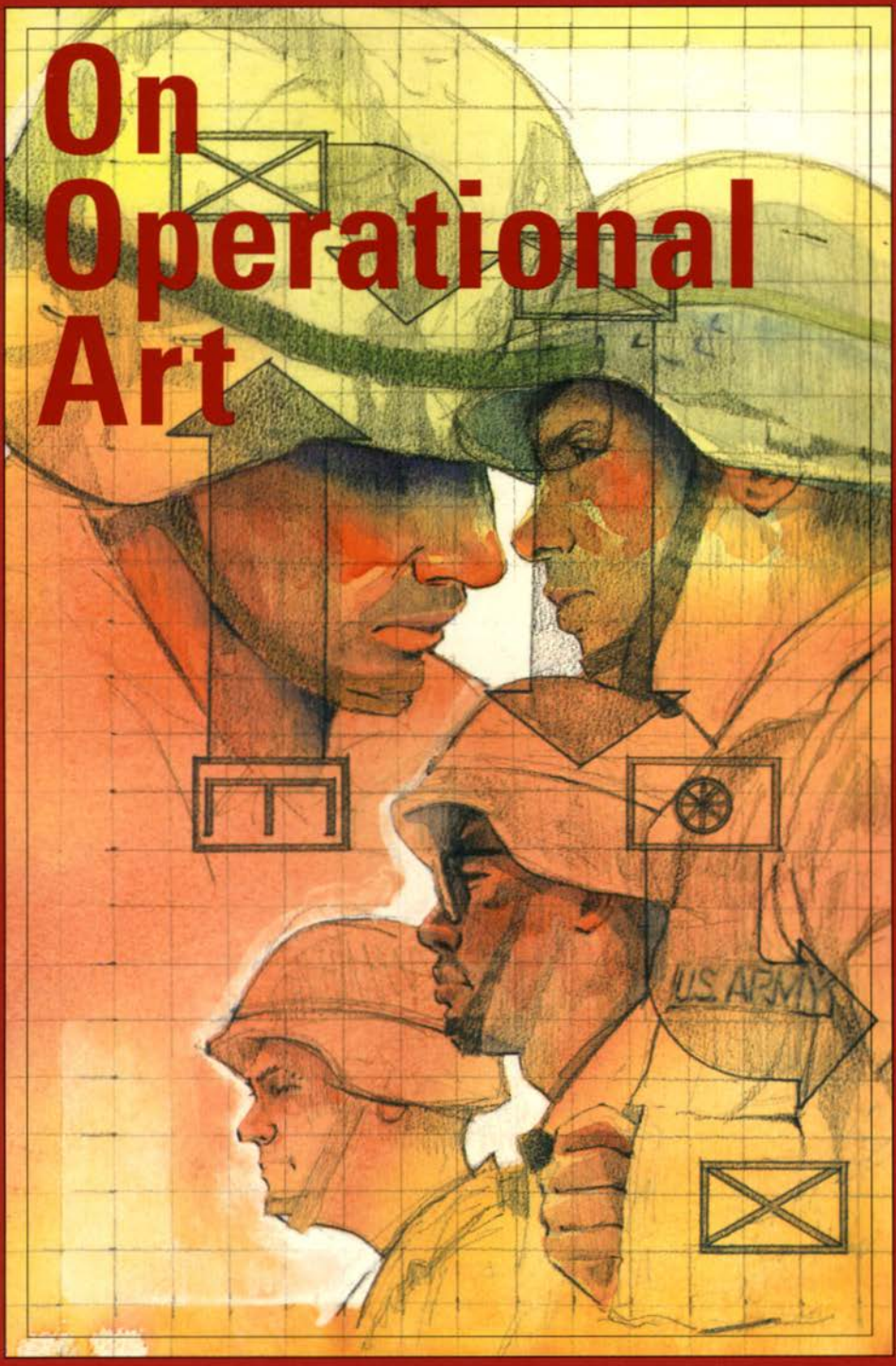
On Operational Art



ON OPERATIONAL ART

Clayton R. Newell
and
Michael D. Krause
General Editors

Center of Military History
United States Army
Washington, D.C., 1994

Library of Congress Cataloging-in-Publication Data

On operational art / Clayton R. Newell and Michael D. Krause, general editors

p. cm.

Includes bibliographical references and index.

1. Operational art (Military science) I. Newell, Clayton R., 1942– . II. Krause, Michael D. (Michael Detlef), 1942–

U163.05 1994

355.02—dc20 94–21015

CIP

CMH Pub 70–54

First Printing

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402–9328

Foreword

In 1982 the Department of the Army revised FM 100–5, *Operations.* Billed as the keystone "How to Fight Manual," the new document provided the basis for the Army's rapidly evolving doctrine, training, and organizational concepts. As such it marked a significant departure from previous editions of FM 100–5, and its ideas sparked controversy among critics in and out of the service. One of the most controversial concepts was the introduction of the operational level of war, a division of warfare falling between the more traditional categories of tactics and strategy. "Most simply," FM 100–5 stated, the operational level of war was "the theory of larger unit operations." The manual went on to explain that it also involved planning and conducting campaigns, while tactics consisted of techniques for smaller units and strategy was the employment of the nation's armed forces to secure national policy objectives. Controversy arose because the concept was new to American military doctrine. Although advocates argued that operational art had been part of European military theory since the nineteenth century, many American officers questioned its practicality, initially seeing little need to expand the study of military affairs beyond the more traditional strategy and tactics.

When the Army again revised its doctrine in 1986 the operational level of war became operational art, a term more commonly associated with Soviet military doctrine. This change, interpreted by many as incorporating into Army doctrine a concept from the United States' greatest potential enemy, the Soviet Union, added fuel to the debate.

Between 1988 and 1990 the Center of Military History invited a group of senior commanders and military theorists to present their comments on the subject. The essays in this volume are the result of that effort. They represent individual reflections on operational art during its evolutionary period. At the time they were written, NATO, and the Soviet threat it was designed to counter, occupied center stage in American military thinking. Many senior

commanders thus viewed the concept of operational art in the context of preparing for a large land war in Central Europe. Since the project began more than five years ago the world has changed dramatically and unexpectedly. Today, with the stunning success of American military power in the 1991 Persian Gulf war, the concept of operational art has become widely accepted in the U.S. military establishment as a valid and useful concept for planning and conducting joint warfare.

This collection presents a historical snapshot of the development of operational art when the Army's attention was focused on Europe and the Soviet Union. Students of military history and theory of war will find it useful in studying the evolution of doctrine from theory into practice.

Washington, D.C.
September 1993

HAROLD W. NELSON
Brigadier General, USA
Chief of Military History

Acknowledgments

This volume began as the brainchild of Brig. Gen. William A. Stofft shortly after the publication of the 1986 edition of FM 100–5, *Operations*. As the Chief of Military History he believed the doctrinal debate then going on over the concept of operational art was of historical significance. At his request a number of senior Army commanders and historians agreed to prepare essays for an anthology of operational art.

In 1989, when General Stofft left the Center of Military History, he turned the project over to the Deputy Chief of Military History, Col. Michael D. Krause. Colonel Krause expanded the effort to include essays from commanders and theorists outside the U.S. Army. Although most of the essays are from Army writers, he acquired important contributions from Navy and Air Force officers as well as a prominent German officer, thus adding a joint and combined flavor.

The time and effort put forth by members of the review panel who read and commented on each essay must be recognized. Dr. Jeffrey Clarke, the Army's Chief Historian chaired the panel. Membership included Brig. Gen. Harold W. Nelson, the Chief of Military History, Col. Ralph Allen, Chairman of the Department of Military Strategy, Plans and Operations at the Army War College, and Dr. Harold Winton, Professor of Military History at the Air War College. Their insightful and candid comments tied the essays together.

The editorial work of Peter A. Curtiss ensured that the essays met the rigid standards of the Center without erasing the unique voices of the authors. The maps were prepared by Sherry Dowdy, the Center's fine cartographer, and Beth F. MacKenzie prepared the charts.

Finally, the patience of the contributors themselves must be acknowledged. When this project was first conceived they could not have anticipated that what began as contemporary commentary would become history before it was published.

Contents

Charts

Maps

ON OPERATIONAL ART

Introduction

Clayton R. Newell

This anthology presents a variety of essays on the operational level of war. Each is based on the author's own experiences in significant command or training positions, and each seeks to supply the reader with a basis for further growth. Although all of the essays were prepared specifically for this work, some have appeared in the September 1990 issue of *Military Review* under slightly different titles.

Most of the senior commanders who contributed to this effort gained their command experience at the operational level in Europe as part of the NATO military structure. At that time, although operational art was Army doctrine, it had not been accepted as either NATO or joint U.S. doctrine. When these essays were written the NATO military commanders were focused on the threat of a Soviet-instigated Warsaw Pact attack into Western Europe. Initial guidance to these authors suggested addressing ten broad topical areas: the objective, the theater setting, the concept of the operation, intelligence, deception, maneuver, operational fires, reserves, logistical functions, and command. However, each author was free to use or ignore this guidance as he wished.

Within this collection of essays, the terms operational art and the operational level of war are synonymous. This is not surprising since U.S. Army doctrine first introduced the operational level of war in 1982 and then modified it to operational art in 1986. In addition, most of the essays were written in 1989 and 1990 and address areas of the world that have since undergone major changes, a process that will of course continue indefinitely into the future. The inevitable passage of time, however, should not necessarily lower the value of the ideas expressed here, while their application in the everyday world arena will enable future historians to better understand how the Army regarded its roles and missions in the late twentieth century.

In the opening essay, "On Operational Art," Lt. Col. Clayton R. Newell, USA, prepares the background for the mosaic by reviewing the evolution of Army doctrine since World War II. The author ar-

gues that postwar Army doctrine was concerned primarily with the tactical level of war to the virtual exclusion of other considerations, a situation that would remain essentially unaltered until approximately 1982. Although World War II had been planned, executed, and won by a series of complex operational campaigns, the mechanics of that effort had been largely forgotten by the early 1950s.

Professor James J. Schneider then examines the conceptual development of operational art and its relationship to the American military experience in his thought-provoking essay, "Theoretical Evolution of Operational Art." Schneider postulates that the American Civil War is the first example of distributed free maneuver, which in his view is the dominant characteristic of operational art. By examining the historical interaction between technology, national interest, and capital, he traces the rise of operational art and outlines its future characteristics. In addition, his analysis of the literature highlights a number of books which can provide further understanding of the subject.

Two senior U.S. Army officers, General Crosbie Saint and General Glenn K. Otis, present their views of operational art from the perspective of the ground component commander in the Central Region of NATO. Although neither commanded the army group in wartime, the theater was in constant readiness for combat. General Otis begins by emphasizing the need to understand what "winning" means in war. A commander must first define his strategic objectives in both military and political terms. Only then can he design a military campaign—the operational level of war—to achieve those objectives. He also makes the point that the operational level commander must visualize the tactical situation in his planning, but must never become involved in the conduct of tactics. General Saint emphasizes personal contact in dealing with subordinates but, like General Otis, urges senior leaders to resist the temptation to be squad leaders or battalion commanders simply because they know how to do those jobs. Both agree that the ability to think ahead and beyond the immediate tactical situation is one of the most important elements of operational art.

From an airman's perspective, Lt. Col. Price T. Bingham, USAF, discusses the integration of air and ground power in "Aerospace Operational Art." Colonel Bingham points out the need to view campaigns from a theater-level perspective and to integrate aerospace and surface forces so as to best use their respec-

tive strengths. In "The Air Campaign," Col. John Warden, USAF, stresses the importance of understanding the complexities of air warfare. A critical element in this task is recognizing the various centers of gravity at the strategic and operational levels of war that can only be affected by air power. Using historical examples, Colonel Warden shows how air component and theater commanders have used their available air power in the past to the best advantage in order to successfully attain strategic objectives.

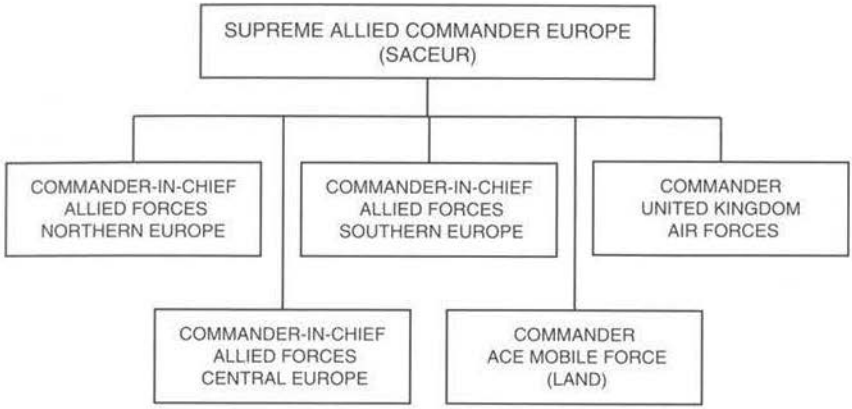
General Charles L. Donnelly, Jr., USAF, a former air component commander in the Central Region of NATO, is more to the point. On a practical note, he states that commanders and their staffs at the operational level must be thoroughly familiar with both ground and air components and also be able to distinguish in each area between the tactical and the operational levels of war. Both are prerequisites for an effective integrated air-ground campaign. Echoing the ground commanders, he also points out that operational level air commanders must restrain themselves from becoming too involved with day-to-day tactical decisions and keep their focus on the long-range objectives of the campaign.

The next three writers discuss their experiences as commanders of markedly different major theaters: Central Europe, the Mediterranean, and Latin America. General Hans Henning von Sandrart, an officer in the German Bundeswehr, commanded a continental theater of operations, the Central Region of NATO, where ground and air forces from a variety of nations constituted the bulk of the available combat forces. (*Chart 1*) Operational art, he argues, was an essential element of deterring war in Europe throughout his tenure and throughout that of his predecessors as well.

At sea, the type of forces may be markedly different, but the parameters are the same. From his experience as the commander of a maritime theater, the Southern Region of NATO, Admiral William Small, USN, presents a similar broad viewpoint. For example, he sees air power as critical in a primarily maritime theater and regards both the air and sea rules of engagement as vital to his command's peacekeeping mission. His point that theater nuclear weapons are not a simple solution to tactical problems provides an important distinction between operational fires and tactical fire support.

Although geography often determines the weight given to land and maritime considerations in any given theater, it is sometimes displaced by other factors. Such is the case in the southern hemi-

CHART 1—ALLIED COMMAND EUROPE (ACE)



sphere of the American continent. General Paul F. Gorman, USA, presents his views on operational art based on his experience as the commander in chief of the United States Southern Command (SOUTHCOM), which includes American forces in Latin America. In General Gorman's experience social, economic, and political concerns are paramount and low-intensity conflict is a primary interest. He points out that in such an environment intelligence may be the most important operational factor. As a corollary, high-technology intelligence collection is vital to success and thus constitutes a critical operational tool. He also notes that in commanding forces of other nations, the creation of an atmosphere of cooperation is an essential element of operational art. In fact, all three former theater commanders emphasize the need for close coordination and understanding when dealing with combined forces (forces from a number of nations under the same command structure). They agree that even though the theater commander in theory commands all such forces, in practice he must persuade, more than demand, adherence to a central operational campaign plan.

Because tactical experience does not necessarily translate directly into knowledge of operational art, the military school systems must bridge this gap in most officer education. In "Educating and Training for Theater Warfare," Maj. Gen. L.D. Holder, USA, analyzes some of the difficulties facing American military schools in teaching operational art and provides some innovative solutions. As he points out, creating an effective operational doctrine is more

than just adding a few key phrases and checklists to the Army's field manuals; it something that must be taught and exercised.

The successful application of operational art in war and peace will depend largely on effective leadership, and Maj. Gen. William A. Stofft, USA, explores the phenomena of leadership at the operational level of war using an informal style which draws freely on historical vignettes. As he describes it, leadership at the operational level is a fundamental element of operational art and includes courage, training, education, experience, imagination, and flexibility.

In the closing essay Col. Richard Swain, USA, heading the Army's Combat Studies Institute, provides a comprehensive guide to further reading on operational art. His introduction explains why reading history is important to understanding the development of theory and doctrine. While the concept of operational art may be fairly new, he argues that "the activities it describes have existed in one form or another throughout history." Since opportunities to practice operational art in wartime are few, those who can absorb the experiences of their predecessors will be more prepared to execute such responsibilities when the need arises.

American military forces have recently recognized the value of joint operations and campaign planning, both of which are key elements of operational art. As the Army passes through periods of change, it is essential that its officers continue to build on what has already been learned about operational art. Reading this diverse collection of essays cannot make one an expert on that subject. It will, however, provide the reader with a better understanding of what to many is an abstract concept and, at the same time, provide some practical guidance for operational level commanders and staff officers on some future battlefield.

On Operational Art

Clayton R. Newell

The political and military leaders of the United States are responsible for formulating plans and policies that support the country's basic national interests over a broad period of time. One of those primary interests is the provision of adequate security. To help accomplish that task, the United States currently has the capability of fielding large air, ground, and sea forces virtually anywhere in the world. These forces are organized, trained, and equipped to plan and conduct joint military operations in a variety of geographical regions. Critical to the success of these joint enterprises is a common operational doctrine and a clear understanding of operational art.

Army doctrine made operational art part of the American military lexicon when it separated the activities of planning and conducting war into three broad divisions: military strategy, operational art, and tactics.[1] Military strategy, the first of these divisions, involves attaining national policy goals by the use or threat of force. This strategy originates at the highest leadership levels of the nation and must be planned and executed in coordination with other elements of national power, such as diplomacy, economics, and technology. Operations form the implementing components of military strategy. Military operations thus contribute to the overall strategic design and are executed over the course of a campaign in a given geographical area. Operational art, the second of the three divisions of war, normally involves a combination of air, land, and sea forces executing a campaign that involves a series of battles to attain both intermediate and final objectives. Planning and conducting those battles constitutes tactics, the third broad division of war. Tactics includes the techniques and procedures that forces from a single service use in attaining their objectives in battle. Operational art is key to modern warfare because it integrates the tactical capabilities of the individual services to attain strategic objectives set by the nation's political and military leadership.

While strategy and tactics are old and familiar terms in the U.S. Army, operational art is not. The Army officially introduced the

operational level of war into its doctrine only in 1982 and the concept of operational art only in 1986.[2] Its late recognition demands explanation. During the Second World War the U.S. Army and Navy successfully planned and conducted a series of campaigns which led to the Allied victory. Those campaigns were virtually all joint; they coordinated various combinations of air, land, and sea forces in a number of very different theaters of operations to attain specific tactical and strategic objectives. While there were differences of opinion, the coordination of the air forces with the surface forces on land and sea was relatively simple because the Army and the Navy each had its own air arm. Overall supervision of the Army's activities was exercised by General George C. Marshall, Chief of Staff, who had the strong backing of President Roosevelt.[3]

Things changed after World War II, however. Under the provisions of the National Security Act of 1947 the War Department became the Department of the Army and a separate Department of the Air Force was established, both of which, along with the Department of the Navy became part of the new Department of Defense. At the same time the Joint Chiefs of Staff, established in World War II to coordinate strategy, developed the Unified Command Plan (UCP)—a "comprehensive system of unified military commands which [assigned] to a single commander the responsibility for the conduct of operations of the land, naval, and air forces in each of several regions of military importance to the United States."[4]

The UCP, first drafted in 1948 and revised as necessary since then, places all military forces in a designated area of the world under the command of a single regional commander in chief (CINC). The CINC, as a joint officer, does not report to his parent service, but to the National Command Authority (NCA)—the President and the Secretary of Defense. Service interests are represented by a component commander. In a typical theater organization a ground component commander commands all ground forces, an air component commander commands all air forces, and a naval component commander commands all sea forces. The component commanders "work" for the theater CINC as experts in air, ground, and naval tactics. This command structure is ideally suited to the conduct of operational art, since it places all military forces in a theater of operations under a single commander who is ultimately responsible for integrating their diverse capabilities.

This arrangement has exhibited certain drawbacks. For example, with almost all operational authority vested in the unified

commands, the Army and the other services did not have to concern themselves with the activities now known as operational art—planning and conducting campaigns to gain strategic goals. Not surprisingly, they instead focused their attention almost exclusively on the tactical level of war, and each service quickly became more interested in enhancing its own individual capabilities than in developing doctrine for joint operations. For the Army this meant comparatively greater attention to the tactics of land warfare and to the organizing, equipping, and training of those forces needed to carry out their battlefield missions.

Along with the organizational changes of the UCP that left the services free to concentrate on their tactical specialties, the Army had to contend with the implications of nuclear warfare. In many minds, civilian and military alike, the atomic bombs that ended World War II marked a new era in warfare which relegated large scale ground operations to the past. Although the Army argued for the continuing importance of ground operations, maintaining that the "occupation of hostile territory" was the only sure way to strategic victory in any future war, it was generally unable to bridge the gap between the tactics it had developed so successfully in World War II and the strategy of nuclear deterrence that dominated postwar American defense policy.[5]

The Army's concentration on the tactical level of war also reflected its increasingly poor relationships with the other services. All of the armed forces had to accept drastic cuts in size and budget after the war, and each service tended to exaggerate its own special capabilities, especially during Congressional budget hearings that would determine its future size and structure. Interservice rivalry and internal bickering were thus common throughout the defense establishment. The Air Force, not surprisingly, focused on its primary mission—nuclear deterrence—and assigned those tasks involving direct support to ground forces a much lower priority. For similar reasons, the Navy and Marine Corps jealously guarded their own service prerogatives, while both the Navy and later, briefly, the Army became involved with nuclear delivery systems that had little to do with their tactical missions.

The Korean War was the first war the United States fought with its new Department of Defense organization. Although the ultimate results of that war are debatable, its conduct under the UCP was fairly effective. It worked primarily because the senior

American military leaders who planned and conducted the war relied heavily on their successful World War II operational experiences. But that experience was never really duplicated or handed down in any way to the generation of officers that followed. Neither before nor immediately following the Korean War did the services train their officers to plan or conduct joint operations. With some notable exceptions, such as the Inchon invasion, the Korean War itself was fought by the services each acting essentially independently of the other. The Army and the Marine Corps (fighting as separate services well inland) conducted their tactical operations on land; Air Force operations focused on the enemy's rear areas; and naval operations were severely limited by the confined nature of the theater. The Army came away from the conflict with little or no apparent interest in learning how to work with the Air Force or the Navy. Its 1954 Field Service Regulations stated flatly that "Army combat forces do not support the operations of any other component."[6] Such an attitude did little to foster anything resembling operational art in its doctrine.

After Korea, the NCA continued to charge the theater CINCs with responsibility for planning and conducting joint military operations, but gave no guidance to the services on supporting the joint commanders in this area. For nearly three more decades this situation remained substantially unaltered. During this interim period officers increasingly saw the road to career success as lying strictly within their own service and viewed any time spent on joint staffs as a waste. The long war in Vietnam, fought almost exclusively on the tactical level, simply confirmed the Army's long-standing tactical focus. In Vietnam the senior Army leadership consisted primarily of officers who had seen service in World War II and Korea at the tactical level. They knew and understood tactics based on their wartime experience, but they had received virtually no education, training, or experience with planning and conducting campaigns at the operational level of war. Their experiences included little that might have shifted their focus to a higher level. The fact that there were no clearly identifiable strategic objectives upon which to base any campaign planning further encouraged the tactical mind-set of the senior military leadership. Their tactical experience did not require a militarily attainable strategic objective, nor did the national military and civilian leadership responsible for military strategy in Vietnam understand the necessity

of establishing one. As a result, the Army, along with the other services, planned and fought the ten-year long war in Vietnam almost entirely on the tactical level. This produced yet another generation of Army leaders whose personal experience with war was limited to this echelon. Unlike World War II, Vietnam produced few, if any, senior officers with experience in planning and conducting campaigns to attain a specific strategic military objective.[7]

In the early 1970s, the Army put aside its disheartening Vietnam experience and turned again to Europe where it had maintained sizable forces since the end of World War II. There ten years of neglect amid a steadily increasing Soviet conventional threat forced the service to take a fresh look at its doctrine and the war plans of the European regional CINCs. Reduced congressional funding and the agonizing transition to an all-volunteer regular force had the same effect. But it was the 1973 Arab-Israeli War that, in the words of one influential senior officer, provided "a marvelous excuse or springboard . . . for reviewing and updating" the Army's tactical doctrine.[8]

The initial results were less than satisfactory. Given the tactical focus of the Army, the immediate review and update concentrated on the tactics of Israeli land operations and ignored the joint operations conducted on both sides which determined the course of the war. One result, the Army's new "how to fight" manuals, used a combination of simple diagrams and straightforward writing style to emphasize what was termed "the active defense." Although billed as the Army's primary operational concept, the active defense was taught and practiced primarily in the tactical-strategic arena of central Europe that demanded that "the US Army must above all else, *prepare to win the first battle of the next war.*"[9] With this admonition the Army stifled any thought of planning, much less conducting, a campaign. Instead, it would focus all of its energies on the first, and presumably only, battle of the next war.

