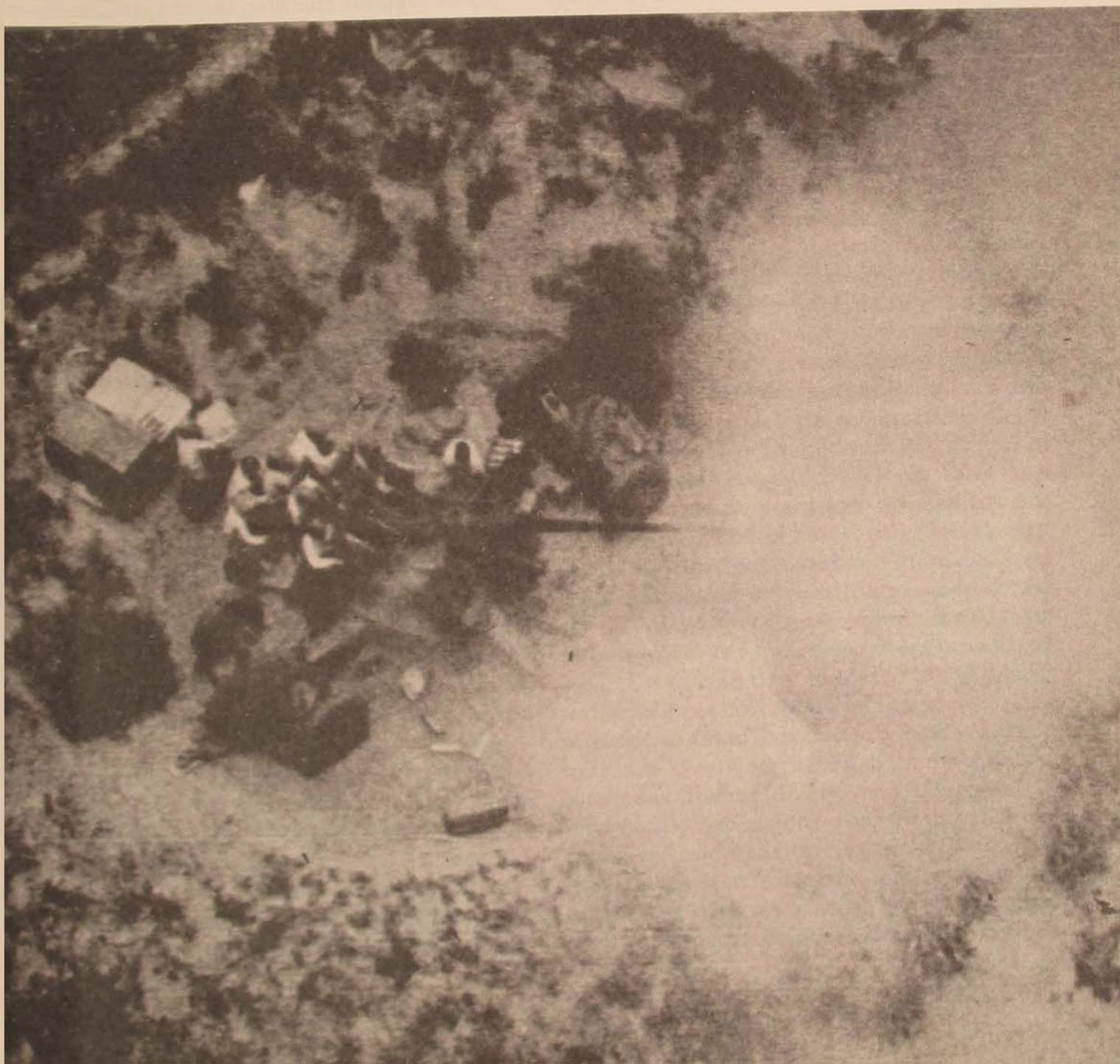
North Vietnam's Premier Pham Van Dong journeyed to Moscow late in 1964 seeking aid to build a modern air defense system. With Soviet help the North Vietnamese soon began constructing one of the best integrated air defense systems in the world.¹⁷ By 1965 they possessed a formidable defensive combination that included MiG interceptors, SA-2 missiles, and a stable of antiaircraft guns from 23-mm to radar-directed 100-mm weapons. Nevertheless, the enemy knew that Americans possessed technological superiority in airborne delivery systems and had the ability to absorb and replace losses. The North Vietnamese shrewdly decided against challeng-

*Aircrew members throughout the Air Force know the HH-53 affectionately as "BUFF." It should not be confused with the B-52's proud handle of "BUF" or Big Ugly Fellow.

**The threat:
Southeast Asia**

Rescue forces in Southeast Asia confronted a varied opposition (clockwise): Interceptor aircraft, here a MiG-21. . . . Surface-to-air missiles, such as the Russian-built SA-2. . . . Small arms and automatic weapons, represented by female militia firing a Soviet DShK 12.7-mm heavy machine gun. . . . Antiaircraft artillery, in the form of a Soviet S-60 57-mm gun, photographed firing by a USAF RF-101. . . . The terrain itself, here a ridgeline near the A Chau valley. At first intimidated by dense triple-canopy jungle and forbidding karst ridges, downed crew members and rescue forces learned to value the incredibly difficult terrain of northern Laos and the Annamite mountains as a valued, reliable ally.





ing USAF air superiority; instead they concentrated on achieving "air deniability," that is, denying the use of the air to their adversary.

Under the strategy of air deniability, SA-2 missiles forced bomb-laden fighter-bombers to low altitude, where relatively simple AA guns (many of World War II vintage) and automatic weapons were more effective. Throughout the war, 23-mm, 37-mm, and 57-mm weapons, working in combination with heavy machine guns and large numbers of armed combatants, accounted for most of the U.S. Air Force's 1737 combat losses.¹⁸ Because rescue helicopters flew at low altitudes, these weapons posed a large threat. The slow speed and bulk of the rescue helicopters made them relatively easy targets for enemy gunners to track and hit. An HH-53, for instance, flying at low altitude and dash speed, remained in the theoretical fire envelope of a 23-mm gun for almost a full minute.¹⁹

As the Air Force shifted its air war, the enemy moved his AA resources. After President Johnson halted the bombing of most of North Vietnam in March 1968, the Air Force focused on interdiction of the Ho Chi Minh Trail. Soon the North Vietnamese moved large numbers of anti-aircraft guns into Laos. By late 1968 the defenses along the infiltration corridors resembled those previously encountered in North Vietnam.²⁰ In spite of the reduction of missions over North Vietnam, Air Force losses continued at about the same rate; there were 421 Air Force combat losses in 1967 as compared to 392 in 1968.²¹

Rescue missions along the Ho Chi Minh Trail became almost as difficult as those in highly defended areas of North Vietnam had been. Aircrew members shot down over Laos had some advantages over those who were downed in the north, however. First, the density of enemy forces was concentrated along the infiltration corridors. If the flyer could stay with his damaged aircraft

long enough to get even a short distance away from the trail, chances for concealing himself in the dense jungle underbrush were good. Second, Laos, and especially the Ho Chi Minh Trail, was closer to ARRS units at Nakhon Phanom and Udorn in Thailand and Da Nang, South Vietnam. The best opportunity for recovery was within the first 45 minutes after being shot down. The longer a survivor remained on the ground, the slimmer the chances for rescue. ARRS picked up a total of 739 aircrew members in Laos as compared to 176 in North Vietnam.²²

Throughout the war the majority of Air Force missions were flown in South Vietnam, where automatic weapons, heavy machine guns, and light AA guns shot down 651 Air Force aircraft—26 more than were brought down over the north.²³ However, chances for rescue were greater in South Vietnam, where ARRS choppers made 1596 combat aircrew recoveries, picking up crews from all services.²⁴

The high number of rescues in South Vietnam can be attributed to the proximity of rescue forces. Each air base in South Vietnam and Thailand had at least two HH-43B/F local base rescue choppers. In the course of the conflict, these little helicopters picked up more downed aircrew members than any other chopper, taking 1029 men to safety.²⁵ In addition to the HH-43s, there were aircrew recovery HH-3Es and later, HH-53s available at Da Nang and other bases where ARRS had forward operating locations. Also, hundreds of U.S. Army, Marine Corps, Air America, and Vietnamese Air Force choppers made aircrew pickups on an informal and unofficial basis.

Air Force tactical strikes in Cambodia, which began in February 1970 and continued until the bombing halt of 15 August 1973, faced less enemy opposition. The North Vietnamese Army, encamped along the Cambodian-South Vietnam border did not possess the large number of AA guns

that guarded the Ho Chi Minh Trail. The Khmer Rouge insurgents, scattered throughout the country in small units or guerrilla bands, remained a force armed with light, automatic weapons to the day they took power. Consequently, in the air war over Cambodia the Air Force suffered only 35 combat and three operational losses.²⁶ Since the Khmer Rouge traveled and fought in small bands, they did not offer the highly orchestrated opposition that rescue forces encountered in many areas of Southeast Asia. Of 61 Air Force personnel who went down in Cambodia, 27 were rescued, 12 were listed as killed, and 22 were counted as missing (as of November 1973).²⁷ None were thought to have been captured.

THE air war in Southeast Asia shifted often, varying in intensity, location, and focus as Americans fought enemy forces that ranged along the warfare spectrum from insurgency to protracted and, finally, conventional action. Rescue forces remained flexible to counter each threat and met every challenge. Wisely, ARRS never followed hard and fast rules nor established rigid regulations defining how much effort was enough. The rescue crews gave each mission all they had. Nevertheless, when enemy anti-aircraft fire was intense, there was only so much the helicopters—even the giant HH-53s—could take. For instance, in the Linebacker II operations of December 1972 (bombing of North Vietnam's heartland), not one aircrewman was picked up from that country because the targets were in densely populated, highly defended areas. However, during that operation ARRS choppers did pick up 25 aircrew members from Laos and Thailand. These people were rescued because they were able to fly their damaged aircraft away from the highly defended areas of North Vietnam.²⁸

The inherent limitations of the helicop-

ter, slow speed and large size, make it highly vulnerable in a high-threat environment. Operations at Koh Tang, an island off the Cambodian coast, during the *Mayaguez* incident in May 1975, illustrate some of these limitations. Fifteen helicopters, eight HH-53s from the 40th Aerospace Rescue and Recovery Squadron, and seven CH-53s from the 21st Special Operations Squadron (both at Nakhon Phanom), landed and then evacuated over 200 U.S. Marines from that Khmer Rouge-infested island. An entrenched enemy force there, armed with automatic weapons, a few heavy machine guns, rocket launchers, and perhaps one mortar, destroyed four helicopters and damaged nine others, at least five seriously. The Khmer defenders held the advantage because the helicopters had to approach the island across open ocean and then hover above an open sandy beach. Hiding in the adjacent jungle bush, the Khmers had a clear field of fire.²⁹

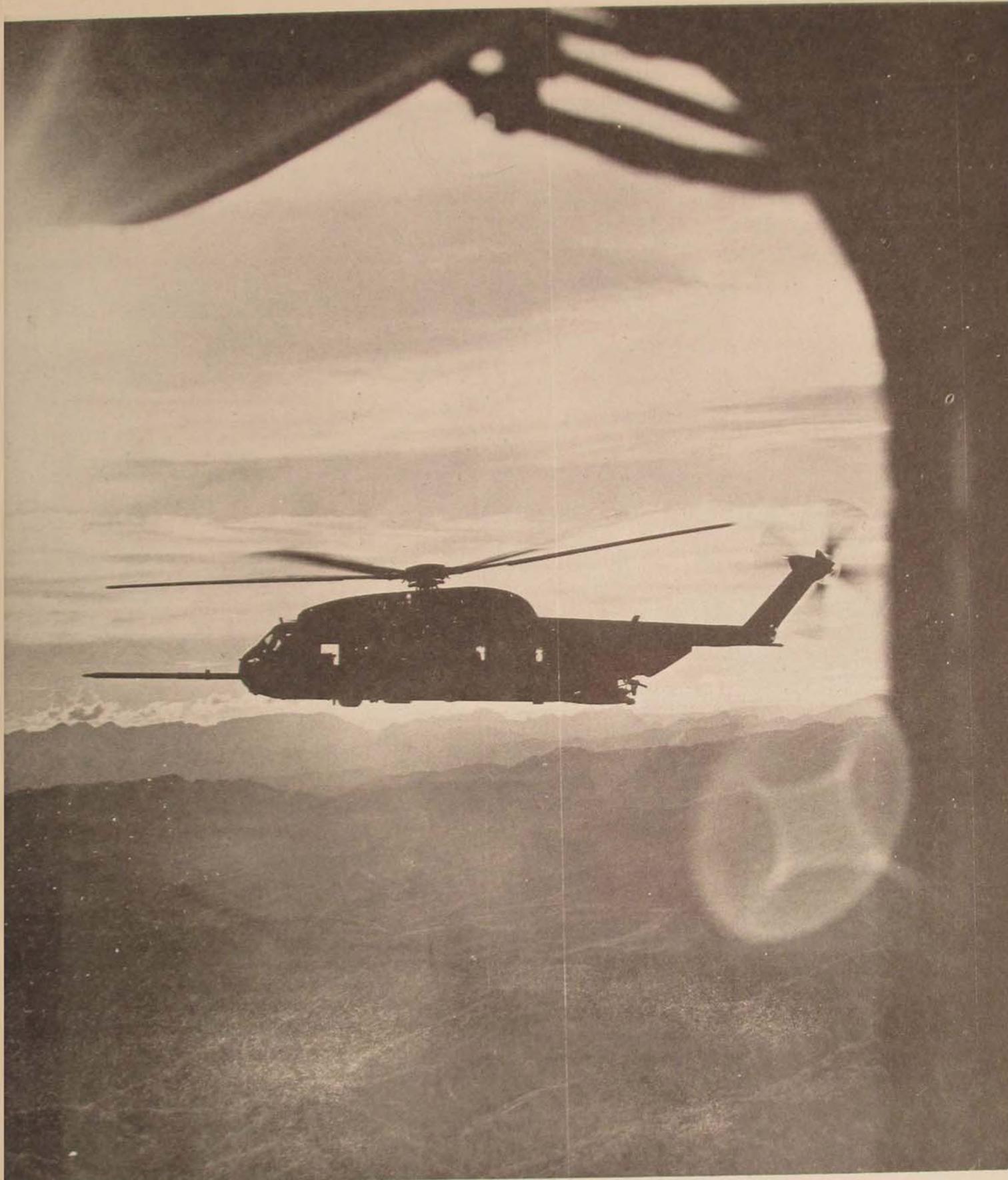
Almost every modern military organization has, at one time or another, been accused of attempting to fight its current war as it had fought the last one. If true, it would seem that we should ignore the lessons of history and concentrate on discovering inventive alternatives to previous tactics and policies. But one should study history to learn from rather than repeat the past.

Those involved in search and rescue can learn valuable lessons from the Southeast Asia experience. The most important lesson can be summed up as readiness. Peacetime rescue forces must be *ready* to perform combat SAR in a variety of situations. Perhaps too much has been made of the lack of preparedness in Air Rescue Service prior to the Vietnam War. Search and rescue was no less ready for the very different and difficult kind of warfare in Indochina than any other organization in the Air Force or the entire military. Nevertheless, it appears that the old Air Rescue Service precept that combat SAR was an extension of peacetime opera-

Combat recovery aircraft

The main actors in the out-of-country combat aircrew recovery effort from 1967 on were long-range, air-refuelable, "Jolly Green" helicopters and their A-1 escorts (bottom). The Sikorsky HH-3E (below) seen on the ramp at Quang Tri, was initially deployed to Southeast Asia in 1965. Nearly twice as large and more powerful than the HH-3, the HH-53 (opposite) was the ultimate long-range rescue vehicle of the Southeast Asia conflict. A large helicopter and therefore presumably easy to hit, it proved amazingly resistant to battle damage: one HH-53 continued to fly after sustaining six 20-mm hits. A specially trained RESCORT (rescue escort) of USAF special operations A-1 aircraft was essential to the SARTF; A-1 pilots performed the dirty, vital function of locating survivors and protecting them until rescuers arrived.





The intimate and highly effective coordination characteristic of SARTF activities in Southeast Asia is summed up here: An HC-130 loadmaster observes a paradrop of hydraulic fluid to an HH-3E forced down in northern South Vietnam, November 1969. After emergency repairs by the flight mechanic, the HH-3 returned safely to Da Nang.



tions was finally made obsolete by events. In addition, the search and rescue task force evolved to overcome the problems of combat aircrew recovery peculiar to Southeast Asia. As a team, the SARTF triumphed over natural obstacles as well as the enemy to save hundreds of aircrew members downed in the jungles of Vietnam, Laos, and Cambodia. Many of the tactics employed by the SARTF in that conflict could be used again should the Air Force find itself involved in operations against lightly armed forces fighting in an area with similar geographic features.

The usefulness of the SARTF in future conflicts will be determined by such factors as the geographic and demographic nature of the battlefield and, of course, the state of the enemy's defenses. It is questionable that an armada of HH-53s, A-7s, HC-130s, and forward air controllers would be able to operate in the highly defended, relatively open areas of Europe, over the flat sands of the Middle East, or over the barren hills of Korea. A future enemy could possess technologically advanced air defenses in-

cluding modern jet fighters (able to detect and destroy aircraft flying at low altitudes), SA-3s, SA-6s, and a host of smaller, hand-held missiles such as the SA-7, and the deadly ZSU-23-4 radar-directed, fully mobile anti-aircraft gun. These weapons would prove vastly more formidable than those of the 1950s vintage the Air Force faced in North Vietnam.

THE Aerospace Rescue and Recovery Service was ultimately successful in Southeast Asia in saving 3883 people from death or captivity because innovation and imagination brought rescue techniques from the SA-16/HC-54 era to the search and rescue task force of the late 1960s. Imagination and innovation within a system receptive to change brought improvement through the introduction of novel tactics and new equipment. Flexibility and readiness in the peacetime SAR force will be the key to future success in combat rescue. That flexibility will require a continuation of the same spirit of innovation and ingenuity that made combat rescue successful in Southeast Asia.

Hq USAF

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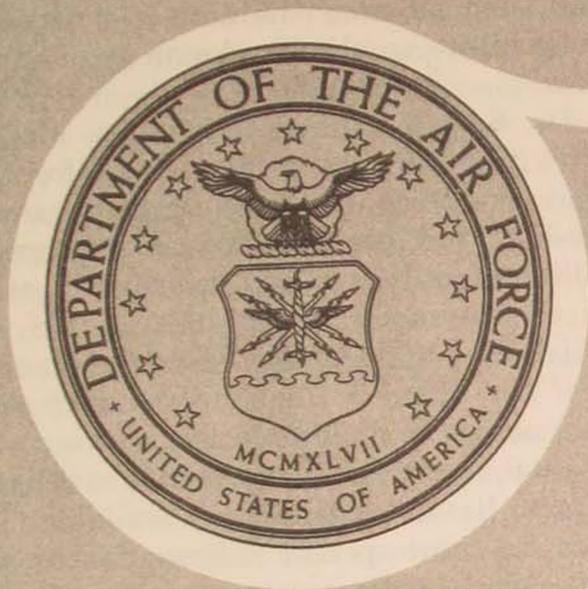
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LIVING AND FAMILY PATTERNS IN THE AIR FORCE

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IT IS quite evident, even to the casual observer, that living patterns in the Air Force are changing. The number of families has increased to the point that the military, once the bastion of single males, is now faced with a growing number of women and a significant number of married personnel.¹ It has traditionally been expected that when a military member was married, his family would routinely adjust to the transitions related to the military's place and type of assignment.² The pattern of adjustment was almost always assumed to resemble a one-way street with the member and family adapting to the needs of the military.