An interesting corollary to the idea of fighting one decisive first battle was a concurrent shift in how the Army trained its officers. Instead of preparing junior officers to assume higher command and staff responsibilities in an expanded wartime Army, branch schools were directed to "train lieutenants to be platoon leaders and captains to be company commanders" and "avoid anything more ambitious."[10] Such admonishments discouraged planning beyond the first battle and once again confirmed the tactical mind-set of the Army.

The 1976 doctrine prompted a considerable debate in professional journals, which quickly brought the tactical concept of active defense into serious question. Although the Army eventually rejected the active defense, it did serve a useful purpose, because the debate leading to its demise stimulated a lasting interest in developing a practical operational doctrine that would reflect both the service's growing technological capabilities and the theater campaign plans of the various CINCs.[11]

In 1982 the Army abandoned the active defense in favor of the "AirLand Battle," an operational concept which put campaign planning into Army doctrine. Still, the concept was not easily absorbed by the Army's officer corps. After thirty-five years of immersion in the tactical level of war, the idea of planning and conducting campaigns that integrated joint forces toward a strategic objective was a new and unfamiliar idea. Although the United States had fought and won World War II through such campaigns, in two generations its officers had forgotten how to do it.

In 1986 the Goldwater-Nichols Department of Defense Reorganization Act stimulated interest in operational art in a number of ways. It redefined the command authority of the CINCs and clearly specified that "all forces operating within the geographic area assigned to a unified combatant commander, shall be assigned to and under the commander of that command."[12] The act decreed that a tour of duty in a joint duty assignment was a prerequisite for promotion to general or flag officer rank.[13] The legislation also provided the opportunity to develop new doctrine "for employing major forces to achieve strategic objectives within a theater of war."[14] The result was a new willingness by the services to work together on joint operations and to develop a better understanding of operational art.

As operational art becomes an accepted component of joint doctrine, the success of American armed forces in future campaigns will depend on how well it is understood. Although operational art is a distinct and essential part of the structure of war, it should not, indeed cannot, be considered separately. In order to fully understand how the military element of national power contributes to the attainment of national goals, all three broad divisions of war—military strategy, operational art, and tactics—are important. Operational art, however, is pivotal to success in war; it is the essential link between the goals of strategy and the capabilities of tactics.

NOTES

1. FM 100–5, *Operations,* Department of the Army, Washington, D.C., 5 May 1986, p. 9.
2. FM 100–5, *Operations,* Department of the Army, Washington, D.C., 20 August 1982, pp. 2–3, defined the operational level of war as using "available military resources to attain strategic goals within a theater of war;" the 5 May 1986 version of FM 100–5, p. 6, defined operational art as "the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization, and conduct of campaigns and major operations."
3. James E. Hewes, Jr., *From Root to McNamara: Army Organization and Administration, 1900–1963* (Washington, D.C.: U.S. Army Center of Military History, 1975), p. 74.
4. R. Earl McClendon, *Unification of the Armed Forces: Administrative and Legislative Developments, 1945–1949* (Maxwell Air Force Base, Ala.: Air University, April 1952), p. 31.
5. Robert A. Doughty, *The Evolution of US Army Tactical Doctrine, 1946–76,* Leavenworth Papers (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College, August 1979), p. 2.
6. FM 100–5, *Field Service Regulations, Operations,* Washington, D.C., Department of the Army, 27 September 1954, p. 4.
7. Harry G. Summers, Jr., *On Strategy: A Critical Analysis of the Vietnam War* (Novato, Calif.: Presidio, 1982), pp. 90–91. Summers makes the point that U.S. forces emphasized tactical operations and that the senior leadership was confused over the difference between tactics and strategy.
8. Romie L. Brownlee and William J. Mullen III, *Changing an Army: An Oral History of General William E. DePuy, USA, Retired* (Washington, D.C.: U.S. Army Center of Military History, 1986), p. 190.
9. FM 100–5, *Operations,* Department of the Army, Washington, D.C., 1 July 1976, p. 1–1.
10. Paul H. Herbert, *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100–5, Operations,* Leavenworth Papers No. 16 (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College, July 1968), p. 27.
11. John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine, 1973–1982* (Washington, D.C.: U.S. Army Training and Doctrine Command, 1984), p. 21.
12. Don M. Snider, "DOD Reorganization: Part I, New Imperatives," *Parameters* 17, no. 3 (September 1987): 93.
13. Ibid., p. 95.
14. Ibid., "DOD Reorganization: Part II, New Opportunities," *Parameters* 17, no. 4 (December 1987): 55.

Theoretical Implications of Operational Art

James J. Schneider

In August 1977 the National Aeronautics and Space Administration launched Voyager II to explore the outer reaches of the solar system, and beyond. Twelve years later Voyager and Neptune rendezvoused in a triumph of scientific forecasting; Voyager was only three-and-a-half minutes late and missed the designated meeting point by just twenty miles, a truly remarkable feat. Unfortunately, military thinkers cannot match the predictive precision of the Voyager mission. In a relative sense, the military as an institution remains on the point of a revolution in the conduct of war. Where strategy had been conducted in a fairly uniform fashion for centuries, the introduction of operational art is a relatively new phenomenon. As a result, its parameters and the relationship between them have often been confused with those in the arena of strategy. The problem is significant since it affects formulating a vision of the future.

For example, imagine a coach who, for whatever reason—unknowingly perhaps—fields a sports team and trains it using the doctrine, principles, tenets, and techniques of *both* European soccer and American football. At some point the players are challenged by an American football team. The results would be obvious: because the former team has trained itself for two qualitatively different athletic contexts it would find it difficult to adopt a single uniform style of play. The football team would clearly understand the objective of the game and conduct its plays with precision, while the dual trained team would be unsure of the objective and uncoordinated in its conduct of play. It is extremely difficult in practice to disentangle such conflated understanding. Although military practitioners of operational art are not faced with such extremes, they must be free of conceptual residues of earlier military conceptual models. This is best accomplished by defining the essence of operational art and delineating its unique structure.

The dominant characteristic of operational art and the one that most clearly distinguishes it from what could be termed "classical strategy" is the distributed free maneuver of forces in a theater of operations. In contrast, the dominant characteristic of classical strategy up to the time of Napoleon was the concentrated maneuver of forces in a single geographical theater. Classical strategy was further distinguished by the concentric maneuver of forces in a theater of operations culminating in a single decisive battle.[1] Distributed maneuver, on the other hand, is characterized by a series of distributed battles leading to the dispersion of combat force in space and time. Operational art is thus associated with protracted campaigns, while classical strategy often results in a concentrated battle produced by a concentration of combat forces in space and time. Battles of annihilation further characterize classical strategy.

The essence of operational art—distributed free maneuver—historically arose as a result of certain subsidiary characteristics that will also tend to dominate any future conduct of operations. The emergence of operational art necessarily followed from a changing relationship between the army and the territory in which it operated. Clausewitz clearly understood that in classical strategy there were three ways to defeat an enemy: destroy his army, occupy his territory, or destroy his will.[2] Until the Industrial Revolution there was a clear disassociation between the army and the territory. Conventional wisdom of the day dictated that the best way to defend one's territory was with a closely concentrated army. It generally made little sense to distribute one's army, cordon fashion, because this usually entailed the loss of command and control over the force. Battles were therefore encounters between the main forces of the opponents. The outcome of these battles of annihilation determined who would possess the territory.

With the coming of the Industrial Revolution, and most especially during the American Civil War, armies became forced increasingly to defend the whole of their critical resource-laden territories. Industrialized war and the resultant protracted style of warfare required holding all such territories. During the Civil War, for instance, the Confederates were essentially forced to hold Texas as a major source for remounts, southern Tennessee for its iron ore, the Shenandoah Valley for its foodstuffs, Richmond for its heavy industry, Atlanta for its rail network, and port cities for their access to the sea. Because these resources were distributed throughout the whole

Confederacy, the armed forces had to be distributed accordingly to defend their own resources while attempting to seize those of the enemy. This led to the permanent operational association of the Confederate army with its territory and meant that the seizure of the enemy's territory entailed, per force, the destruction of his army. Also, the destruction of the enemy's army meant the occupation of his territory. This could only be accomplished through operations of distributed free maneuver—through operational art.

The occupation of the enemy's territory and the concomitant destruction of his army gave rise to the contingent characteristics of distributed free maneuver. These discriminators were present for the first time in Grant's campaign of 1864.[3] Indeed, the historical record shows that operational art had emerged completely as a qualitatively distinct style of warfare by this time. The distributed free maneuver of operational art of the future, in its most resonant form, will depend on a similar but more modern set of characteristics, as follows:

First, joint service headquarters will control forces greatly distributed in space and time in the same theater of operations. The ultimate scope of future operations will depend largely on the extent of the theater of operations. Second, a system of sustainment will provide logistical depth in proportion to the operational depth of the theater. Third, strategic aims will be set forth in a war plan which will define the theater of war. A campaign plan will translate these strategic war aims into operational objectives. The campaign plan in its turn will define the theater of operations. Fourth, the campaign plan will be executed by means of a series of simultaneous and sequential distributed operations. Fifth, these distributed operations will generally be conducted jointly by air and land forces, often supported by naval action and allied troops. Sixth, during the initial period of war, forces will deploy laterally, but not necessarily in a continuous front. Many of these forces will quickly become engaged and portray a pattern of numerous nonlinear actions unfolding through the depths of the theater. Seventh, these actions will occur initially as meeting engagements and quickly escalate into battles of relatively great depth. Eighth, *all* maneuver forces will be designed to sustain and conduct operations to great depth. The most successful design for ground forces will be a maneuver formation of all arms very similar to today's armored cavalry regiment. The heavy division will wither away with

only its command and control structure remaining to control, in essence, a force of reinforced forward detachments. Ninth, successful commanders will demonstrate "operational vision"—the ability to transform a superior commander's intent into a carefully defined objective and develop a rational plan accordingly. Successful commanders, while invariably forced to deviate from their initial plans, will be able to hew to the original objective because of the enhanced operational flexibility provided by a lighter force structure. Tenth, the most decisive factor in the conduct of future operations will be the successful employment of operational reserves. The use of reserves will be the most telling indication of superior operational vision. Eleventh, the rapid tempo of operations will entail the employment of a highly decentralized form of command and control supported by near real-time intelligence. Finally, nuclear and chemical weapons will not be used.

The foregoing operational variables will give rise to a form of distributed free maneuver that will constitute the ideal case. The task of an informed debate on the future of operational art will be to discern real world constraints that will prevent movement toward the ideal and to determine other factors tending to release those constraints. In practice the impact of these various influences are as difficult to forecast as they are to identify. There are three factors, however, that have been causally linked to the historical emergence of operational art— technology, national interest, and capital.

Technology serves the needs and interests of society. Indeed, it is this relationship which has given rise to civilization as man sought to control nature. The historical emergence of operational art was shaped and molded in the foundries of the Industrial Revolution. In this instance there was also a serendipitous convergence of technological innovation that conspired to pave the way for the emergence of operational art. During the early part of the nineteenth century American democracy rode rails west along a path blazed by expansionist national interests. The telegraph ran in the wake of this westward movement. Together the railroad and the telegraph would become the bones and nerves of operational art sustaining the first great manifestation of distributed free maneuver in 1864.

In 1850 the United States led the world in railroad lines with 9,000 miles. Ten years later a total of 30,000 miles of track had been laid, greater than the combined rail mileage of the rest of the world. The operational impact of the railroad was profound.

In September 1864, for example, two Federal corps of over 20,000 men with all their equipment and horses were moved 1,233 miles. The trip took just eleven days and was the greatest rail move in military history prior to 1904.

The military significance of the telegraph was also recognized with the Union Army's establishment of the world's first signal corps in July 1863. The telegraph allowed for rapid communications throughout vast theaters of operations. The telegraph also found its way down to division and brigade headquarters thanks to the portable battery-operated Beardslee telegraph and helped support distributed free maneuver at increasingly lower echelons. For example, during the fifty-mile maneuver of Meade's Army of the Potomac through the Wilderness to Petersburg, signalmen strung over 300 miles of telegraph wire.

All this suggests an opportunistic employment of technology. It was, after all, the innovative use of emerging and existing nonmilitary technology that revolutionized classical strategy. Today national leaders take a much more premeditated and rational approach. The utility of this approach is that it actively shapes technology to serve the interests of operational art. More often, however, these operational needs may be overridden by national interests. The relationship between future technology and needs at the operational level are inextricably bound to national interests. The real resource that fuels these interests is capital, the other essential characteristic of civilization.

Capital is a primary strategic resource. The Industrial Revolution in the United States and throughout the world depended on the availability of capital for investment. Indeed, the emergence of operational art was as much due to the British banking industry as to anything else: virtually our entire railroad expansion in the middle of the nineteenth century was, at least figuratively, forged in sterling in the form of loans of British pound sterling. The extent to which operational art is to serve future security interests through the use of technology begs the more fundamental question of the amount of capital available to finance it by the year 2000—the probable answer is not encouraging.

During long periods of relative international stability, fiscal and economic interests tend to overshadow those of national security. We are now on the threshold of a major fiscal implosion that could cast defense priorities into a budgetary darkness. Lurking on the

horizon is a budget deficit that can no longer be ignored. In February 1989 the cumulative U.S. national debt, not to be confused with the annual budget deficit, hit $2.7 trillion. Fifty-four cents on every tax dollar must go to pay the interest on this debt, now running at $240 billion. Currently the United States must borrow about $10 billion a month from foreign investors to help pay for this interest. For the sake of perspective it is interesting to recall that, in 1965, only 24 percent of our tax dollar ($11.8 billion) went toward interest on the debt. Present trends suggest that by the year 2000 interest payments of $930 billion will consume 102 percent of our fiscal revenue.[4] This seems to suggest that we will have no tax revenue for defense spending, much less operational art. Given the continuing rapid changes in Eastern Europe, fiscal interests will dominate all the more and military force reductions must inevitably follow.

Whatever the ultimate size of these force reductions, they must be made rationally with a view toward retaining a real capability to conduct campaigns. This will entail a lighter and reorganized force structure. Such a transformation will surely evoke much debate concerning the future of operational art. In order to participate intelligently in this debate every officer should develop some theoretical and historical understanding of operational art. The genesis of such an understanding can be found among the books discussed below.

A thorough discussion of the relationship among technology, national interests, and capital can be found in a new book by Paul Kennedy entitled *The Rise and Fall of the Great Powers* (New York: Random House, 1988) as indicated by the subtitle, "Economic Change and Military Conflict from 1500 to 2000."

A genre of writing that provides an especially keen insight into the evolution of operational art is the military memoir. There are two that merit mention because of their relationship to military theory. The first was written by William J. Slim and the second by T. E. Lawrence. Slim was a rare commander of great intuitive depth. Although Slim was not a theorist in the formal sense of the word, his memoirs display the patterns of his thought with such clarity and frankness that it is easy to discern the pattern of his ideas. Slim, like Grant, harnessed his theoretic creativity to the rigor of practice in so harmonious a fashion as to give uncommon currency to the meaning of common sense. Slim's *Defeat into Victory* (New York: Macmillan, 1972) can be regarded as one of the best military memoirs written in the last fifty years. T. E. Lawrence's *Seven Pillars*

of Wisdom (New York: Penguin Books, 1986) casts its author in some manner as Slim's alter ego: both served in secondary theaters of operations in a global war; cultivated a close rapport with native troops; and viewed military reality in a highly undogmatic fashion. Perhaps the most remarkable passage in Lawrence's entire book is Chapter 33. In this extraordinary chapter Lawrence discusses how, while confined to a sickbed, he constructed in the span of ten days a comprehensive theory of unconventional warfare. Lawrence's account evokes a keen sense of near physical concussion, as each theoretical insight crashes into its proper logical place, like slamming doors on so many steel vaults. A careful reading of Lawrence's description in this chapter discloses the fundamental relationship between theory and the commander's estimate of the situation. The entire assessment process is the logic of creating a theory—a map—of the empirical battlefield. In elaborating his theory Lawrence even manages to invoke the name of Clausewitz.

Thanks to the translation by Michael Howard and Peter Paret, Clausewitz's *On War* (Princeton: Princeton University Press, 1976) is readily accessible to the modern reader. As a work of military theory, it is unequaled. Nowhere else can the student enter the black box of the theory process better than by following the patterns of Clausewitz's own thought. This is the great eternal strength of the book. As a pure work of theory it is Newtonian in its scope. Indeed, considered strictly as a work of science, it could have earned Clausewitz a Nobel Prize in another time. As a treatise of philosophy *On War* provides the foundation for a theory of military knowledge. The philosophical quality alone of Clausewitz's work was sufficient to compel the French sociologist and philosopher, Raymond Aron, to write a lengthy exegesis of *On War* in *Clausewitz, Philosopher of War* (New York: Simon and Schuster, 1986).[5]

There is, however, a dark side to Clausewitz's brilliant work. *On War* stands like a bright beacon shining across a sea of theoretical darkness, and yet in an important sense Clausewitz has eclipsed his own work. This is because the author stands on the far shore of the Industrial Revolution. If the treatise of Clausewitz is to shed light upon the near shore of operational art, great care must be exercised in its use.

Where the Industrial Revolution is concerned, the impact of the telegraph and railroad has already been mentioned. In terms of overturning the contextual foundation of Clausewitz, Jomini,

and Napoleon, the Industrial Revolution had more far-reaching implications than even the French Revolution. In *Industry and Empire* (Middlesex, GB: Penguin Books, 1969) Eric J. Hobsbawm wrote, "The Industrial Revolution marks the most fundamental transformation of human life in the history of the world. . . . No change in human life since the invention of agriculture, metallurgy and towns in the New Stone Age has been so profound as the coming of industrialization." With the rise of industrialization the conduct of war was placed in a wholly new context. Only recently have the military implications of the Industrial Revolution, as they relate to operational art, been understood.

The traditional view is that modern war began to emerge around the time of Gustavus II Adolphus (1594–1632). The fact that this view conflicts with the military consequences of industrialization has caused some interesting historiographical gymnastics. Most recently Geoffrey Parker in *The Military Revolution* (Cambridge: Cambridge University Press, 1988) hedges his bet by expanding the duration of the origins of modern war to include the origin of industrialization in England (c. 1750). But this broad period (Parker uses 1500–1800) is not in consonance with the term "revolution" as meaning "a comparatively sudden and violent change." Edward Hagerman, however, has offered a new and cogent counter-argument in *The American Civil War and the Origins of Modern Warfare* (Bloomington: Indiana University Press, 1988) by showing that the revolution in modern warfare actually occurs in the short span of four years.

If the Industrial Revolution generated a concomitant revolution in military reality, who recognized it? Certainly not Clausewitz who died in 1831 just as industrialization began to emerge on the continent. Nor did Antoine Henri Jomini (d. 1869) who, writing his "Second Appendix" to *The Summary of the Art of War* (Philadelphia: J. B. Lippincott, 1862), makes no mention of the electric telegraph or the steam engine and asserts that the rifled musket would have little fundamental impact on the battlefield. But one who did recognize the implications of the Industrial Revolution on warfare was a now-forgotten German officer writing after the American Civil War, who, in one of those rare moments of intellectual history, saw reality as it really was. His name was Sigismund von Schlichting (1828–1909), the great interpreter of Helmut von Moltke.

Schlichting presents us with an object lesson toward understanding the purpose of military theory. Studying von Moltke's

campaigns, Schlichting came to recognize that a qualitative change had occurred in the conduct of war. Where he failed was in his inability to impart this understanding to the military profession at large. Schlichting never successfully demonstrated how his theory of war would better serve the interests of the profession than the dominant theory of future war then being offered by Count Alfred Schlieffen (1833–1913). The Schlieffen Plan was clearly a vision of the future mediated through a Napoleonic lens. Schlichting recognized this and attacked Schlieffen relentlessly. In his seminal work *Tactical and Strategic Principles of the Present* (Berlin: Mittler und Sohn, 1897–1899, 3 vols.), Schlichting used Clausewitz as a stalking horse, quoting extensively from him to show how the Clausewitzian model no longer adequately reflected reality. Schlichting, echoing Hobsbawm, wrote: ". . . [T]he means of fighting war have changed between 1815 and 1866 more than they changed in the previous half thousand years . . . [This has led to a] concept of strategy completely new and different from Clausewitz's."[6] Where Clausewitz had defined strategy as the art of using battles for the purpose of the war, Schlichting emphasized the importance of using operational maneuver to achieve the purposes of war. By laying stress on the importance of distributed maneuver, Schlichting had recast the semantic content of classical strategy.

Eventually the term "strategy" migrated to a higher level and came to mean the conduct of war as a whole, but the bare semantic content remained in its recast form. In this century the resultant semantic nudity was cloaked in the garment of "operational art." Schlichting followed this work two years later with the publication of *Moltke's Legacy* (Munich: Verlag der Allgemeine Zeitung, 1901). One of Schlichting's younger colleagues, General August von Caemmerer, placed his mentor's work within the general context of nineteenth century military thought when he wrote *The Development of Strategical Science* (London: Hugh Rees, 1905). Within months of the publication of Schlichting's *Principles* another theorist in the wilderness published his own vision of future war. He was Jan S. Bloch (1836–1901), the father of modern military science.

Bloch, a banker from Warsaw, published a multi-volume, multilanguage work in which he mapped out a theory of future war. A sixth summary volume was translated into English as *The Future of War* (New York: Doubleday & McClure Co., 1899). The author's thesis was that future war would become impossible to wage suc-

cessfully because nations lacked the economic depth to conduct protracted military operations. He supported his thesis with the most exhaustive scientific analysis of the technical, economic and political factors heretofore ever attempted. The French language edition, for example, is over 3,000 pages long. Bloch's work is still unsurpassed as a paragon outlining the role military science ought to play in support of a theory of future war. Although Bloch's perspective encompassed the conduct of war as a totality, he addressed issues of operational art and campaign planning. In the end, of course, Bloch was right. His readings evoke an eerie sense of foresight even today. But like so many theorists, his vision failed to redirect the core of professional understanding dominant at the time.

Following the turn of the century, the evolution of operational theory took a decisive shift to the east. The Russian Imperial Army had acquired a rich base of experience to nurture the growth and flowering of operational theory. Schlichting's work was translated into Russian in 1910 and used at the General Staff Academy. More importantly, the recent Russo-Japanese War provided a relevant historical context to give Schlichting's ideas greater and renewed impetus. The Russian experience in World War I further confirmed many of the ideas espoused by Bloch and Schlichting. In 1917 the Russian Revolutions finally destroyed the old Napoleonic world view and demonstrated one of the most powerful dynamics affecting operational art—the impact of political revolution on military thought. This notion is particularly timely once again in light of the recent revolutions in Eastern Europe.

The fires of the Russian Revolutions destroyed the undergrowth of old outmoded ideas of warfare. In the absence of these dogmatic professional weeds, new beliefs took root and flourished. The leading operational "gardeners" of the period include A. A. Svechin, M. V. Frunze, V. K. Triandafillov, M. N. Tukhachevsky and G. S. Isserson. The first-ever treatise on operational art, published in a form a modern reader could readily understand, was written in 1929 by Vladimir Kiriakovich Triandafillov (1894–1931) and entitled *The Nature of Operations of Modern Armies* (Moscow-Leningrad: State Publishing House, 1929). The book has also been translated under the auspices of the Soviet Army Studies Office, Fort Leavenworth.[7] In this work, the author set forth the idea of successive operations as the primary form of modern warfare. The ideal that Triandafillov sought was to link several *successive* operations into one single con-

tinuous *deep* operation. The subsequent work of Mikhail N. Tukhachevsky (1893–1937) sought to develop the idea of the deep operation. Only a limited amount of his written work has been translated into English. Richard Simpkin and John Erickson, however, have provided a translation of Tukhachevsky's "New Problems of War" in *Deep Battle* (London: Pergamon-Brassey's, 1988).

The most useful collection of Soviet military theory of the period can be found in *Problems of Strategy and Operational Art, 1917–1940* (Moscow: Military Publishing House, 1965), but this book has not yet been translated into English. An excellent biography of Mikhail V. Frunze (1885–1925), the father of Soviet military doctrine, can be found in M. A. Gareev's *M. V. Frunze, Military Theorist* (London: Pergamon-Brassey's, 1988). Unfortunately, the work suffers somewhat because the publishers chose to lift the translation directly from the U.S. government's Foreign Broadcast Information Service edition (JPRM–UMA–85–027–L, 7 November 1985). John Erickson's exhaustive *The Soviet Army High Command* (New York: Macmillan Co., 1962) is still the authoritative work in English covering the period. Although Erickson does not seem to understand the significance of operational art, the work is especially useful in portraying the great impact a few youthful individuals can have in recasting theory and doctrine in a post-revolutionary environment.