Recently, however, the pattern is approaching that of a two-way street, with increasing adjustments being required and made by both the military system and the military family. This point has been made most forcefully by Dr. Charles C. Moskos in his analysis of changing occupational and support requirements in the military.³ The most obvious example of this departure from the traditional composition of the military community has been the shift, since World War II, from a predominantly single military force to a predominantly married military force.⁴ As of 30 September 1976, 56 percent of all military personnel were married, with all types of dependents outnumbering military personnel by about 1.5 to 1.⁵

The intent of this article is to clarify the changes in living and family patterns occurring within the Air Force community. Historically, the tendency has been to look at the military family as fitting into a particular mold, most often the traditional model of working husband, dependent homemaker wife, and children. Yet, this stereotypical family pattern is becoming increasingly atypical. In this treatment, we will examine current data on living patterns in the Air Force as well as some of the factors involved in the diversity of family life-styles that are now appearing.

Dr. Hamilton McCubbin and his asso-

ciates noted that "military and national leaders face an important and difficult challenge: to make the family a primary and integral component of military policy."⁶ Our article is intended to aid in that process, but it is *not* our purpose to offer recommendations for Air Force family policies. Rather, we will attempt to provide an accurate description of current living patterns in the Air Force in order to understand better the nature of the Air Force community. We feel that such an understanding is a necessary prerequisite to the development of family policies.

Dr. Edna J. Hunter, one of Dr. McCubbin's coauthors, notes that ". . . before policy-makers can do those things [examine, modify, and evaluate the assumptions of military family policies], they must be aware of the characteristics of the sample with which they are dealing."⁷ She also observed that her office is frequently queried as to such things as the number of working wives or dual-career families but that such information has not been readily available. This plea for more specific information on lifestyles and family patterns was consistently offered at the 1977 Military Family Research Conference.⁸ One personnel officer knew that many divorced persons were in his branch of the service, but he could not tell "how many of those families had custody of the children or whether those children were living with a former spouse."⁹ Without knowledge of the living patterns and household composition of military families, it is difficult to anticipate the need for or consequences of military family policies, regulations, or services.

WHY are Air Force family patterns changing today? Changes throughout society are occurring because of the demand of persons for greater freedom in selection of personal and family life-styles.¹⁰ Increasing numbers of persons are inten-

tionally delaying marriage, remaining childless after marriage, or choosing to remain unmarried.¹¹ Women are intentionally seeking jobs with career potential, and married women are increasingly preferring employment and career to full-time family and parenting responsibilities.¹² Marriages that are no longer considered satisfactory are being terminated, and a growing number of children are being reared in one-parent families.¹³

The Air Force has been attempting to understand and accept these changes in personal and family life-styles. It appears that for some of the changes taking place, the military has been a more conducive environment for change than the civilian sector. For example, it is probably easier to choose to remain single in an environment that has been traditionally single in orientation than in one that has been traditionally marriage-oriented.¹⁴

Why is it important that we understand the present patterns of Air Force personnel and families? For one reason, the all-volunteer status of the U.S. military has put all of its branches in direct competition with the private sector for its recruits.¹⁵ An obvious consequence is that life in the military must be considered by its members and potential members as desirable while the highest possible level of mission capability is maintained. Therefore, trends within society as a whole, but especially trends among military personnel, must be taken into account if the system is to be responsive to the preferences of its members.

The problems related to retention and the growing cost of training new members are another important reason for allowing as much flexibility as possible in the personal and family preferences of military members. The recent DOD appropriations act particularly notes the importance of reducing personnel losses through attrition.¹⁶

A study relating retention in the Army to marital satisfaction and job satisfaction

found job satisfaction and family life satisfaction to be extremely important factors in the member's decision to remain in or leave the military.¹⁷ With military personnel becoming sensitive to the increasingly comparable levels of income, current benefits, and retirement benefits between the military and civilian sectors, it is very probable that satisfaction with one's life-style, an already important factor, will increase in significance as a factor related to retention.

The present trends of decreased personnel manning and requirements for high levels of operational readiness mean that job performance of every member must be maintained at a high level. With family life satisfaction and job satisfaction known to be related,¹⁸ it is essential that the military system better understand the family pattern preferences of its members.

Family Patterns in the Air Force

In order to describe current family patterns in the Air Force more accurately, data on all members, their marital status, and the dependents in their households were examined from records at the Military Personnel Center. These data were derived from the computerized file records of 30 September 1978, the end of the fiscal year. The total force on that date included 469,838 enlisted persons and 95,456 officers. Information on children was recorded by age in order to determine preschool and school-age dependents. Data relating to parents of dependent children were separated from those concerning nonparents in order to facilitate further analysis of household arrangements.

singles

While accurate trend data on the living patterns of personnel are not readily available, it is clear that there has been an overall decline in the proportion of single persons

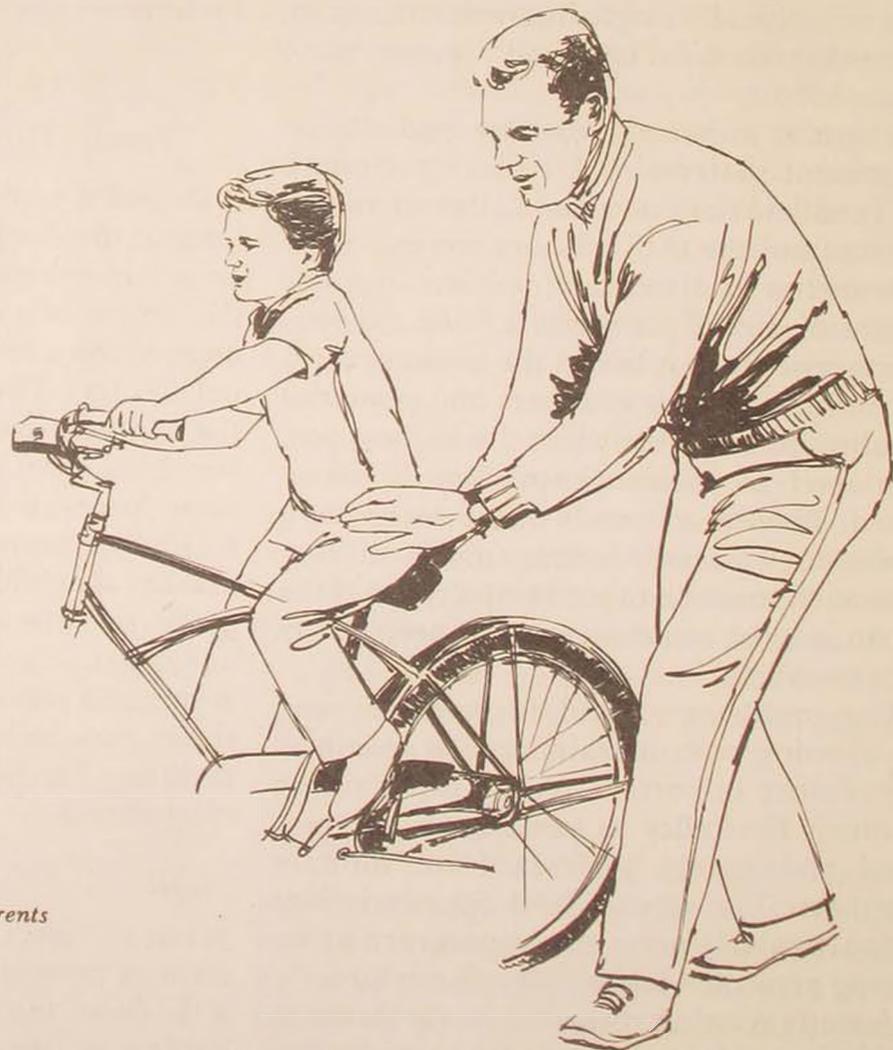
in the military services, particularly in the Air Force. At present, persons who are not currently married or who are legally independent account for only 33.7 percent of the total force in the Air Force. Of the 190,596 persons represented here, 91.3 percent have never been married, 8.4 percent are divorced, and a small fraction are separated or widowed.

It is quite apparent that female Air Force personnel are much more likely than male to be single. In the female officer force, 62.3 percent are single, compared to only 14.8 percent of the male officers. Among the enlisted, 50.5 percent of the females are single, compared to 35.7 percent of males. These differences probably reflect the greater feeling among women that their occupational flexibility and mobility will be hin-

dered by marriage, especially for officers. Men often marry and assume that their wives will follow them, an assumption that has some legal backing as well.¹⁹ But a woman with career intentions must be more selective in marriage, otherwise her own career will be jeopardized. Undoubtedly, this results in the subject of marriage being considerably more sensitive for women in the Air Force, with the likelihood of a continued higher proportion of them remaining single during their military careers.

married, civilian wife

The conventional marriage pattern in the military has been for the husband to be the



"In the U.S., nine out of every ten single parents are women, but in the Air Force, three out of four single parents are men."

only family member in uniform. Husbands with civilian wives now represent 58.9 percent of the total force in the Air Force. Among male enlisted personnel, 60.2 percent are married to civilians while among male officers, 83 percent are married to civilians.

A rather high proportion of these traditional military marriages are childless, probably due to the number of young married couples in the lower officer and enlisted ranks. But for many male personnel, fatherhood is an important role as well. Some 70 percent of the marriages of men married to civilians include children in the household. Forty percent of these children are in the formative period under six years of age, and 60 percent are of school age. The average number of children for families with children is two, a figure which is similar to national norms. The enlisted men in this marriage pattern have an average of 1.9 children per family while officers have an average of 2.2 children per family.

One complicating but necessary factor in some of these military marriages is separation due to assignment. However, separation is not a common practice at this time in the Air Force since only 4.8 percent of the men with civilian wives live apart from them. This affects 6 percent of the enlisted and 2 percent of the officers in this category. The figure would be higher if temporary duty assignments were included. Separation can be difficult for the families involved; however, extended separation is not the norm in these military marriages, and perhaps no more separation occurs than is normal in civilian marriages. Particularly significant is the finding that men with dependent children are not very likely to be separated from them. While 11 percent of the men with civilian wives but no children are living separated due to assignment, less than 1 percent of those who are fathers are separated from their families. These data suggest that separation may cause strain

and result in a higher divorce rate in childless marriages; for families with children, there is usually a more stable two-parent home environment. This is especially important given the growing recognition of the father's contribution to healthy child development. With the recent authorization of Junior Enlisted Travel (JET) entitlements, separations may be decreased in the future.

married, civilian husband

As the Air Force becomes a more attractive career alternative for women, a new family pattern emerging includes an Air Force wife and civilian husband. These married women account for slightly less than 1 percent of the total force in the Air Force and 34.6 percent of the married women officers and 22.9 percent of the married enlisted women.

The proportion of these marriages that are childless is very high, reflecting the potential strain that parenthood may imply to many of these women juggling their occupational and marital responsibilities. Some 80.8 percent of the women officers married to civilians are childless as are 73.4 percent of those enlisted women, more than one would expect from most other occupational groups in the U.S. One factor that may explain the high childlessness and foster its continuance is the frequent separation of military wives from their civilian husbands. Over 36 percent of the enlisted women and 10 percent of the women officers in this category are stationed apart from their husbands. But the high childlessness rate among the women officers, even though 90 percent of them are living with their civilian spouses, no doubt reflects a concerted preference for career independence that parenthood might threaten. This certainly counters the general idea that marriage of a military woman to a civilian man, who may not understand her responsibilities, necessarily results in parenthood and a potential conflict with her career priorities.

Of the 20.4 percent of Air Force women/mothers married to civilians, 66 percent of the children are of preschool age and 34 percent of school age. The average number of children in these households is 1.6 per family. When families are separated by assignment, which is presently true of nearly one-third of both the officer and enlisted women married to civilians, the children usually go with their mothers. Essentially, these women then become single parents for the duration of the separation, having to balance sole responsibility for childrearing with the career demands of their duty station.

military couple

With the employment of married women increasing rapidly in our society, it is not surprising to find that dual-career marriages are becoming almost commonplace. The Air Force has not been immune to these influences, as we have noted among its women members married to civilian men. However, it is more common for Air Force women to marry men in the military. Of those who marry, 76 percent wed military husbands. Yet only 4.5 percent of Air Force married men are married to military wives. By far the most common in-service marital arrangement is the marriage of an enlisted man and enlisted woman (13,755), both male and female officers (968 marriages), a female officer and an enlisted male (363 marriages), and, least common, marriages between male officers and enlisted females (295). In addition to these marriages between Air Force members, 299 women and 213 men in the Air Force are married to members of the other military services.

The tendency toward childlessness remains high in military couple marriages, as it does with Air Force wives of civilian husbands. About 80 percent of officer-officer marriages are childless. In enlisted-enlisted marriages, 69 percent have no children; in

marriages between Air Force and other military service personnel, 65 percent are childless; and in those marriages between Air Force officers and enlisted personnel, 35 percent are childless. While the latter percentage is lower than the rest, all of these marriages have significantly fewer children than we might normally expect. Again, this probably reflects the voluntary desires of these couples to give their work careers higher priority than parenthood. Thus, even though the military-benefit system might ease the financial costs of children, it is not sufficient for many career couples to offset the costs of occupational independence.

Contrary to the notion that the military rather coldly determines duty stations for its members, most military couples are located in the same vicinity. However, one of eight of these marriages, 12.4 percent, are split by different assignments. This is a rather high percentage of marital separation, compared with marriages in which members are married to civilians. Certainly, Air Force personnel decisions are often strained to the limit by military couple considerations, but the frequency of these separations, if continued, may be a factor that will influence higher marital dissolutions.

When separations by assignment do occur in military couple marriages, the children, if any, are as likely to stay with their father as with their mother. This is quite unlike the situation in military-civilian marriages in which the wife, whether the military or civilian member, is much more likely to have the children with her during the separation. Apparently, these couples feel that the Air Force community provides support adequate to allow either the father or mother to be the temporary, primary parent of their children.

single parents

One-parent families are not new to the military community. There are now more than 5400 single-parent members in the Air

Force, approximately 1 percent of the total force. These are parents with custody of all the children living in their household. There are many times this number who have partial custody or for whom their

children are listed as dependents but are not living with them. Nearly 2 percent of the children living with their parents in the Air Force are now living with a single parent.

There are a variety of circumstances that have resulted in these single-parent families. In 69.6 percent of the households, divorce is the precipitating factor. One of every five divorced members has live-in children. Legally separated persons account for 2.4 percent of the single parents, the widowed account for 5.4 percent, and single persons account for 22.6 percent of the single parents. Those listed as "single" could be misclassified in part, but it is just as likely that they represent unmarried parents and adoptive parents, situations that may have occurred prior to enlistment but not uncommon in the military today. Almost 40 percent of the children being reared in these single-parent families are preschoolers.

In the U.S., nine out of every ten single parents are women, but in the Air Force, three out of four single parents are men. This is not surprising, given the high proportion of men in the service, but it does point out that Air Force men are taking a greater responsibility for fathering and that this is being recognized by the courts. The assumption that in divorce the military men will simply allow the children's mother to have custody should also be relaxed since 76 percent of the single-parent fathers became single parents after divorce or legal separation. These fathers are not being restricted to older children either; 30 percent of them are rearing preschoolers in their households. The single-parent mothers in the Air Force are also most likely to be divorced, but quite a high percentage are listed as single (39 percent), probably reflecting the growing number of unmarried women who get pregnant and decide to keep and rear their babies themselves.

Single parenthood is frequently a temporary status. Many of these persons will marry or remarry, while other military



"... married women are increasingly preferring employment and career to full-time family and parenting responsibilities."

members will undoubtedly enter this status due to divorce, widowhood, marital separation, or pregnancy. Since single parenthood is often temporary, it would be appropriate to point out that the Air Force has other "temporary" single-parent members due to separations by duty assignment in which the children remain with a member parent. This includes 2854 Air Force mothers and fathers and 5574 children, a total of 8315 separated single parents rearing 13,158 dependent children. Of course, these figures, as large as they are, do not reflect the tens of thousands of civilian single-parent mothers who are rearing children due to separation by assignment of their Air Force husbands.

*implications for
Air Force leadership*

This information about the "state" of the Air Force family should be particularly relevant for planning and implementing programs and policies that affect the Air Force community. For commanders and supervisors, knowledge of personal and family lifestyles can help in personnel planning, recruitment, and motivation, factors that are vital to maintaining an efficient and effective Air Force. For chaplains, awareness of personal and family needs is crucial to their ministry to the total Air Force community. A good minister knows the community and is sensitive to the diversity of needs within it. For the Air Force at large, it is important to have leaders who are aware of their constituency, who are aware of the variety of life-styles being experienced by the persons for whom they provide direction and to whom they minister.

Perhaps the major finding of this study of Air Force personnel is that it identifies the nature and extent of diversity in family living patterns among Air Force personnel. The data indicate that we cannot assume a fairly consistent, predictable family arrangement in the Air Force today. Rather,

we find there are single men, single women, married persons, single fathers, single mothers, childless couples, military couples, and other probable arrangements, such as unmarried cohabitation, about which data are not presently available. Since each of these groups has different needs, we need to be very careful when making uniform assumptions regarding outcomes to personnel and dependents from broad policies and decisions.

Of course, the question might be asked: Why should the Air Force be sensitive to the variety of living arrangements of its members? Should not our concern lie principally in the job that the member performs for the Air Force? The answer lies in the special relationship between the job and community in the military. A person does not "take a job" in the Air Force; he or she "joins" the Air Force. They have a job to do, but they enlist in a community, in a life-style that is mutually supportive. Not only the members but their dependents also become part of this community, and there remains an intimate link between the satisfaction received from their overall life-style and the satisfaction derived from the job.

As the number of Air Force members with dependents has increased to over two-thirds of the total force today, the ability of the Air Force to meet the personal and spiritual needs of dependents is becoming an even more important part of our demands for enhanced productivity from members. The shift to an all-volunteer force, the necessity of reenlistments to lower training costs, and continuing requirements for maximum personnel efficiency and mission effectiveness mean that making the Air Force community an attractive environment is more important now than ever before. Nothing can be more effective for encouraging work satisfaction than the knowledge that personal and family needs are being addressed; nothing can be more damaging to the spirit and the job than feeling that

these needs are being neglected.

Given the data we have examined and the important role the family plays in the life of Air Force personnel, some traditional assumptions regarding family behavior may need to be relaxed. For one thing, most single persons today are assumed to be temporarily single, one step away from marriage. However, many of the single persons in the Air Force appear to be preferentially single, with little intention of marriage. This is true of women in this branch of the service, but, among the sexes, there are a large number of upper-grade personnel who have not married and will probably never marry. It would be wrong, therefore, to assume that single persons eventually "settle down" in marriage and relax some of their military career aspirations. It would also be unfortunate if we neglect the needs of these preferential singles since they contribute greatly to the flexibility of Air Force missions. A reexamination of current policies and programs may need to be established to enhance their self-respect, reinforce their single identity, and provide them with the privacy—for example, in housing—that offers greater flexibility in their personal lives.

A second assumption we need to reevaluate is that marriage inevitably leads to children. Among married Air Force women, the majority clearly reconcile their marital and career demands by remaining childless. Military couple marriages are most often childfree today, allowing both members to maximize their career obligations. Many women may feel frustrated and handicapped by the assumption that they will one day trade in their uniforms for an apron and the nursery. Many of their husbands may feel frustrated and handicapped by a lack of medical, chaplain, or personnel support for their decision to be childless. To date, it appears that the Air Force is doing a great deal to keep its military couples together in their assignments, but in these marriages, as well as childless marriages with a civilian

spouse, the separation by assignment rate is rather high. If this practice continues, it could have detrimental consequences for these marriages and individuals.