A theory of operational art flourished in the Soviet Union for two reasons. First, the political revolution had destroyed the dominance of the old Imperial military understanding. Without this professional foundation to sustain and justify causally existing beliefs, the previous refracted view of reality was seen with a clear theoretical eye. Second, the Soviets had six years of war, rich in operational experience, to study and analyze. In the west, however, different conditions led to a divergence in operational understanding.

Western theories of operational art were shaped ultimately by the solutions developed toward ending the tactical clinch on the Western Front in World War I. The Germans found a tactical solution with the institution of small unit storm tactics. The Allies countered with a technological answer—the tank. By 1939 the Germans had developed a theory of operational art founded upon two elements: *Blitzkrieg* and operational exploitation. *Blitzkrieg* was a theory of combined arms tactics aimed at achieving rupture through the depths of the enemy's tactical deployment. Following tactical rupture rapidly moving armored forces would

exploit the tactical penetrations by driving deep into the operational depths of the enemy and shattering the coherence of his defense by means of encirclement. One of the earliest books on the German style of operational art was written by Heinz Guderian in *Achtung Panzer!* (Stuttgart: Union Deutsche Verlagsgesellschaft, 1937). In 1941 Ferdinand Otto Miksche published *Attack: A Study of Blitzkrieg Tactics* (New York: Random House, 1941) which for the first time presented a coherent analysis of the tactical component of German operational methods.

Efforts to develop something that approximated a theory of operational art were initiated in Great Britain by John Frederick Charles Fuller (1878–1966) and Basil Henry Liddell Hart (1895–1970). The most relevant of Fuller's works on theory include *The Reformation of War* (New York: E. P. Dutton, 1923), *The Foundations of the Science of War* (London: Hutchinson, 1926), *On Future Warfare* (London: Sifton Praed, 1928), *Lectures on FSR III* (London: Sifton Praed, 1932), *Machine Warfare* (London: Hutchinson, 1942), and *Armored Warfare* (London: Eyre & Spottiswoode, 1943). Liddell Hart's theory of the indirect approach can be found in *Strategy* (New York: Signet Books, 1974). When studying the Western theorists it is important to bear in mind, however, that their understanding and interpretation of operational art often contains a strong Napoleonic bias that can lead to confusion as to the true nature of the conduct of operations.

Following World War II, perhaps the first theorist to write about operational art in the nuclear dimension was F. O. Miksche in *Atomic Weapons and Armies* (New York: Praeger, 1955). Another important work was written by S. M. Shtemenko *On the Soviet General Staff at War, 1941–1945* (Moscow: Progress Publishers, 1985). This two-volume study illustrates the important part that a staff plays in linking operational theory to practice. One of the first glimpses of an operational theory that anticipated AirLand Battle doctrine was a collaborative effort written by Wesley W. Yale, I. D. White, and Hasso E. von Manteuffel entitled *Alternative to Armageddon* (New Brunswick, N.J.: Rutgers University Press, 1970).

The single most coherent core of theoretical writings on operational art is still found among the Soviet writers. In the early 1980s the U.S. Air Force began publishing titles from the Soviet "Officer's Library." Three of these titles are particularly relevant: A. A. Sidorenko, *The Offensive* (Washington: U.S. Government

Printing Office, 1984), V. Ye. Savkin, *The Basic Principles of Operational Art and Tactics* (Washington: U.S. Government Printing Office, 1982), S. P. Ivanov, *The Initial Period of War* (Washington: U.S. Government Printing Office, 1986).

The most recent, as well as the most useful, study on operational art by a Western theorist is Richard Simpkin's *Race to the Swift* (London: Brassey's, 1985). Beyond Simpkin's work one must turn directly to official doctrinal statements, such as *FM 100–5 Operations* (Washington: Department of the Army, May 1986), to find current perspectives on operational theory. Certain military periodicals are also useful in articulating various theoretical views on operational art. The most important include the *Journal of Soviet Military Studies*, *Journal of the Royal United Services Institute*, *Military Review*, and *Parameters*.

The future of operational art depends on today's officer corps understanding the historical and theoretical basis of the concept. Only by knowing what has gone before can it hope to build a doctrine for the future which takes full advantage of the fruits of technology. In an era of diminishing resources, understanding operational art will be an invaluable asset to the decision-makers who will have to select which technological advances will be pursued and which will not.

NOTES

1. There is evidence that classical strategy characterized by concentric maneuver even predates Napoleon by several hundred years. Tu Yue, a military writer of the T'ang Dynasty (618–905 A.D.) wrote: "Now those skilled in war must know where a battle will be fought. They measure the roads and fix the date. They divide the army and march in separate columns. Those who are distant start first, those who are near by, later. Thus, the meeting of troops from distances of a thousand li [about three hundred miles] takes place *at the same time.* It is like people coming to a city market" [emphasis added]. Sun Tzu, *The Art of War,* trans. Brig. Gen. Samuel B. Griffith, USMC (New York: Oxford University Press, 1971), p. 99.
2. Carl von Clausewitz, *On War,* trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1984), p. 90.
3. J. J. Schneider, "The Loose Marble—and the Origins of Operational Art," *Parameters* 19, no. 1 (March 1989): 85–99.
4. See C. Fred Bergsten, *America in the World Economy* (Washington, D.C.: Institute for International Economics, 1989), *passim.*
5. See also R. M. Swain, "Clausewitz for the 20th Century: The Interpretation of Raymond Aron," *Military Review* 66, no. 4 (April 1986): 38–47.
6. Sigismund von Schlichting, *Tactical and Strategic Principles of the Present,* 3 vols. (Berlin: Mittler und Sohn, 1897–1899), 2: 9–10, 97. See especially Donald Cranz, "Understanding Change: Sigismund von Schlichting and the Operational Level of War," *Student Monograph* (Fort Leavenworth, Kans.: School of Advanced Military Studies, USACGSC, May 1989). Cranz has provided an extensive translation of Schlichting in an appendix to his monograph.
7. See also J. J. Schneider, "V. K. Triandafillov, Military Theorist," *Journal of Soviet Military Studies* 1, no. 5 (September 1988): 287–306.

The Ground Commander's View—I

Glenn K. Otis

Before one can discuss operational art there are three points which must be clear. First, when thinking about strategy, operational art, and tactics, one must go beyond the strict definitions and look at the goal of each. In brief, strategy wins the *war*; operational art aims at winning the *campaigns* that support the strategy; and tactics win *battles* in the campaigns. That may be a simplified way of looking at it, but it does anchor each term on a concrete objective.

The second point is that in the military command structure each headquarters operates in two different leagues—planning, or preparation, and current operations. Every headquarters has to operate in both of those leagues at the strategic level, certainly at the tactical level and, in my view, clearly at the operational level. Understanding that tells a lot about how to think and what a commander can do to influence the action.

Finally, each headquarters—that is, every echelon of command—must clearly understand the concept of the next higher headquarters. If it is not understood, or more likely, if it is misunderstood, then the actions and orders transmitted from the headquarters that creates the misunderstanding are going to be at odds with the commander's intent. With an understanding of these three points we can discuss the strategic, operational, and tactical levels of war. I have categorized a set of major factors for each level. Together they illustrate some of the fundamental differences among the three levels of war.

At the strategic level the goals are unquestionably national, but in almost every case those goals are going to be international as well and influenced by more than just national desires. One has to be prepared to cope with and help structure international goals as well as national goals at the strategic level. Also, at the strategic level we are talking about large force capabilities—bringing together the resources and might of a nation or a coalition of nations. An important factor at the strategic level is force generation. No strategic commander has forces available to him that are his to do with as he pleases. Rather, he has *resources* available and he must put them together. The resources—including people, equipment,

facilities, and time—can make a major impact on strategy and the campaigns which make the strategy succeed. Force generation, whether that force is specifically military operating elements or other types of resources, is more important at the strategic level than at the tactical or operational level. At the strategic level one has to almost always talk about multiservice as well as multinational factors which clearly differentiate it from the other levels of war.

Another major factor at the strategic level is public opinion. It is at least as important as objective, mass, surprise, and the other principles of war. In this past century, that has been proven on several occasions. Harry Summers' book, *On Strategy*, for example, shows how important public opinion is to the strategy of war. It is so critical that it deserves to be one of the principles of war. At the strategic level, public opinion is going to be a major influence, making strategy fundamentally different from operational art and tactics.

Finally, and though this is not necessarily a difference but rather a critical factor at the strategic level, we need to define what it is to "win" the war. We had a clear definition in World War II: unconditional surrender of the Axis powers. In the Civil War Grant demanded unconditional surrender of the southern forces. When the United States went into Korea it did not have a clear concept of military victory; the fact that we are still on the Korean peninsula, under an armistice instead of a peace, is a clear indication of the consequences of not defining "winning." In Vietnam we did not have a clear military objective. At the strategic level one must define the military goals to be achieved if that strategy is going to mean something.

With those broad remarks about the strategic level, let me next turn briefly to the tactical level of war in order to set the stage for a more detailed discussion of the operational level. At the tactical level, there is little latitude for commanders to define their own operational area. Commanders are given a specific, usually well-defined operating area. That area is where they must conduct their business, and so there is a definite smaller scope with which the commander must deal. The focus at the tactical level is to bring firepower on the enemy. One can do it by movement, by deception, by all sorts of things, but the goal is firepower on the enemy. At the highest tactical levels—division or corps—perhaps the synchronization of fire and movement is a key factor. However, at the lower levels—brigade, battalion and company—the actual application of the fires is what counts.

Even though the tactical level is theoretically the "lowest" of the three levels of war, it is the focus of all the other levels. It is here that men die and that equipment is destroyed. The tactical level is where winning and losing are much more easily defined.

Just as at the strategic level, one must have clear objectives at the tactical level; here, however, success or failure is much clearer. At the close of a tactical engagement the side that has been captured, killed, or forced to withdraw has lost.

The tactical level is not joint. The commands are almost always from only one service. Paradoxically, it is at the tactical level that the actual firepower from all services comes together. So at the tactical level, commanders are almost always interdependent upon other commanders from other services for mutual support without having a command arrangement that ensures it. It is an interesting phenomenon and it works, but it has to be recognized. For example, air power can be very important at a critical stage in a tactical battle. The ground battalion commander is allocated air power if it is available. He may employ air power to good effect, but he does so only by requesting it and by using standardized operating procedures. An airman downed in that battle, in no mans land, relies in part on the Army to pull him out. It is inter-service cooperation at the tactical level rather than command by a joint task force that governs the kind of operations and how effectively they can be handled.

Having set the parameters of the strategic and tactical levels of war, I will go to the operational level. If a nation does not recognize that there is an operational level of war—and we did not until a few years ago—any clear thinker can see there is a gap between strategy and tactics. When one discusses the nature of war, the gap is obvious and hence needs filling. Even if you don't give it a name, you still have to refer to it. I am therefore delighted that the U.S. Army has chosen to bring back the operational level of war so one can now talk about it and understand it.

Like strategy and tactics, the operational level of war has some factors that are unique to it or at least more important to that level than to the others. First of all, there is a much wider latitude in the area of operations for the operational level commander than there is for the tactical. I don't just mean in size, but in terms of diversity of area, of being able to move forces very differently in different schemes. Visualize a battalion commander who is given 15 kilometers of terrain to defend. He can move anywhere in that area, but the fact is he is fixed in how much he can do in the way of deception by movement, for example. This is not so at the operational level.

At the operational level the emphasis has to be on a series of battles which constitute a campaign. The emphasis is not on a single battle; it is not even on battle itself. Battle, or fighting, is the concern of the tactical commander alone. Whereas the strategic level is always joint and combined and the tactical level almost never is, the operational level can be both. At the operational

level there are joint commands, there are combined commands, and there are joint combined commands. In NATO these commands exist in peacetime and presumably will function at the operational level in wartime.

Functions important at the operational level include time. As a parameter, time is much more important at the operational level than it is at the tactical level. For example, an infantry company can be pulled together and told to attack a hill in a very short time. A battalion can do the same, but an operational level commander with one or more corps or larger units cannot. The time from making a decision which affects a major part of his force to the actual execution is measured not in hours but in days. A planning cycle which gives a reasonable amount of time to subordinate commands to plan, react, and execute in conjunction with the concept of the operational level commander ought to be five days. This means the operational level commander has to expedite his planning and then keep the alterations to his plans at a minimum, in order to give time for the execution to be handled by the lower levels.

At the operational level, campaigns must be synchronized with strategy. That may seem like a trivial statement since the goal of campaigns is to make the strategy successful, but it is not. There are times when an operational level commander will deliberately have to adopt undesirable actions in some sectors in order to achieve the more important strategic goal.

Another factor at the operational level is the commander. He must determine where and upon what he exercises direct control versus indirect control. For example, as an army group commander I had four corps of different nations in my command, and I had another brigade size national formation. Some of those corps and other national formations had weapons systems that had great reach but were very different from each other. Some nations even had organic air assets in their contribution to my army group while others did not. Therefore, as an operational level commander I had to make judgments on where it was necessary to exercise direct control over certain formations and certain parts of those formations and where it was more logical—or politically acceptable—to execute by indirect means down through a rather long chain of command.

I am convinced that at the operational level the commander has to visualize the tactical level as well. There is an old adage that at the tactical level one looks at things two echelons below. Command is one echelon below, but the tactical commander *looks* two echelons below. I don't think that is totally appropriate at the operational level, because in planning a campaign it is not adequate to consider what corps and divisions can do. But in looking at oppor-

tunities for achieving success—in analyzing enemy capabilities and our own capabilities at the operational level—one has to get right down to the tactical level where the real fighting elements are and visualize how the clashes will or must take place. As a matter of fact, it seems to me that when you do that, it educates the operational level commander on things like terrain and force capabilities. The danger, however, is that an army group commander visualizing at the battalion level might start fighting at the battalion level, and that would be fatal. But clearly an operational level commander has to visualize the tactical level so that at his level, the commander will know where, when and how much "to take the hurt."

Few wars are ever fought where one side is totally successful in all phases at all times. NATO forces, for example, had they been called on to fight, would probably have started a war seriously outnumbered, out-manned, and out-gunned. Their defenses would certainly have been ruptured and in need of repair. At the operational level, one has to understand and calculate where to "take the hurt" in order to achieve the best success. Put another way, the operational level commander may structure the battlefield so that he deliberately accepts a setback in an area where he thinks he can afford it in order to achieve a greater good in another area for a greater advantage.

The concept of the operation is critical. At the strategic level, we already said that we need to define our military objectives and that one must have a set of strategic goals. At the operational level, in order to plan and execute a campaign and have all the tactical elements come together for that campaign, those tactical commanders have to be "inside the head" of the operational level commander. The only way they can do that is through the concept of the operation. It has to be clear and precise, and it must convey the intent of the operational level commander. This is very difficult, especially in a multi-language international command.

At the tactical level I emphasized the clash of arms or the battle at the front. U.S. Army doctrine defines two other battles: one in our own rear and one in the enemy rear. To some tactical commanders those three battles will mean something, but the majority of tactical commanders will fight where and when they are told. If it happens to be in the rear, it is no different from being at the front. At the operational level, however, there are always these three battles. There is always the battle in the rear because of enemy air action or perhaps enemy sympathizers. Whether deliberate or indirect, there is always our own rear to consider at the operational level. The enemy rear must also be considered at the operational level. If it is not, then our air interdiction and long-range weapons just become weapons of op-

portunity rather than weapons of plan. Finally, there is the battle at the front, which is fought at the tactical level.

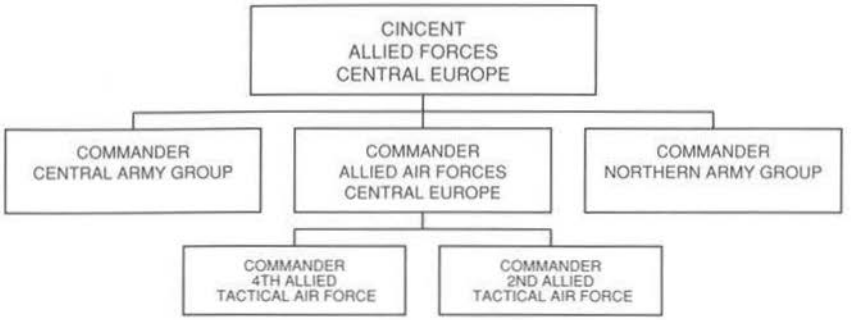
There are other elements of high importance at the operational level that are different from the tactical level and in a way are different from the strategic level. The first is air power. At the tactical level air power influences the battle with close air support, battlefield air interdiction, and usually intelligence support through airborne observation and sensors. At the strategic level, air power can directly attack the economic power of an opponent, while at the operational level the entire gamut of air power and all its missions comes into play. Close air support, battlefield air interdiction, the air interdiction campaign, the offensive and defensive counter-air campaign, the suppression of enemy air defenses, and intelligence all contribute at the operational level. An important element of the joint national force commander or the joint combined commander is how he works out the allocation of that air effort among his various mission capabilities. The employment of air power at the operational level can be crucial to the success of campaigns.

For example, the air in support of NATO's Central Army Group (CENTAG) was controlled by my commander, the Commander-in-Chief of the Central Region (CINCENT). He was the lowest level *joint* commander in the Central Region, and he had the authority to allocate the total air effort throughout his assigned area. It was his responsibility to allocate air support to the subordinate army groups. (*Chart 2*)

An important aspect of air support is that some types of aircraft are suitable for only certain missions. For example, the German Alpha jet and the American A–10 had "short legs" and were unable to penetrate too far beyond the forward edge of the battle area; they are therefore primarily confined to a close air support role. The F–4s and selected other NATO aircraft have only a slightly greater range, so in a deep interdiction campaign they are of little use, hence the majority of them will be in battlefield air interdiction, an immediate concern to the ground commander. Depending upon those aircraft that have dual capability (air-to-ground and air-to-air), more or less air can be allocated to support the ground commander depending upon the mission assigned to the air arm for offensive and defensive counter air, especially defensive counter air. All of those are factors that have to be taken into consideration.

As a ground commander, what I needed most in the first two to three days of the war was to see the enemy so that I would know where his main attack was and be able to move major forces to counter the main attack. I did not necessarily mean to block it, but I might want to delay or channel it. Put that all together and

CHART 2—AFCENT ORGANIZATION



my mission statement to the air commander might be something like this: "For the first two to three days of the war your top priority for support to me is: Number one, keep the enemy off my back so I can move major formations in daylight, and number two, do not let the enemy move major forces in daylight."

I never actually wrote this mission down and sent it by messenger to the air commander, but we frequently discussed these concepts and constructs. The air commander told me that the first two to five days would determine who would achieve true air superiority. He told me that a mission like I gave him—"keep the enemy air off my back"—was a mission that allowed him maximum flexibility in putting aircraft to work in air-to-air, defensive-counter air, and in offensive-counter air, where he was going after enemy airfields to attack enemy close air support aircraft on the ground.

The air commander in NATO commands the integrated air defense weapons, which include all the army weapons not assigned to the front lines. That means all Hawk and all Patriot air defense missiles come under the air, not the ground commander. The mission of "keep the enemy air off my back" meant he could better synchronize the joint employment of surface-to-air, air-to-air, and offensive counter-air weapons. It also meant that aircraft with sufficient legs to reach enemy airfields which might otherwise be used for battlefield air interdiction or even for close air support would not be available. The agreement was that for the first two or three days into the war, our air force would make its presence felt on the other side so that the enemy would not feel free to move in daylight, and friendly air would concentrate on the air-to-air, and air-to-ground, anti-air campaigns to keep the enemy off my back.

What I had to transmit then to the subordinate formations of CENTAG was that for the first two or three days of the war close air

support missions would be at a minimum, and would consist mostly of the Alpha jets and the A–10s. Because their numbers are relatively small—maybe 350 aircraft—I did not want to parcel them out across the board just to give everybody some. I would concentrate those assets on areas that were critical. When we translated that through map exercises, war games, discussions, and councils of war, it really meant that the III German Corps would probably get little in the way of close air support. That is an example of the thinking process that one goes through at the operational level.

Another important aspect of operational art is logistics. At the strategic level, the commander is interested in gathering the total resources of the nation to prosecute a war, while at the tactical level the emphasis is on consumption. At the operational level, however, the emphasis is on providing logistics from the wholesale level down to the consumer. In that provision, reallocation (or cross-leveling) is perhaps the most important aspect. No operational level commander is going to be able to plan and execute plans with five-day decision cycles if he hasn't given full consideration to the logistics of the situation. I am using logistics as shorthand to mean the consumable items of war: food, fuel, ammunition, and spare parts. The most important of those in operations regarding the U.S. Army as a mechanized force is going to be fuel followed closely by ammunition and only thereafter by spare parts and food. Food is plentiful, is packaged, and is easy to distribute. Spare parts are available because of cannibalization on the battlefield in addition to the normal logistics. So the two items that must take the most attention at the operational level are fuel and ammunition.

If we narrow logistics down to ammunition rather than the whole gamut of logistics factors, ammunition is a form of reserve, and in almost every case limitations exist. For example, in Europe not all nations have the same stockpiles of ammunition available for weapons systems. Where ammunition is "multi-lingual," it is primarily the 155-mm. artillery. Because the majority of NATO artillery units fire the same round, 155-mm. ammunition becomes very critical. Through NATO agreements a corps from one nation can use logistical assistance to help a formation from another nation with needed ammunition. At the operational level, I always made that assistance contingent upon agreement by the army group commander, because one corps giving ammunition to another corps for today's battle or tomorrow's battles might very well upset what was planned for the corps to have for the day after tomorrow or the day after that. So in that respect I treated logistics as a form of reserve, and it could not be committed without my approval as the army group commander. In any case, we are only

talking about ammunition on the margin and not that which is already issued to the troops and available for use in today's battles.

There is another type of ammunition which is a form of reserve. Air defense missiles are in very short supply in Europe. If our front line troops use their air defense missiles to fire at every enemy aircraft seen, the return on the investment made in those weapons would be small and we would soon run out of these short-supply items. So in the army group, we looked at schemes that used the ammunition available to do the most good rather than resort to a random attempt at attrition. That is a form of reserve. But practically speaking I did not call it a reserve. All I looked at were schemes of husbanding ammunition. Antitank missiles are another critical ammunition supply because the backbone of our front line defense, other than the tank itself, is the anti-tank weapon. Dragons, MILAN, and TOW launchers were available in great quantity, but the costly missiles themselves, especially in non-U.S. formations, were in short supply.

Finally, at the operational level—just as at the strategic level—the commander must look at force generation. At the operational level, however, it takes on a different form. Where the strategic commander worries about mobilizing national forces or moving them from perhaps remote places into the theater of operations, the operational level commander must develop his own force generation. Effective force generation depends upon how well he can articulate his needs and how good his decision cycle is so that he doesn't have forces moving in an untimely way to a place where they are not needed, instead of being at the right place at the right time. At the operational level of command, one of the great weaknesses can be having forces available but not having them where you need them. Force generation is therefore an important aspect of the operational level.

As an army group commander in NATO I had an entire army in reserve—the First French Army. However, in one exercise the reserve army was unable to be employed where it was needed simply because I failed to make proper decisions at the proper time and make those decisions stick, so I could ensure that the force was available where and when it was needed. By the time the decisions were made, the window of opportunity was gone because of movement time, logistics, national problems, and a whole series of things. It doesn't matter what the series of things are, it simply means that force generation failed, not because it wasn't available, but because it wasn't where it was needed.

So far I've been dealing with definitions, characteristics, and factors of strategy, operations, and tactics, all of which is somewhat

theoretical. In getting to the practical aspects I'll focus at the operational level. The old formula of METT–T, *mission, enemy, terrain, troops available,* and *time,* is a good way of thinking it through.

First, the mission. As an army group commander, I was given a specific mission that said defend, do not lose critical terrain, and the critical terrain was defined. I was also to employ reinforcements and be prepared for nuclear weapons employment. At the operational level the commander has to focus not only on the specific mission but also on the implied mission. U.S. Army doctrine requires that at all levels, but it becomes very important at the operational level. The first place to look for implied missions is in the concept of operations from the next higher commander. As an army group commander my next higher commander was also at the operational level. His campaign plan and concept of operations defined some implied missions for me. One of them, for example, was to make sure that I had reinforcements that might be available for operations outside the CENTAG sector. I derived from his concept that he was faced with a strategy of "forward defense." My mission, therefore, entailed relinquishing the least amount of terrain given the conditions of the battle. The mission of defense, at the operational level, allows flexibility to the commander; one can be operationally on the defense but tactically on the offense. As I saw the terrain and the enemy situation, there were many opportunities in the army group to execute defense while also conducting a tactical offense. The point is that a study of the mission, a careful consideration of both the specific and the implied missions, and the incorporation of the other factors of METT–T can lead the operational level commander to a variety of solutions.