A third assumption we need to reconsider is that children will remain with the civilian spouse when marital separations occur. In contrast to this, there are a large and growing number of parents in the Air Force who are keeping their children after divorce or when they are separated by assignment. Since 75 percent of these single parents are fathers, it is important to note that the number of single fathers has tripled nationally in the past decade and that the legal and social opportunities for fathers to retain custody of their children are just beginning to have an effect on the statistics. Perhaps we should reexamine the degree to which these single mothers and fathers need parent support groups, childrearing classes, and personal and legal services that are sensitive and more responsive to their needs. Most of these single parents are rearing at least one preschool child, and, without a spouse to fall back on, it may be important to assure these parents of quality child care while they work and at other times as well.

WHAT does the future hold for family patterns in the Air Force? If present trends continue, we can expect even more shifts toward diversity in personal and family life-styles.

- With the current decline in the national marriage rate, the Air Force should receive a greater influx of single persons, particularly women, who prefer to remain single. This may be considered good for mission flexibility, but more of these women and men are going to expect personal flexibility as well.

- As career opportunities attract more women into the service, military couple marriages should increase, and the shortage

of male nonmarried officers will increase the number of women officers who marry civilians. These trends are going to place more and more strain on personnel officers who have to decide on duty assignments for Air Force members.

- The high divorce rate and shifts in child custody laws should also increase the number of single parents in the Air Force.
- The family type that will more than

following her husband wherever he may go is beginning to change nationally. Fewer women are willing to sacrifice their own career or family goals because of the occupational demands of their husbands.

How Air Force leaders react to these trends will have a great deal to do with the continuing ability of the service to attract and motivate qualified personnel. Personal and family conflicts will no doubt rise and



"The tendency toward childlessness remains high in military couple marriages, as it does with Air Force wives of civilian husbands. About 80 percent of officer-officer marriages are childless."

likely decline proportionately, but still remain the predominant pattern overall, will contain an Air Force husband and civilian wife. But even here policies may need to shift since the prospect of the dutiful wife

subsequently affect morale unless we carefully anticipate the psychological, social, career, and spiritual needs of Air Force members and their dependents. This means greater cooperation among the various com-

ponents of Air Force leadership in order to sensitize themselves to potential problems and solutions. Better programs for married persons and their families will be necessary in order to facilitate personal adjustments and ease the strains that sometimes accompany military life.

More research is also needed in order to determine accurately the needs of families in the Air Force and the services that can maximize the effectiveness of Air Force members. The present study is but an intermediate step in the process of developing sound personnel and family policies that augment rather than hold back Air Force mission requirements. Descriptive position papers that suggest some of the directions future policies might take have previously been offered.²⁰ Here, we have examined and described in the most complete and accurate detail to date the types of living and family patterns that must be considered in the development of these personnel and family policies. Now, we need to move toward hard research that will determine the potential effects of policy and program changes on the recruitment, morale, and retention of Air Force members and their dependents.

There is no reason to suspect that the efficiency of the Air Force and its mission will be handicapped by the diversity of living patterns now represented in the service. The careful acceptance and integration of current, conventional life-styles should not result in the deterioration of personnel quality; rather, it should enhance the ability of the Air Force to attract and retain persons with a variety of talents and skills.

But mission readiness and effectiveness require a consistency in allegiance from members that can be fostered only by equally consistent reinforcement of all members' needs and the needs of their dependents. This means that readiness and mission effectiveness, the heart of the Air Force imperative, depend as much on our commitment to the respective life patterns of personnel and families as on their commitment to the Air Force and to their country. Since this is a two-way street, to maintain the mutual commitments that are necessary for our national security, we must begin immediately to consider what is needed to accommodate the living and family patterns now operative in Air Force communities.

Greensboro, North Carolina
and
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Notes

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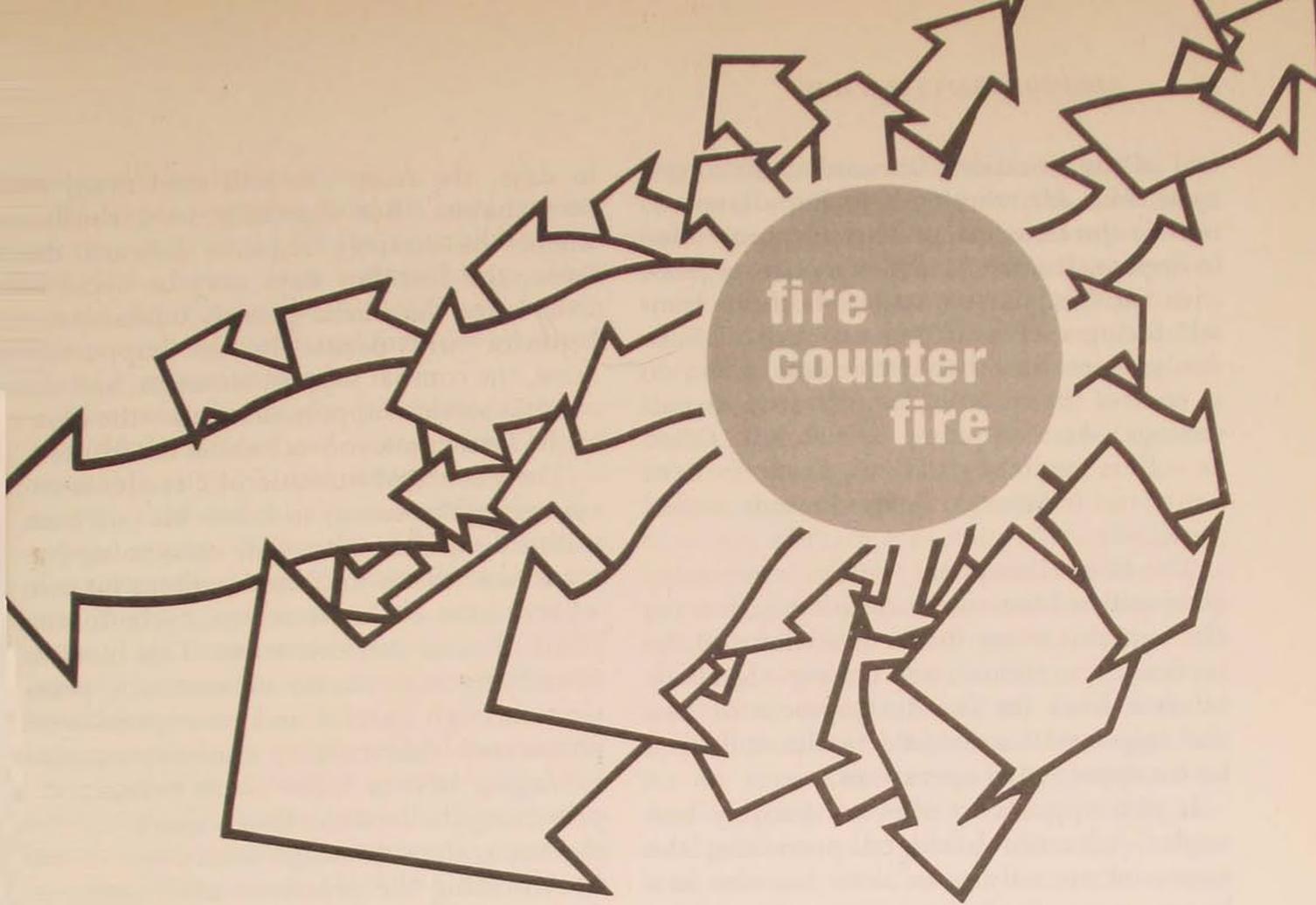
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Acknowledgment

Grateful appreciation is expressed to the staffs at the Air Force Manpower and Personnel Center and the Human Relations Laboratory for their assistance in preparing the data for this report.





BUREAUCRATIC TACTICS

WILLIAM S. LIND

THE recent work of Colonel John Boyd, USAF (Ret), on the nature of conflict has provided a new and useful basis for the development of military theory. Colonel Boyd was the father of energy management air combat tactics. More recently he has evolved a "fast transient" approach to air tactics from an analysis of air combat, including that in Korea. There, he noted the MiG-15 could perform almost every *single* maneuver better than the F-86. Why, then, did the F-86 usually win the engagements? According to Boyd, it was because the F-86 could *transition* from one individual maneuver to another much more quickly than

the MiG-15. Fast transient tactics, as opposed to energy management tactics, emphasize the transition from one maneuver to another. These tactics are proving highly effective. Why?

In answering this question, Colonel Boyd began to evolve a theory of conflict. He observed that in any conflict situation all parties go through repeated cycles of observation-decision-action. The potentially victorious party is the one with an observation-decision-action cycle consistently quicker than his opponent's. As this party *repeatedly* cycles inside his opponent's actions, the opponent finds he is losing con-

trol of the situation. Because of his longer cycle time, his reaction is facing a later action by the faster party than it was intended to oppose. Instead of achieving convergence with the first party's action, he finds himself facing ever-widening divergence. Suddenly, he realizes there is nothing he can do to control the situation or turn it to his advantage. At that point, he has lost. Often he suffers mental breakdown in the form of panic and is defeated before he is destroyed physically.

The Boyd theory that conflict is in essence competitive observation-decision-action cycles explains many forms of combat on the tactical, operational, and strategic levels. It offers a basis for the development of new and improved battlefield tactics and for a better approach to operations.

It also appears to offer an entirely new tactics, a tactics based on perceiving the opponent not only as an army but also as a bureaucracy. Such a tactics would supplement, not replace, battlefield tactics. But such "bureaucratic tactics" may require few resources to implement, yet offer substantial returns.

The basis of bureaucratic tactics is the realization that to be militarily effective, a military force must maintain a rapid observation-decision-action cycle. Yet, in peacetime, military services tend to develop a number of routines, standard operations procedures, requirements and organizational habits that have little or no relationship to military effectiveness (although they may relate to efficiency) and which materially slow the observation-decision-action process. Officers will have little difficulty in identifying such routines within elements of their own service.

On D-Day, two armies and air forces will clash, but so will two bureaucracies. Both sides are likely to come to the initial battle with their peacetime bureaucratic habits largely intact. Within hours, certainly with-

in days, the front line will shed many of these habits. But especially in a conflict where the strategy requires forward defense, the first few days may be decisive. Even after the initial period, bureaucratic behavior will persist in the supporting arms, the combat support elements, and the combat service support elements—the more so the farther one moves behind the front.

The essence of bureaucratic tactics is encouraging the enemy to follow his own least militarily useful, most time-consuming bureaucratic habits until he lengthens his own observation-decision-action cycle to the point of total ineffectiveness. This involves identifying such enemy bureaucratic practices through careful and conceptually sophisticated vulnerability analysis, and *encouraging* him to follow these practices by preserving the facilities they require while at the same time (through selective destruction) making the practices take even more time than normal. It must be fully understood that in bureaucratic tactics, preservation is as important as destruction. Those elements of the enemy's system, which he may regard as assets but which our vulnerability analysis shows to be liabilities must be preserved, and the opponent must be encouraged to use them.

A detailed example may illustrate the concept more clearly. Currently, there is a major divergence in tactics and operational philosophy between the U.S. Air Forces, Europe, and the European air forces.¹ The Europeans emphasize high sortie rates, local control, and preplanned sorties. USAFE operates on the basis of a low sortie rate, centralized control, and midair control of sorties.

The European system appears more robust and more efficient in generating combat power from total resources. It also appears more appropriate for armored warfare, in that it relates air support to the ground commander's scheme of maneuver,

not just to exchange ratios.

If forces opposing USAFE used normal tactics, they would see the centralization of the U.S. forces as a vulnerability. They would shoot down the AWACS and destroy the centralized command facilities on which the U.S. system depends.

However, this might be counterproductive. If the centralized system is no longer workable, USAFE may have no choice but to adopt the potentially more effective European system. Thus, the enemy's action in destroying the planned centralized U.S. system might actually *raise* U.S. net effectiveness. (This assumes, of course, that USAFE would have sufficient time to make the transition.)

In contrast, an enemy using bureaucratic tactics would carefully preserve USAFE's centralized C³ system. It would degrade that system's observation-decision-action cycle by shooting down some AWACS—but not all. It would be careful not to attack the central control headquarters. It would restrict but not cut off the communications channels between the central headquarters and the units and between units and their airborne aircraft. It would force the U.S. Air Force to choose between operating its preferred peacetime system with a substantially

lengthened observation-decision-action cycle, or abandoning it while it is still nominally operable in favor of the European system, a system which USAFE has devoted some effort to opposing. The opponent would count on (and possibly use disinformation and deception to reinforce) the Air Force's bureaucratic behavior to lead it to choose the former, with potentially disastrous results on the battlefield.

Bureaucratic tactics promise to be an economy-of-force measure. They would require very precise vulnerability analysis prior to the conflict but should need only small battlefield resources, since they do not require much destruction of enemy assets. They could be used by units such as Special Forces and Rangers. They might offer an answer to some of the problems of declining relative effectiveness faced by tactical aviation. If nothing else, they might lead us to see some of our own policies and practices in a different light.

Washington, D.C.

Notes

1. See Dr. Steven L. Canby, "Tactical Air Power in Armored Warfare: The Divergence within NATO," *Air University Review*, May-June 1979, pp. 2-20.

A RESPONSE

CAPTAIN JAMES B. SMITH

WILLIAM LIND'S discussion of bureaucratic tactics has suggested two problems: the exploitation of enemy vulnerability to "fast transient" tactics and the evaluation of our own weaknesses. The former offers promise for novel tactics; the

latter could be the sounding board for a doctrinal renaissance.

In terms of exploiting the enemy's cycle, both tactical and strategic issues come to mind. In a tactical sense, we should look at command and control centers. For exam-

ple, since the Soviets depend heavily on ground-controlled intercept (GCI) support while making fighter intercepts, we should attack these GCI sites along with our fighter attacks. If enemy fighters are dependent on GCI control for a part of their decision-making process, by eliminating the controller, we would seriously inhibit his ability to make decisions.

At the same time we need to analyze the enemy's capabilities for independent action. If Soviet aircrews rely on flight lead for their guidance, then a prudent tactic is to concentrate forces against the lead aircraft; once he is destroyed, the remaining aircraft will be reduced as a threat. Keeping the Boyd theory in mind, we realize that these aircraft are less of a military threat simply due to their lack of decision capability.

If you set up a model, I suggest that you look at all aspects of the observation-decision-action process as separate entities. In the cited example, the emphasis has been on the decision aspect. Other tactics such as deception, camouflage, etc., tend to affect the enemy's observation capabilities. Obviously, if it takes longer for him to observe than it does for friendly forces, his cycle will have started later, and he is behind from the start. Likewise, if he is prohibited from making a decision because of restrictive standard operating procedures, his action is limited.

I think it is important to separate decision and action. The ability to make decisions may be determined by training, while action is a function of organization. Let me return to the earlier example to explain. If a formation of MiG-21s is dependent on lead for direction, the remaining members of the flight have not been trained for independent thinking and action. On the other hand, the flight lead's ability to act may be restricted because of excessive bureaucratic interference. If he is prohibited from engaging in a certain area without command post

approval, he may place his flight in jeopardy for lack of authority. The analysis of the "action" part of the cycle should take a close look at the chain of command structure; what level of authority is granted by and to respective levels of command.

Strategically, the same issues come to the fore. It has often been argued that it takes longer for a democracy to make decisions than a centralized government. If true, this notion gives the Soviets an advantage from the beginning. Lind's model might evaluate the inability of our command structure to make military decisions without political approval. The objective here should be to move decision-making down to the level of appropriate authority.

This analysis suggests intriguing offensive possibilities, particularly since in Europe we appear hopelessly outmanned. But Mr. Lind's study will be most valuable in allowing us to criticize the state of our own doctrinal and force structure. He quotes Mr. Canby's article "Tactical Air Power in Armored Warfare: The Divergence within NATO," reinforcing Canby's central thesis of the tactical diversity among NATO allies.¹ The interesting point about the discussion is that if the Soviets applied the fast transient approach to our doctrine, they would prefer to leave our centralized command facilities alone and let us bureaucratically defeat ourselves. I see this appraisal of our own vulnerability to bureaucratic tactics as a frightening suggestion of our own doctrinal problems. Canby developed some of the problems in Europe; if they are so apparent, then Lind's bureaucratic tactics model might just point out some of our vulnerabilities. In sum, if he enables our planners to make positive steps to shore up doctrinal deficiencies, even if not recommending his own thesis, the study will have been worth the effort.

And I think some gains can be made. Group Captain R. A. Mason suggested some

problems in our doctrine that might be analyzed in the Lind theory. For example, how will our command and control systems contribute to indecision? Mason, in discussing the enduring application of Clausewitz to the modern airman, indicates problems associated with "fog" and "friction" in war. I agree with him in that in war, modern command, control, and communication equipments must "enhance our strength without imposing a rigidity of operation and dependence that would make us vulnerable to blinding and paralysis."² Whereas Mason speaks of "fog" and Lind of "fast transient tactics," they are both referring to the same thing: the ability of allied forces to make accurate and timely decisions in the face of incomplete or misleading information.

As a test of our vulnerabilities, we should examine each echelon command to determine if that level can actually make the decisions for which it is responsible. If, for example, we find that a battalion commander cannot execute alert procedures without approval of higher headquarters, then he would certainly be susceptible to fast transient tactics. Whenever the enemy can maneuver while we wallow in our indecision-making, they will certainly come out ahead. I would also subject each command and control facility to examination, to find out whether in fact it helps our decision chain or hinders it. If you determine that a certain control facility inhibits operations, delete it from the exercise and see if we can live without it. I suggest that if commanders cannot make decisions without the command facility, then it restricts decision-making capa-

bility and makes the commander more vulnerable to fast transient techniques. Command facilities must speed up not hinder the decision process.

I would also agree that it would be dangerous to place too much reliance on a strategy based on Boyd's fast transient tactics. It has always been popular to advocate a strategy that would shed less blood and cause less destruction while still ensuring victory. Strategic bombardment emphasized the defeat of the will of the enemy without first destroying the enemy's armies in battle. In reality, we found in the Second World War that strategic bombardment was extremely important in Germany's defeat, though the German army still had to be confronted. Also, the submarine campaign in the Pacific accomplished the same end as a strategic bombardment campaign, but still the Japanese did not surrender until defeated. There is no reason to assume that we can confuse the Soviets into capitulation without a fight. But the fast transient approach does offer exciting possibilities for offensive maneuver and for self-evaluation.

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Notes

1. See Dr. Steven L. Canby, "Tactical Air Power in Armored Warfare: The Divergence within NATO," *Air University Review*, May-June 1979, pp. 2-20.

2. See Group Captain R. A. Mason, RAF, "The Challenge of Clausewitz," *Air University Review*, March-April 1979, p. 78.

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A RESPONSE

MAJOR LEONARD L. ("JACK") WALLS

MR. LIND'S article, "Bureaucratic Tactics," is very interesting. I think the concept is a good idea but not a new one. Rather, "bureaucratic tactics" seems to be a new name for tried and true strategies. Knowing the enemy, his weaknesses and strongpoints, is a universally accepted axiom. Confusing, disrupting, and thus delaying the enemy commander's decisions have been tactics frequently used in battle. Thus I find the idea of viewing our enemy not only as an opposing military force but also an opposing military bureaucracy as looking at the problem of fighting and defeating the enemy in only slightly different terms than planners have in the past. The difference seems to be more one of semantics than realities. However, I have other problems with some of the more basic ideas presented by Mr. Lind.

The first problem is his general presentation of the Boyd theory. If viewed in the narrow sense of actually having to observe an event before deciding and acting, the Boyd theory becomes a reactive proposition. However, if observation can be broadened to mean everything one does to know what the enemy is about, then the problem is not so grave. In the first, narrower interpretation, one is doomed to defeat in battle because he will always be reacting to observed events. This interpretation negates "knowing the enemy" and minimizes the impact of capitalizing on being able to predict what the enemy will do. The broader view of Boyd's theory can accommodate the idea of prediction and foreknowledge as decisions based on previous observations and, thus, influencing innovative, bold actions. However, the examples used in the article tend to lead one toward the narrower interpre-

tation. More time should be spent defining just what observation, decisions, and actions include.

Another major problem with the narrow view of Boyd's theory is that it leads one toward technological and rationalized solutions; for example, if one could just devise a better widget to speed up the communications process and shorten the observation-decision-action cycle. Another example would be an idea to return to autonomous, more simple but reliable systems. This would be a *rationalized* argument for working the observation-decision-action problem. Neither process addresses the real problem of military inferiority but only exacerbates it. We develop new widgets, conceive new strategies such as "bureaucratic tactics" in an effort to tell ourselves that we can fight and win the war. The President, Congress, and even our people believe us. Less money is appropriated for defense, at least less than is actually necessary.

Certainly military planners and tacticians should discuss, think, and propose solutions, but these solutions must be presented in light of present realities. To say the enemy may have incompetent generals is one thing; to imply that by taking advantage of the enemy's incompetence will win the war is something else. The idea of being able to slug it out with the enemy's incompetent generals because your observation-decision-action cycle will be less than theirs is one connection I cannot make. It reminds me of the welterweight attempting to duke it out with the big, methodical heavyweight. Another image is of General U. S. Grant's defeating the Confederacy by being more resolute. One must assume that the enemy is at least as smart as he is.

Mr. Lind inferred that the European system for employing air power is more "robust" than the U.S. system. His contention that "USAFE operates on the basis of a low sortie rate, centralized control, and midair control of sorties" is incorrect. USAFE, in

fact, has validated the need for high sortie rates through the "Sortie Surge" program. Preplanned sorties are certainly part of the tactical air employment concepts in USAFE and all other tactical air forces of the USAF. Centralized control with *decentralized* execution has long been a concept for employing tactical air forces, in supporting the land battle. This concept takes advantage of the airplane's inherent capabilities and the principles of war. Thus, while there are differences between the European system and the U.S. system, those differences are not as great as Mr. Lind and Dr. Canby would lead one to believe.

Again, I found Mr. Lind's article interesting but the concept of attacking the enemy's military bureaucracy not really new. Nor is

attempting to destroy, disrupt, or degrade the enemy's command and control capabilities. The observation-decision-action cycle needs to be expanded into a broad interpretation to ensure that planners using Mr. Lind's concepts do not take the narrow view. The narrow view necessarily leads one down the paths of technology and rationalization. Neither path is inherently harmful in itself, but if they are offered as the solutions to gross imbalances of forces, then these paths lead to disaster.

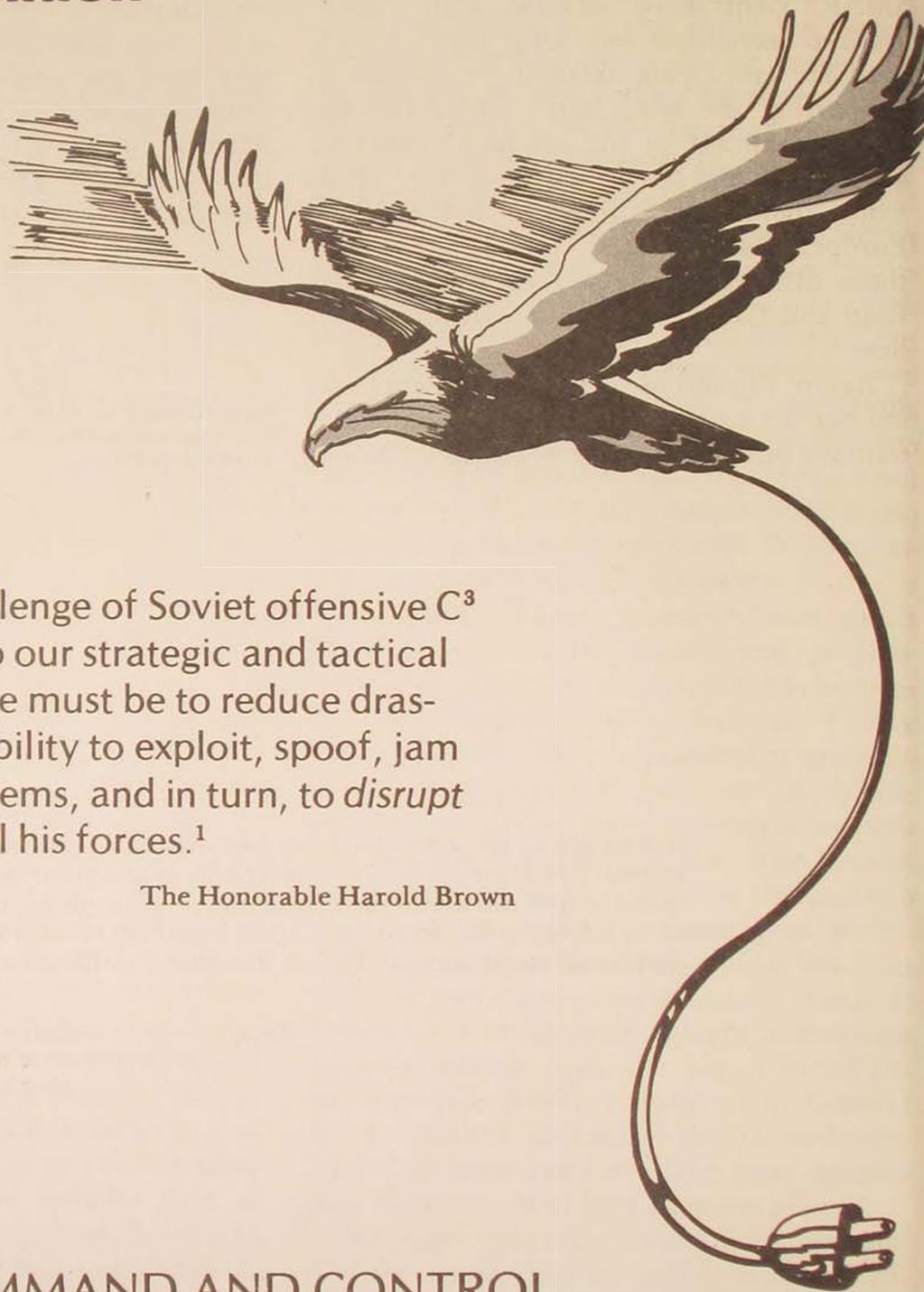
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If men are to be precluded from offering their sentiments on a matter, which may involve the most serious and alarming consequences that can invite the consideration of mankind, reason is of no use to us; the freedom of speech may be taken away, and dumb and silent we may be led, like sheep to the slaughter.

*From George Washington's address
to the officers of the Army,
March 15, 1783*

R in my opinion



To meet the challenge of Soviet offensive C³ countermeasures to our strategic and tactical forces, our objective must be to reduce drastically enemy capability to exploit, spoof, jam or target our C³ systems, and in turn, to *disrupt* his ability to control his forces.¹

The Honorable Harold Brown

COUNTER COMMAND AND CONTROL IN CONCEPTUAL PERSPECTIVE

LIEUTENANT COLONEL JOHN E. ROTHROCK, JR.

WITHIN the Department of Defense, command and control and counter command and control capabilities are now perceived as key elements of combat power, rather than merely as means of support. This recognition over the past few years has resulted in a number of studies, working groups, and contractor evaluations, intended to develop an optimum application of command and control (C²) and electronic warfare (EW) as "force intensifiers."²

While all of these efforts are making important contributions to development of our capability to seize control of the battlefield, they are lessened in their combined effect by lack of a common conceptual (doctrinal) base. For example, some groups consider electronic warfare's counter command and control (counter C²) function only in a defense suppression sense, while other groups (often within the same organization) consider EW's counter C² capability as a means for attacking a broad spectrum of enemy offensive and defensive military capabilities.

My intent here, then, is to focus on command and control and counter command and control within a general conceptual context. I believe that a critique of the strong and weak points of this analysis by a variety of audiences will contribute to a common conceptual thread for the continuing and future development of capabilities in the struggle to control the battlefield. My emphasis will be on needed friendly counter command and control capabilities, especially in regard to theater warfare as in a NATO/Warsaw Pact air/land conflict.

WHY do the United States and the West need a strong counter command and control capability? There is little doubt that current American interest in C² and counter C² has grown in almost direct proportion to Soviet emphasis in these same areas.

The desire to improve U.S. and Western capabilities in these fields could be cynically attributed to some shallow mirror-image aspirations, a sort of knee-jerk reaction to an emerging Soviet capability. Yet, quite frankly, there is a growing awareness throughout the U.S. and allied defense communities that a U.S./allied counter command and control capability is a social, cultural, political, and economic, as well as a military and technological, necessity in maintaining an adequate NATO/Warsaw Pact balance.

The following appraisal of the NATO/Warsaw Pact military balance, though now generally accepted in the West, still is rather sobering: The sociocultural and politico-economic structures of the U.S. and the other Western democracies will not support standing general-purpose military force postures adequate for reliance on a strategy of simple attrition in combat against the Warsaw Pact. If one accepts this appraisal, it follows that the Western allies must develop precise general-purpose force employment strategies. And these strategies should be based on the principle of disruption of the opposing forces' abilities to command and control their numerically superior manpower and equipment assets on the battlefield. These tactics would be particularly important in the initial phases of the conflict when the quantitative imbalance would be the greatest.

If this disruptive concept were successful, it would involve well-coordinated applications of Blue firepower (air delivery, tube, and nonnuclear missile) as well as electronic warfare assets. These applications, to be used against enemy C²/C³ forces, should establish the vulnerability of *key* enemy air and ground forces, thereby ensuring their destruction by relatively limited levels of allied fire/weapons. This type of disruptive capability is basic to the objective of maintaining a high theater nuclear threshold.

What military factors are appropriate in consideration of a disruptive strategy against

the Soviet/Warsaw Pact theater war concept? Is a disruptive strategy with primary focus on countering enemy command and control feasible?

For one thing the highly structured Soviet concept for theater war emphasizes extensive preplanning, precise scheduling, and continuous, detailed lateral and vertical coordination among all combat elements. I believe that these aspects of the Soviet approach to theater war constitute something more than just battlefield technique; rather they appear to establish a type of basic combat mindset seemingly vulnerable to confusion and loss of confidence when encountering unanticipated circumstances requiring immediate initiative. Further, this mindset is deeply rooted in Russian culture and Marxist-Leninist ideology, which emphasize hierarchy and central control.

Although the Soviet combined arms concept is popularly referred to as a "blitzkrieg" approach, it is really similar to blitzkrieg only in its emphasis on surprise, envelopment, and rapid advance. What it lacks in comparison to the *Wehrmacht* blitzkrieg concept is that it does not emphasize subordinate initiative.³ According to a 1977 U.S. Army handbook on Soviet ground forces, "Avoidance of responsibility and lack of initiative appear to be deeply rooted in the Soviet military."⁴

In Soviet writings where initiative is emphasized, such urgings seem to be offset by equally or more stringent calls for extensive, rapid lateral and vertical coordination of alterations to the plan. Apparently, the Soviets see computers (supported by extensive command and control communications networks) as a solution to the dilemma of desiring blitzkrieg battle results on the one hand as opposed to their cultural and ideological imperative for a centralized battlefield on the other. For example, a 1976 article by General-Colonel D. Grinkevich, Chief of Staff of the Group of Soviet Forces, Germany (GSFG) indicated that

... command and control have . . . become just as important a condition for victory as the quality and quantity of weapons . . . control in combat requires *timely decision making* . . . and *persistent implementation* of the decision. The commander and staff *must* maintain *continuous communications* with both the senior chief and his subordinates and adjacent units . . . the time has come to adopt more widely an *automated [command and] control system*.⁵

Grinkevich's attitude reflects current thinking within the Soviet military science discipline, especially his concern with and call to "adopt more widely an automated (command and) control system."

The Soviets have noted a "revolution in military affairs" precipitated by the evolution of military technology since World War II. According to Soviet theory, this revolution has consisted of three watershed technological breakthroughs: nuclear weapons, nuclear-capable missile delivery systems, and the evolution of computers as a major factor on the battlefield.

One Soviet military theorist very much inclined toward the use of cybernetics on the battlefield is General-Colonel V. V. Druzhinin, former Deputy Commander of *PVO Strany* (Air Defense of the Homeland) for Radio-technical Troops (radar); in 1977 he was a member of the General Staff and assumed to be Chief of the General Staff's Armaments Directorate.⁶

Druzhinin and the Chief of the General Staff, Marshal N. V. Ogarkov, are prime movers in the Soviet quest for computer technology.⁷ It is very likely that Druzhinin is a principal architect of the Soviet/Warsaw Pact combined arms battlefield posture that will face NATO in the '80s and '90s.

The battlefield uses to which the Soviets intend to put computer technology are well described by Druzhinin and Colonel-Engineer D. S. Kontorov in *Concept, Algorithm and Decision, 1972*, which emphasizes the Soviets' need in combined operations for

copious amounts of information on friendly and enemy forces.⁸ The book also develops concepts for computer-based rapid information collection, transfer, processing, and lateral/vertical dissemination of the extensive information load. It even anticipates the eventual allocation of responsibilities for "creative work" to machine processes (which may have to do with targeting).⁹ It is worth noting that Soviet authorities have refused copyright permission to Western publishers for the translation and publication of another (later) book by Druzhinin and Kontorov.¹⁰

In reading these authors, the principle of centralization appears to be the prime factor underlying Soviet enthusiasm for computerized command and control systems. In view of the cultural and ideological predispositions to centralism mentioned earlier, I conclude that there are definite limits to Soviet military science's ability ever to extract itself conceptually from heavy centralization of decision-making, resulting in a deep reliance on "positive control" and an associated dependence on communications.

Two other books by Soviet authors, widely acclaimed within Soviet military circles, also provide evidence of Soviet dependence on centralism. *The Offensive* by Colonel A. A. Sidorenko clearly stresses that "the determination of combat missions lays the foundation for the *organization of coordinated action* and provides for *strict centralization* and firmness of leadership. . . ."¹¹

V. Ye. Savkin's book, *Basic Principles of Operational Art and Tactics*, strongly supports the fundamental importance of centralized control:

. . . establishing rigidly centralized troop control in the hands of the senior commander at critical moments of battle. . . . the military commander has begun to resemble . . . a scientist at control panels and radio station controls . . . to unite troops . . . combat equipment, weapons . . . for a common mission . . . only with centralized troop control. Under

the contemporary conditions a *rigid centralization* of control permits the senior commander to determine the outcome of the battle as a whole at the necessary moment.¹²

If one compares these statements, which stress centralized battlefield decision-making capabilities and concepts, with Soviet/Warsaw Pact operational training and exercises, he notices the degree to which Soviet practice accords with the written theory. I find it difficult to believe that the Soviet/Warsaw Pact forces will be capable of broadly based, significant innovative action in actual combat, since it is not widely practiced in field training exercises.

Centralization is not the only factor that inhibits Soviet combat innovation, with a resulting heavy dependence on command and control communications. One can observe the nature of the Soviet combined arms operation in itself. Simply stated, Soviet combined arms operations rely on the concept of "critical time," meaning adherence to precise schedules in the completion of detailed series of independently pursued but heavily interdependent combat tasks. Failure in any of these tasks creates a pervasive "ripple effect" on the overall combined arms operations.¹³ Thus, schedule changes for completion of any one task require extensive lateral/vertical coordination.

I am of the opinion that Soviet command and control centralization and the associated time-critical concept require a specific counter U.S./allied C² capability: *the capability to cause informational delays/errors cumulatively resulting in a series of decision delays/errors which would minimize Soviet capability to realize the combat potential of their greater numbers on the 1980/1990 battlefield.*

This goal should be achievable because of the increasing amounts of information needed by Soviet combat decision-makers for making decisions for each combat task and the resulting lessening critical time available

for each decision. There will be further vulnerability to attacks of this type primarily because of the relatively more structured decision-making/implementation procedures required by the increasing reliance on formatted digital data communications systems inherent in Soviet computer applications. I also expect this format of reliance on specific data systems to lessen the combat value of even heavily redundant multimode C³ networks.

WHAT are the technological factors operating within command and control capabilities, and how do they apply to a conceptual context for counter C²?

While a well conceived and applied disruptive strategy would exploit deeply seated culturally and ideologically driven Soviet vulnerabilities, the importance to U.S./NATO military preparedness of a comprehensive counter C² capability also possesses another dimension. Within that dimension one must look at Western technological superiority (although nonexistent or lessening in some areas), which should be dominant within the '80s, in the interrelated fields of microcircuitry, data correlation and display, and high speed/capacity communications. With that superiority comes a conceptual vehicle whereby U.S. military advantage in advanced information correlation and display and communications technology could most effectively exert leverage on the battlefield through a counter C² disruption strategy based on precise orchestration of fire/weapons/jamming deliveries. I believe that the development of a comprehensive U.S./allied counter C² concept with expert forces for its execution would certainly allow for the fullest exploitation of the superior military potential of Western technology.

CLEARLY, the United States and its NATO allies need a disruptive strat-

egy based on counter command and control tactics. Following, then, are some general concepts that could be useful in developing such a counter command and control capability.

- *A new combat medium has emerged.* Whether it be called "C² warfare" (my preference), or "control warfare," or some other term, it possesses certain characteristics, most fundamentally the need to disrupt enemy control while protecting friendly control. Inasmuch as increasingly sophisticated tactical weapon systems place a greater burden on friendly and enemy battlefield control systems, this capability would be more important to the side depending on the precise application of fewer but more technologically sophisticated weapon systems. Having success in this combat medium would be a force intensifier.

- *"Disruptive deliveries" concept.* In most discussions of counter command and control, the focus is primarily on electronic warfare initiatives for jamming and spoofing enemy communications and radars. One must acknowledge, though, that the traditional approach of killing opposing commanders and destroying their control mechanisms are also effective disruptive tactics (to say the least!).

A comprehensive counter C² capability must contain the options of electronic warfare (including electronic deception) and also include lethal deliveries for countering enemy C² functions.

To categorize electronic warfare and lethal means together as "disruptive deliveries" gives one the option of exploiting the full range of these possibilities and puts electronic warfare on the battlefield as a legitimate weapon to be "fired" at the enemy in the sense of "electronic ordnance."

- *"Disruptive deliveries" objective.* Obviously, no disruptive delivery or delivery against any single "critical node target" can be expected to produce an Achilles' heel ef-

fect within enemy operations.

Actually, disruptive deliveries (electronic warfare/lethal) should pursue the "functional targeting" concept (discussed later), creating informational delays/errors cumulatively resulting in a series of enemy decision delays/errors which minimize their capability to realize combat potential.

Coordinated disruptive deliveries would ultimately affect *key* enemy fire and maneuver elements and thereby produce their attrition or neutralization (e.g., through denial of fuel/spare parts). However, attrition in and of itself cannot be used as a measure of effectiveness (MOE) in calculating the impact of disruptive fire/weapon/electronic warfare applications; the battle effect of attriting equivalent enemy air, armor, infantry, and artillery units depends greatly on time and place. That is to say, destruction of a particular type aircraft or ground unit at one time and place in battle is not necessarily equivalent in influence on the battle outcome as destruction of the same type of equipment or unit at another place and time on the battlefield.

Attrition is further limited in its utility as a combat MOE because it does not account for the battle effect of denying certain fire and maneuver options to the opposition.¹⁴

- *The "functional targeting" concept.* Rather than basing air, artillery, and electronic warfare targeting on an "entity targeting" concept which focuses only on particular installations, units, or complexes, effective disruption requires targeting to focus on targets defined as "functions." For example, a "functional targeting" approach targets the artillery fire control functions of a particular unit rather than simply targeting the fire control authority.

This functional targeting approach allows for alternatives that are not available with entity targeting. In the fire control example, these alternatives include (at a minimum): destroying the fire control authority,

jamming the fire control data/information receiving capability of subordinate fire elements, spoofing the fire control authority, destroying all (or selected) fire elements being controlled, and spoofing the fire elements being controlled.