Turning to the second part of METT–T, the enemy, means different things to different people. It means to me to know his doctrine. As he trains in his school system, as he trains in the field, and as his manuals dictate will be the way he will fight. One doesn't change the nature of a force overnight after the war starts. Understanding enemy doctrine is critical to knowing the enemy and becomes more important at the operational level than at the tactical level for two reasons. First, at the tactical level you are still faced with guns being brought into position to kill and to fight directly. That doesn't mean doctrine isn't an important element tactically, it just means one has a different view of it. Second, when one discusses the enemy at the operational level you just won't see enemy divisions or enemy armies. No one has ever seen an entire division all at once in combat. In all my years as an Army officer, I saw an entire division only once. That was on an airfield, and it took a week to line it up and another week to dismantle it. Other

than that, one does not "see" divisions. So what you are visualizing in looking at the enemy in terms of a higher level formation like a division or above is a series of smaller units, how they can move, how they can deploy, where they can deploy, and the rapidity, or lack of it, by which they can do all that.

I divide looking at the enemy into two parts: peacetime and wartime. In peacetime we need to focus on their doctrine, their potentials, and their possibilities. Looking at the Soviets, for example, we ought to be experts on their doctrine. It is available in open literature. Their potential is a function of where they are, how much they have, and what kind of weapons they have, most of which we can measure. Their possibilities are legion, but do have some limitations. Limitations include strategic movement, mobilization, and the terrain itself. I look at those three points in peacetime—doctrine, potential, and then possibilities. By studying that, you can take the whole universe of things and focus it into a manageable, countable number. It also allows you to build peacetime templates for wartime. In wartime, however, I think in terms of two parts instead of three: what is possible and what is likely or probable.

In CENTAG, for example, in order to see what was possible, I tried to lay the enemy out on the terrain without regard to a tactical plan, only with regard to what was feasible on the terrain itself. When you have done that, his ninety-four divisions become something smaller where guns can be shooting. That kind of visualization gives you an idea of the possible.

To determine what is probable you apply enemy doctrine, and if you know enough about the enemy commander's proclivities for doing different things you can narrow those possibilities into likely probabilities. It is often said that we need to look at enemy capabilities and not their intentions. I totally disagree. While we do have to look at their capabilities, because that is their potential and their possibilities, we also need to assess enemy intentions on the battlefield at the operational level, as well as at the tactical level. It is clearly possible to make informed judgments about enemy intentions. There are a whole series of indicators of intentions and we have sensors and other means to measure those indicators. By putting those measurements together we can come up with judgments about the intentions, although any commander assessing enemy intentions has to make his own judgments about them and how reliable they might be. For example, in one sector which could be critical to the CENTAG, it is quite clear that an enemy army has only two options for the way it can deploy itself. Depending upon the way the artillery is positioned and depend-

ing upon how the rear part of that army is deployed, one can get a very clear indication of the intention of that army commander.

Another thing that I needed to know as an army group commander was the location of the enemy main attack as compared to holding attacks. At the tactical level, virtually all attacks are going to seem to be main attacks; but at the operational level one area or another, perhaps two at most, will be his main attack actions. There are indicators which one can get with some clarity to identify what the enemy intention might be. One of these is how he uses artillery. An army or front commander will allocate his own artillery, missile, and rocket assets to the main attack axis. He will not normally allocate these artillery weapons to the secondary or supporting attack axis because he cannot afford to. There will also be certain kinds of radar and certain kinds of signals intelligence which can give a clear indicator of the enemy commander's intention to make a main attack in a particular area.

Making a judgment about the main attack can allow a commander to take actions that give him an advantage over the enemy. It will be risky, but that is what war is. If you are fighting outnumbered, you are not going to have sufficient forces to take on all possibilities nor all capabilities, so informed judgments have to be made. In studying the enemy in peacetime look at his doctrine, potential, and possibilities. In wartime, figure out what is possible and what is probable, and then go after him with appropriate sensors oriented in advance for those key indicators of what you need to know and the areas in which you need to know it. At all times watch out for ruses and deception by the enemy, since his doctrine requires him to employ that as well.

The first of the three T's in METT–T is terrain. At the tactical level, one looks at a piece of ground terrain to see how many tanks can come down that area at any given time and what other options they have. A commander can war-game various possibilities to get a fairly good understanding of the piece of terrain on which his next battle might be fought. At the operational level, however, terrain takes on a different perspective. For example, in CENTAG the conventional wisdom looks carefully at the so-called Fulda Gap. The Fulda, however, is not a gap; you can walk the ground for a long time at Fulda and not find a gap, because that is the tactical view. Almost the entire area around Fulda north and south is ground that can be fought over; in war it would have been fought over, I am sure, with some degree of intensity. The key in looking at terrain at the operational level is to consider where the enemy can move his major forces, and where he can employ major forces with major reinforcements. There are some four hundred and sixty

kilometers of front in CENTAG, but there are only four areas in that entire front where an enemy can move major forces to create a main attack. Were he to try to move major forces in other than those four axes he would be confined to moving in relatively small columns, and hence his fighting force at the point of impact would be seriously constrained. Some axes of possible main attack can be ruled out, because of the constrictions of terrain and the capabilities to support major forces. For an enemy front commander to have a main attack in the Meiningen area or the Fulda Gap is probably impossible, because the constriction of the terrain to the direct rear of the front lines would prevent the movement of major forces in an orderly way. At the tactical level, we look at small units, weapons positions, obstacles, orchestrations of fires, observation, and fields of fire as some of the critical aspects of terrain. At the operational level one has to look at major routes, the capability to employ and sustain major forces of division size and higher, and the ability to continue to support forces in those areas.

Another aspect of terrain is denial. At the tactical level one uses mines or obstacles to deny certain pieces of ground for enemy use, at least temporarily, to gain time for a tactical battle commander to get an advantage. At the operational level one has to look at the denial of terrain in a different way. Taking out a dam in a major area, for example, can deny a large area of use to an enemy force and thereby put him into a much different situation. Taking out critical bridges changes the terrain for the enemy's movement capability.

Let me turn to troops, the second T in METT–T. There are troops, including weapons systems and so on, that *are* available to the operational commander, and troops that *could* be made available to him. In CENTAG, for example, I had no air forces assigned to the command. On the other hand, one of the allied tactical air forces (ATAFs) which belonged to my next higher commander was given the mission of supporting the CENTAG. Therefore, those "troops" under that ATAF could be available depending upon how the operational commander visualized the deployment, and how successful he was in convincing the air commander of the specific need for air support.

In a combined force one also has to look at the troops available and understand different national formations. A full-strength German division has 25,000 troops in wartime; a U.S. division has 19,000; but a French armored division has only 7,000. Each of these formations has a variety of tanks and mixtures of weapons systems. At the operational level—commanding four corps (and perhaps in war even a French army)—it is not sufficient to con-

sider just divisions. One has to look inside the division for force capabilities and differences in national formations. Some national formations had very little in the way of intelligence-gathering capability at the corps level, whereas the U.S. has a great deal. At the operational level, dealing with four corps of different nations, one could be faced with a U.S. corps having a very good picture of the battlefield and its neighbor having a very different picture of that same battlefield because of the lack of sensor capability. The operational level commander has to be able to pull the different national capabilities together.

In considering attacking the enemy in depth, especially his follow-on force attack (FOFA), I have already said that at the operational level there are always three battles going on, and there are varying national formations with varying perceptions of employment of those formations. The operational commander has to make judgments about how best to conduct the deep battle against the enemy, and air is a critical part of the equation. But because air is not a part of the assigned CENTAG command, air support provides another dimension to consider in troops available.

Finally, in almost any international arena where we might have to fight, there will probably be indigenous troops available. In Europe, for example, there are many German brigades and regiments that are not assigned to NATO but kept under national control. Those brigades and regiments, some of which are located in the CENTAG area, are troops available under the right conditions and the right employment, despite the fact that they are not part of the assigned force. So the considerations for the second T—troops available—are highly important. I tried in this discussion to bring out only those things that are unusual.

The last of the three T's is time. The time parameter has a dimension that is tied to the decision cycle of the command. In talking about time at the tactical level, for example, if one deceives an enemy for perhaps a few minutes or a few hours, then a tactical advantage can accrue to the deceiver. At the operational level where the emphasis is on a five-day planning cycle, deception is very different. If it is a deception operation which can be uncovered in a matter of a day or two then perhaps the real return on the effort will be small. So time takes on a different dimension between the tactical and operational levels. It means that your thinking has to be different. One could have an entire division available to the command in a matter of hours, but if the time required to move that division to where it is needed is not carefully calculated in advance, then the combat power of the division may not be use-

ful for the contemplated action. This point may seem obvious, but it is often overlooked or miscalculated.

One talks about time with the idea of flexibility. In that respect Army aviation is given high grades for being able to deploy rapidly from flank to flank. It is also true that Army aviation at the operational level has a certain lack of flexibility. It has to be tied to a very large umbilical cord. To move that umbilical cord is a long and involved operation. Consequently, whereas we think of moving a division with all its logistics and being able to re-position it from here to there in a certain amount of time, to do the same thing with an aviation unit is very different.

The Air Force operates from fixed bases, goes out to fight, and returns to fixed bases. The umbilical cord there is the length of the legs of the aircraft themselves, and that limits flexibility. With Army aviation you can move your base, but when you do there is a down-time that is significant to the conduct of the entire scheme of operations.

Time is a parameter in surprise. For example, if one can employ his forces so as to surprise an enemy force which is available but can't be brought to bear in sufficient time, then one has achieved surprise. For the tactical level units fighting at that point and that time, there may have been no surprise because they were seen. But at the operational level it can hold the enemy for a day, because the subsequent reinforcements needed to exploit any advantage are just not going to be available. So there is a different view of surprise and deception at the operational level.

In the discussion of definitions of characteristics and factors above, I mentioned that each headquarters is involved with two leagues—the operations going on currently and those operations being planned within the decision cycle time frame. At the tactical level (and when I say tactical I am referring to division and below, with corps on the "seam" some place) the commander has to be directly involved in today's battle. Likewise, he has to be planning for tomorrow and perhaps the day after, but he is mostly involved in today and planning for tomorrow. A lot of this tomorrow planning will be a continuation of what is going on today; and if one were to split the time between those two for that tactical commander, one would find that at division level it is probably fifty-fifty. At the battalion level it is eighty-twenty; eighty for current operations and twenty for tomorrow's.

It is very different at the operational level. At the operational level the commander's influence with decisions and orders on today's battle is very small, due in part to the time frame. But the assets available at the operational level to influence today's battle today are only those things that can be diverted on short notice.

Therefore, the majority of the operational level commander's time is spent on the planning cycle rather than today's operations. That does not necessarily mean a time division of 0 and 100 percent, but it does mean that a majority of his time is spent planning for the future. His major role in today's battle is how he influences his subordinate commanders by presence, as well as by passing orders and instructions on what assets he can reallocate quickly—some forms of long-range artillery and some forms of air. However, he can do very little with major ground forces and logistics, although some types of logistics can be quickly reallocated. Another part of the operational level commander's involvement in today's battle is to understand the dynamics of it sufficiently to see where the results may impact on his plans running through his decision cycle time period. When the operational commander made his campaign plan to cover the next four or five days, he assumed something about today's operation, and that assumption may be changed by the actual outcome of today. Obviously, this can influence his future actions and orders.

Those are just a few of the considerations, some obvious and perhaps some different, in using METT–T as a shorthand for thinking through the battle or campaign situation with a focus on the operational level of war.

The Ground Commander's View—II

Crosbie Saint

History teaches us that the things that really win battles have always been the same. Although speed, distance, and technology may change, it is those warriors with the sharpest short swords from the best-prepared companies who often carry the day. No matter what the era and no matter how rapid the tempo, it has been the best-trained companies that have won the fight. Commanders above the company level, however, can cause the well-trained company to lose. Ultimately their jobs are to place that company in the right place, at the right time, with the right materiel to accomplish the mission. As you go up the chain of command, commanders must do what is appropriate at their level to prepare the battlefield for those companies.

In my view of war, you have fighters, integrators, and shapers. These are not scientific terms, but they carry special meanings. Fighters concentrate on destruction and kill everything that gets within reach. Companies and battalions are pure fighters—they are like the Pacman video game. Battalions go forward or backward to attack, or they sit still in the defense and look around to kill whatever attacks them. Good battalions are ferocious in the fight—they are the teeth of the modern war-fighting machine.

As formations become larger and more complex, the killing becomes more selective and has a broader focus. While battalions are pure fighters, brigades are both fighters and the first level of integrators. Integrators at the brigade and division levels focus combat power; they focus it at the right places and at the right times based on the guidance and direction of the commanders above them—the same ones who provide the assets from which combat power is developed.

When you get to the shapers, you enter a fuzzy area. Shaping is the bringing together of disparate combat capabilities in sequence, over time. This is the essence of operational art. Shaping is the way to use the means at hand to accomplish an end within the constraints and restrictions of the military and political envi-

ronment. I use constraints in the sense of those actions which *must* be done, as opposed to restrictions which are those actions which *must not* be done. I would say that the corps is about half integrator and half shaper. An army group in NATO is about three-quarters shaper and one-quarter integrator.

Depending on the constraints placed on it, the army group may also get into a bit of strategy. For example, instructions to operate in a particular area or defend other areas might well be constraints which give army-level operations a strategic twist. Remember, an army group today operates over much larger pieces of terrain and has much more lethality than army groups of World War II vintage.

The theater-of-war level allocates resources; this clearly enters into the realm of strategy. The mix here is about one-quarter operational art and three-quarters strategy. In furtherance of his military strategy, the theater-of-war commander specifies ends to be achieved, provides resources, and defines restrictions and constraints. The army group then combines the resources and limits in ways to achieve the designated ends.

The army group is also the operational link between the first and second battle. It could be the link between the fourth or fifth battle or even the sixty-fourth and the sixty-fifth battle. It accomplishes this linkage by establishing control measures such as boundaries, allocating uncommitted force and the firepower available from external means, or dividing air power among the corps. In other words, the army group is an allocator of resources.

The term allocator is critical because it goes back to the concept of shapers, integrators, and fighters. The fighters at the tactical level actually employ combat power. We are confused when we say the army group targets something. The army group cannot target anything because it does not have the communications, the timely intelligence, or the up-to-the-minute appreciation of the tactical scheme of maneuver to kill the "right" somebody. Even if you have the greatest operational scheme in the world, if the killing does not get done at the bottom, you are going to lose. Remember, ultimately it is the companies who do the killing.

Sometimes it is difficult to stop being a fighter and stick to being an integrator or shaper. I think army group commanders are sometimes frustrated squad leaders. Even though they know how to be squad leaders and they know how to be battalion commanders,

they must take great care to keep to their part of the hierarchy; otherwise, they can screw everything up. Commanders always seem to revert to what they know how to do well; they just cannot keep their hands off it. Senior-level commanders must develop the mental discipline to stay away from the temptation to interfere with the lower-level fighters. The key is to think and act as a shaper, to effect prudent, personal intervention, but not overwhelming control.

The planning horizons of each echelon are critical to battlefield success. For example, today's division commanders integrate a series of battles or "islands of conflict" in order to gain tactical advantages or create enemy vulnerabilities. They use forward-looking decision cycles to integrate operations 24 to 36 hours out. As the tactical link between the first and second battles, corps operate in the 36 to 72-hour time frame. This time frame varies depending on how far one can see into the future as well as how fast one can move forces and firepower around the battlefield. Some of the ways the corps prepares to create or take advantage of enemy vulnerabilities are establishing priorities of fire, allocating resources, developing unit boundaries, and defining objectives such as specific terrain objectives (not just "goose-eggs"), enemy units, or enemy facilities.

The army groups that are in the Central Region of NATO operate 72 to 96 hours in the future. They are mainly limited by the intelligence needed to create or take advantage of enemy vulnerabilities and then destroy the enemy's ability to fight a coherent battle. The army group spends much of its effort in the allocation of forces. It receives forces from outside the group and determines who in the group gets them. An army group has to predict three to four days in advance who is going to need the additional resources. Resources should not necessarily go to a corps because it had heavy losses today; rather, resources should go to a corps because it needs them for a future battle. Otherwise, you are reacting to the enemy. You are falling prey to what I call the "Oh, my God" syndrome.

Catastrophic emergencies should not happen at echelons above the army group. In fact, catastrophic emergencies should not occur much above the corps. Anything that happens that fast is within a two-day time frame. Even at corps level, we normally ought to be able to act within our planning windows. We want to avoid knee-jerk reactions. There are about a dozen different things you have to consider in planning ahead: reserves, maneu-

ver, combat power, joint and combined operations, intelligence, deception, initiative, battlefield support, communications, operational fires, command and control, and preparation. Even though I will discuss each separately, it should be obvious that they are all interrelated at the operational level.

Reserves

Reserves are the use of engaged forces in future time. As an army group commander, I do not put strings on such forces. I give my subordinate commanders the maximum latitude to use their available forces. I tell them what I want, and I give them a time frame which is reasonable. For example, I might direct a corps commander to give me a division in 48 hours. This is one of his constraints, but he can use that division for the next 48 hours. "Putting a string" on a force tells a commander he cannot do anything with it until I tell him he can. In that case, step one for him to use it is to have staff officers at his level convince my staff officers that it is a worthwhile cause. In addition to being a lengthy process, it is a waste of effort.

Using "be prepared" missions causes some unavoidable drawbacks but not as much as using "strings." If I ask for a force within a certain time frame, I expect to get a force which is capable of performing its mission. When I give a "be prepared" order, unless I specifically modify force capability requirements, I expect to get a unit which is substantially capable of performing its mission. This expectation may place some restrictions on the subordinate commander's employment flexibility but the restrictions are far fewer than if his staff were forced to seek approval for every employment option.

My employment philosophy is to derive a mutually agreed upon plan, deploy the forces, and use the terrain to execute the plan to gain advantage over the enemy. One way to gain that advantage is by the proper use of the reserve. Reserves represent future force capabilities. They are forces to be used in accordance with your scheme of maneuver. That does not necessarily mean you wait and see what the enemy does; reserves are a part of your scheme of maneuver. You must determine several schemes of maneuver, branches to the plan, which will allow you to recapture the initiative. That is why I call the reserve the "attack force." It is a linebacker force prepared to take the offense.

Our current thinking is that you commit the reserve as a counterattack force to prevent a disaster. But that simply leaves the enemy with the initiative, and you are left waiting to see if he is going to pop you in the stomach or the chops. That is not the way to win. I differ from that mentality. I do not want to be reacting to the enemy with an "Oh, my God" force. It will happen occasionally, but then it is probably the result of a failure of intelligence, a failure to develop a viable scheme of maneuver, or a failure to wrest the initiative from the enemy.

The formula for regaining the initiative holds regardless of the level of war—tactical, operational, or strategic. We must successfully fight the current close operation while at the same time retaining the capability to exploit enemy vulnerabilities as they appear. When an enemy weakness becomes evident, the friendly commander must see the situation unfolding, decide quickly how to exploit it, and then execute the plan decisively and violently before the enemy can protect himself.

Generally, the Central Army Group (CENTAG) will lack the resources to exploit every opportunity. At the operational level, it is important to focus our combat power and exploit only those vulnerabilities which fit the overall scheme of maneuver and the theater campaign plan. Even if an operation promises success, if the success will not support achievement of the commander's overall intent, then the resources are better used elsewhere.

Enemy vulnerabilities appear and disappear rapidly; hence the absolute requirement for agility within our maneuver forces, sustainment system, and the command and control lash-up which ties everything together. For example, if an enemy is unable to overcome the effects of friendly follow-on forces attack (FOFA) operations, he will have insufficient follow-on forces to maintain his desired operational tempo. Following his doctrine, he may transition into a hasty defensive posture. The interval between this transition and when he reinforces the defense becomes a friendly window of opportunity.

The critical ingredient necessary to transform a commander's desire to exploit an opportunity into an actual maneuver of "killers" on the battlefield is tough, focused, and realistic training. Proper training establishes a command mind-set at all levels toward recognizing and capitalizing upon enemy vulnerabilities. This training is necessary for all elements of combat power. Staffs must produce plans quickly; the sustainment community must react quickly; and

air and ground operations must be synchronized rapidly. Maneuver battalions must cross the line of departure on time and execute their plan violently. All parts of this complicated system must fit and function properly, and that truism puts a premium on practice.

Maneuver

Mobility provides the capability to maneuver for positional advantage over the enemy so you can redirect fire and forces against him. Traditionally, military theorists have postulated a three-to-one advantage for the defense. If, however, you are going to fight somebody who is about three times your size but who can concentrate at a ratio of up to seven-to-one, I'd say you are going to lose. Therefore, you need to do something that gives you some advantage. You have to figure out how to achieve positional advantage over an attacker and shoot him in the back. To do that you move your force so you can focus on the combat column. You move your artillery so it is within range, and you move the rifleman so he can shoot. You shoot from your advantage into his disadvantage.

The Lord did not put tracks on tanks to sit around. If you fight a larger force and become locked into a positional defense, I believe you are dead. You can fight it out for a period of time, but it is like dancing with a bear. If the bear ever puts his arms around you, you are going to dance to his tune. That is what happens when you are dealing with very large forces; if they ever pin you down, they will drive you into the ground. Also, a large force probably has so much indirect fire capability that as soon as they get you pinpointed, they are going to club you to death. They will freeze your mobility so you cannot move. Their huge volume of indirect fire will not allow you to leave your protected position.

Remember, the key is using mobility to attain positional advantage. If you are on the enemy's flank, you reduce your vulnerability to targeting because his entire system cannot be oriented 360 degrees. It is only 90 degrees between shooting him in the flank and hitting him head on. If you are going to hit him in the flank or in the back, you have to do it fast to prevent him from reorienting on you and setting up another head-on collision. Deception and electronic warfare sometimes help accomplish this task. You can also use the guerrilla concept of hit and run. When the guy turns on you, bug out. Mobility also means that I must know how quickly

and efficiently a large force like a division or corps takes to move. Today, we do not know how long it takes a corps to move from point A to point B, but we need to know that so that schemes of maneuver can be based on reliable time factors. So, as an army group commander, I demand training standards for large units to move fast. I want divisions to be able to move in a short period of time on a sufficient number of routes and have command and control systems that will allow them to move faster than the enemy.

Combat Power

If you use your systems right, you can gain a second order of sophistication. Our force size does not allow us to kill everybody. We simply do not have enough people or equipment. Therefore, you use target value analysis, not for the immediate effect, but for the larger, long-term effect. For example, you destroy an opponent's artillery, not because it drops shells on you, but because enemy fires limit the capability of your own antitank weapons like TOWs. In other words, you are focusing your combat power on the right targets. This requires good intelligence about the enemy. Intelligence leads naturally into deception because no self-respecting enemy is going to allow you to get the jump on him unless you deceive him. You must move faster and bring your firepower to bear so you gain the advantage.

The Germans have the term *Schwerpunkt* ("main point of the effort") and Americans have the principle of mass or concentration. I think these ideas are often misinterpreted. The term mass is especially inadequate because it has the connotation of "let's all go down there." Concentration conveys the same thing—bring it all together in time and space—but it does not really mean getting everyone in the box together. My aim, rather, is to focus combat power like a flashlight on the battlefield. I want to move it around so that important things will happen. If crossing the river is critical to my plan, then I need to focus my combat power so that there is nothing the enemy can do to keep me from getting across the river. Maybe *Schwerpunkt* is a good term if you use the flashlight analogy. Or maybe it is better to say that you should operate like a magnifying glass does on the rays of the sun—if you hold it right and manipulate its movements, you burn whatever you are aiming at.

As an army group commander in Germany, I have certain constraints. My mission is to defend the Federal Republic. Operational depth is very shallow, so we must use a forward defense. In the forward defense the enemy has the option of where to attack, and there is no way you can protect all the places where he can put his *Schwerpunkt* or focus his combat power. Hence, I prefer a mobile defense with covering forces and screens and those kinds of things. That ties into my ability to allocate and move forces in a scheme of maneuver.

I have told the corps commanders that the first battle belongs to them. There is very little as that I can do as an army group commander about the initial fight, but I want to be able to tell them where I will fight the second battle and to define the overall parameters for success. I do not want to be partially successful; I want to win big. The army group must make timely decisions which will not disrupt or lose the corps' first battles, and these decisions must help win the second battle. After all, the operational artist's job is to set the scene for the next battle and the one after that, until a strategic objective has been won.