The choice of the particular alternative would be geared to the type of enemy operation being countered. To continue with the example of artillery fire control, one disruptive technique might be best for countering enemy control of artillery support used for a breakthrough operation, while another disruptive technique may be better used for countering enemy fires in a meeting engagement. And since the alternatives or the modes of optimum employment will differ depending on the type of operation being countered, it follows that the relative priorities for each target would not be constant. For example, priorities that apply in attacking a hasty defense would probably differ from those in attacking a prepared defense.

Therefore, the functional targeting process requires every friendly intelligence echelon to determine just what type(s) of enemy operations are being encountered at a particular time. The current technique of "intelligence templating" the unfolding of an enemy operation allows this sort of continuous assessment.¹⁵

- *The need for joint employment/targeting doctrine.* The disruptive deliveries and functional targeting concepts require the development of a joint doctrine that would prescribe certain delivery medium/target type options for the various air/land combat echelons. Thus it could be doctrinally directed that each echelon of the air/land warfare team be permitted and equipped to attack certain C² targets with various means.

For example, if, doctrinally, a ground division commander had the means to fire upon but not electronically disrupt a functional target and if he later determined a need for that target to be electronically disrupted (perhaps his fire was ineffective), he

could forward that requirement to the next echelon. On consideration of that request, an electronic warfare action by units (perhaps air units) equipped and doctrinally authorized would be employed to disrupt the target electronically.

Although complex, it is my opinion that with the Western lead in information correlation and other data-handling technologies, we could use these types of doctrinal employment/targeting distinctions to effect the necessary battlefield coordination. This concept is similar to current concepts for artillery and offensive air support.

• *A functional basis for counter C² organization.* What are the possible organizational arrangements as well as functional requirements for support of a counter command and control organization? Within the context of the previously recommended doctrinal employment/targeting prescriptions for each air/land echelon, the counter C² structure at each echelon should be capable of managing, in an integrated manner, the following mix of traditionally separate disciplines:

— Collection, analysis, reporting of counter C² relevant intelligence (including information on threats to friendly C²/C³).

— Communications security/operations security surveillance, analysis, and reporting to give friendly commanders an idea of how enemy intelligence is perceiving friendly operations.

— Electronic warfare, air, tube, missile deliveries (disruptive deliveries), including lethal means against enemy C² functions and attritive deliveries against *key* enemy force elements made vulnerable by induced breakdown of the enemy command and control process.

— Analysis of Red deception activities.

— Development of Blue tactical deception initiatives.

— Responsive management of friendly communications to minimize the effect of

enemy counter command and control operations.

The integrated management of these disciplines should allow for the following processes:

Analyze enemy threats and friendly vulnerabilities for defensive planning, and enemy vulnerabilities and friendly capabilities against them for offensive planning.

Apply assets to monitor enemy and friendly C³, identify enemy vulnerabilities and friendly compromises, and react with appropriate offensive and defensive tactics (e.g., communications jamming, spoofing, weapons/fire targeting, intelligence exploitation).

Evaluate effectiveness of defensive and offensive measures and provide feedback for the next iteration of analysis.¹⁶

Current Western information correlation and display technology should allow for this sort of functional integration.

COUNTER command and control, pursued as a combat medium, has the potential for significantly increasing U.S./Western war-fighting capacity, especially with regard to general-purpose forces' actions against the Warsaw Pact. I believe that the total concept of command and control warfare must be understood and evaluated within the terms of combat and force intensification potential. This evaluation must be first and foremost in the context of the battlefield. It must ignore whatever administrative programming inconveniences that result from the concept's requirement for integrated management of currently separately programmed and funded disciplines.

The overall concept of counter command and control is vital for Western military preparedness, but it presents the U.S. and her NATO allies an extreme management/organizational challenge of historical significance.

Washington, D.C.

Notes

1. Harold Brown, Secretary of Defense, *Department of Defense Annual Report, Fiscal Year 1979* (Washington, D.C., February 2, 1978), p. 100. Emphasis added.
2. The term "command and control" is used instead of "command, control, and communications." Most people first considering the problem tend to focus on the technical aspects of communications rather than assess all facets of command and control capability; "communications" is simply one important medium for support of that capability.
3. I was influenced in this assessment of the respective *Wehrmacht* and Soviet blitzkrieg concepts by a very perceptive tactical concepts briefing given by Colonel John Boyd, USAF (Ret), to an Air Staff-hosted "Battle Doctrine" seminar on 16 April 1978.
4. *Handbook on the Soviet Ground Forces*, (U), revised, SupR 69720 (Fort Huachuca, Arizona: United States Army Intelligence Center and School, July 1977), p. 2:9.
5. D. Grinkevich, "Command and Control in Response to Contemporary Requirements," *Military Herald*, April 1976, pp. 47-51. Translated in *Soviet Press Selected Translations*, 77-11, November 1977, pp. 289-96. Emphasis added.
6. Harriet F. Scott, "The Soviet High Command," *Air Force*, March 1977, p. 56.
7. Ibid.
8. V. V. Druzhinin and D. S. Kontorov, *Concept, Algorithm, Decision* (Moscow, 1972), translated and published by the USAF, 1974.
9. Ibid., p. 295.
10. Druzhinin and Kontorov, *Problems of Military Systemotechnology (Voprosi Voennoj Sistemotekhniki)*, Military Publishing House, Moscow, 1976.
11. A. A. Sidorenko, Colonel, Doctor of Military Science, *The Offensive (Nastuplenie)*, Military Publishing House, Moscow, 1970.
12. V. Ye. Savkin, Colonel, Candidate of Military Science, *The Basic Principles of Operational Art and Tactics (Osnovnye Printsipy Operativnogo Iskusstva i Taktiki)*, Military Publishing House, Moscow, 1972. Translated and published by the USAF, 1974. Emphasis added.
13. Ibid. Savkin presents a good explanation of the critical time concept on pp. 184-87.
14. This observation, while certainly not original with the author, was confirmed for him by his experience as an interrogator in the Republic of Vietnam (1969-1970). Numerous North Vietnamese officers and Viet Cong cadre explained to him that, owing to the B-52 threat, standing orders often precluded large-scale maneuver operations. This denial value of B-52 operations could not be quantified, but it was an important factor in the evolution of the war.
15. See Army FM 100-5 for a concise, unclassified discussion of intelligence templating, pp. 7:13-17.
16. The author appreciates the thoughts of Mr. Gordon Sommers, Civilian Advisor to the Commander, USAF Security Service, in development of this functional delineation.

There is no security on this earth; there is only opportunity.

General Douglas MacArthur

RESPONSIBILITY FOR DEFENSE

LIEUTENANT COLONEL DONALD L. HUTCHINSON

RECENTLY, while reading James Fallows's article, "Muscle-Bound Superpower" in the October 1979 issue of *Atlantic Monthly*, I concluded that perhaps the reason many of our defense planners are reluctant to discard reliance on management rationality and advanced technology is that they are so closely linked to our traditional beliefs in a firepower-attrition doctrine versus a maneuver doctrine. There is one thing that is clear to all of us—if you can annihilate your enemy, you will be successful in combat. The ability to outmaneuver your enemy does not necessarily lead to the same conclusion. Reliance on managerial analysis to evaluate our technologically superior weapons systems shows (though obviously there will always be someone who disagrees with the analysis) that we can annihilate our enemy if only we acquire enough of these offensive systems, and this comforts us because we are now dealing with a known capability. It is more difficult to show that we can be victorious in battle simply by outmaneuvering our enemy. When one has the responsibility for the nation's security, it is much more comforting to rely on a sure thing and optimistically hope that the resources provided will be sufficient, than to discard a winning formula in favor of an unprovable alternative. The consequences if that alternative proves to be wrong or is poorly executed are disastrous.

When one does not have the responsibility for national defense, the choice of alternatives seems easy, but to the planner the choice of a defense posture based on a maneuver doctrine is made even more difficult by two factors. First, he must be able to demonstrate to the people who approve the systems and appropriate funds our ability to succeed by using these technically advanced systems. This is more easily done with quantifiable data. Second, he must also convince our enemy, whose perceptions of our capability define reality for him, of our ability to succeed. Our enemy's perception of our capability will definitely influence his behavior whether our systems actually work or not, and that in actuality is the essence of deterrence.

I am not trying to justify or pass judgment on the actions of our defense planners. Rather I am trying to understand one more possible reason (and there are many, I am sure) why they may cling to ideas or follow a logic that seems utterly ridiculous to those who do not bear the same responsibility for the nation's defense, do not feel the same burden that is associated with making a wrong decision, or whose convictions are so strong as to remove any doubt of the superiority of an alternative way of planning our defense.

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R books
and
ideas

THEY ALSO SERVED

KENNETH P. WERRELL



A VISIT to the bookstore or even to a local drugstore or discount house will show that much is being written about World War II. Authors and publishers churn out endless floods of paper, pages of which seem to drip with blood and gore. These books, stressing the dramatic and heroic, run up an astronomical body count, nearing the 40 million actually killed in the conflict. Apparently, such an approach is profitable, for the buying public consumes the material almost as rapidly as it is produced. Unfortunately though, the important but much less bloody and dramatic home front has been neglected.

There have been studies on the home front, but none have caught the attention or imagination of the public. There are Richard Polenberg's excellent general study of the U.S. home front and Richard Lingeman's more journalistic social history. Probably a better example is John Blum's *V Was for Victory*, reviewed in an earlier issue of *Air University Review*.¹ For those interested in the broader aspects of World War II, three recently published books on the home front should also be considered.

ALAN MILWARD's *War, Economy and Society: 1939-1945*[†] is the most important and the best of the three. To his previous studies of the economies of Germany, France, and Norway during World War II,² Milward offers this scholarly economic survey of the Second World War. The author makes extensive use of foreign language sources and of the United States Strategic Bombing Survey (USSBS) in putting the economic aspects of World War II into 365 pages of text. For those readers who may want more detail on a particular

subject, footnotes and a 19-page bibliography are useful.

Milward tells how Germany got a sizable jump on the Western Allies during the period 1933-38 when the U.S. and Britain each spent only about 43 percent as much as the Germans did on arms. (p. 25) Germany's strategy of warfare of loot and profit was based on armament in width, that is, sufficient armament for immediate superiority without gearing up the economy for total war. The blitzkrieg strategy was successful until the continued resistance of Britain and Russia turned the war into a conflict dependent on mass armies and mass production. Germany's short war strategy failed in the protracted conflict that followed, for the Allies had the advantages of greater resources and having begun total mobilization sooner than the Axis. As early as 1941, Allied production was equivalent to Axis production, and, by 1944, the Allies were outproducing the Axis three to one, with the U.S. producing 40 percent of the world's armaments. (pp. 57, 67) The American contribution to production was unmatched. The U.S. supplied not only her own troops but extended massive assistance to her Allies as well. One example is the American production of almost 300,000 aircraft, only slightly below the combined wartime production (305,000) of Germany, Britain, and Japan; Russia produced about 137,000 aircraft. (p. 74) If adjustments are made for size and complexity of the aircraft produced, the U.S. edge would be even greater. The official Army Air Forces history estimates that in 1944 the combined airframe weight produced by Britain, Germany, Japan, and Russia was less than two-thirds that of the U.S. production.³

Milward can be provocative. For exam-

[†]Alan S. Milward, *War, Economy and Society: 1939-1945* (Berkeley: University of California Press, 1977, \$12.95), 365 pages, bibliography.

ple, he asserts that: "there is no convincing evidence that the overall speed of technological advance was greater in wartime." (p. 180) Here is one place where further explanation and footnotes would have been welcomed. Another, better developed idea, although certainly worthy of even greater attention, concerns the contrast between the Allies' success with aviation and their relative failure with armor. Milward states that the strong American commercial aviation base helps explain the former while a number of factors account for the latter. He includes the initial Allied decision to field highly mobile but lightly armored tanks, long lead times, and tactical doctrine. Another factor he mentions is that both the U.S. and Britain emphasized air and sea forces over ground forces. (pp. 40, 182-83, 295).

Milward discusses control of the wartime economies, the economies of the occupied countries, and such topics as technology, labor, finances, and agriculture. He also touches on such diverse subjects as the economic impact of the war on the economies of the smaller countries and on women, as well as the Bengal famine that left 1,500,000 people dead.

Unlike many another author, Milward shows an understanding of the strategic air war, which, in light of his fine study on the German economy, is to be expected. Strategic bombing is discussed in a 34-page chapter which, within the limits of the book and relative to the discussion of other topics, adequately covers the subject. He writes that air warfare fell short of Allied expectations because the bomber was not as potent as expected, the bombing campaign lacked the required continuity, the Axis powers were able to adapt to both their opponents'

tactics and their own weaknesses, and because the economic systems were more complex than anyone had anticipated. Nothing new or startling here, reflecting Milward's reliance on the USSBS studies. (pp. 298-99)

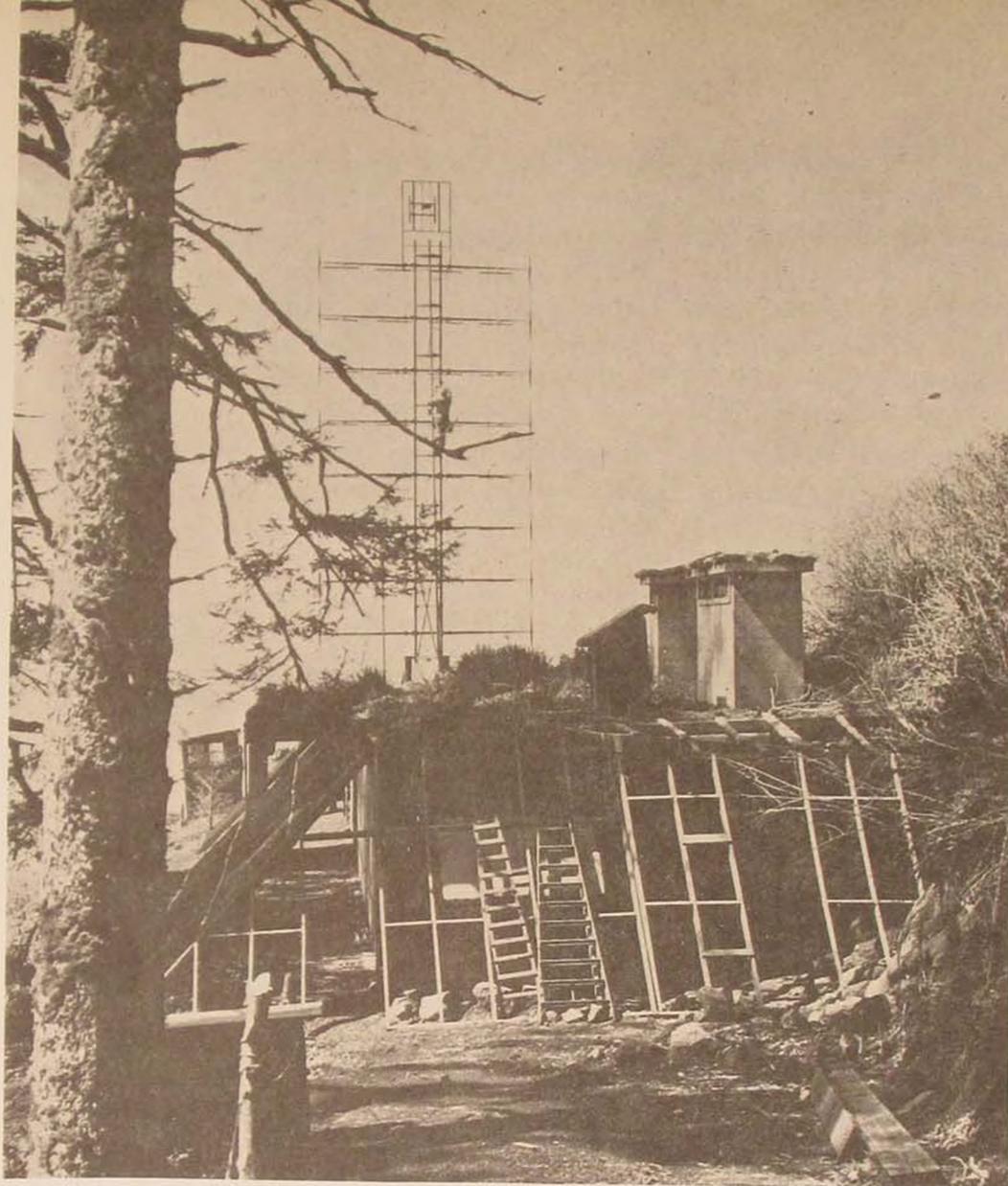
Milward's effort is to be applauded as a badly needed and well-done scholarly survey, covering the important aspects of a significant and neglected subject. In light of the scope of the topic and the space available, Milward has done a fine job.

BUT there are other ways to approach the home front story. *Americans Remember the Home Front*[†] is just that—quite a different kind of book, approaching the subject through the recollections of 200 Americans on the home front. Author Roy Hoopes writes that "maybe, with a little poetic license, a hundred people can speak for a hundred million." (p. xiv) Perhaps.

Certainly some doubt the utility of oral history. Others will criticize Hoopes's sample as unrepresentative; indeed, it does seem to consist mainly of successful, middle-class, college-educated folk. Another weakness is the decided lack of editing, which results in overlong segments, apparently randomly arranged, and, at times, seemingly endless trivia.

For those undaunted by these real and potential problems, there are redeeming qualities. The interviews occasionally sparkle with the excitement, the prowar feeling, and the patriotism of Americans engaged in a war they believed in. The reader senses and is almost overwhelmed with the feeling of the American people being brought together for and by the common endeavor, a refreshing contrast with more recent experience.

[†]Roy Hoopes, *Americans Remember the Home Front: An Oral Narrative* (New York: Hawthorn, 1977, \$12.95), 395 pages.



Home front '44

An aspect of life in the United States during World War II that was carefully shielded from public view at that time and is generally forgotten today was the emergence of early warning radar sites along our coastlines.

The SCR-271-D radar site (above) and the SCR-588 with its radio link (right) are identified by their wartime captions only as the spring of 1944 in "the Portland area," whether in Maine or Oregon requires sharper eyes than ours.



Other impressions abound, some of which are of current interest. Coverage of the progress and difficulties of blacks and women, two groups that prospered during the war, is good. The other is that the most serious difficulty encountered on the home front was not food rationing, blackouts, air raid drills, or the like, but gasoline rationing.

The final three chapters are very good, much better than the bulk of the book. One entitled "The Ultimate Cost of Victory," deals with the reaction of civilians toward the death and capture of their loved ones. It is truly marvelous and worthy of being read by all.

So, *Americans Remember the Home Front* is what its title proclaims. Because it is very personal, it will probably be of greater popular interest than either of the other books reviewed here.

A THIRD approach to the home front is that of a detailed study of a limited topic. Michael Sherry does just this in his *Preparing for the Next War*, the contents of which are better described by the subtitle, *America Plans for Postwar Defense, 1941-45*.[†] Sherry's object is to give an overall view of the U.S. military's wartime planning, concentrating on the Army.⁴

The book is not only based on extensive research and documentation but, in addition, is also well written. The heart of the book is the discussion of universal military training. Sherry insists that a "determined, well-organized, and articulate opposition," bad timing, and the fortunes of war defeated the measure. (pp. 74-75) While this probably explains specific events in the 1940s, Sherry does not consider the Ameri-

can antimilitary tradition and the more important and deeper question: Can America ever adopt universal military training?⁵

Airmen should be alerted that they may be put off by this book. First, Sherry uses rather pejorative language in referring to aviators; employing such adjectives as "ambitious" and "brash" and such phrases as "strategic air power infected the air staff" and the "melodramatic AAF effort." (pp. 19, 96, 109, 227) Second and more serious is the author's failure to appreciate air warfare, especially strategic bombing in World War II. A comparison of Milward's treatment with Sherry's makes that point. Sherry, like so many others, is guilty of citing and quoting USSBS but not reading it very deeply. He does not mention the impact of Allied air superiority or the oil campaign on the course of the war. Pertinent to Sherry's work regarding the AAF position on postwar policy are the concluding three pages of USSBS's *Over-all Report*, especially the next to last paragraph:

Speed, range, and striking power for the air weapons of the future, as indicated by the signposts of the war in Europe must—specifically—be reckoned with in any plans for increased security and strength. The combination of the atomic bomb with remote control projectiles of ocean-spanning range stands as a possibility which is awesome and frightful to contemplate.⁶

Another issue not fully developed is that of the Soviet threat. Sherry never makes clear whether the Soviets were a threat in 1945 or not. Had this point been clarified, the author's conclusions might be more soundly based.

Sherry concludes that the postwar growth of America's military resulted from economic and power factors as well as military plan-

[†]Michael S. Sherry, *Preparing for the Next War: America Plans for Postwar Defense, 1941-45* (New Haven, Connecticut: Yale University Press, 1977, \$12.50), 238 pages.

ning, which he labels "an ideology of preparedness." He claims this mentality emerged before the end of the war and before the U.S.-Soviet rivalry. But in view of the oscillating fortunes of the U.S. military in the years since 1945, this argument is difficult to support.

Sherry is clearly on target on occasion, such as when he writes that "policymakers developed a misguided faith in American technology, especially air power and nuclear weapons, to deter or check future aggressions." (p. 237) That he is often far afield, though, is probably no more evident than in the book's concluding lines:

Determined never again to be caught off guard by a Hitler, they [America's soldiers and scientists] set out to patrol the world in the interests of peace. They seemed unaware that they might provoke other nations as much as pacify them. In 1945, the alternative to preparedness and global peacekeeping appeared to the policymakers to invite national suicide. The course they ultimately followed became for the world, including the United States, substantially as dangerous. (p. 238)

All in all, Sherry's survey is an important work on a little studied subject. While it will not have much popular appeal and may be criticized by some, students of military policy in the post-World War II period will have to come to grips with it.

THESE books indicate how little study has been done on the home front and that there are important and neglected aspects of the subject that need to be explored. But, with the exception of the oral history approach, these same studies show no possibility of rivaling the popularity of battle history. The overwhelming fact is that the number and impact of combat histories push studies of noncombat activities into relative unimportance. A more realistic approach, that is a balanced view of how the war was fought and won, would give the home front more prominence. Such a view is shared by neither the public nor the publishers; but the student of World War II who does not give the home front the greater attention it deserves, unnecessarily limits the value of his work.

Radford, Virginia

Notes

1. Richard Polenberg, *War and Society: The United States 1941-1945* (Philadelphia, 1972); Richard Lingeman, *Don't You Know There's a War On?* (New York: 1970); John M. Blum, *V Was for Victory: Politics and American Culture during World War II* (New York, 1976), reviewed by Captain Robert C. Ehrhart in *Air University Review*, July-August 1978, p. 92. Also see Keith L. Nelson, editor, *The Impact of War on American Life: The Twentieth-Century Experience* (New York, 1971), an anthology with a valuable bibliography.

2. *The German Economy at War* (London, 1965); *The New Order and The French Economy* (London, 1970); *The Fascist Economy in Norway* (Oxford, 1972).

3. Frank Craven and James Cate, editors, *The Army Air Forces*

in World War II, Vol. VI: Men and Planes (Chicago, 1955), pp. 350-51.

4. See Perry M. Smith, *The Air Force Plans for Peace, 1943-1945* (Baltimore, 1970); Vincent Davis, *Postwar Defense Policy and the U.S. Navy, 1943-1946* (Chapel Hill, North Carolina, 1966); and William M. Wix, "The Army's Plans for Its Postwar Role, 1943-1945," Ph.D. dissertation, Columbia University, 1976.

5. The author uses Robert Ward's 1957 University of North Carolina Ph.D. dissertation, "The Movement for Universal Military Training in the United States, 1942-1952." A more recent study is Frank D. Cunningham, "The Army and Universal Military Training, 1942-1948," Ph.D. dissertation, University of Texas, 1976.

6. United States Strategic Bombing Survey, *Over-all Report (European War)* (Washington: GPO, 1945), p. 109.

SOVIET POWER ON THE THRESHOLD OF THE EIGHTIES

DR. JOSEPH E. THACH, JR.

IF any consensus can be derived from Western analytical perspectives on the contemporary Soviet scene, it is that the 1980s probably will not differ measurably from the 1970s with respect to the U.S.S.R.'s major domestic and foreign policy thrusts. Current Soviet writings, and particularly high-level party and state policy pronouncements, further reinforce this admittedly cautious but not complacent trend projection. Barring unforeseen events that might alter current Soviet internal programs and international policies, this predictable trend reflects neither extreme optimism nor abject pessimism for the probable course of Soviet affairs. Even with probable leadership changes, the absence of prominent reform elements in the Communist Party elite hardly optimizes prospects for significant systemic alterations in the post-Brezhnev context.

In the event then, it may be worthwhile for the West to evaluate the Soviet system intensively in order to reach a broader understanding of the system itself and attain a better indication of its traditional domestic bases and current external projections of national power. One work that provides significant current reference data on just about every aspect of Soviet domestic and international affairs is *USSR Facts and Figures Annual (UFFA)*, under the editorial direction of Professor John L. Scherer.[†] As the first volume of a continuing series, *UFFA* presents the latest possible data on Party and Soviet state affairs, armed forces organiza-

tion, and the vital economic sector, as well as a number of other significant aspects of the Soviet system.

Although the publisher's deadline evidently affected the editorial effort, in that 1976 data are the latest reflected in the work, *UFFA* presents a wide array of recent source material and has significant value as a current reference work. For those who seek data on the major internal sources of Soviet power, *UFFA* is especially useful in pointing out the readily apparent Soviet emphasis on intensive and interlocking organizational structures throughout the entire party-state apparatus. *UFFA* coverage of these organizational and administrative areas also makes it quite obvious that the Communist Party of the Soviet Union (CPSU), while still a distinct minority party after sixty years in power, far exceeds the quantitative weight of its membership (about 6 percent of nearly 260 million people) in maintaining control of the Soviet state. Briefly put, this initial edition stands on its own merits as a solid research effort that is both timely and comprehensive in its coverage of Soviet affairs. As the Soviet system enters its seventh decade, one hopes that future editions will maintain this excellent precedent as a reference guide to both its internal sources and external projections of power.

IN another approach to Soviet power, Colonel M. P. Skirido provides a

[†]John L. Scherer, editor, *USSR Facts and Figures Annual (UFFA)*, vol. I (Miami: Academic International Press, 1977, \$31.50), 320 pages.

firsthand assessment of the socioeconomic elements of Soviet national strength in his characterization of the continued CPSU monopoly of power within the huge Soviet state.† A recent addition to the U.S. Air Force translation series, this 1970 work gives an inside glimpse into CPSU dominance of the military and other key socioeconomic areas that remain vital to the continued maintenance of a powerful Soviet national security posture. Lest someone assert that Skirido's work is of predétente vintage and, hence, out of step with more recent Soviet perspectives, travelers to the U.S.S.R. report that it remains on prominent display in Soviet military bookshops after some ten years in print.

Primarily concerned with military matters and the essential role of the Soviet population in supporting the defense effort, both past and present, it seems fairly obvious that the author might have added "the Party" to the book's title. Colonel Skirido, who prepared this work while a senior faculty expert on Marxism-Leninism at the Soviet Armed Forces General Staff Academy, declares without hesitation: "The strength and invincibility of the Soviet people and their army are attributable to the wise and battle-seasoned Communist Party." (p. 165) Ideological propaganda—yes; an accurate portrayal of who controls the Soviet system—without a doubt! Nor does he shy away from identifying the U.S.S.R.'s *glavnyy vrag* ("main enemy"), which requires the peace-loving Soviet state to maintain its huge offensive-oriented military establishment:

The principal organizer and inspirer of imperialist aggression is the U.S. *American im-*

perialism constitutes the principal threat to peace in the entire world. It is preparing to commit the most terrible crime against mankind, i.e., a thermonuclear world war. (Italics in original, p. 7)

While it is worth noting that ten years have passed and the U.S. has not revealed any such inclination to initiate a nuclear holocaust involving the Soviet Union, one should also observe that the détente-era "relaxation of tensions" also has not resulted in any less vehement ideological characterizations of the United States in Soviet writings. Most current publications, and particularly those emanating from the Soviet military press, tend to reinforce Skirido's officially endorsed assertions of 1970. Also suggestive of this thematic consistency, Colonel-Doctor Skirido has since departed from the General Staff Academy and now is a research professor at Moscow University's G. V. Plekhanov Institute of the Economy. (The Plekhanov Institute, a prominent Soviet "think tank," is often consulted by the Soviet decision-making elite regarding such national security matters as SALT, MBFR, and Soviet-American economic relations.)

IF Skirido furnishes an all-too-familiar inside view of the CPSU's direction and control of the total Soviet effort to achieve superiority over its ideological enemies, Professor Roy Godson's insightful monograph on Soviet efforts to gain influence within the international labor movement furnishes another dimension to its current projections of power abroad.†† While the CPSU has long since reduced Soviet la-

†Colonel M. P. Skirido, *The People, The Army, The Commander*, USAF "Soviet Military Thought" series, No. 14 (Washington: U.S. Government Printing Office, 1977, price not given), 166 pages.

††Roy Godson, *The Kremlin and Labor: A Study in National Security Policy* (New York: Crane, Russak and Company, 1977, \$3.25 paper), 79 pages.

bor unions into useful mechanisms for full control over its workers, it also has maintained an active interest in gaining control of non-Communist labor organizations elsewhere as an important means of altering the global *sootnosheniye sil* ("correlation of forces") in its favor. Godson observes that despite heavy setbacks during the immediate postwar years, the Soviets have continued their efforts with both renewed vigor and considerable sophistication over the past decade. He also points out that this huge Soviet campaign, particularly in the Third World, has included a consistently substantial expenditure of human and financial resources which, in spite of recent exposés, makes earlier U.S. and Western counter-efforts appear rather puny by comparison.

His treatment of CPSU direction of this effort through the Soviet-controlled international labor front organization, the World Federation of Trade Unions (WFTU) and its regional counterparts, deserves careful consideration for its assessment of current activities by this oft-overlooked, quasi-official instrument of Soviet external policy. For the 1980s, Godson believes that Soviet efforts to gain influence among international labor will continue as an "indirect approach" mechanism in complete coordination with more overt projections of its global politico-military power. As a possible countermeasure, he strongly recommends that the West develop a concerted strategic program to deny any further attempts to capture this vital human resource.

LAST, but certainly very meaningful for this new decade, is the critical issue of Soviet-American détente. Amidst a steady stream of topical works that have appeared since the signing of the initial

SALT accords in May 1972, one book that merits attention for its coverage and perspectives is Richard Barnet's *The Giants*.[†] Quite similar in approach to his previous studies that exposed the inner workings of multinational corporations and international arms merchants, Barnet's historical development of sixty years of Soviet-American relations bears with it a certain bias toward the superpowers' political elites. From his rather revisionistic viewpoint, these rival elites appear to have somehow fumbled and blundered their respective ways over the past six decades into the common realization that they *do* share a number of vital interests, particularly the avoidance of a devastating nuclear war, in spite of their widely divergent ideological belief systems and gross misperceptions about one another. Not that Barnet errs in his basic facts or historical coverage, but he does tend to carry his arguments to rather tenuous extremes. It is as if the author expects his readers to don sackcloth and ashes in expiation for Ambassador William C. Bullitt's deep mistrust of the Stalinist regime back in the 1930s or Cardinal Spellman's well-founded animosity toward communism two decades later. Nor will military readers find much comfort in that he seems to equate "military" with "militarism," and the *Doctor Strangelove* image of General Jack D. Ripper looms large in his reflections on the influence of the U.S. Armed Forces leadership on the détente process. Likewise, an evident downplay of the avowed Soviet detachment of "ideological struggle" from détente seems to equate periodic shifts in Soviet tactics with overall strategic aims as he traces the first five years of the post-1972 U.S.-Soviet relationship. While it may be true that official U.S. policies and perceptions have tended to shift in one direction

[†]Richard J. Barnet, *The Giants: Russia and America* (New York: Simon and Schuster, 1977, \$7.95), 190 pages.

or the other in nearly every decade since 1917, it is much more correct that the Soviet leadership has never renounced its longstanding ideological intent to achieve final victory over the "imperialistic" West. Moreover, immediate circumstances more critical to Western survival than traditional misperceptions brought the two superpowers into confrontations over Berlin in 1961 and the Cuban missile crisis the following year. While sharing the author's optimism for the future durability of détente, it is also difficult to concur with the objectivity of his analytical perspectives. For that reason, this work does not represent the final word on this most crucial issue of our times.

WHILE it may be prudent to forecast that the domestic roots and external projections of Soviet power in the 1980s will not vary

widely from their current scope and thrusts, this outlook is hardly complacent. If anything, the substantial expansion of Soviet military and economic power during the post-1960 "Revolution in Military Affairs" offers lesson enough for the coming decade. The additional Soviet inclination to project this power and influence in many areas abroad, especially in the Third World, and its apparently nonnegotiable insistence on continued ideological struggle with the "imperialist bloc" leave an obvious implication that the West will face a multifaceted, highly sophisticated Soviet challenge in the years ahead. Understanding the full essence of that challenge in its current context may well represent a meaningful first step in formulating an effective Western response for the future.

Annandale, Virginia

KILLING IN THE NIGHT SKY

DONALD M. BISHOP

BECAUSE of the profusion of aviation books now pouring off the presses, the officer interested in the study of air war in its personal, technical, and tactical dimensions must buy and read very selectively, for only a very few are written with an eye toward the profession. Among these are *Full Circle* by Group Captain Johnny Johnson and *The First and the Last* by Adolph Galland. Two additional recent publications deal historically with the special requirements of air warfare at night. "All flying is uplifting and exciting," writes Bill Gunston. "Flying to fight other fliers is more exciting still. But flying to fight by night reaches pinnacles of human experience that are touched but rarely."

Gunston's book, *Night Fighters*,[†] is a formal history of night air fighting from World War I to the present. Gunston, himself a World War II night fighter pilot who later became editor of *Flight* magazine, has produced a rare book—one which combines with economy and style the story of tactics, aircraft, equipment, and men over six decades.

Historically, the successful engagement of aircraft at night has been the result of the development of radar. But the problems first arose during World War I. In a lively opening chapter, Gunston brushes the peculiar blend of incompetence and disorganization on one hand and ingenuity and bald bravery on the other that characterized attempts by the British to intercept and down

German Zeppelins and bombers operating at night over England. In the age of over-the-horizon radar and data link, who can imagine the British solution to the detection problem?

Sound seemed to be the only way of establishing the direction of night bombers. Humans have two ears, and binaural listening was once (and still is, among primitive peoples) vital to the accurate hunting of game. Today the most accurate binaural hearing is possessed by people who have lost their other distantly stimulated sense, sight. Blind people had top priority in south-east England in September 1917, and soon they were able to give a fairly accurate bearing on a Gotha at a range of up to five miles. (p. 24)

By the end of the war, the British had made great progress in developing an interception system and in "lashing-up" day fighters to perform night interceptions (by modifying the guns, for instance, to suppress the flash, which would destroy the pilot's night vision). By the end of the war, German losses over England were serious.

Between World War I and World War II, the problem of night flying, let alone night interception, was neglected, and the technological developments that would ultimately lead to the development of night combat were ignored. In 1931, King George V attended a lecture on sonar developments and asked, in a moment of offhand inspiration, whether electronic waves could be reflected off aircraft in the same way that

[†]Bill Gunston, *Night Fighters: A Development and Combat History* (New York: Charles Scribner's Sons, 1976, \$8.95), 192 pages.

sound waves bounced off submarines. The lecturer assured the king that such was an impossibility.

During the 1930s, however, the idea of radar was conceived of in the United States, Germany, and Great Britain. The United States made some initial advances; the Germans proceeded to develop radar detection and antiaircraft gun control systems. In Britain, however, the problem was ignored until it was referred by chance to a government electrical engineer, Robert Watson-Watt. He conceived the entire system of radar defense in a short time, and the British soon outdistanced the other powers in radar development. The development of the theory, hardware, aircraft, and, above all, the coordinated radar defense system is given thorough attention by Gunston, and he describes as well the separate problems faced by the "boffins" (research scientists) in developing airborne microwave radar for use by night fighters.

GUNSTON'S developmental history is nicely complemented for the period of World War II by another book which skillfully combines tactics, hardware, and personal experience. Early in World War II, Jeremy Howard-Williams joined the Royal Air Force and was assigned to the then emerging night fighters. *Night Intruder* is his personal account of how radar altered the air combat environment in World War II.[†]

The author flew combat with both 604 Squadron, the pioneers of night fighting, and with the RAF's Fighter Development Unit, which had the mission of testing the latest products of the electronic laboratories in combat. His experience went far beyond

that of the average line pilot. In the development unit, he flew in British, American, and captured German aircraft and used every type of airborne radar. He tested new equipment by flying "intruder" sorties over Germany. His expertise gives the book special authority and relevance for the student and practitioner of air war.

In three respects *Night Intruder* is noteworthy. The personal side of the night war comes through in abundant excerpts from the author's diary—skillful, literary entries which relate both the tactics and the spirit of night fighter crews. The technical aspect of the war is presented in the accompanying narrative, which is enhanced by very clear diagrams of the radar coverage and scope display of the different airborne interception radars used by the RAF. The author also adds a historical dimension by comparing British measures with the contemporary Luftwaffe efforts.

Personal narratives of the air war over Europe are commonplace, but Jeremy Howard-Williams has produced a book that successfully combines reminiscence and history in a fine fashion. Though his memoir lacks the precision and detail of a formal military history, it is entertaining and, above all, instructive.

As Gunston and Howard-Williams both demonstrate, night fighting per se reached its climax in the closing years of World War II. German night fighters penetrated the British bomber streams, using either their own radars or homing in on the bombers' own electronic emissions. British intruders accompanied the stream and did battle with the German fighters. And both sides sought to foil (forgive the pun) ground radar systems with primitive electronic countermeasures. There are enough lessons to be

[†]Jeremy Howard-Williams, *Night Intruder: A Personal Account of the Radar War between the RAF and Luftwaffe Nightfighter Forces* (North Pomfret, Vermont: David and Charles, 1977, \$13.95), 184 pages.

learned from World War II alone to occupy air strategists for a lifetime. Indeed, Gunston includes in one chapter, "Riddles of the Night Sky," twenty tactical, developmental, and doctrinal questions that stem from historical experience (thirteen from World War II); they should be mandatory reading for all air tacticians.

After World War II, development continued. Gunston follows the story of night warfare from the early jets to the F-15; his narrative is not quite so detailed and compelling for the years after Korea, however, perhaps because of the difficulties of security classification. Moreover, night fighting is no longer a distinct subset of air combat.

Now all advanced aircraft are designed with radar systems for all-weather use; they can be easily adapted for night combat.

Well illustrated with photographs and diagrams, carefully written to avoid jargon, short, lively, and professional, these two books might well occupy a prominent place on the airman's bookshelf. They are more than flying stories; they are highly useful accounts of a specialized kind of warfare. They are important studies of radar and air defense and such related concerns as instrument and bad-weather flying and air traffic control.

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POTPOURRI

Oil, the Arab-Israel Dispute and the Industrial World: Horizons of Crisis edited by J. C. Hurewitz. Boulder, Colorado: Westview Press, 1976, 331 pages, \$6.95.