Joint and Combined Operations

You pick up several problems when you run joint and combined operations. Joint problems stem from different perceptions and missions. The timely integration of combat power is a particularly important example. The Air Force not only has a tremendous amount of available combat power but also has a high degree of vulnerability while using it. Also, the Air Force can react so fast that it does its targeting the night before the event. But at army group, we are talking and planning about three or four days out. So, the two are like oil and water—they do not mix well. We are also having an increasing amount of trouble because the Army is now reaching out in time and distance with missiles and helicopters. What was once a fairly clear division of responsibility is now confused with both Army and Air Force operations in the same area. We have not fully sorted it out yet.

Synchronization of air and ground operations is critical. There is a strong possibility for conflict of needs between the ground and air arenas in terms of operational fire orientation and missions. For example, assume that the NATO regional commander, the com-

mander who makes joint decisions, decides to go to a maximum defensive air posture. Does he understand what he just did to the army group? He decided that the army group will get very few air interdiction or battlefield air interdiction sorties; that means that it will not be using all assets to fight deep. Under these circumstances, AirLand Battle simply will not work because the second echelon will close at the time and place of the enemy's choosing. Under the current force organization, when the joint commander goes to a maximum defensive air posture, the army group can win the first battle; but it will lose the second battle because in a maximum defensive air posture the army group commander loses a portion of an important dimension of his scheme of maneuver—deep fires.

Moving from a joint to a combined perspective, we have national corps which have different capabilities. I use the corps as a centerpiece around which tactical operations revolve. Corps are like different actors in a theater, and I am the director of the play. I control the lights and when the curtain goes up and down. The corps fight the battle at center stage.

There are two fundamental ways to cope with the different national corps organizations. If you have uneven capabilities, you can take the stronger assets away from the one who has them and keep them at army group level to share with the have-nots. We did that with the air forces of NATO. We took the air forces away from each country and assigned them to allied tactical air forces so we could share them across the board. The only trouble is that we now have them at such a high level that they no longer seem to be a flexible element of combat power. If I don't know whether they are going to be available to support me several days in advance, I must plan a scheme of maneuver which does not include them. Remember, the operational level commanders should not be involved in day-to-day battle. If they determine air priorities on a daily basis, operational planning is weakened. My regional air commander should determine which army group needs air support three days out. In my own army group, I will determine who needs it and provide it to them in sufficient time for them to be successful. Air support must be dependable and predictable so the commander can base his long-term plan on its availability. If needed, a portion could be withheld for the "Oh, my God" mission or to reinforce.

With combined forces, the second way to achieve equity in ends and means is to tailor mission assignments. A national force

structure is put together so all the pieces fit. When you take something out, you unbalance the national force. It must fight differently from the way it was trained, and differently from its doctrine. Changing it creates an unnatural situation. That is why I will not take organic assets away from national forces. I may, however, ask them to do things for allies in their proximity on a mission basis for a limited period of time. If I do that, then I preserve the natural national synergism and cohesiveness essential to combined success.

To preserve that optimal synergism, an army group commander in NATO needs to understand his subordinate national units fairly well. He must know what they can and cannot do. For example, German corps have drones capable of aerial reconnaissance; American corps do not. It is national corps capabilities, then, that help define boundaries, missions, depth of areas, and the speed with which they can move around the battlefield. All those things have an impact on your decision and what you ask your subordinates to do.

From an army group perspective, I am more interested in how things fit together at the various levels and in the impact that they have on each other than I am in their differences. In other words, I am interested in the interfaces and getting the most out of every available unit. This is where you get synergism and the combined arms effect so important in winning battles.

Intelligence

Seeing the battlefield is an interesting exercise. Divisions collect the information that brigades and battalions need; corps collect information that divisions need; and the echelon above the corps, the army group in NATO, collects information the corps need. Yet we do not feed the lower echelons the information directly; we send it through filters. A better approach would be to let the user of the intelligence be the collector of the information.

In that regard the definition of areas of operations becomes very important. How far out is the coordination line between the division and the corps? We have collectors that run around the battlefield like vacuum cleaners and pick up intelligence. The current system is to give everybody in the net everything. This overwhelms the intelligence-sorting capability and distracts commanders and staffs from focusing on their close operation. In response to both of these adverse realities, I allocate the ground in terms of

the mission, which in turn defines the appropriate areas of influence and interest. Commanders need to control the priority of collection efforts in those areas which will influence their battle and scheme of maneuver. They need access to all the intelligence available about those particular areas. If I want them to see farther, then I need to move their boundaries and give them more assets to put into their decision-making process. As the army group commander, I determine how far out I want them to see.

For example, if the army group wants to take out the enemy's 19th Tank Army because it will be committed soon and disturb a corps scheme of maneuver, there are a couple of ways to do that. The Air Force can attack them deep. I can also change boundaries or give the corps the mission to target the tank army. I must decide if I want to kill them, disrupt them, or delay them; I must then pass the mission to an operator, a fighter, who does the targeting and links it with the scheme of maneuver.

Deception

Deception must be a part of the scheme of maneuver. The central focus for virtually every operational deception operation is at the corps. We now have roughly two pages of signatures for a corps—things like radiation, sound, infrared, smoke, radio, and electronic systems. When you are going to deceive somebody, you have to take care of all of those signatures; they all must play the same tune. That is rule number one. Rule number two is that the success of your plan should not depend on deception. The third rule is that if the enemy fails to do something that you needed him to do, then your deception has not been worthwhile. If you fool him but you needed him to move or stop and he did not move or stop, then fooling him was irrelevant.

From an army group perspective, deception usually involves movement to capitalize on time and distance. Deception should allow you to get the positional advantage over your opponent. If you give a motorized rifle battalion 24 to 72 hours in one place when they know you are coming, you have a bear by the tail. They go to ground and are tough to root out. Therefore, you have to get at them before they can go to ground, deceive them, and get them up. Whatever you want the enemy to do must seem to be to his advantage. Intentions play a role, but it is tough to deceive the

thinking man. He is constantly making trade-offs and doing cost-effectiveness analyses. He must be convinced that your deception story is to his advantage.

A successful deception has to be perceived as within the normal course of events. Therefore, you must hide what is really taking place. Of course, the enemy is trying to do the same thing to us. So we must evaluate our entire range of collectors, and lay all the signatures down to see if the whole picture matches the normal course of events. You use electronic platforms which pick up key signals; you exploit information from imagery systems; and you rely on human intelligence. When you compare these results and they do not match up, then there is something screwy going on. Everything has to be synchronized for an effective deception effort. We have to understand that or we will not achieve our deception objectives and will get deceived to boot.

In World War II, both sides used decoys, but physical identification capabilities in those days were not as good as they are now. The Germans would simply turn off their radios and disappear; that was part of their deception and it often worked very well. That brings up the question of what system we have that is able to defeat deception. At corps and army group levels, almost every plan must have a deception component, and the people who execute it must think it is real or it will not work. For example, I ran a river crossing at the corps level. There were only eight people in the headquarters who knew it was a deception. With the exception of those leaders and the troops down on the ground flashing lights and talking on the radio, everybody else in the whole corps thought it was part of the real plan.

Initiative

In our Army, we constantly make little trade-offs on what is the best thing to do right now. Some other armies are very doctrinal and rigid. They do not permit much initiative. In those armies, battalions and divisions simply execute the plan. Commanders do exactly what they are told. That is not a thinking enemy. At present, the "thinking" of our most potential adversaries takes place up at the front or army level, and that limits their initiative.

Initiative is extremely critical when you are coming up with your own army group scheme of maneuver. You must accept the

fact that your enemy has three or four options, and you must keep an eye out for all of them so that you will not be fooled. In other words, it is sort of like a bear coming through the woods. You are not sure which path he is going to be coming down, so you have to stay on guard. You can use special forces, electronic systems, and overhead systems to determine what he is up to so when he comes down the path you will know it. Then you can launch your own scheme to seize the initiative and win big.

Battlefield Support

The logistician needs to know the scheme of maneuver before the tactician, or he needs to have sufficient resources and flexibility so that it does not matter. However, that second condition rarely, if ever, exists. There are two major problems the logistician must resolve: the sheer volume of supplies and how to distribute them to units. In practical terms, the first problem is how to move materiel in bulk, and the second is how to get the diesel into the tank, the rounds to the mortars, or the bullets to the rifle. You need a procedural system for doing that rapidly if you are going to capitalize on mobility. That is why I expect my corps in their training to emphasize re-arming and re-fueling on the move. As an army group commander, I will tell you that you must be able to move in this time frame over this distance. For example, you must be able to move one to two hundred kilometers in 24 to 48 hours and arrive ready to fight. The only way you can accomplish this is to tune up the logistical effort for that kind of massive sustainment and operational mobility.

Yet a third problem in battlefield support is force regeneration. After a force has been in combat, there are two major ways to regenerate it. One method is to just keep trucking stuff to it. The unit gets bigger or smaller and will continually reorganize depending on the stuff coming in. It is often more advantageous if you can pull the unit out of the line for 24 to 48 hours and rebuild it as a unit—a battalion, a brigade, or a division. There are both doctrinal and training considerations which deal with reconstitution and regenerating a force. For example, you must reconstitute in the proper sequence by servicing the most critical combat elements first so that if things change and a unit is needed now, it can go. There continues to be a significant training problem after reconsti-

tution, especially after new soldiers have been inserted into a unit. I am convinced, however, that if you can pull a unit out of the line, pile stuff on it for 48 hours, take it from 40 or 50 percent up to 80 or 90 percent fill, and then send it on its way again, you can obtain a significant advantage from an army group perspective. This is simply another way of tapping the future capabilities of a force.

How you send the reconstituted force on its way is important. A major concern is always how, when, and where to train and who is in charge of training the reconstituted unit. Ultimately it is the unit commander's responsibility to ensure his force is ready to fight. If the situation requires immediate deployment of a reconstituted force, the commander can do basic combat training enroute to his new assembly area. A place along the route of march should be found where test firing, rudimentary battle SOPs and other basic skills can be drilled. The aim is to prepare the unit so that when it hits the enemy, even if unexpectedly, it has its act together.

Communications

What army group commanders must try to accomplish over time is to manipulate their corps to have them in shape for the next battle. However, you do not get up one morning and start the next plan; in fact, plans sort of meld together. You must understand how to do that because there is no way you can personally control all the little elements in the corps.

Personalities play a very large part in determining the way you talk to your corps commanders. Some people respond to tough language and threats; others to a more fatherly style of encouragement. Some are on your frequency and understand very quickly what you are talking about; others have been brought up in a whole different world and require more guidance. In any case, there is a lot of interface that goes on between the army group commander and the corps commanders. I use the written word; I use the staff; and I use the telephone.

Normally, I prefer to talk to more than one of my commanders at a time. If the plan has a scheme of maneuver which involves coordination by two of your key subordinates, then get them in the same van and talk it over. If it is necessary, talk to each of them individually. If you do not communicate well you will have confusion, and that is simply a flat, 100 percent guaranteed rule. When

you talk face-to-face to your commanders things come out which would never surface in a telephone conversation. I have no doubt about the requirement for that kind of personal coordination. That is the reason why a corps or army group commander needs a mobile command post. The commander can send it out ahead of time to someplace convenient and then bring commanders together to synchronize everything.

Remember that army group commanders are normally talking about events which will happen some number of days in the future. However you get it to them, the corps commander must either buy into your plans willingly or by force. That is the only way the army group's scheme of maneuver becomes *his* scheme of maneuver. It is the only way that the plan becomes part of his personal knowledge. If you have the feeling that a subordinate commander cannot grasp your scheme or is not going to execute it as you intend, you basically have three choices: change the plan, personally supervise his execution of the plan, or fire him. You can't have it any other way.

Operational Fires

The way to do operational fires is to use your available air interdiction and battlefield air interdiction within the allotted time frame, but that process begs a lot of questions. Today we do not have a usable unit of measurement for firepower, nor do we know how to articulate what we are talking about until we talk sorties. Most people talk about percentages. In terms of target killing, percentages do not rank really high in my understanding. It assumes that we can measure firepower. How do I know how much firepower I have in my little flashlight beam over time? That is the number one doctrinal issue for me. At present, I cannot tell whether I have enough. We must figure out some way to portray over time what we need.

On a more positive note, I have a very good relationship with my allied tactical air force commander. I ask him for an air tasking order prognosis 72 hours out, which tells me that status of his air assets. Then I take that prognosis and pass it down to the corps so their commanders can now actually plan for a certain amount of air power, assuming something unforeseen doesn't happen.

Command and Control

I firmly believe that the commander is in charge, not the staff. Everywhere it says the staff supervises something, I cross out the word "supervise." The staff coordinates and works out problems—they do not tell anybody to do anything. I am not trying to give the staff a hard time; they will evolve into power because of their capability to predict what the colonel or the general is going to say. In fact, they become increasingly useful as their understanding of the commander's concept of operations grows.

Remember that even though staffs do not command anything, they will ensure that you can move fast. If mobility is an element of combat power, then you have to conclude that the staff is an element of combat power. How fast it can coordinate and how fast it can plan will determine how fast your unit can do something—that is the bottom line. It is very important that your staff be proficient at the critical things you want to do. They take care of their areas, and when they cannot handle them they call you. You move from command post to command post, or you hang around in your place to get a better feel for the longer-term plans.

Wherever you are on the modern battlefield, there will be some risk. To me, taking personal risk is sort of like sleep. You have to take prudent risk, but it does not pay to get yourself killed unless you think somebody else can do a better job. Similarly, it does not pay to exhaust yourself, either. As I used to tell my subordinates, "If you want me to stay up all night, I'll stay up all night, but then you are going to have to live with the decisions I make." They always responded, "Go to sleep." I do not believe people make good decisions when they are really tired. One needs to store up energy. If you have a requirement to stay up, that is one thing; you may have to stay up all day and night. That is not the issue. What is important is that you understand that the risk you place yourself in and the degree to which you drive yourself must be worth the long-term price.

Preparation

How does a commander prepare himself to become a CINC? It is an interesting question to which I have not had time to give much thought. Mostly it has been through on-the-job training. I studied a

bit of Jackson's Valley Campaign and looked at smaller forces versus larger forces. Some things I learned as a company commander and again as a corps commander have not changed. In fact, the principles really stay the same—for example, reliable communications. You have to talk to your subordinates eyeball-to-eyeball so that you understand them and they understand you. Every time I have not talked to subordinates things have come unglued.

Another principle is the necessity to think ahead. The time frame in which you are thinking is really the only thing that changes. Company commanders may think only an hour or so ahead. They want to ensure that their troops get chow or do whatever needs to be done. But at each succeeding level you have to readjust all these little wheels. As more and more factors require synchronizing, it takes longer and longer, and you have to think further out. This principle first started dawning on me when I commanded a cavalry regiment. You had to think at least a day in advance because the squadrons were large and operated over large areas. They just did not do things at the snap of a finger. But where it really comes home is when you take the three brigades of an armored division to the field and try to orchestrate their battlefield support. When I said, "Okay, lst Brigade, tomorrow I want you to do this," the commander responded, "You are out of your tree! There is no way I can get my battalions there." He was right. He needed to issue a plan, and his battalion commanders needed time to react. Obviously I had to plan further ahead.

I think these things dawn on you slowly. The army group puts out the order, but how long does it take to get down to the bottom, and how much time is required to make it happen? At the army group level, five days might not be sufficient, and I can tell you it is hard to think four or five days in advance. But thinking ahead is a must. If the small unit commander does not know what is happening and he cannot get there on time, it makes no difference how many stars the army group commander wears on his shoulder, it just won't happen.

Today's operational level commander must be master of many colors, media, and trades. He must be an integrator, a shaper, and a leader blessed with both foresight and imagination. His knowledge must span the full range of doctrine, strategy, and logistics. And, because the human dimension of combat has not gone away, he must be a psychologist. But above all else, he must be a vision-

ary. He must foresee what conditions constitute an acceptable end state, link that vision into his campaign plan or scheme of maneuver, and then clearly communicate his overall intent to his subordinates in a timely manner. The successful army group or large unit commander knows his job and he effects prudent, personal intervention but not overwhelming control. Only when he molds his scarce resources into an effective killing machine focused on well-conceived objectives can he give his warriors with the sharp short swords the opportunity to win big.

Aerospace Operational Art

Price T. Bingham

> "It is quite clear that no commander of the future will be worthy of either his name or his job unless he has a deep knowledge of the work of the two Services other than his own."
>
> General Sir Hastings L. Ismay [1]

Increasingly, success in conventional war is likely to depend on the caliber of operational art a commander exercises when employing aerospace power. To understand why, we must examine war from a campaign rather than a battlefield perspective.[2] The importance of a campaign perspective derives in part from the fact that modern conventional military forces can rarely be neutralized in a single battle, let alone with a single type (aerospace, land, or naval) of military force.[3] Another reason is that only a campaign perspective reveals the immense importance of the advantages aerospace forces can provide surface forces before a battle begins and the major contribution they can make in exploiting opportunities after the battle. A campaign perspective can also explain why analysis that measures the effectiveness of aerospace forces only in terms of the physical destruction they cause during a surface battle can be so spectacularly misleading.[4]

No universal formula exists for solving the problem of how to employ aerospace forces in a campaign. The lack of a formula results in large part from the host of factors that must be considered when orchestrating aerospace missions into an effective effort. The problem is made even more complex because most of these factors are variables that will interact with each other during the course of the campaign. As a result, the effective exercise of operational art requires a comprehensive understanding of complex cause and effect relationships. This aspect alone makes the exercise of operational art so different from tactics that excellence in one does not equate to excellence in the other.[5] It is also why tactical expertise is an insufficient basis for determining how joint forces should be organized, trained, and equipped. Besides the

amount of knowledge it requires, the effective exercise of operational art also differs from tactics in that it demands a degree of imagination, judgment, and moral courage far exceeding that needed to win battles. These differences explain why so few successful tacticians are able to fight successful campaigns.

Many of the factors to be considered when making campaign decisions regarding the employment of aerospace forces involve the nature of the enemy. One of the most important of these factors is the enemy's objective. Campaign success may easily depend on whether the enemy's objective is accurately identified. Assessing the determination of enemy leaders and their people to achieve this objective can be even more important.[6]

The ability to successfully integrate aerospace power into a campaign also depends on consideration of all the various means the enemy can employ to achieve his objective. Consideration of these means requires assessing the enemy's entire military force structure, not just his aerospace forces or combat forces, to determine his capabilities and limitations. Moreover, the means the enemy can employ in a campaign are not limited to military forces. Thus, campaign decisions must also evaluate such things as how the enemy's civilian population, communications and transportation infrastructure, manufacturing capability, and food production can influence his willingness and ability to fight. The population can be a major source of labor, as was the case in Southeast Asia where the North Vietnamese population helped transport supplies and repair damage to transportation infrastructure caused by American air attacks. Similarly, the 1968 Tet offensive shows how a portion of the population can provide valuable intelligence and other assistance enemy forces need to attack such key facilities as air bases.

Since the enemy is a living opponent who not only will react but will also initiate actions, the employment of aerospace forces requires careful consideration of the nature of war. War, in the view of Martin van Creveld, "differs from the physical world which constitutes the foundation of technology precisely in that two plus two do not necessarily equal four, and that the shortest line between two points is not necessarily a straight one. On the contrary, the more evenly balanced the opponents, the more important it is to take the line least expected."[7] Edward Luttwak emphasizes the importance of understanding that "the entire realm of strategy is pervaded by a paradoxical logic of its own. . . . It often violates ordi-

nary linear logic by inducing the coming together and even the reversal of opposites, and it therefore, incidentally, tends to reward paradoxical conduct while confounding straightforwardly logical action, by yielding results ironical if not lethally self-damaging."[8]

A commander must devote special attention to factors which magnify or minimize the effects of fog, friction, and chance. Because a campaign's duration exceeds that of a battle, decisions regarding the employment and maintenance of aerospace forces also require understanding how to reduce the effects that danger, physical exertion, and losses have on performance. Early in World War II, U.S. leaders discovered that fatigue was one of the conditions that had a tremendous impact on a man's ability to cope with fear. One fighter squadron commander on Guadalcanal noted that "There's one fact which I believe is not properly understood, and that is pilot fatigue. A man's "guts" is directly proportional to how rested he is—nothing more or less. . . . I think that about five days of intensive action is about all a man can stand; with interims I think he can last three weeks." Army Air Force leadership concurred and, thus, "it was no accident that, at a time of critical manpower shortages, the punch-drunk survivors of the early air battles in the Philippines and Java [1941–42] had to be sent home."[9]

Other key factors the commander must assess when employing aerospace forces involve the nature of friendly forces, including allies. The characteristics that make up the nature of friendly forces are identical to those that apply to one's own units or those of the enemy. Accurately assessing friendly forces, however, often poses a greater challenge. Although there may be more information available on friendly forces, a balanced assessment of this information requires an objectivity that is not always easy to achieve.

The nature of the theater has an important influence on a campaign. It requires examining how factors such as the location of the theater in relation to friendly and enemy nations can affect the employment of military power, particularly aerospace forces. Topography and weather are also critical. In addition, the theater's civilian population requires careful attention to determine how numbers, attitudes (friendly, hostile, or neutral) and education could affect the employment of aerospace power. Other important factors are the theater's communications, transportation (including air base availability and operability), manufacturing infrastructures, and the availability of food, fuel, and water.

The type of war (insurgency, conventional, or nuclear) being waged must be carefully considered, as this factor exerts a major influence on how aerospace forces are employed in a campaign and determines what type of aerospace forces are needed. The type of war is crucial in determining the political constraints involved in the use of military force, especially aerospace forces. In this era of instant communications, employment of air power can have an immense psychological effect on friend and foe alike. The effect on "friendly" domestic opinion was apparent in the December 1972 bombing of North Vietnam and Israel's 1982 air attacks on Beirut, Lebanon.

Orchestrating the employment of aerospace power into a campaign requires understanding yet another factor—the capabilities and limitations of space assets. Increasingly, space assets can perform tasks that were previously performed by aircraft. The key to success, therefore, is to determine what mix of air and space resources is most effective, given the various other factors that must be considered in the orchestration of aerospace missions.

The essence of aerospace operational art is integrating aerospace forces with land and naval forces into a successful campaign. This requires creation of a concept of operations that determines when, where, or even if battles should be fought, based on how they might contribute to the campaign's objective. "The commander's concept is his supreme contribution to the prospect of victory on the battlefield whether he is at the tactical or operational level. Without a sound and dominating concept of operation, no amount of command presence, personal flair, years of rectitude, demonstrated integrity, advanced degrees, perfectly managed assignments, warrior spirit, personal courage, weapons proficiency, or troop morale can hope to compensate." [10]

Once the commander decides when and where battles are likely to be fought, he must orchestrate his forces so they can help provide advantages (such as concentration, position, and surprise) to both aerospace and surface forces that will give them the best chance of tactical success. When such advantages are provided, forces will not have to fight outnumbered and may even be able to win despite having numbers, equipment, or tactical skills inferior to those of the enemy. The success of this approach was evident in the Soviet defeat of German forces in 1944–45. It is also a major reason for the success Allied armies had in France against the German army.

Excellence in the exercise of operational art requires much more than merely winning individual battles. A successful campaign ultimately depends on the commander's ability to exploit opportunities created by battle. These opportunities must be used to provide more advantages, and thus more opportunities, which will eventually lead to achieving the campaign's objective. An excellent example of how battlefield events can be exploited to achieve campaign success was the German deep penetration after crossing the Meuse in May 1940. This attack isolated French and British forces on the left flank, leading to their destruction, capture, or evacuation.

Achieving a campaign's objective usually requires combining aerospace and surface forces to achieve a synergistic effect. Such synergies can occur by accident, but usually being unanticipated they are rarely exploited fully. If a synergy is the product of an accidental combination, its causes are not likely to be understood well enough for the synergy to be duplicated.[11]

The careful integration of aerospace and surface forces has the potential of magnifying the enemy's confusion. As Carl von Clausewitz pointed out, war is not "the action of a living force upon a lifeless mass . . . but always the collision of two living forces." This collision produces a climate consisting of danger, exertion, uncertainty, and chance. Clausewitz determined that "Friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper." [12]

A campaign's success can easily depend on whether the amount of fog and friction the enemy faces is sufficient to prevent him from anticipating friendly actions or from reacting well enough to counter them or to make them excessively costly. A commander's ability to achieve success will also depend on whether his concept enables him to gain and maintain the initiative. The initiative is important because it allows a commander to reduce, if only slightly, the uncertainties and friction involved in the execution of his concept, while at the same time magnifying those forces in the enemy camp. The role fog and friction play in military success explains why knowledgeable military professionals will usually try to avoid being predictable and instead will put great emphasis on achieving surprise. It also helps explain why they will usually prefer the offensive to the defensive.[13]

Fog and friction help explain why the maneuver of both surface and aerospace forces can be one of the most effective means

a commander can employ, especially if he can prevent the enemy from anticipating the speed, timing, or location of his strike forces. This explains why deception in the form of a feint or a fixing force is often a part of successful maneuver. FORTITUDE SOUTH, the Allies' deception operation supporting OVERLORD, the Allied invasion of Europe in 1944, is an outstanding example of a successful feint. Once the Allies had successfully landed in France, Operations GOODWOOD and BLUECOAT, while falling short of their goals, succeeded in fixing German panzer forces on the Allies' left flank, setting up conditions for COBRA, the Allied attack that broke through the German defenses.

A commander who uses maneuver successfully will usually be able to concentrate superior force against the enemy, often against a position where the enemy is unprepared. Besides allowing a commander to create advantages that make success in battle more likely, maneuver allows a commander to better exploit the opportunities resulting from battle, perhaps through a pursuit or envelopment, either of which could lead to still more successes. These advantages explain why Napoleon said, "Marches are war. . . . Aptitude for war is aptitude for movement. . . . Victory is to the armies which maneuver." [14]

Fog and friction also explain why a joint approach to war can be so effective. When a commander employs forces with different capabilities—together, in the same area, at the same time, and often against the same enemy unit—he increases the complexity of the problem the enemy must solve, and this in turn tends to magnify the enemy's fog and friction. In addition, the employment of joint forces produces a powerful synergy because the strengths of the different forces can compensate for and shield the other's limitations.[15]

The World War II Pacific campaigns fought by Admiral Chester W. Nimitz and General Douglas MacArthur provide excellent examples of neutralizing enemy surface forces while avoiding combat with the bulk of those forces. They did this by conducting campaigns that by-passed many islands occupied by large numbers of Japanese ground forces. However, before they could by-pass these islands, they first had to fight and defeat Japanese air and naval forces in order to gain control of the aerospace environment over and around those islands.

A commander who appreciates the importance of reducing his own fog and friction, while at the same time magnifying the enemy's, will realize that control of the aerospace environment must be one of the first considerations in his concept of operations. To gain and maintain control of the aerospace environment a commander will not usually have the option of avoiding combat with the enemy's aerospace forces, as can be the case when he is employing at least some of his surface forces. Instead, the range and speed of the enemy's aerospace platforms often will make it necessary for a commander to destroy most, if not all, of the enemy's aerospace capability to prevent it from posing a serious threat.

If the enemy has the initiative and possesses powerful aerospace forces, it may be necessary for a commander to gain control in increments, beginning first with the aerospace environment over his own surface forces. Initially, he may be able to achieve only temporary control. In any case, to achieve and maintain control a commander must create advantages for his forces that enable them to inflict disproportionate losses on the enemy. The magnitude of these losses must be sufficient to persuade the enemy that they cannot be sustained. Both the Japanese and German defeats in the air in World War II were due in large part to their inability, compared to the Allies, to sustain high pilot attrition.[16]

Once a commander has gained the degree of control he needs in the aerospace environment above his own forces, he is likely to find it easier to maintain if he makes a persistent effort to expand his control into the aerospace environment above the enemy's forces that are closest to his own. Such an expansion of aerospace will usually be necessary in order to keep sufficient pressure on the enemy to deny him the opportunity to recover and rebuild his strength. There will be problems, however, if the enemy is allowed to operate his aerospace forces from a political sanctuary. A sanctuary gives the enemy the opportunity to preserve his forces by refusing to fight, except under conditions of his own choosing. In this circumstance, it may be difficult for a commander to permanently achieve the degree of control he desires over the aerospace environment in close proximity to the sanctuary, which would force him to modify his concept of operations accordingly. This was the case in the Korean War where achieving air superiority close to the Yalu proved difficult, resulting in limitations in the United Nations' ability to employ B–29s.[17]

Gaining and maintaining control of the aerospace environment, let alone expanding it, is rarely a task for aerospace forces alone. A commander is likely to find he has the best chance of success when he employs his surface forces so their maneuver complements his employment of aerospace power. An example of such a concept would be one where a commander used his surface forces to seize air bases or locations suitable for bases. The need to seize bases was emphasized in a lecture on World War II by Sir Arthur Tedder in which he stated "that in our discussions (during the North African campaign) my naval colleague was as insistent as I was in emphasizing to our army colleague the urgency of the recapture of the airfields in the Benghazi [Libya] bulge. . . . The land-war in the Mediterranean became, in fact, a battle for airfields. When we lost airfields we lost the initiative on land and at sea." [18]

Learning from the Allies' experience in North Africa, the U.S. Ninth Air Force gave great attention to the subject of air base availability in its preparation for the invasion of France. After the war, its analysis noted that, "Mobility, closely analogous and second in importance only to flexibility, is another prime requisite. To a tactical air force mobility on the ground is what flexibility is in the air. Fundamental to the mobility of a tactical air force is the provision of air fields where, when, and of the types required by the tactical commands and administrative elements most effectively to carry out their respective tasks." [19]

Despite these advantages, it is possible that a commander will make the aerospace forces more vulnerable if he moves his bases closer to the enemy. Actual increases in base vulnerability, however, may not always materialize. For example, improvements in the ability to operate effectively may make it possible for a commander to gain or maintain the initiative and thus reduce or even prevent the enemy from exploiting the opportunity provided by the location of his bases. During the North African campaign Maj. Gen. James H. Doolittle noted that the lack of suitable bases within reasonable range of the enemy meant that he could employ at one time only about a third of the 600 aircraft at his disposal.[20] Increases in aircraft effectiveness resulting from having bases "as far forward as we could get them" was vital to General Kenney's success over New Guinea in the fall of 1943.[21] Along the same lines, Brig. Gen. Edward J. Timberlake, deputy commander of Fifth Air Force in Korea, noted that "one F–51 adequately sup-

ported and fought from Taegu Airfield is equivalent to four F–80s based on Kyushu." [22] This was also the case with the forward bases Kenney built in the Pacific and those the Allies built in Normandy.

If a commander possesses sufficient numbers of long-range aircraft his need for bases close to the enemy may be reduced, but not eliminated. This is because increasing the distance from a base to the fight reduces the numbers of sorties a commander can fly with a given force structure. Moreover, unless his aircraft loiter in the air close to the enemy, their responsiveness will be poor, a critical factor in a dynamic situation. During August 1944, for example, the U.S. VI Corps' unexpected exploitation north of the Rhone Valley quickly outran the ability of air units operating from Corsica and newly-opened bases on the Riviera coast to support it.

Another problem is that aircraft capable of flying a great distance without aerial refueling tend to be very large, which may reduce their survivability and utility for air-to-air combat. Such aircraft are often much more expensive, which acts to decrease the number of available platforms, making losses less affordable.

Air refueling provides a commander with another important means for making his concept of operations feasible when he does not have either bases that are close to the enemy or large numbers of long-range aircraft. Extensions in range from refueling are likely to make it easier for a commander to achieve surprise and to more effectively concentrate his aerospace platforms. Extensions in endurance are likely to reduce his risk of losing platforms due to fuel exhaustion. This capability may be particularly valuable when a commander is limited to using a small number of bases, and the availability of these bases is uncertain due to weather or enemy action. But air refueling cannot change the impact the distance from a base to the enemy has on sortie rates and responsiveness. Moreover, air refueling may increase the complexity of achieving aerospace control, because air operations are more predictable to the enemy. In addition, air refueling may lead to increased risk in the concept of operations when refueling takes place within range of an enemy's aerospace forces.

Adding to the number of available bases should allow a commander to better disperse his aerospace platforms, making each base a less concentrated and therefore less lucrative target. Dispersal should also enable him to reduce the overall impact on his operational concept, including the risk of aircraft losses due to fuel

exhaustion during diverts, should enemy actions or poor weather prevent the use of a particular base. Moreover, increasing the number of available bases should make it easier for a commander to use deception and concealment to increase the survivability of his aerospace platforms. Concealment and deception were essential to General Kenney's ability to establish a base at Marilinan, New Guinea, which was closer to the enemy at Lae than his Dobodura bases. Until Marilinan was available, his fighters could not remain over Lae for more than half an hour.[23]

Besides seizing bases, a commander may be able to increase the effectiveness of his aerospace forces in the battle for control of the aerospace environment by creating a concept which uses the maneuver of his surface forces to attack the enemy's surface-based air defenses. Such attacks by surface forces can enhance the effectiveness of aerospace forces either by destroying the enemy's defenses or by degrading their operation through the denial of advantageous locations (which may simultaneously improve the effectiveness of friendly surface-based aerospace defenses) and disruption of their command and control and resupply. Even the potential of such attacks may make an important contribution by causing the enemy to devote scarce resources to the protection of his air defenses or causing him to relocate his defensive systems. Unfortunately, the impact of mobility on the effectiveness of a surface-based air defense system is given little more consideration in many models that are attempting to simulate fluid combat conditions.

Still another way a commander can use his surface forces to enhance the effectiveness of his aerospace platforms is by using their maneuver to create a dilemma for the enemy. Such a dilemma would result if a commander created a concept involving a powerful surprise surface offensive in an area where the enemy's surface defenses were weak. Ideally, this attack would occur where the commander had or could quickly concentrate a superior amount of aerospace power (perhaps because he possessed more nearby bases), while the enemy's aerospace forces did not possess similar advantages. This situation would force the enemy to choose between allowing his surface forces to be defeated or throwing his aerospace forces into what could be a prohibitively costly attempt to buy time for his reserve surface forces to react. The Germans would have been faced with such a dilemma in 1944 at Normandy, if the Allies had not already achieved air superiority by the time

they landed. Before the invasion the Allies attacked and neutralized all German air bases within a 150-mile radius of Caen. Then, soon after the initial landings, they began building bases to ensure they could achieve and maintain a more powerful concentration of air power over Normandy than the Germans. By 24 July 1944, the Ninth Air Force had 18 fighter-bomber and reconnaissance groups (equivalent to today's wings) operating from 15 bases in Normandy and bases for 5 more groups were under construction.[24]

To a limited degree the initial actions of the Egyptian and Syrian armed forces had this effect on the Israeli Air Force in their 1973 war. However, neither the Egyptians nor the Syrians were able to capitalize on the situation. A better example is the British effort to recapture the Falklands. In his attempt to defeat the British naval maneuver the Argentine commander was forced to commit his air forces to battle at such a distance from their bases that their effectiveness was severely compromised. The British took advantage of this situation and succeeded in inflicting losses that Argentine pilots could not sustain. As a result, the British were able to gain and maintain the degree of control of the aerospace environment over the Falklands they needed for their campaign to achieve its objective. Regardless of the concept a commander creates to gain air superiority, it is sure to provide early evidence of the caliber of his operational art.

As he increases the degree of control he exercises over the aerospace environment, a commander will often be able to reduce his uncertainty and magnify that of the enemy. This is because he will be better able to exploit the elevation, speed, and range possessed by aerospace platforms to gain information on the enemy and the environment that will allow him to employ all his forces more effectively. At the same time, this control will deny the enemy similar opportunities.[25] Moreover, besides providing a commander with vital information, control will also make it more feasible for his aerospace platforms to provide transportation, navigation, and communications capabilities that make it possible for him to employ maneuver and combined arms more effectively.

Should a commander choose to achieve success by depriving enemy military forces in the field of support they require, control of the aerospace environment may make it more feasible for him to employ his aerospace forces in a strategic offensive against the enemy's means for producing and sustaining military power. Such

an effort could, for example, interdict the lines of communications which an industrialized enemy depends on to move raw materials to his factories and finished products to his combat forces. Allied commanders in World War II demonstrated the effectiveness of this approach in the Pacific when they conducted campaigns that employed air and naval power to destroy the Japanese merchant fleet. Submarines destroyed 4,774,000 tons of merchant shipping, while land- and carrier-based air power destroyed 2,762,000 tons.[26]

Control of the aerospace environment is likely to be essential to the success of a campaign designed to defeat enemy military forces in the field where air superiority makes air interdiction and close air support feasible. The effectiveness of air interdiction and close air support depends, to a major degree, on whether a commander's concept of operations integrates these missions with the maneuver of his surface forces so they create a synergy by complementing each other in his pursuit of the campaign's objective. Integrating air interdiction and surface force maneuver (sometimes just the possibility of their integration may be enough) can make it possible for a commander to create a dilemma for the enemy: if he attempts to counter surface maneuver by rapidly maneuvering his own surface forces and their support, he is likely to expose his forces and support elements to unacceptable losses from air interdiction; yet if the enemy employs measures that are effective at reducing his losses, he is less likely to be able to maneuver his forces or their support fast enough to prevent friendly surface maneuver from achieving important advantages. Thus, regardless of which choice the enemy makes, a commander may succeed in creating advantages that make it more likely that his surface forces will prevail in battle.

During the Battle of the Bismarck Sea, for example, General Kenney's land-based aircraft sank a convoy of eight transports carrying the Japanese 51st Division from Rabaul to New Guinea. This action created a dilemma for the Japanese Imperial General Headquarters by demonstrating that without air superiority the maneuver of major formations across large bodies of water involved great risks. Faced with this dilemma the Japanese chose not to attempt large-scale reinforcement or evacuation, making it possible for the Allies to neutralize large numbers of Japanese troops by passing numerous occupied islands.[27]

The Germans faced a similar dilemma in the battles for Stalingrad and Tunisia. In both cases the desperate nature of the situa-

tion caused the Germans to choose to use airlift for resupply without possessing air superiority. Both efforts proved futile, costing the Luftwaffe 495 aircraft, including 269 Ju–52s at Stalingrad and 371 more transports in Tunisia, including on one day six Me–323 "Giants" and 25 Ju–52s carrying a total of 800 troops.[28]

To have the best chance of creating a dilemma through the integration of surface maneuver and air interdiction, a commander must design his concept of operation to exploit the nature of the surface. The nature of land is characterized by its complexity. It possesses infinite variations in gradient and its strength varies according to location, weather, and traffic; vegetation and man-made structures add to this complexity.[29] For example, if his concept involves fighting on and over the land, a commander must base his design on how the surface's complexity will influence where various types of land units (mechanized, armored, light, air mobile, etc.) can maneuver, in what strength, and how quickly. He must also base his design on how this complexity influences the ability of his air crews performing air interdiction to find and destroy enemy land units or delay and disrupt their maneuver. By employing measures such as dispersal, concealment, and deception land units can take advantage of surface complexity to make it difficult for air interdiction to find and destroy them. This complexity, however, also tends to make it easier for air crews to delay and disrupt the maneuver of land units by destroying transportation infrastructure, such as bridges and tunnels, that make rapid maneuver on the ground possible.

Likewise, when a commander's concept of operations involves fighting on and over the sea, he must consider the profound impact the nature of that medium has on maneuver and air interdiction. Due to its nature, the maneuver of naval forces across water is totally dependent on the availability of ships, the characteristics of those ships, and the infrastructure needed to transit between land and ship. The same fluid nature results in a lack of surface complexity which makes it relatively easy for air crews performing air interdiction to employ technologies like radar to locate ships. When an air attack sinks a ship, it completely destroys both the ability to maneuver and, often, the forces relying on that ship for maneuver. Even when air crews do not detect ships, they can still have a significant impact on the enemy's ability to use water for maneuver by destroying the facilities (such as docks and oil terminals) needed for trans-shipment of materiel or by mining bodies

of water (such as harbors, canals, and straits) that limit where maneuver by water can take place. The success of mining was clearly evident in 1972 when the U.S. Navy mined Haiphong. The Iraqi air attacks on Iran's Kargh Island oil terminal provides still another example of air power's ability to influence movement by sea.

The same cause and effect relationships that apply to surface maneuver and air interdiction also apply to close air support. If enemy surface forces attempt to maneuver rapidly, they are less able to employ measures that reduce the immense physical destruction close air support can cause. Yet, if the enemy attempts to reduce the risk of high losses from close air support by dispersing and hiding his surface forces, they are less likely to have the strength (concentration) or speed needed to counter the maneuver of friendly surface forces. This was the case in 1950 when Chinese units attempted a rapid pursuit of retreating United Nations ground forces. By the middle of December the Chinese decided they could no longer sustain the high losses caused by air attacks and broke off their pursuit.[30]

Although enemy forces on land can take advantage of the surface's complexity to construct defensive positions that may reduce their losses from close air support, this does not necessarily mean that close air support will be ineffective. One reason is that the time and effort it takes the enemy to build these positions may cause significant delays and disruption in other areas. Another is that, applied suddenly and in concentration, close air support has an immense physical and psychological impact that can temporarily suppress the enemy's ability to react effectively, even when the attacks inflict relatively few casualties. When friendly surface forces are prepared to exploit the opportunity provided by this temporary effect through rapid maneuver, they are likely to be able either to close with and destroy or to by-pass the enemy before he can recover. Many World War II German commanders believed close air support such as that provided during Operation COBRA was extremely effective, even though relatively few troops were lost. As they noted, such bombing produced "terrifying immobility" because troops were demoralized, communications broke down, and tanks were immobilized by craters and debris. These effects, however, were only temporary and an immediate assault by ground forces was necessary to achieve the "maximum benefit."[31]

Similarly, a commander must also ensure his aerospace forces are prepared to exploit opportunities provided by the dynamics of

surface combat through the timely application of close air support. For example, recognizing that bombing errors can have a debilitating impact out of all proportion to the physical damage caused, a commander must also ensure that the aerospace platforms, munitions, and tactics he uses to attack enemy surface forces in close proximity to friendly troops do not create unacceptable risks for those forces. He must judge these risks in terms of how such attacks can contribute to the success of his concept of operations, recognizing that at times significant risks not only will be acceptable, but required. For example, during COBRA Allied bombing inflicted numerous friendly casualties. Despite these losses, the air attacks were a major factor in the Allies' success.[32]

Besides creating advantages vital for tactical success, a commander who integrates air interdiction and close air support with surface maneuver will also be better able to exploit any opportunities that result from tactical victories. One way a commander might choose to exploit these opportunities is by maneuvering his own surface forces to envelop and destroy large portions of the enemy's ground troops. A series of such envelopments could weaken the enemy to the point that he is unable to continue to resist. After the Allied break-out from their lodgment in Normandy, they missed such opportunities at Falaise, on the Seine, and on the Beveland Isthmus to envelop and destroy large portions of the retreating German Army. German forces during their invasion of Russia in 1941 conducted several large envelopments and succeeded in capturing or destroying massive portions of the Soviet Army.

Another way a commander might choose to exploit opportunities resulting from tactical victories would be to have his surface forces penetrate deep into the enemy's rear area, where the infrastructure the enemy needs to control, move, and sustain his combat forces is located. Here surface and aerospace forces could wreak havoc, causing such immense physical and psychological disruption that the coherence of the enemy's entire defense could collapse. The German invasion of France in 1940, for example, is seen by many as a classic example of psychological dislocation leading to a sudden collapse of effective defense. Although this was clearly the result, it may not have been the intent of the German leadership.

A commander's ability to successfully execute his concept of operations depends greatly on whether the organization he uses to exercise command is capable of coping with the uncertainties

inherent in the conduct of war by making it possible for him to make modifications quickly and effectively. According to Martin van Creveld, "From Plato to NATO, the history of command in war consists essentially of an endless quest for certainty—certainty about the manifold factors that together constitute the environment in which the war is fought, from the weather and the terrain to radioactivity and the presence of chemical warfare agents; and, last but definitely not least, certainty about the state, intentions, and activities of one's own forces. [This certainty] is best understood as the product of two factors, the amount of information available for decision making and the nature of the task to be performed. . . . Everything else being equal, a larger and more complex task will demand more information to carry it out. . . . In order to attain certainty, one must first of all have all the relevant information. The more the available information, however, the longer the time needed to process it, and the greater the danger of failing to distinguish between the relevant and the irrelevant, the important and the unimportant, the reliable and the unreliable, the true and the false. . . . [This leads to] the realization that certainty is the product of time as well as of information, and the consequent willingness to do with less of the latter in order to save the former. . . ." As a result, he sees two basic ways of coping with uncertainty: centralization and decentralization.[33]

Given the speed and range of his aerospace forces, a commander's ability to exploit their potential by acting rapidly depends upon whether he can exercise centralized control over his aerospace forces. For reasons of expertise, however, a commander should normally exercise this control through a subordinate air component commander.

To make rapid action effective, the command organization must be able to integrate the employment of aerospace forces with the maneuver of surface forces so that each complements and reinforces the other in pursuit of the campaign's objective. To do this successfully in an environment characterized by great uncertainty, the commander's organizing principle must make it easy to decentralize authority for controlling the tactical employment of aerospace and surface forces to the subordinate echelons of his component commanders. Decentralized authority acts to reduce a commander's span of control limitations while minimizing the time it takes to observe, orient, decide, and act. Still another ad-

vantage of decentralizing authority is that it increases survivability by making control more redundant and, often, headquarters smaller and easier to move and conceal.

In conclusion, aerospace power has the potential to make an immense contribution to success in conventional war. Realizing this potential, however, requires commanders and staffs who possess a comprehensive understanding of what the exercise of operational art involves and why—unlike tactical expertise which depends largely on training—understanding of operational art depends on being thoroughly educated in the study of war from a campaign perspective. Only education that has a campaign perspective will reveal how and why aerospace power can make such a big contribution to the effectiveness of surface forces. Just as important, such a perspective will show how and why surface forces are often the key to making aerospace forces more effective.

NOTES

1. Chairman's remarks following a lecture, "Air, Land and Sea Warfare" by Marshal of the Royal Air Force Sir Arthur Tedder on 9 January 1946, *The Journal of the Royal United Service Institution*, February 1946, p. 68.
2. "A campaign is a series of joint actions designed to attain a strategic objective in a theater of war. Simultaneous campaigns may take place when the theater of war contains more than one theater of operations. . . . A major operation comprises the coordinated actions of large forces in a single phase of a campaign or in a critical battle. Major operations decide the course of campaigns." U.S. Department of the Army, *Operations*, Field Manual 100–5 (Washington,D.C.: Government Printing Office, 5 May 1986), p. 10.
3. In proposing revisions to the 1947 National Security Act, President Eisenhower's message to Congress on 3 April 1958 expressed the same idea, that "separate ground, sea, and air warfare is gone forever. If ever again we should be involved in war, we will fight it in all elements, with all services, as one single concentrated effort." Alice C. Cole et al., eds., *The Department of Defense 1944–1978* (Washington, D.C.: Government Printing Office, 1978), p. 175.
4. For example, see Barry R. Posen, "Is NATO Decisively Outnumbered?" *International Security*, 12 (Spring 1988): 186–202. Posen attempts to perform an admittedly abbreviated "campaign analysis" while totally ignoring how air power in the form of air interdiction might influence ground force ratios. The only mention of air power in his "campaign" analysis is in a footnote where he states that due to space constraints he has omitted "certain important issues, such as NATO and Pact attack helicopters and close air support aircraft."
5. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1972), pp. 100–12.
6. For a discussion of how important it is for a leader to understand both the enemy's objective and his determination to achieve that objective, see Mark Clodfelter, *The Limits of Air Power* (New York: The Free Press, 1989).
7. Martin van Creveld, *Technology and War* (New York: The Free Press, 1989), p. 317.
8. Edward N. Luttwak, *Strategy* (Cambridge, Mass.: The Belknap Press of Harvard University Press, 1987), pp. 4, 5.
9. Col. John Howard McIniry, Jr., USMCR, *A Marine Dive-Bomber Pilot at Guadalcanal* (Tuscaloosa, Ala.: The University of Alabama Press, 1987), pp. 86–7, and Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II*, vol. 7, *Services Around the World* (Chicago: University of Chicago Press, 1949), p. 457.
10. General William E. DePuy, USA, "Concepts of Operation: The Heart of Command, The Tool of Doctrine," *Army*, August 1988, pp. 26–40.
11. For further discussion see Lt. Col. Price T. Bingham, USAF, "Ground Maneuver and Air Interdiction in the Operational Art," *Parameters*, March 1989, pp. 16–31.
12. Clausewitz, *On War*, pp. 104, 119, 579.
13. See Richard K. Simpkin, *Race to the Swift* (London: Brassey's Defense Publishers, 1985), pp. 181–95. Richard K. Betts, *Surprise Attack* (Washington, D.C.: The Brookings Institution, 1982).
14. Le Comte de Dervieu, *The Transformations of War*, cited in J. F. C. Fuller, *The Conduct of War, 1789–1961* (New York: Minerva Press, 1968), p. 50.