The Middle East: Critical Choices for the United States edited by E. V. Rostow. Boulder, Colorado: Westview Press, 1976, 211 pages, \$15.00.

These two books bring together a variety of essays and conference speeches on a wide range of topics relating to politics, oil, war, and the Middle East. Some are the dispassionate appraisals of scientists, while others appear to be the petulant carplings of bureaucrats overlooked for high-level posts. Whatever the bias of these authors, the general tone of most essays is, at the very least, a sensible, reasoned, and well-thought-out expression of middle-ground opinions. In a world plagued by questions of petrodollar recycling, energy autarky, shifting political alignments, and chaos in our industrial system which strain our national tolerance for ambiguity and cry out for the catharsis of simplistic solutions, can we ask for more? The editors, Eugene V. Rostow and J. C. Hurewitz, have gathered a circumspect restatement of basic positions and left the judgment to us as it should be. For in the absence of a genius with the capacity for providential synthesis, we are all thrown back on our abilities to formulate a response.

There is much in both these collections that recommends itself to our attention. I shall, however, devote my remarks only to those sections which are of interest to my audience: military matters, foreign policy, and oil. In Rostow's book, *The Middle East: Critical Choices for the United States*, the view is not very optimistic. Admiral Elmo Zumwalt points out in his contribution, "SALT, Détente and the Middle East," that the Soviet Union has not substantially changed its policy in the Middle East for a number of years. The admiral indicates the many ways the Soviets have violated the spirit of détente at the time of the Yom Kippur War. He states that the Soviets withdrew their advisers from Egypt and Syria in 1973 and then went on strategic alert without prior warning, which violated the 1972 summit agreement. The Soviets also urged the Arabs to employ an oil embargo against the West, goaded the Organization of Petroleum Exporting Countries (OPEC) to quadruple oil

prices, promised to protect the Arabs from economic retaliation, assured them that Russia could prevent U.S. military intervention, and challenged with an ultimatum the success of the Israeli Army in surrounding Egyptian forces in the Sinai. If this is détente, reasons the writer, then any sacrifice of Israel in its name must rank as a moral travesty.

Professor Edward Luttwak of Johns Hopkins University voices the same concerns in his article, "The Strategic Nuclear Balance." He argues that the doctrine of mutual assured destruction (MAD), which was initially intended to represent a floor for nuclear weapons, soon became an official ceiling that has allowed the Soviet Union to develop its recently acknowledged advantage in ballistic weaponry. These doctrinal principles, he contends, inhere in an ingenuous American attitude toward power which requires its continual justification, especially if power is to be deployed to achieve objectives on a continuing basis. The Soviet Union suffers no such qualms. Therefore, the author states, it is not unreasonable to expect that the volatile political climate in the Middle East might trigger a nuclear exchange that could only result in a Russian victory.

J. C. Hurewitz's collection, *Oil, the Arab-Israel Dispute and the Industrial World: Horizons of Crisis*, shares the general tone of the Rostow book. Paul Jabber's essay "Petrodollars, Arms Trade, and the Pattern of Major Conflicts" addresses the question of arms and oil. Jabber claims that a new generation of low-cost, high-accuracy weapons with considerable versatility in development may either threaten or stabilize the Middle East. He speculates on future scenarios in the region resulting from these new petropolitical conditions. We may see a political settlement based on arms control and partial dismemberment of existing weapon stockpiles. Jabber views this as an optimum situation. He also perceives the possibility of a future cold war based on an increase in the arms race, whereby a nuclear balance of terror may come into existence. Finally, the author concludes that a settlement may be reached with a built-in quotient of potential instability that would revolve around the unresolved military relations between the new Palestinian state and its neighbors. At any rate, the balance of power concept has never worked in the Middle East, especially now that arms transfers have become an instrument of U.S. economic policy vis-à-vis the oil-rich Arabs.

I found much more material of interest in these collections too lengthy to comment on in detail. If the military reader makes his own judicious selection, he is bound to come out with a fairly well-rounded view of the problems facing the Middle East today.

Dr. Lewis Ware
Air University

Youth or Experience? Manning the Modern Military by Martin Binkin and Irene Kyriakopoulos. Washington, D.C.: Brookings Institution, 1979, 84 pages, \$2.95 paper.

I could just cry. Martin Binkin and Irene Kyriakopoulos have written a tight little torpedo titled *Youth or Experience? Manning the Modern Military* that should be read by every military professional. I cry because it won't be read by enough of us. This well-written Brookings study drives a wooden stake deep into the heart of the traditional military religion that worships the god of youth.

Youth is no longer worth the price; at least that's the bottom line of this well-documented look at enlisted manning. After an unemotional and carefully researched analysis of recruiting, training, and retention costs, occupational needs, pay, retirement, technological demands, economic realities, and demographic changes, the authors methodically march the reader to the conclusion that the Pentagon should abandon traditional policies that support a young, inexperienced military force. This study is not a cavalier suggestion that menopausal men and women man the front lines, but rather a cautious appraisal of how an increasingly technical force can be maintained in an environment of shrinking manpower pools and soaring training costs. We must seek, it is suggested, the retention of certain skilled personnel for longer periods of service—even to the age of 55. The possibilities for reducing costs while increasing the effectiveness of our armed forces is the tough thread of logic that unerringly guides the reader through the analysis.

I sincerely hope the authors apply their analytical framework to a future effort aimed at the officer corps. I'll bet a paycheck the conclusions are consistent—youth no longer deserves its vaunted position in a world where experience is becoming more critical, is more effective, and is less expensive.

Lieutenant Colonel H. A. Staley, USAF
Air Command and Staff College

Liddell Hart: A Study of His Military Thought by Brian Bond. New Brunswick, New Jersey: Rutgers University Press, 1977, 275 pages, appendixes, index, \$14.95.

Brian Bond has admirably sketched the ideas and impact of one of the foremost military thinkers of this century, Basil H. Liddell Hart. His purpose has been

"to put Liddell Hart's military thought in proper perspective by tracing the origins and development of his principal ideas over his whole career." The author is ideally suited for this task because he alone has been given unrestricted access to Liddell Hart's extensive files; he also enjoyed Liddell Hart's friendship for over a decade. Even so, Bond maintains his objectivity—one of the book's major strengths.

It was between the World Wars that Liddell Hart developed and refined his two major ideas, limited liability and mechanization. Liddell Hart believed that Britain's army should not become entangled on the continent as it had in 1914; rather, it should rely on the other, more indirect means of influencing events. This belief evolved into the theory delineated in his famous work, *Strategy: The Indirect Approach*. But Liddell Hart was also instrumental in formulating a new theory of warfare that employed tanks and mechanized infantry—the germ of blitzkrieg. This theory became reality during World War II.

During the war Liddell Hart severely criticized Winston Churchill and the Allied strategy of unconditional surrender. Like his noted contemporary, Major General J. F. C. Fuller, Liddell Hart believed such a strategy would be disastrous. He felt Germany's destruction would create a vacuum in Central Europe that only the Soviets could fill. Largely because of his outspoken criticisms, Liddell Hart suffered an eclipse in his professional career which did not abate until after the war.

As the war ended, Liddell Hart realized that the atomic bomb marked a watershed in history, and he became one of the first to reflect on this new weapon and try to discern its impact. He concluded that nuclear weapons did not make war obsolete but rather *increased* the likelihood of limited wars. In this he has proved remarkably accurate.

Bond also addresses the difficult question of Liddell Hart's influence on the German generals. The link between Liddell Hart and the German officer corps rests largely on statements made by various generals after the war. Men like Guderian and von Manstein stated that their tank doctrine owed a great deal to the writings of Liddell Hart. Bond points out, however, that such claims must be weighed carefully. Liddell Hart was opposed to the Nuremberg trials, feeling such trials were unjust and that the German officer corps had been amazingly humane throughout the war. He published numerous articles to this effect and extended courtesies to imprisoned German generals. The author suggests that perhaps these officers appreciated these efforts in an otherwise hostile environment and, therefore, were more laudatory about Liddell Hart's influence than was actually the case.

Overall, Bond has done well at distilling the thought of Liddell Hart, showing him to be a compas-

sionate, sincere, and incisive thinker who had an enormous impact on the conduct of war during his lifetime. An excellent book: clear, thorough, and objective.

Captain Phillip S. Meilinger, USAF
Department of History
United States Air Force Academy

New Means of Financing International Needs by Eleanor B. Steinberg and Joseph A. Yager. Washington, D.C.: Brookings Institution, 1978, 256 pages, \$11.95 cloth, \$4.95 paper.

If the reader thinks the world suffers from an inadequate system for transferring resources from rich nations to poor nations, this book by Brookings Institution staffers has some ideas to ponder. The authors proceed from the assumptions that the international community needs more and more money to deal with developmental and environmental problems, and they are not certain current arrangements can meet the need.

The gap between resources and needs could be partly closed, they assert, by international revenue taxes, e.g., charges for use of the international commons (waters, air space, or telecommunications frequencies). Other possible revenue sources include levies on investment income, financial transactions, or international trade (a .1 percent ad valorem tax on 1977 total world trade would have yielded \$1 billion), on selected items of international commerce such as oil, or on nonliving ocean resources such as manganese nodules. Taxes on polluters of the air and the oceans get considerable attention from the authors, the main purpose of these taxes' being behavior modification.

What the authors suggest is no less than a revolutionary approach to international fund-raising. Readily recognizing that the power to tax is an attribute of sovereignty and that no such internationally sovereign body now exists, they view "each approach as a possible subject for negotiation and the totality of approaches as a complex area for 'international bargaining.'"

Given the likelihood of increasing pressures from lesser developed countries for resource sharing and transfer from the industrialized nations, a quick reading of this book would be useful.

Dr. James H. Buck
Air War College

The Wired Society by James Martin. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1978, 300 pages, \$12.95.

Last year was not a good public relations year for technology. Oil spills near the Brittany coast, nuclear trauma in Pennsylvania, and poisoned milk in Michigan are but a few of the many reminders that living in a technological age can have its disadvantages.

Ecologists remind us daily that if we do not clean up our act, our progeny may inherit a bequest more gruesome than even science fiction has yet imagined. Conservationists and others have rightly pointed to the fact that our consumer habits and throw-away life-style could lead to waste and devastation on a grand scale.

"It is technology," writes James Martin, "that has created this dilemma, and yet the only way out of the dilemma is more technology." Far from being a prophet of doom, which many of today's antitechnology activists have become, Martin is decidedly protechnology in his approach to our latter twentieth century problems. "To abandon technology or to stop further development would mean starvation on a scale the planet has never known before. . . . What must happen instead is identification and development of those technologies which are in harmony with nature."

Martin, who has written a dozen other books on computers and data processing, sees the current revolution in telecommunications as one form of technology in harmony with both nature and the times in which we live. In *The Wired Society*, he describes in simplistic but vivid terms how the coming changes in telecommunications will affect our work patterns, leisure time, education, health care, and industry. In fact, he says, "the entire texture of society will be changed by telecommunications and related products."

While there appear to be natural limits to growth in other fields, Martin sees no boundaries in the near term for telecommunications and electronic technology. A problem arises, however, when we introduce governments and private interests into the picture. While a better mousetrap or newer pocket calculator is likely to reach the marketplace soon after its invention, the same is not necessarily true in the communications media. A complex set of laws and special interests governs communications in the United States, and a new technology may not easily fit into the existing structure.

The main reason for such obstacles to the marketplace, according to Martin, is that "when new technology is introduced, large organizations committed to an older technology can be hurt." Also, many of the telecommunications innovations described in *The*

Wired Society are in conflict with the existing order and are likely to encounter fierce opposition from vested interests.

If such resistance to innovation can be overcome, it may be possible to revolutionize and substantially improve the ways in which we live, while exercising concern for our environment and the legacy of future generations.

Martin provides an intriguing look at a society of the twenty-first century based on expanded applications of telecommunications, all predicated on existing technology; there are no magic carpets or non-existent energy beams involved. We can do it all, he says, with the knowledge and resources available today. Special interests, unnecessary governmental regulation, and misplaced profit motives in the private sector, however, may delay any real progress.

Martin has shown us a vision reminiscent of McLuhan's "Global Village" — a better life through existing technology, particularly through enhanced applications of telecommunications. And he has identified the obstacles to success. Unfortunately, what the author fails to provide is what seems most needed: a workable solution to the marketplace dilemma. Perhaps, though, authors like Martin may sufficiently stimulate the creative conscience of those who stand guard at our societal roadblocks, causing them to re-think their role in helping technology solve a few of the problems created by our desire for a better life.

Captain James S. O'Rourke
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U-Boat War by Lothar-Gunther Buchheim. New York: Knopf, 1978, pages unnumbered, \$17.50.

The Boat by Lothar-Gunther Buchheim. New York: Knopf, 1975, 563 pages, \$10.00.

As a young man, Lothar-Gunther Buchheim, artist, photographer, and war correspondent, spent much time at sea in German U-boats during World War II. *U-Boat War* is his dramatic, superbly illustrated report. It is not a history but a gripping, factual tale of life in a submarine where "under depth charging, dying is hard work."

Veterans of rugged U.S. submarine duty can only marvel at the durability of the Germans. They fought a sophisticated enemy in the wild North Atlantic under intolerable living conditions, and many, Buchheim freely admits, "killed their pants" (German slang for show of fear) in their perilous existence.

The Type VII-C German submarine, a small vessel

of only 1100 tons, was an exceptionally rugged, capable vessel early in the war, but the later subs were worse, not better. When hideous losses finally forced a redesign, the radically new Type XXI came too late and never sank a ton of enemy shipping.

Air conditioning was considered unnecessary in the German submarines, either for equipment or personnel. With dampness, mold, insufficient supplies, and the knowledge of their tenuous existence, misery became part of the human condition. Clothes were rarely laundered; black underwear, called "whores' undies," was never changed at sea. Morale, understandably, sank low; with it sank efficiency and, consequently, more submarines.

Bathing for American crews was adequate, but for the Germans it was a dispirited ritual conducted by rank in the control room, with a single basin of water and bathing only above the waist. In American submarines, air conditioning was required for protection of equipment, not for personnel comfort, but enterprising sailors found condensation from air conditioning coils quite usable as bath water. However, by the end of a two-month tropical patrol, skivvies and skin were often the same shade of jaundiced yellow.

Not the least of the fascination of Buchheim's book is the advent, late in the war, of Hitler's *Jugend* skipper, 21-year-olds who knew nothing of the traditions of the sea. However, even Admiral Doenitz, demigod to the proud submariners early in the war, became a Hitler fanatic, seeking a *Götterdämmerung* where man no longer mattered.

The German submarine contingent lost 30,000 of its 40,000-man force during the war yet Buchheim sees significance not in the ghastly loss of life but rather in the relatively few men who made the sacrifice in the longest battle of the war and which almost toppled an empire.

Buchheim's novel, *The Boat*, has been an international best seller in its Bantam and other editions, going through five printings since 1975. This fictionalized drama of real events in submarine warfare is a gamy and somewhat brutal version of undersea battle. Even the hardened veteran may be able to take only a few pages of this version at one sitting.

Reader tastes vary, of course, but of the two books this reviewer opts for *U-Boat War*. Its superb summary of conditions in Germany at war's end and the forgetfulness of the German General Staff in their "maritime school of thought" will be particularly valuable to the military professional. For vivid description and excellent photography, here is an unforgettable action story of courage by extraordinary men in a type of warfare that may never be repeated.

Dr. Paul R. Schratz
Air War College

The Face of Battle: A Study of Agincourt, Waterloo, and the Somme by John Keegan. New York: Random House (Vintage Books), 1977, 354 pages, \$2.95.

This is a book about battle, a book that answers the question, "What is it like to be in battle?" After 80-odd pages of *raison d'être*, Keegan gets to the meat of the matter and chronicles the battles of Agincourt, Waterloo, and the Somme in the manner of a superior military historian. *The Face of Battle*, then, is a very good piece of analysis, prophetic and unsettling on one hand and factual and scholarly on the other.

For fifteen years John Keegan has been Senior Lecturer in War Studies at the Royal Military Academy, Sandhurst, England. During those fifteen years, a parade of young men passed before him—men who asked about the essence of battle, the reality of war, and the ingredients of leadership. Keegan answered those questions, and with each answer came further nagging doubts and perplexities and ultimately more questions. Finally, in order to acknowledge those questions and put his doubts to rest, John Keegan wrote this book.

The selected engagements, Agincourt, Waterloo, and the Somme, have been subject to previous inquiries, but never before have the three been examined together. From 1415 to 1916, Keegan looks for similarity, forcing us at the same time to think in terms of a total systems approach. Our assessment of the battlefield situation must include not only the generals and the art of generalship and weapons and their capabilities, utility, and destructive capacity but also the psychology of battle, the inducements offered to the warrior, the unholy noise of the battlefield, and the use and effects of narcotics.

To get to the core of the matter, Keegan argues that we must reduce that which by nature is chaotic and instinctive to something orderly and rational. That is no mean task, and perhaps the cloak of subjective experience that covers so many personal battle histories is indeed a merciful covering. However, the Keegan charter demands an objective analysis, and he proceeds to sift a rich storehouse of data, hoping to shed light on "compulsion" wound damage and weapon utility and give a vivid description of the same at hand. In his introduction to Agincourt, Keegan states:

Agincourt is one of the most instantly and vividly visualized of all epic passages in English history, and one of the most satisfactory to contemplate. It is a victory of the weak over the strong, of the common soldier over the mounted, height of resolution over bombast. . . . It is also a story of slaughter-yard behavior and of outright atrocity.

Keegan proceeds then to relate the events of Agincourt to the tone set by the Middle Ages. It is straightforward and frightening—as was existence itself. Violence was a primary fact of life. Fear for survival was commonplace. This accounting, then, of the battle of Agincourt is vivid and strangely exciting.

Keegan leaps 400 years to Waterloo, a battle immortalized both by a host of narratives and Wellington's admonition to leave it alone and not "muck it up" with history. However, Waterloo did affect all of nineteenth-century Europe; it will continue to be "mucked" about by historians—and Keegan is no exception. He tells the story of Waterloo in terms of what it was like for those who were there and does an admirable job of it.

All battles are, in some degree, and to a greater or lesser number of the combatants, disasters. Waterloo was a disaster of very considerable magnitude. Within a space of about 2 square miles of open, waterless, treeless, and almost uninhabited countryside, which had been covered at early morning by standing crops, lay by night-fall the bodies of 40,000 human beings and 10,000 horses, many of them alive and suffering dreadfully.

A kind of distress settles on the reader after reading of Waterloo. In fact, the impression of having been close to something unearthly is pervasive and eerie. The reader approaches the third battle, Somme, with some slight wariness but also with a curiosity that must be satisfied.

To Americans, the First World War, or the Great War, was possibly un-American. Many of the battlefield circumstances had been obvious to those of our fathers whose fathers had in turn served in Virginia in 1864. Many of them saw that the twentieth century would bring firepower to its greatest fruition and would create an unbelievable havoc on the young who practice it.

By the time the battle had ended, 419,654 British soldiers had become casualties on the Somme, and nearly 200,000 French. . . . But the principal memorial which the Somme left to the British nation is not one of headstones and inscriptions. It is intellectual and literary, and it turns on the revelation, from which the British had hitherto been shielded by their Navy, that war could threaten with death the young manhood of a whole nation.

The legacy of the Somme pervaded British strategic thinking for a long while. The lessons of the Somme will haunt all military men forever. But what then, asks Keegan, of war in the future? Battle will be even more anonymous, the noise deafening, accidents will be rampant, and the face of it may render it impossi-

ble. Keegan leaves us to our own devices, having filled a void yet causing now an even greater one to open.

For those who have seen the face of battle and even for those who have not, this book is recommended.

T.M.K.