15. General William E. DePuy, "Toward a Balanced Doctrine," *Army*, November 1984, pp. 18–25.
16. R. J. Overy, *The Air War 1939–45* (New York: Stein and Day, 1981), pp. 141–45.
17. Robert F. Futrell, *The United States Air Force In Korea 1950–1953* (Washington, D.C.: Office of Air Force History, 1983), pp. 401–31.
18. Tedder, *Journal of the Royal United Service*, p. 63.
19. Col. William B. Reed et al., eds., *Condensed Analysis of the Ninth Air Force in the European Theater of Operations* (Washington, D. C.: Office of Air Force History, 1984), p. 3.
20. Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II, vol. 2, Europe: TORCH to POINTBLANK, August 1942 to December 1943* (Chicago: University of Chicago Press, 1949), p. 116; see also pp. 83, 89–91, 94, 100, 117–21.
21. General George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan, and Pearce, 1949), p. 299.
22. Futrell, *U.S. Air Force in Korea*, pp. 65–68, 87, 94–95.
23. Kenney, *General Kenney Reports*, p. 251.
24. Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II*, vol. 3, *Europe: Argument to V–E Day, January 1944 to May 1945*, p. 69. Reed, *Ninth Air Force*, p. 25.
25. Control of the aerospace environment was a major factor in the success of FORTITUDE SOUTH. Adolf Galland, *The First and the Last*, trans. Mervyn Savill, (New York: Ballantine Books, 1965), p. 212.
26. Overy, *The Air War*, p. 96.
27. Ronald H. Spector, *Eagle Against the Sun* (New York: The Free Press, 1985), pp. 226–29.
28. Williamson Murray, *Strategy for Defeat* (Washington, D.C.: Government Printing Office, January 1983), pp. 155, 163.
29. Simpkin, *Race to the Swift*, pp. 57–77.
30. Futrell, *U.S. Air Force in Korea*, pp. 261–64.
31. General Omar N. Bradley, *Effect of Air Power on Military Operations* (Air Effects Committee, 12th Army Group, 15 July 1945), pp. 37, 183.
32. Ibid., pp. 103–5, 108, 185.
33. Martin van Creveld, *Command in War* (Cambridge, Mass.: Harvard University Press, 1985), pp. 264–67, 270, 274.

The Air Campaign

John Warden

An air campaign can be an immensely complex undertaking. The majority of air assets that take part in the campaign can move from one end of the theater to the other in a very short period of time, thereby presenting significant opportunities for concentration of force, and can strike at the enemy in tactical through strategic depths. To understand the air campaign, it is useful to divide it into three areas: the objectives of the air campaign, the air situation confronting the commander, and the actual construction of the air campaign.

The objective of the theater campaign is to attain strategic goals that lead to the realization of political aims. In basic terms, the political objectives will be realized when the enemy government is forced to make concessions. But the enemy civil-military command structure must be the ultimate aim of all military operations. Although every state and every military organization will have a unique set of centers of gravity, or vulnerabilities, it is possible to create a general model for analysis. Some centers of gravity are more important than others and consequently can be laid out in the form of five concentric circles, or rings, with the most important element in the center.

The most critical ring is the civil-military command ring because it is the only element of the enemy which can make concessions. Wars throughout history have been fought to induce the command structure to make concessions. Capturing or killing the state's leader has frequently been decisive. In modern times, however, it has become more difficult, but not impossible, to capture or kill the command element. Rather, the task becomes one of applying sufficient indirect pressure so that the command element rationally concludes that concessions are appropriate. The command element will normally reach these conclusions as a function of the degree of damage imposed on the surrounding rings.

In an industrialized society the next most critical ring contains essential industry. If a state's essential industries or its external ac-

cess to industrial products or raw materials are destroyed, the state becomes incapable of employing modern weapons and must make major concessions. Depending on the size of the state and the importance it attaches to its objectives, even minor damage to essential industries may lead the command element to make concessions. The concessions may come because damage to essential industry makes it physically impossible to fight, or it causes internal political or economic repercussions too costly to bear. The number of key industrial targets in even a large state is reasonably small and the targets are relatively fragile.[1]

The third most critical ring contains the enemy state's transportation infrastructure. For both military and civil purposes it is necessary to move goods, services, and information from one point to another. If this movement becomes impossible, the state ceases to function. Compared to key industrial targets, transportation facilities are more diffuse, and thus a greater effort may be required to do enough damage to have an effect.

The fourth most critical ring holds the population and its food sources. Moral objections aside, it is difficult to attack the population directly; there are too many targets and in many cases the population may be willing to suffer grievously before it will turn on its own government.

The last ring holds the fielded military forces of the state. Although we tend to think of military forces as being the most vital in war, in fact they are but a means to an end. Their only function is to protect their own inner rings or to threaten those of an enemy. A state can certainly be induced to make concessions by severely downgrading its armed forces. If all of its fielded forces are destroyed, it may have to surrender simply because the command element knows that its inner rings have become defenseless and liable to destruction.

Viewing "fielded forces" as a means to an end and not an end in themselves is not a classical view, because the majority of the classical writing and thinking on warfare has been done by continental soldiers who had no choice but to contend with enemy armies. For example, Clausewitz wrote that the clash of armies was the essence of warfare, but this held true only for his own time period.

In most cases all the rings exist in the order presented, but it may not be possible to reach more than one or two of the outer ones. As an example, the Germans in World War II were incapable

of making a serious attack on anything but the fourth and fifth rings—the population and military forces—of their primary enemies, losing both the Battle of Britain and the submarine campaign because they lacked an effective long-range attack capability. The Japanese could attack only the fifth ring—military forces—of their primary enemies. Conversely, the United States and her allies eventually struck every German and Japanese ring of vulnerability.

All actions are aimed against the mind of the enemy command. An attack against industry or transportation infrastructure not only has an effect on the enemy's military forces, but also influences national leaders who must assess the cost of rebuilding the state's economic position in the post-war period, and whether the cost is worth the potential gain from continuing the war. The essence of war is applying pressure against the enemy's innermost strategic ring—its command structure. It is pointless to deal with enemy military forces if the command ring can be influenced directly.

Centers of gravity exist not only at the strategic level but also at the operational level. At the operational level, the goal is still to induce the enemy commander to make such concessions as retreating, surrendering, or giving up an offensive. Like the civil-military command structure the operational level commander has rings of vulnerability—or centers of gravity—surrounding him. In fact, each major element of his command will also have similar centers of gravity.

At the operational level, the first ring or center of gravity is the commander himself. He is the target of operations because he is the one who will decide to concede something to the enemy. Included in his center ring is his command, control, and communications system; without the ability to collect information and issue orders to his subordinates, the commander—and his command—are in peril.

The next operational ring is the logistics ring that contains the ammunition, fuel, and food necessary to prosecute war. A cursory review of history quickly reveals the dire straits that operational level commanders have encountered when their logistics ring suffered from enemy attack. Indeed, war in the seventeenth and eighteenth centuries was in large measure designed around isolating a commander from his logistics ring.

The support infrastructure that moves the materiel found in the logistics ring, as well as military forces themselves, constitute

the third operational ring. It consists of roads, airways, seaways, rails, communication lines, pipelines, and the myriad other facilities required to satisfy the needs of the military forces.

None of the three inner rings will function without personnel to man them, and these support personnel constitute the fourth operational ring. Like the population in the fourth strategic ring, however, these personnel present difficult targets and will rarely be appropriate for direct attack.

The fifth ring of the operational commander consists of his military forces—aircraft, ships, and troops. It is the toughest to reduce, simply because it is designed to be tough. As a general rule, a campaign that focuses on the fifth ring is likely to be long and bloody. Nevertheless, it is sometimes appropriate to concentrate against the fifth ring, and sometimes it may be necessary to reduce the fifth ring to some extent in order to reach inner rings.

Some air situations will severely limit which operational or strategic rings—or centers of gravity—the commander can attack or even defend. To simplify analysis of the air situation and to establish a framework for planning, most wars can be divided into one of three cases that are defined by the relationship between the opposing air forces.

In Case I both sides have the capability and will to strike at each other's bases. This was the situation in the Pacific in the first part of World War II when both Japanese and Allied forces could, and did, strike bases behind each other's lines.

Case II occurs when one side is vulnerable to attack but is unable to reach the other. This was the situation in which Britain found herself during the Battle of Britain. She did not believe she had the capability to strike the Luftwaffe fields in France; thus, for practical purposes, German bases were safe during the two months of the battle.[2] By 1943 the situation was reversed, and the Allied air forces were able to attack Germany without fear of militarily significant ripostes by German air power. There are often phases in a war; a war that starts out with a particular air situation may not end with the same situation prevailing.

Case III describes the situation where neither side can operate against the rear areas and air bases of the other, and where air action is therefore confined to the front. During World War I, for example, air forces lacked the technical capability to attack deep into each others territory effectively. But this condition is better il-

lustrated by the Korean War where the United States imposed upon itself political constraints which prohibited operations against Chinese fields and infrastructure north of the Yalu River. The Communists, on the other hand, were unable to attack American fields effectively. Such a situation could thus come about through mutually agreed political constraints or because of technological limitations. For example, proxies of two great powers might meet in a place where neither power chose to provide combat aircraft. Clearly, either side could change the rules; thus, it would be useful for participants to anticipate that possibility. Similarly, in a war between two poor countries there might not be any significant air activity simply because neither side could afford it.

The three cases discussed provide an overview of the situation prevailing at the start of a campaign or phase. The commander and planner must understand that the air situation confronting him will have a profound effect on every category of operations. As an example, if a commander uses his air assets defensively when he could be using them offensively, he tethers his most mobile operational level tool and renounces the opportunity to attack anything but the enemy's outer ring, thus risking massive defeat for his front line fielded forces across the theater. The commander must understand that there are different air situations and that these affect all of the operational options on the surface and in the air.

The air campaign may be the primary or the supporting effort in a theater. The air campaign plan should describe air centers of gravity, phasing operations, and resources. It must provide general guidelines for the division of effort among air superiority, interdiction, and close air support. It should explain how other arms will support or be supported, and, like the overall theater operational plan, it must carry through to the conclusion of the war. Of first importance is the concept of air superiority.

Air superiority means having sufficient control of the air to make air attacks on the enemy without serious opposition and, conversely, to be free from the danger of serious enemy air incursions. There are variations of air superiority. Local air superiority gives basic air freedom of movement over a limited area for a finite period of time. Theater air superiority means that friendly air can operate any place within the entire combat theater. Air neutrality suggests that neither side has won sufficient control of the air to operate without great danger.

There is technological air superiority. For offensive operations, it is possible to produce aircraft and weapons that enemy defenses cannot destroy. Protection of this sort could come from low-detection, on-board lethal self-defense weapons, electronic devices, or a combination of speed and altitude beyond the capability of enemy weapons. In the history of warfare, however, every weapons development has eventually led to a counter-weapon.

The contention that air superiority is a necessity to ensure victory or avoid defeat is based on theory and on an analysis of the last half century of warfare. Theory suggests that it is not possible to succeed if operational and strategic centers of gravity are under constant attack by enemy aircraft. In addition, it is hard to envision success even for surface forces if they and their support are under heavy enemy air attack. Conversely, air superiority is necessary for offensive operations if the commander intends to attack enemy strategic and operational level centers of gravity. Failure to attack these centers of gravity means that the commander is left with little choice but to fight a war of attrition at the front.

In Case I where both sides are fully vulnerable to attack and in Case II where only one side is vulnerable, the commander should normally go on the offensive as soon as possible to win that degree of air superiority needed to bring enemy strategic and operational centers of gravity under attack. To win air superiority under these conditions, the commander must identify and attack appropriate air centers of gravity and their associated targets.

The enemy's air center of gravity may lie at the command center with its attendant command and control apparatus (the first ring); in logistics (the second ring); in the infrastructure ranging from air bases and their locations to roads and pipelines (the third ring); in personnel including pilots (the fourth ring); and finally in combat forces such as planes or missiles (the fifth ring). Each of the rings must be further evaluated in terms of position. It may not be possible to reach every part of the aircraft chain from manufacture to employment. Refineries may be outside the operational theater while pipelines and storage tanks are within it. A careful analysis of enemy doctrine may highlight significant strengths and weaknesses to be exploited or avoided.

There is a tendency to associate air superiority with destruction of enemy aircraft. Although a valid approach, it is not the only one. There is a potentially vulnerable sequence of events that

must take place before an aircraft fires a missile or drops a bomb. Raw materiel must be assembled, formed, and moved by some method to a manufacturing plant. At the plant, power from some source enables workers to put the aircraft together. The aircraft must then be moved to an operational field where it must be protected from enemy attack while it is being prepared for its mission. Finally, it takes to the air. Theoretically, it is possible to eliminate an air force by successful attacks on any point in this chain. The most difficult and costly place to attack the aircraft chain is in the air. It takes one friendly plane to destroy one enemy plane.[3]

Going back down the chain from the air leads to aircraft on the ground. Under ideal circumstances, the results of airfield attack can be impressive. The Germans destroyed over 4,000 Russian aircraft on the ground between 22 and 30 June 1941 with less than 1400 bombers and fighters.[4] The Israelis had similar results from their attacks on Arab air in 1967 when, with 196 operational combat aircraft, they destroyed almost 400 Arab aircraft on the ground in two days.[5] The historical experience has been that it is cheaper by far to destroy aircraft on the ground than in the air. Whether circumstances will permit such success, however, is a function of surprise, the state of enemy defenses, and the physical protection given aircraft on the field. It may also be possible to attain air superiority by methodically eliminating enemy air bases, although experience in the major wars of this century indicates airfields must be attacked persistently and heavily if they are to be destroyed. Single attacks will probably not eliminate an airfield, but may keep its aircraft on the ground for a limited period.

The next step back in the aircraft chain—the movement of aircraft from the factory to their operational fields—does not normally present much of an opportunity. Ferry routes are generally on internal lines that are not subject to attack. The shocking losses by the Japanese ferrying aircraft to forward bases was an exception.[6]

The next significant step back in the chain is the factory. The production of aircraft may depend on a great many factories producing engines, ball bearings, airframes, munitions, and fire control systems. Power and transportation facilities serving such installations are particularly critical; interviews and studies after World War II indicated that these were the weakest points in German and Japanese war production.[7] The last step back is to the raw materiel that goes into aircraft building. The sites of raw ma-

teriel production themselves are not normally good targets, but transportation nets to the plants can be very vulnerable, as was the case of Japan and Germany in World War II.

Choosing a point at which to attack the aircraft chain is far from easy. The important thing to remember is that there are many ways to attain an objective, and that the most obvious choice—in this case, attack on aircraft in the air—may be the worst one. Circumstances will vary with each conflict, but the idea is to attack to gain the greatest return. In some cases there may be a critical choke-point, such as Germany's oil industry in World War II, a target which could be constantly attacked with vigor.[8]

If production sources are outside the operational theater, as they were for the United States in the Vietnam War and for the Israelis in their wars against the Arabs, then the problem of preventing additional aircraft or missiles from entering the enemy's inventory changes. In Vietnam, it was theoretically quite easy to keep the North Vietnamese from acquiring new equipment, as almost everything came by sea and terminated in a limited number of ports. Once the United States decided to close the ports and put pressure on the enemy, the North Vietnamese quickly ran out of missiles.[9] In the case of the Israelis, it was not feasible to block entry of aircraft and missiles into the Arab countries; consequently, both had to be addressed closer to the front where the cost can be quite high, as the Israelis discovered in the 1973 war.

Enemy logistics may well constitute the real air center of gravity. Aircraft cannot fly if they lack fuel and they cannot accomplish anything if they lack weapons. Ground-based air defense systems are useless if they have no missiles to fire, and neither ground or air systems last very long without spare parts. Attacks on logistics can play a major role in winning air superiority and in winning significant advantages at the operational and strategic level of the war. The commander needs to be careful with sequencing air attacks; if he goes for war-winning attacks on strategic logistic targets without first attaining an acceptable level of air superiority, he may suffer catastrophic losses before the fruits of his strategic attacks appear at the tactical level. Similarly, although he may be successful with his attacks on strategic logistics, if he has not won air superiority the enemy may be making his own telling attacks at operational and strategic depths. The result could be a bizarre strategic

war of attrition with the winner being the side which last runs out of a critical commodity.

If the entire logistics chain is open to attack, the most promising will almost certainly be petroleum. The whole petroleum cycle, from the initial collection points through the refineries to the end user, is exceptionally vulnerable. In World War II, the Allies did not concentrate on the petroleum chain in Germany until May 1944. At that point they attacked every element of German petroleum processing, with special emphasis on the refineries and synthetic fuel plants. Three months later, Germany's ability to produce aviation fuel had fallen about 98 percent, and by December the German military was in such dire straits that it had to rely on the seizure of Allied fuel dumps to keep the panzer divisions rolling in the Ardennes offensive.[10]

Fortunately for the attacker, the movement of refined products in any quantity is difficult to protect. Petroleum products must go by rail, by road, by sea, or by pipeline. All of these modes of transport can be struck with great success from the air. Such attacks are most effective, however, when the overall fuel situation is fairly tight. In other words, a particular airfield is not going to suffer from attacks on petroleum production or transportation until its own reserves are low. Patience is needed because there are normally enough reserves to last for a long time, even after the source is completely destroyed.

Other parts of the logistics base might be attacked if analysis indicates that the effort is worth the cost. For example, a sustained attack on plants producing spare parts or munitions may produce satisfactory results over an extended period of time. If time is important, however, it is probably an error to choose a relatively rugged and probably dispersed part of the logistics base. Regardless of the way in which logistics are attacked, there will almost certainly be a delay between successful attacks and observable deterioration in the enemy's air efforts; patience and persistence are necessary.

Targeting priorities are a function of perceived enemy air centers of gravity. There may be defensive considerations for striking first at something other than the final objective. If the enemy has a dozen airfields that are especially well suited for offensive operations these fields may not be important in the long term but could support damaging enemy strikes in the short run. Attacking these fields might therefore be the first order of priority. Likewise, it

may be necessary to neutralize a portion of the enemy's ground-based defenses for the campaign to develop, since the route to the center of gravity may not be a straight line.

To win air superiority in Cases I and II, the commander can attack enemy air centers of gravity. In Case III, however, he can only strike at enemy aircraft in the air, the most difficult of all environments. The Case III situation can develop in a number of ways. Equipment, such as long-range aircraft, may not be available to carry the war to the enemy, or there may be a lack of will to carry out strikes against the enemy. Doctrine may influence or control the situation. Just as there were theorists in the 1930s who were sure that the unescorted bomber would always get through, there are also those who think that current air defense systems will suffice and that offensive operations are futile. Even if doctrine provides for offensive operations, it is quite possible that they have not been practiced in peacetime and that the force is consequently unprepared to take on such a complex and sophisticated operation. Finally, a variety of circumstances may prohibit an offense. An initial enemy onslaught may be so violent that it destroys the systems or personnel needed to support an attack. In any event, it should be clear that the lack of air power can be devastating, as happened to Poland and France in World War II, to North Korea, to the Arab states in 1967 and 1973, and to North Vietnam.

As Clausewitz postulated, the defense in classical land warfare may well be stronger than the offense. In air war, however, the opposite seems to be the case: air forces have such tremendous mobility that they can attack from far more directions than can a land army; the rapidity with which air forces move makes concentration against them more difficult than concentrating to defend against a land attack; the defender on land normally has prepared positions from which he can fire at an attacker who must by definition move across open territory where he is at a decided disadvantage; and when air forces meet in the air, the difference between attacker and defender tends to blur.

Historically, it is clear that being on the pure defense in air matters is fraught with danger. The danger depends on what has to be defended. Easiest to defend is a reasonably tight complex where defenders can meet a challenger anyplace on the periphery, and where the defenders can provide each other mutual support. Most difficult to defend is a long narrow area where dis-

tances preclude mutual support and where the attacker can choose a variety of targets. We are speaking here of theater-size operations, not defending a single airfield, factory, or city, and we are making the assumption that, for the foreseeable future, the only really effective counter to an aircraft is another aircraft. This is not to suggest that ground-based defenses can be ignored or that they are not dangerous. They are so dangerous that one must assume that no one will commence an offensive air campaign unless he is relatively sure that he will be able to neutralize ground defenses by one means or another.

The relations of mass, or numbers, between the attacker and the defender make geography—or more specifically, the disposition of airfields—of prime importance for the air defender. For the attacker, it takes mass to do a reasonable amount of damage on a theater basis. It is true that a single aircraft with a guided weapon can take out a point target such as a bridge. On the other hand, a single aircraft cannot put an airfield, marshalling yard, or other significant military targets out of commission; only a mass of aircraft can do that. One must expect that any serious enemy will attack with strong forces. Strong forces must be met with strong forces.

The history of air war, as short as it is, has shown clearly that mass in the air can only be opposed by counter mass. Attempts to defend with inferior numbers or to attack with inferior numbers have been notably unsuccessful.[11] The problem becomes one of producing mass at the appropriate time. Mass is only important when it can be brought to bear against an enemy attack. Aircraft that cannot participate in an air battle are irrelevant.

Nothing positive can be achieved from defense, although a successful defense may prepare the way for a subsequent offense. Fortunately, there is one advantage to being on the defensive; simply, the enemy's motivation for offense, and thus his willingness to accept punishment, may be less than that of the defender. The attacker is hardly likely to throw his entire air force into the fray and lose it all before deciding to give up the attack. Conversely, the defender might expend his entire force in an attempt to protect himself. This fact gives the defender a slight psychological edge that can be exploited. The key to not losing is to inflict enough damage on the enemy that he becomes unable or unwilling to pay the price. It is necessary to think exactly what must be done to lead the enemy to give up his offense.

On the defense, the only way to hurt the enemy is to knock down his aircraft and capture or kill his flyers. The numbers of aircraft knocked down are important, but more important is the timing of their destruction. The enemy will certainly accept some level of losses and has probably determined that level in advance. One percent is an attrition level which most air forces could sustain without making drastic changes in their campaign plans. For illustrative purposes, assume an air force of a thousand aircraft suffers a 1 percent loss each day for ten days. Total losses would amount to just under one hundred planes. If results had been good for that ten-day period, the commander would probably continue his operations. But the same total loss on a single day would cause almost every commander to seriously reconsider his plans. First, he clearly can't accept losses of that magnitude more than once or twice. Second, losses of that size are almost certain to have hurt some units so badly that they would have to be withdrawn. Third, his flyers would suffer a blow to their morale and to their feeling of invincibility. There is a difference between losing a little each day and losing a lot on a particular day. The defense must inflict as many bad days on the offense as possible, even if that necessitates reduced activity on some days.

A primary defensive goal is thus to impose very heavy losses on the enemy in the shortest time possible. There are two general principles which must be followed. The first is to concentrate forces, to confront the enemy with superior numbers in a particular battle, sector, or time. The second is that it is not possible to defend everything everywhere. Accepting the fact that penetrations are going to take place makes it easier to concentrate forces to gain significant victories with acceptable defender losses. Loss rates vary with the ratio of forces involved. All things being equal, two forces equal in numbers will tend to have equal losses when they meet. Given the same equipment and personnel, as the force ratio goes against one side, that side will have greater loss rates than the changed ratio would suggest. Conversely, on the side for which force ratios become more favorable, loss rates will fall more than the ratios would indicate. The change in loss rates is geometric. There seems to be no point of diminishing returns for the larger force; the larger it gets, the fewer losses it suffers, and the greater losses it imposes on its opponent.[12]

There is no good rule of thumb for how much superiority the defender should have over the attacker. A few examples, however,

may give some ideas. The Japanese attacked Midway with 108 bombers and fighters. Midway's U.S. Marine Corps squadron of 26 fighters suffered almost 100 percent losses.[13] On 11 January 1944, the American air force attacked a target deep in Germany with a force of 238 bombers and 49 escorting fighters. The Germans opposed it with 207 fighters. Losses were 34 bombers. Just over a month later, on 19 February, a force of 941 bombers escorted by 700 fighters met German opposition of about 250 fighters. In this encounter, the Americans lost just 21 bombers—a lower absolute number and a lower percentage. Finally, in June 1982, an Israeli defending force of 90 fighters met a Syrian force of 60 fighters. The Israelis had no losses while the Syrians lost 23 of their aircraft.[14]

It might seem that modern weapons have invalidated the experiences of World War II and Korea and that the Israeli battle last cited was an anomaly, but it seems unlikely. Many aircraft targeting fewer aircraft are bound to achieve better results than the other way around. This conclusion has nothing to do with the quality of the aircraft or their crews. Better airplanes are going to perform better than inferior ones—a fact noted by the great German ace Manfred Von Richthofen in 1918 when he commented, "Besides better quality aircraft they [the British] have quantity. Our fighter pilots, though quite good, are consequently lost." [15]

The emphasis on numbers may suggest that the outcome of the Case II air superiority campaign could be judged on the basis of relative prewar strengths, perhaps tempered by production rates after the war started. It might also suggest that the defending commander is doomed if he has fewer aircraft than the offense. Neither is true. Static balances are of interest, but they don't have much to do with how the war is likely to end unless the numbers are absolutely overwhelming. What counts is the numbers when two forces meet in actual battle. The smaller defending air force has a chance to win if its aircraft are properly employed, and if they are concentrated so as to outnumber the attacker in any given engagement. It is imperative to achieve numerical superiority even if doing so leads to some attacks escaping without interception. It is far more important and effective to impose heavy losses in one battle or on one day than it is to get a constant 1 or 2 percent a day. It is also important that the defending commander, especially the commander of a force which is overall inferior in

numbers to the enemy, recognize that his losses will be lower when he outnumbers the enemy in an engagement.