Famous American Admirals by Clark G. Reynolds. New York: Van Nostrand Reinhold, 1978, 446 pages, appendixes, index, \$16.95.

In an era that worships the manager rather than the combat hero, *Famous American Admirals* should be pure nostalgia. America has had more than its share of heroes on the sea in a wide variety of roles, and Clark Reynolds's compilation is easy reading for a casual hour. His reputation as a fine naval historian apparently influenced a prestige publisher to market the book. Yet it does not quite come off, largely for problems that more careful research would have avoided. Some of the biographies offer too much official detail; others omit colorful career episodes that are the essence of reader interest.

Reynolds seems not to understand the laws governing flag rank, nor the so-called "tombstone" promotion to those with a combat citation. Enacted in 1925—not in 1947 as claimed—the combat advancement at retirement corrected an inequity in the Navy, which lacked the battlefield promotion of the Army and Army Air Forces. Few such naval officers served as flag officers, and it is questionable that they should be included as famous American admirals since none achieved fame in that rank.

Reynolds also falls into the myth of "vicious anti-Semitism," which Admiral Hyman Rickover allegedly battled "from his earliest days." Many Jewish colleagues of Rickover served uneventful careers, some achieving flag rank. One must judge whether Rickover's "uningratiating, even obnoxious manner" is the result of anti-Semitism or the other way around, the cause of his unpopularity with colleagues. The evidence supports the latter. An abrasive personality in close living conditions creates its own image.

Last, one must question many whom Reynolds includes and others who are omitted. The author, undoubtedly influenced by his earlier *Fast Carriers and Carrier Admiral*, appears to favor flag officers of the post-1930 era and particularly air admirals. On the other hand, we do not find two former Chiefs of Naval Operations, four-star admirals such as Charles M. Cooke, or either of the Ike Kidds—the two-star father, killed on his flag bridge at Pearl Harbor, and his outspoken, activist four-star son. Where, in fact, is the ultimate in colorful personalities? For example, Vice Admiral Milton E. "Mary" Miles, who merited a

Reader's Digest piece for his exploits in World War II in China, disguised as a Buddhist monk.

In summary, this is a good book which could be much better.

Dr. Paul R. Schratz
Air War College

The American Naval Heritage in Brief by Paolo E. Coletta. Washington, D.C.: University Press of America, 1978, 504 pages, \$14.00.

Paolo Coletta's latest offering, a history of the U.S. Navy entitled *The American Naval Heritage in Brief*, is a perplexing book. It is full of useful information, yet it has a number of glaring deficiencies.

Certain topics are covered quite well. For instance, the volume contains an excellent account of the European evolution of fighting ships and naval warfare, answering many questions that the landlubber has longed to ask about sailing ship design and naval tactics in days of old. Equally impressive is the book's coverage of America's wars. Coletta never fails—save in the instance of the Vietnam War, to which he devotes a scant seven pages—to describe the causes of each conflict as well as the naval/military strategy and combat operations, results, and "lessons" that should have been learned. In addition, he treats the reader to intelligent coverage of the present Soviet naval threat.

The American Naval Heritage in Brief makes further contributions; it describes the administrative side of the sea service's development, and it provides the reader with an excellent bibliography of American naval history. Sprinkled throughout are brief synopses of the character and contributions of each of the Secretaries of Navy. The book also provides a useful account of changes in the Navy's administrative structure, from the advent of the bureau system to the present organizational arrangements.

On the other hand, Coletta's work suffers from a variety of deficiencies. Apparently written for use as a text at the Naval Academy, where the author teaches, the book is plagued with undefined abbreviations, unfamiliar terms, and generalizations that are confusing to the general reader. The author's direct, almost abrupt style enables him to encapsulate a great deal into a few words, but this frequently leaves the reader begging for more information. In addition, the volume appears to have been rushed into print, for there are numerous typographical errors, vaguely worded sentences, and confusing paragraphs that could have been eliminated by careful editing. The few footnotes that do appear are, for the most part, unintelligible.

Coletta also is guilty of making a host of faulty generalizations and factual errors. For instance, when writing about the strategic bombing campaign during World War II, he states that: ". . . Japan was not hurt until after 15 May 1945, when LeMay began using incendiaries." No doubt the people of Tokyo would be happy to learn this, for it would dispel the popular myth that a large portion of their city was burned out by B-29s in March 1945. Depreciating the Army Air Forces (AAF) World War II contributions, elsewhere, he tells us that: "In Europe strategic bombing was fourteen percent effective, with one bomb in twelve striking near enough to damage a target"—an interesting but distorted conclusion. (Nowhere does the author give the AAF proper credit for its accomplishments in the war against Germany.) When analyzing the situation in Vietnam, Coletta writes that one of the clear lessons that should have been drawn from the French experience was that "air support is of little value in underdeveloped countries." The Marines at Khe Sanh in 1968 would, no doubt, disagree. These and other inaccuracies and hasty generalizations point clearly to a lack of adequate research.

Even more disturbing is Coletta's treatment of the post-World War II period. Writing in the style of an unabashed cold warrior, the author holds the Russians completely responsible for the American-Soviet split of the 1940s. This interpretation should have gone out of vogue with the death of Joe McCarthy. In addition, Coletta's pro-Navy prejudices show clearly in his descriptions of the intense Navy-Air Force rivalries of the late 1940s and '50s. The author does a service by revealing the narrow-minded views of Air Force leaders of that age, but he appears incapable of seeing this same narrow-mindedness in the Navy's leadership. For instance, in describing the 1948 "revolt of the admirals," he tells us that the senior naval officers who were making unsubstantiated, public charges concerning the Air Force B-36 program were sincere officers only doing their duty to the nation.

The American Naval Heritage in Brief is not the best choice for the general reader who wants to learn something about the history of the U.S. Navy. Coletta has written a thought-provoking book, but it is not for the novice.

Major John F. Shiner
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USAF Academy

Panzers at War by A. J. Barker. New York: Charles Scribner's Sons, 1978, 144 pages, \$14.95.

Colonel A. J. Barker has combined an interesting narrative with excellent photographs to produce an

enjoyable book on German armor in World War II. The work begins with a thumbnail sketch of the formative years of the German juggernaut and takes the reader on a whirlwind tour of the major panzer campaigns of the war: Poland, France, North Africa, Russia, Italy, and Western Europe.

The most attractive feature of this book is a series of dramatic vignettes of men at war, often under the most demanding conditions. One reads of German soldiers with hands frozen on weapons withstanding massive Soviet night attacks in temperatures of 45° below zero and wonders how men endured such torture. One marvels at the bravery of the five panzer grenadiers who held out for a week in "Command Post 506," an immobilized German tank, succumbing to Russian attacks.

These fascinating stories are accompanied by equally engaging photographs. Included are pictures of everything from the tiny Goliath, a small-tracked vehicle that was remote controlled and carried an explosive charge, to the Maus tank, a 189-ton behemoth known as "The Traveling Bunker."

In spite of these strengths, several factual and interpretative errors mar this book. One of the most serious is on page 10, where one reads:

when the war began in September 1939 the Germans enjoyed a technical superiority in tank design and construction which they were able to maintain throughout the war, despite intense efforts by the British, Americans and Russians to catch up.

This statement is simply inaccurate. In May 1940 the Germans found all their tanks outgunned and out-armed by the French Char B tank. And later, in July 1941 at Tolochin, the Germans received another shock when they encountered the excellent Soviet T-34/76 tank and found that no German tank was its match. The immediate German response was to order their engineers to build copies of captured T-34s. Only when the engineers said this could not be done did the Germans rush the Panther and Tiger I into production and up-gun and up-armor existing tanks so they could deal with the T-34.

Anyone interested in the history of armored warfare, especially the novice, will enjoy the fantastic stories and pictures in the Barker book. More serious students will continue to rely on the writings of men like Kenneth Macksey, Charles Messenger, and R. M. Ogorkiewicz for the historical details of armored warfare.

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Department of History
USAF Academy

Soviet Strategy for Nuclear War by Joseph D. Douglass, Jr., and Amoretta M. Hoerber. Stanford, California: Hoover Institution Press, 1979, 138 pages, \$5.95.

Attila swashbuckled out of Asia and across The Steppes of eastern Russia, carving a path in blood across what is now Northern Europe with his rugged, uncouth warriors. Many years passed before the Westerners stopped the Hun hordes at Châlons-sur-Marne. If our strategy in the West is allowed to swing in reaction to daily events, we may again be defending the Western world on the banks of the Marne.

Joseph Douglass and Amoretta Hoerber have drawn heavily on the classified official theoretical journal of the Soviet General Staff, *Voyennaya Mysl* (*Military Thought*). Pre-1969 articles from this internal publication of the Soviet Defense Ministry (not subject to misinformation as are many of the other Soviet organs circulated in the West) have been belatedly declassified by the Library of Congress. The authors found the substance of the articles to have enduring relevance, however, and the Soviet military thinking is seriously directed to the problems of fighting and winning any war with nuclear warhead rockets as the prime weapon from the outset.

Douglass and Hoerber explored some other doctrinal verities held high by the Soviet leaders. For example, the Soviets place almost religious importance on great depth of reserves at all levels. This is so strong an article of faith that the authors believe the use of concealed reserve reserves of intercontinental ballistic missiles (ICBMs), even with a Strategic Arms Limitation Talks (SALT) treaty, is a virtual certainty. Another item of faith is a newly created science, military economics. This discipline is being used not only by the Soviets to determine how best to protect their national assets in nuclear war but also to define the optimum targeting priorities and timing of what they term "phased" nuclear rocket attacks against their enemies. And perhaps the most dichotomous of items that separate Western strategies and those of the Soviets is that for them the struggle is continuous. Because we in the West lack an equivalent for that code word, we too often lose sight of the First Principle of War: The Objective. For us, we make peace the objective of war, and, thus, we become mired in strange conflicts. According to the authors, the Soviets have no such difficulties either in the semantic sense or in reality. The end of a war for the West is an event; for the Soviets, the only end for a war is victorious termination, a Clausewitzian transition from one form of struggle to another in their long-range goal of the destruction of capitalism.

The authors seem to be saying that the West must look to these published goals, methods, and strategy of the highest Soviet leaders (who seldom disagree since they wear both civilian and military hats). From these factors, we must create an unswerving strategy based on crisp geopolitical realities, the considered advice of experienced military men, and the long-range necessities of U.S. international intercourse—including protection of critical sources of energy and strategic minerals. Most certainly, our Soviet counterparts are not swayed by the ephemera that seem to tilt and bend successive U.S. administrations. The Soviets studied nuclear-age arms in relation to their political doctrine for a couple of decades in order to craft a hard-nosed, enduring strategy that they published in *Voyennaya Strategiya* (*Military Strategy*). Soviet strategy and Western shortcomings are becoming more visible due to the detailed pursuit and analysis of available Soviet military writings by scholars such as Douglass and Hoerber.

Lieutenant Colonel Richard E. Hansen, USAF (Ret)
Prattville, Alabama

U.S.-Japan Relations and the Security of East Asia edited by Franklin B. Weinstein. Boulder, Colorado: Westview Press, 1978, 336 pages, \$14.00, \$7.00 paperback.

This collection of essays on U.S.-Japan relations by security experts from both sides of the Pacific attempts to put relations between the two countries into perspective and proposes policies that would best serve the interests of both in the future.

Editor Weinstein is director of the Project on United States-Japan Relations at Stanford University and the author of a previous book on Indonesian foreign policy. Weinstein also teaches in the department of political science at Stanford.

The theme of the book is that the strategic picture in Asia has changed with the end of the war in Vietnam, and with it the basis of U.S.-Japan relations in the security field has changed as well. The question is raised, for instance, of just how much of a role Japan should be expected to play in its own security and in the security of Asia.

Because the book includes the views of both Americans and Japanese security experts, there are the expected conflicts and differences of opinion. This cross-fertilization of points of view alone makes the book valuable.

The military professional can benefit from exposure to the Japanese view of the security situation in Asia as well as how the Japanese view themselves vis-

à-vis the rest of the world. This area, NATO notwithstanding, will assume increasing importance in its impact on American foreign policy and, consequently, our defense policy.

The book is heavily academic, but the concluding chapter outlining some policy recommendations is succinct and to the point. It is not light reading by any means but definitely worthwhile and recommended.

Major Charles Ray, USA
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Imbalance of Power: An Analysis of Shifting U.S.-Soviet Military Strengths by John M. Collins and Net Assessment Appraisal by Anthony H. Cordesman. San Rafael, California: Presidio Press, 1978, 316 pages, \$6.95.

This is the now famous 1976 report to the Senate Armed Services Committee. Senator Howard H. Baker, Jr., supports protégé John Collins and introduces the text with a calm yet firm sense of urgency. Baker asks us to understand the dynamics of the imbalance and adjust our perspective without the hysterics of second-class power or defeatist paranoia.

Collins uses valid data; his charts, graphs, and other visual paraphernalia are a great boon to the book. Countless staff and war college students will appreciate this assemblage of relevant data.

Anthony Cordesman provides an appraisal to follow each of Collins's chapters. The two authors never conferred, or at least that is the editorial indication one gets. Instead, Cordesman reacts to Collins with-out the advantage of the well-known Collins dialogue, and, as a result, the strength of the team approach in this volume is lessened.

The Soviets have passed from inferiority to parity and, finally, now to maturity. Their ability to transfer resources into military forces at a faster and more resolute pace than does the U.S. complicates our assessment of this maturity stage. In this volume, Collins demands our attention through an impressive collection of data and a forceful analytic presentation that helps us in our assessments.

T.M. K.

Webster's American Military Biographies edited by Robert McHenry. Springfield, Massachusetts: G. & C. Merriam Company, 1978, 548 pages, \$12.95.

Because people are really the essence of history and its most interesting elements, there is a ready market

for books like *Webster's American Military Biographies*. It is a compilation of brief biographical sketches of the most prominent people in American military affairs and a fascinating book for browsing. However, for the air power specialist, it is probably too general to be of much use. For the most part, only the four-star men are represented here—or those airmen who have attracted the attention of the popular press. Moreover, since the aerospace era constitutes such a small segment of our military history, airmen receive scant attention. A similar compilation, *U.S. Air Force Biographical Dictionary* (1965) by Colonel Flint O. DuPre, USAFR, is more useful for anyone researching those who made their reputation before 1965.

As with all anthologies or compilations, it is easy to quibble with the entries. Yet, whereas selectees from the Revolution and Civil War seem endless, Benjamin Foulois, who played a vital role in the foundation of the USAF, receives no mention. Of all the airmen listed, only two were unknown to this reviewer: Thomas Hitchcock, a member of the Lafayette Escadrille (but more famous as a polo player), and Kiffin Yates Rockwell, who also was a member of the Escadrille and who gave his life in combat. Because of the present Chief of Staff's recent rise to eminence, it is understandable that he does not appear in a book published in 1978. Less understandable is the fact that Alexander Hamilton, who was so prominent in the founding of both the country and the Army, does not merit recognition.

The end papers of *Military Biographies* contain useful tables designed to help the researcher by cross-referencing battles, campaigns, and services against names. Here, again, there is not much on the USAF because our battles are not as "discrete" as those of the other services, and, they say, it is more difficult to associate names with them.

For the military historian, *Webster's American Military Biographies* is probably worth the price and a useful addition to his reference set. For the student of air power or for the professional Air Force officer, the book is of limited value. One would be better advised to rely on the library until a biographical dictionary especially devoted to air power or twentieth century military affairs is published.

Lieutenant Colonel David R. Mets, USAF (Ret)
Fort Walton Beach, Florida

Speak Easy: The Art of Expressing Yourself by Sandy Linver as told to Laura Dean. New York: Summit Books, 1978, 222 pages, \$8.95.

Your knuckles turn white; your brow sweats so bad you can't see. You're going into combat! No, you're making a speech—for many, the worst fear in the world. But, as Sandy Linver believes, fear of public speaking should not exist because it can be easily overcome. The book is based on her belief that your effectiveness and spoken image are directly tied to your everyday speaking habits and not to traditional speech etiquette. As such, the book shows you how to relate with your audience, to be yourself, and how to maintain your control in all types of speaking situations.

Speak Easy focuses on four concepts: "Energy, Awareness, Strength, and You." First, the book helps the speaker learn how to direct the appropriate amount of energy by focusing on the audience and listening to their reactions. Strength is being in control, not just of the audience but holding on to who you are and what you are. Finally, the book stresses you. Everything depends on you—your needs, your strengths, your objective ability to analyze yourself, and your willingness to work to obtain what you want. Thus, her book superbly illustrates how to improve your ability to communicate naturally, convincingly, and with strength—thus improving your effectiveness.

Speak Easy is excellent for anyone who is uneasy in speaking situations, and for any instructor (military or civilian) the book is a must. The constructive guidance offered focuses on the important aspects of speaking—the spoken image and the message—rather than on techniques.

Major Reed M. Anderson, USAF
Air Command and Staff College

Military Families: Adaptation to Change edited by Edna J. Hunter and D. Stephen Nice. New York: Praeger, 1978, 278 pages, \$22.95.

This volume is a collection of papers delivered at a Current Trends and Directions in Military Family Research conference at San Diego in 1977. The American family is changing and so is the military family,

as these researchers show. However, military family sociology is still new, and this work suffers the heaviness of scholarly initiation and caution. To make this book valuable to the average military family, it would be useful to provide a collection of the summaries and conclusions that follow most of the articles. Those complaints notwithstanding, this volume is filled with good data for the military sociologist and is a necessary addition to every military library. The epilogue by Edna Hunter is an articulate and eloquent call for additional, yet measured, military family research.

T.M.K.

Canadian Pilot's Fitness Manual by David Steen. New York: Delacorte Press/Eleanor Friede, 1979, 203 pages, \$10.95.

This book is about "grounding." It is a preventive-medicine approach to warn us of the danger signs that usually precede grounding actions. Flyers are particularly susceptible because of stress, irregular hours, much sitting, and constantly changing diet; Steen wrote the book especially for them. He advises that all aviators should assess their fitness through a complete self-evaluation. Depending on the results, a concerned pilot should then either see his medical officer or embark on a rejuvenation plan, a sample of which Steen has prepared for us.

The plan includes calisthenics as well as some of the isometric exercises that can be accomplished without a change of clothes. Furthermore, one's diet needs close scrutiny; fewer coffee shop doughnuts and more of grandma's bran muffins is the first step. Overall, the typical flyer's diet needs the addition of simpler meats and grains and the subtraction of sauces, gravies, and buttered delights. Steen calls this book a no-nonsense advice manual for crew personnel and "desk pounders" alike, and it may be worthy of your attention.

T.M.K.

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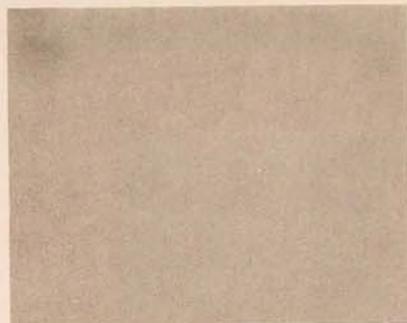
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William S. Lind (A.B., Dartmouth College; M.A., Princeton University) is legislative assistant for the Armed Services Committee to Senator Gary Hart of Colorado. He has served as legislative assistant to Senator Robert Taft, Jr., of Ohio, and assisted him in the preparation of the Taft white paper on defense. His publications include a critique of U.S. Army doctrine in the *Military Review* (March 1977); proposals for restructuring the Marine Corps in the *Marine Corps Gazette* (December 1975); and a critique of current naval force structure in U.S. Naval Institute *Proceedings* (March 1978). Mr. Lind is a doctoral candidate at Princeton.



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The Air University Review Awards Committee has selected "Principles of Deterrence" by John M. Collins, Senior Specialist in National Defense, Library of Congress, Washington, D.C., as the outstanding article in the November-December 1979 issue of the *Air University Review*.

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