When the rear areas of both sides are relatively safe (Case III), either because of political restraints or because of physical inability to reach appropriate targets, the overall campaign plan is easier to devise, although it may be harder to execute. In this case, air superiority is unlikely to be an end in itself; rather, it is needed to prevent enemy air interference with ground operations over or near the front while permitting friendly air operations over corresponding parts of enemy territory. When the enemy rear cannot be reached, the options are very limited. To achieve air superiority, little can be done beyond the elimination of enemy aircraft in the air and the suppression of enemy ground-based systems. Under these circumstances, the commander must decide whether the ground-based system constitutes a threat that must be attacked or whether it can be suppressed by electronic means while enemy aircraft are defeated in the air.

When enemy air forces cannot be attacked on their bases, they must be attacked in the air. The options depend on the enemy's strength and doctrine. If the enemy considers himself comparatively weak, he will attempt to avoid aerial combat while concentrating his efforts against aircraft that may be harassing his ground troops or supply lines close to the front. One could even imagine a situation where waves of fighters are sent over the lines to engage enemy air, but always return without destroying any enemy aircraft because the enemy chose not to fight. Should this occur, air superiority comes by default and the next phase in the campaign can begin.

The distinguishing feature of Case II is the base area sanctuary enjoyed by both sides. Given this sanctuary, the campaign is likely to turn into a long slugging match where it is difficult for either side to do anything more than wear the other down. This is especially so when both sides have roughly equal numbers and supporting production of weapons and personnel. If one side is notably inferior to the other in terms of either pilots or aircraft and missiles, that side can only play a careful game looking for opportunities to do damage to the opponent without large losses to itself. As long as it takes this course, it can stay in the war for a long time. This is not to say that its ground forces are not going to suffer horribly in the process, as did those of North Vietnam after the United States entered the war. This case is one of the easiest to handle from the operational level because there are so few options. It is apt to be mad-

dening for all concerned, and significant differences may arise with the political leadership if the restraints on attacking enemy rear bases are politically motivated or militarily unsound. Should this happen, the operational commander must give his candid advice as to likely costs with and without the constraints.

In a Case III situation, where air power is not significant, a commander must still think about air power. A war without combat aircraft is most likely to occur when two relatively primitive forces clash. Less likely, but still possible, might be a phase in a war that took place after both sides lost the use of their air forces either because of combat attrition or because of maintenance problems. Regardless of how it comes about, air superiority will not be a problem for either side. The air superiority operation, whether it is an end in itself or a means to an end, should not be waged with air assets alone. Naval and ground forces should play a role wherever possible. The more innovative their actions, the more likely they and the campaign are to succeed. Historical examples of other components participating in the air superiority effort include British dispatch of commandos to destroy German airfields in North Africa,[16] MacArthur's and Kenney's employment of ground forces to seize airfields in the Pacific, and Israel's use of naval and ground forces to knock holes in ground-based air defense systems in the 1973 war[17] and in the 1983 Lebanon incursions. If theater CINCs and component commanders understand the need for air superiority, they will work together to win it.

Once air superiority is won or assured, the commander can begin his assault on other enemy centers of gravity. In general, this means that he can begin an interdiction operation that attacks enemy centers of gravity at strategic and operational depths.

The history of interdiction is as long as the history of battle. From the earliest recorded times, commanders have sought to place their forces between the enemy and his base. So serious can such an interposition be that there have been periods, notably in the eighteenth century, when this act alone, without any battle taking place, was often sufficient to induce the interdicted side to make peace. The advent of the airplane simply added a new dimension to this form of warfare.

Any operation designed to attack enemy centers of gravity not located at the front or to slow or inhibit the flow of forces or materiel from their source to the front or laterally behind the front is

interdiction. We will not make any distinctions between operations directed at the source and those targeted immediately behind the lines. Thus, an attack on a train carrying iron ore to the smelter is just as much interdiction as destroying a bridge a mile behind the front. Naturally, the time period required for the effect of either to be felt at a ground front will vary. Even so, both are interdiction in the commander's theater air campaign.

The concept of combining an interdiction campaign with an offensive on the ground is of such importance as to merit an example. The Allied invasion of Normandy was planned with the full knowledge that German forces in northern France would greatly outnumber the invaders. The only way the invasion could succeed was to prevent the movement of German reinforcements into the Normandy area. Allied planners depended on a massive interdiction campaign to accomplish that end. That part of the campaign depended primarily on air assets but integrated the actions of commandos and partisans into the overall effort.

An interdiction campaign is most effective when the enemy needs to move major forces and equipment quickly such as during a retreat or pursuit or during a defense against a determined offense. A simple three-level categorization based on relative distance from the front gives us an ample framework for analysis and planning. In this taxonomy, interdiction can be close, intermediate, or distant. Distant means the source of men and materiel, or in the case of a warring party which has no industry, the ports or fields where materiel provided from outside enters the country; intermediate is halfway between the source and the front; and close is that area along the front where lateral movement takes place. Each category has its own specific problems and opportunities.

Distant interdiction has the capability of producing the most decisive effect, but it also has the greatest time lag between attack and discernible results at the front. For instance, if every oil refinery in the world blew up tomorrow, oil-based industry and transportation wouldn't be forced to shut down the following day. In some cases, they could continue to operate for weeks or even months. Eventually, though, they would stop if the refineries were not rebuilt. If the commander is sure that the war will be decided before there can be effect from a given action, then it is pointless to waste resources carrying it out. He needs to be very careful in this assessment, however, for wars are inevitably much longer or

much shorter than anyone expects. Intermediate interdiction also has a time lag associated with it, but one that will probably be much less than that for distant interdiction.

Close interdiction seems most useful when a ground battle is in progress. It played a key role during the 1973 Arab-Israeli War. On Sunday, 7 October, the Syrians committed their armor reserves on the Golan Heights. Three hundred tanks drove to within five miles of the Benot Yacov bridge. Nothing stood between them and the plains below Golan except a handful of Israeli reservists. But just as a serious setback to the Israelis seemed imminent, the Syrian advance "ran out of steam." As it turned out, the Syrians had run out of gas and ammunition because "the Israeli Air Force had destroyed it." The previous night the Israelis had conducted night interdiction operations just behind the front against the Syrian ammunition and fuel trucks. This interdiction, conducted in lieu of close air support despite the desperate ground situation, had a major impact on the battle.[18]

Successful interdiction campaigns have generally been sustained, concentrated efforts. It is futile to expect that one or two missions of a handful of planes each are going to accomplish anything lasting. Interdiction operations inevitably lead to loss of aircraft and flyers; thus, it is necessary to ensure that something useful is gained for the loss. One modern aircraft and a highly trained pilot is a high price to pay for one truck.

Interdiction operations should not be done at the expense of something more important. That something more important will almost certainly be air superiority since there will be many instances when a ground commander will demand interdiction before air superiority has been won. Interdiction missions, except under unusual circumstances where the benefit clearly outweighs the risk, should not be attempted in the absence of air superiority. A commander does so at his peril for he is likely to jeopardize his chances of winning air superiority.

After interdiction, the next major role for air power is close support. Close air support is any air operation that theoretically could and would be done by the ground forces on their own if sufficient troops or artillery were available. Air strikes on attacking troops fits into this category. Aerial bombardment of the enemy line preparatory to an offensive would also fit because artillery could do that job. Using air to hold a flank belongs under the

rubric of close air support because an extra division or corps could be assigned flank-holding duties. It does not, however, include attacks on enemy troops moving laterally across the front, because ground forces have no realistic way to deal with that. An air action that does not fall within this definition is either interdiction or air superiority. This definition of close air support may or may not agree with the definition currently in use in any particular army or air force, but it is not especially important that it does. What is important is that air and ground commanders differentiate between close support and other air operations.

Because of the ability to rapidly mass forces, close air support will normally be most useful supporting the employment of the operational ground reserve. If we think of close air support in terms of committing the operational ground reserve, we tend to put proper value on a scarce and valuable commodity, and we put it in terms both the airman and the soldier can understand. We also make it easier to comprehend that close air support, like the operational reserve, is something to be used quickly and effectively and then reconstituted as soon as possible. The fact that some combatants have used close air support continually, as though it were unlimited organic artillery, does not mean that it should be used in that manner. Like the operational ground reserve, it is a shock weapon that is most effective when concentrated in space and time.

A commander should use close air support where he would like to use his operational ground reserve—if he could move it there in time. This leads us to the nature of the airplane. It is fast, reacts quickly, and can deliver significant firepower in a short time. On the other hand, a single airplane normally can't stay on station very long, and there are rarely enough of them to maintain around-the-clock coverage.

We now have two ideas for where to use close air support: where an operational level commander would want to employ his own operational reserve, and where bursts of power—as opposed to the long-term power of ground forces—are required. Commanders have historically used their operational ground reserve to break through the enemy lines, to prevent an enemy breakthrough, or to cover a flank. Close air support has also accomplished all these missions at one time or another.

The Normandy invasion of 1944 was a big success due in part to the heavy air support employed. Nevertheless, the cost for di-

verting the big bombers was a delay in the attacks on the German petroleum industry. Would the war have ended sooner if the Germans had run out of fuel for their tanks and aircraft three months before they did? Or would the question be academic if the Allies had been unable to gain a suitable foothold on the Continent? There is no way to answer the question, but the point is that the Allies paid a definite price for diverting air away from Germany.

The theory of reserves is not an easy one to grasp, especially on an emotional level. We are inclined to feel that a unit not committed to the battle is somehow not pulling its weight. We think in terms of gathering our strength and charging the objective with everything we have. We accept, perhaps on a visceral level, the theory of concentration and mass, and interpret that to mean all of our resources. We calculate ratios and, never quite comfortable with our superiority, want to make them better by adding more, thinking that by so doing we are increasing our chance of success or at least decreasing our chance of failure. In a certain sense, none of these thoughts is entirely wrong; in fact, in a perfectly predictable world, each might be entirely right. But if the world were perfectly predictable, war would never happen as the antagonists, knowing in advance the outcome, would sign the armistice terms before the first bullet flew. War is, of course, an intensely human activity, and as such defies prediction. That is one of the key reasons why reserves came to be so important for land warfare. Through them, the operational commander preserves his ability to maneuver and retains the initiative.

Clausewitz wrote of the fog, friction, and uncertainty of war. Nothing can eliminate these hindrances to perfect action, but reserves can ameliorate their negative consequences in at least two major ways. First, they provide a commander the wherewithal to exploit an error or failing by the enemy. He can pour into the battle masses of fresh troops who have the potential to break remaining enemy resistance and force a retreat or rout. On the other hand, reserves can be thrown against an enemy attempt to exploit a commander's own error. The arrival of strong, fresh forces may break the enemy attack and restore the defender's lines.

There is a general feeling that aircraft should be flown as frequently as maintenance requirements allow and that there should always be a target for each sortie. These ideas produce a general belief that the concept of reserves does not apply to air opera-

tions. In fact, there are few historical instances where air was consciously kept in reserve. There are, however, two fascinating illustrations of the use of air reserves. The first occurred during the Battle of Britain in 1940 when Vice Air Marshal Sir Hugh Dowding deliberately held forces in strategic and operational reserve until 15 September when he judged the battle had reached a critical juncture for both sides. The sudden appearance of forces which the Germans did not believe existed constituted a powerful shock that demoralized the German flyers and convinced Hitler that he should abandon the invasion of Britain.[19]

The second example did not occur, but it almost did. Late in 1943 and in 1944, General Adolf Galland, Inspector of Fighter Forces for the Luftwaffe, asked Hitler for permission to build a reserve of fighters which would be committed against American bombers in such a manner as to ensure a three- or four-to-one ratio and lead to the destruction in a single day of up to five hundred American bombers—a 25 to 50 percent loss rate. For various reasons, Hitler reneged on his promise to allow Galland to execute this plan.[20] Whether it would have worked is moot. In retrospect, a loss of this magnitude, with its accompanying shock and demoralization of flyer and commander alike, would almost certainly have forced the Americans to stop the bombing campaign for some period. In the interim, the Germans might have been able to rebuild their air forces into a more potent opponent.

These two examples from World War II suggest that air reserves might be of extraordinary importance. They also show that the theory of reserves can be applicable to air operations. The U.S. Air Force has never kept a reserve—although in a sense, its production capacity gave it a strategic reserve in World War II—and one could say that its string of victories since 1943 suggests that it did not need a reserve. Of course, in every conflict since then it has been on the offensive, even if highly circumscribed in Korea and Vietnam, and it has had overwhelming numerical superiority. The two air forces in our examples were on the defensive and were numerically inferior. Reverting to our theoretical discussion, we recall that reserves seem to be most useful when the situation is unstable and susceptible to being unbalanced by the addition of a new force. These observations would lead us to suspect that air reserves are most needed when the enemy is equal to or somewhat stronger than our own forces.

Another way to look at reserves is through sortie allocation. For the sake of simplicity, let us look only at close support operations. The standard assumption, based on current doctrine, is that there will be as many close air support sorties flown as possible on the first day of a war. Thereafter, there will be a decreasing number due to attrition. Several alternative methods of using sorties are possible. First, no sorties could be flown until day two or three. Ignoring possible destruction of aircraft on the ground, this would mean that the full weight of close air support would hit the enemy on his second or third day of operations. One can imagine that this could be more disruptive than would the same weight of effort applied on day one. On the other hand, sorties could be kept constant by deciding on some level of sorties that could be maintained over time. That level would clearly be much less than the maximum surge capability but would be higher at the end of the period than if a standard approach were used. The last theoretically possible variation is to start out on day one at a very low level and increase over time. It is not possible for obvious reasons to attain the same number of sorties on the last day as could be achieved on the first day with a maximum effort. It is possible, however, to fly more on the last day than would be available using a standard plan.

One benefit from varying the sortie pattern comes from the prediction that not every day of battle is equally important. In fact, effort in war comes in spurts and surges rather than some inexorable pressure like a flowing river. The lulls between enemy surges offer opportunities to be exploited. The theater CINC would like to be able to concentrate ground and air power to take advantage of these opportunities, but he can't if close air has been expended in some mechanistic way. Thus, sorties may be more valuable on one day than on another.

So far we have discussed producing air reserves by rearranging sortie production patterns. The same can be done by holding units out of the battle, as the British did and the Germans almost did, until the time is right to use them. One counter argument is that air, because of its mobility, can be shifted quickly from one chore to another and thus constitutes its own reserve. In theory, that may be true but in practice, at least when the situation has been tense, no one has been willing to relinquish any air support.

The commander with numerical superiority has a better chance of shifting effort than the commander who is strapped to

do the minimum things that need doing. The beauty of an air reserve, controlled by the air component and theater commander, is that it can be thrown in without taking anything away from anyone. Lastly, there can be great advantage, as the British discovered, if some system allows the rotation of battle weary units off the front to allow them to rest and rejuvenate.

Having selected or been assigned a military objective, the theater CINC must determine the center of gravity against which his campaign should be directed. Each level of operations—and possibly even each phase of the war—has a center of gravity that may or may not be related to the level or phase above and below. This is not an easy concept to grasp because it seems almost self-contradictory. To help understand it, let us use the World War II Pacific campaign as a model. To idealize it, we will make certain assumptions that were not the case but could have been.

Let us assume that the American Joint Chiefs of Staff and the Pacific commanders had met the day before Pearl Harbor and had agreed that the Japanese center of gravity was war production—the second strategic ring—in the home islands, that war production was best attacked from the air, and that air superiority over Japan was a prerequisite. Given the aircraft available, it would be necessary to acquire bases from which to launch air attacks. To acquire appropriate bases, it would be necessary to prevent or eliminate Japanese ground occupation of those bases. Thus, the second-level objective becomes territory. To secure the second-level objective, however, it would be necessary to position men and materiel at the right places which in turn demands control of requisite sea lanes. The third-level objective is now Japanese sea power. Sea power, though, cannot survive against land-based air. Thus, the fourth-level objective is again air superiority.

There are many centers of gravity in a theater campaign. Nevertheless, there should be a unifying theme, a central center of gravity, and an accompanying central instrument to reach it. In the hypothetical case of Japan, it was essential industry that could best be attacked by air which in turn created a requirement for air superiority, and everything was subordinated to that central theme. Imagine how much different the campaign would have been had destruction of the Japanese armed forces been the goal. In that event, the bypass approach would have been inappropriate, ground forces would have been predominant, and every other

arm would have been in support of ground action. It should now be apparent why identification of a thematic center of gravity is vital. Without its identification, there is nothing to direct the campaign and the campaign risks wandering down back roads that, although exciting and breathtaking, may lead nowhere. For any campaign, there are three possible themes which will lead to the most important enemy centers of gravity: air superiority, sea superiority, and ground superiority.

The easiest of the three themes to choose or reject is sea superiority. It is clearly not appropriate if the campaign is against a continental power which has little sea commerce and where the area of hostilities is not bordered by oceans. On the other hand, it may be entirely appropriate if the campaign is against an island power which can be isolated and starved into submission if its sea lines are cut. If sea superiority is chosen as the theme for the campaign, air may still be crucial to allow appropriate sea operations and ground forces to take or occupy land formations controlling key sea passages.

Choosing between ground and air superiority as the campaign theme is far more difficult because given enough time, money, and blood either can theoretically accomplish what the other can do. That is, it is theoretically possible to kill every enemy ground soldier by air attack, and it is obviously possible to capture and control all enemy means of production with ground forces.

Ground superiority must be the theme if air cannot make a substantial or timely contribution to the campaign effort. Air is of marginal value in a fight against guerrillas where the guerrillas merge with the population, and outside support is not crucial. In this case, there is no useful target for air attack. Ground superiority must be the theme if short-term occupation of limited pieces of territory is the military objective for either side and will in itself end the war. In the short term, air cannot stop large bodies of men; interdiction takes time to work, and attacks on war production take even more. Lastly, ground superiority must be the theme if time is of the essence and it is agreed that ground action can lead to the political objective significantly faster than could air action. To some extent, time drove British and American strategy against Germany. It was quite conceivable that Germany could have been defeated through air attack and blockade but the certainty of her defeat with these means alone decreased if the Soviet Union made a separate peace with Germany. Since the Soviets intimated that possibility if a

second front in France were not opened expeditiously, the ground instead of the air approach appeared more appropriate.

Territory is a dangerous enchantress in war. Serious wars are rarely won by capturing territory unless that territory includes the enemy's vital center of gravity, the loss of which precludes continuing the war. Territory may well be the political objective of a campaign, but it should rarely be the military objective. It will be disposed of at the peace conference as a function of the military and economic situation of the loser. Assumptions about time are apt to be wrong and dangerous because few things are more difficult to predict than how long a war or a campaign will last. Germany planned for a short war and was unable to handle a long one. Outside observers were almost unanimous in predicting that the Soviets would fall by Christmas 1941. MacArthur talked about sending troops home for Christmas from Korea in 1950. The "light at the end of the tunnel" prediction was hopelessly wrong in Vietnam. On the other side, British and American forces covered more ground after Normandy in three months than they had planned to cover in a year.[21] Territory is beguiling, and time is deceiving; the commander must beware of both.

Air superiority must be the campaign theme when ground or sea forces are incapable of doing the job because of insufficient numbers or inability to reach the enemy military center of gravity. As an example, the German campaign theme against Britain after Dunkirk was air superiority because the army and navy could not come to grips with the British home forces; this is slightly simplified because there was a submarine campaign going on against Britain while the Battle of Britain was in progress. It may be the theme when enemy ground forces can be isolated or delayed while air works directly against political or economic centers. Similarly, it could be the theme if enemy power was confined to a relatively small area such as an island. Pantelleria, an island between Malta and Tunisia, surrendered after intensive air attack[22] and British-held Malta was on the verge of doing so. Air superiority may be the theme for a phase of a campaign that is leading to a point where sea or land becomes predominant. It should be the theme if the military objective of the war is destruction of the enemy's war economy. Lastly, it may be appropriate to select air superiority under an even wider variety of circumstances if time is *not* a significant constraint.

The last several paragraphs have suggested guidelines for determining what the unifying theme of a campaign should be. Making

the decision will frequently be difficult, but it is a task that cannot be shirked. Once decided, each participating component can see what its role is and how it fits. When these things are known, there is less likely to be the jealousy and suspicion that are part and parcel of such an intense human activity as war. Just as one cannot imagine an orchestra playing without a theme, one should be unable to imagine a war without one. However, there have been many wars without a score, and many where the conductor used one sheet of music and his players another. When his philosophy is understood and his themes established, the commander can plan and execute the air campaign, whether it be the major movement or a supporting accompaniment. Only by doing so can air power make its greatest possible contribution to winning the war in its totality.

Concentration is probably the most important principle of air war. Therefore, the air commander should make every effort to convince his ground component commander counterpart and the theater CINC that they should all choose some mission which a concentrated application of air power could bring to fruition. In this decision process, the commander must remember how dangerous it is to attempt other missions before air superiority is won. It will also be worth emphasizing that air power has been more useful in interdiction then in close support. The German army decided too late on the Russian front that it should have asked the Luftwaffe for interdiction rather than close air support. Given the critical importance of air superiority, and the historical success of interdiction, it may be possible to propose a compromise solution to demands that all three missions be carried out simultaneously.

It seems clear that air superiority must be the first air priority because so much else—ground operations, close support, and interdiction—is heavily dependent on it. An interdiction effort should not begin before the air superiority campaign is obviously on the road to success. There is, however, an area for logical compromise, an area that will benefit both missions. There are systems which support both enemy land and air operations. Their precise identity will vary from war to war, but for the foreseeable future the petroleum net will be a strong candidate, as will the transportation net if it can be hit behind the enemy airfields it is supporting. Another potential target is the enemy's theater command and control system. To the extent that systems mutually support-

ing air and ground can be identified and struck, it makes good sense to mix interdiction and air superiority.

Before undertaking any operation, the commander must make decisions about reserves. He must decide whether he is going to have them and when he is going to commit them. His assessment of the length of the war is important to this decision. If the war will most likely end in one or two days or with one very short decisive battle, reserves may not be useful. If the war is going to last beyond a few days, then the commander probably should hold reserves for the reasons previously enumerated. Once the decision is made to maintain reserves, the commander must then adopt a principle for commitment. If the commander is going to commit the reserve, he should do it in mass to capitalize on shock and surprise. As to where he commits it, he has two choices: he can reinforce his own success or reinforce against an enemy success. In ground war, the general American approach has been the latter and the Soviet approach the former. The Soviet approach is particularly well suited for fast offensives while the American approach has been the product of a more conservative defensive orientation and even as part of an offensive.

Finally, air should play an enormously important role in most wars, but can only do so when it is employed as part of an integrated air campaign focused against the enemy centers of gravity identified by the theater commander as the most lucrative and whose destruction will most surely lead to attainment of political and military objectives.

NOTES

1. Superficially, our attacks on German industry in World War II would seem to contradict the idea that essential industry is fragile. In that conflict, however, bombing accuracy was atrocious; more than half of all bombs dropped missed their targets by more than a thousand yards. When accuracies are improved to where more than half of all bombs fall within a few feet of their target, it becomes clear that what took thousands of sorties and many tons of bombs can now be accomplished with orders of magnitude less effort.

2. During this period, the few British raids on the German homeland had no military effect on the battle, although their subsequent political effect was perhaps significant.

3. To illustrate, less than 1 percent of American pilots have become aces (shooting down five or more enemy aircraft), but that 1 percent has accounted for over 30 percent of all enemy aircraft destroyed in the air. Gene Gurney, *Five Down and Glory* (New York: Ballantine Books, 1957, 1965), pp. 207, 242.

4. Richard Suchenwirth, *Historical Turning Points in the German Air Force War Effort* (Maxwell Air Force Base, Ala.: Air Research Studies Institute, 1959), p.83. Cajus Bekker, *The Luftwaffe War Diaries*, trans. Frank Ziegler (New York: Ballantine Books, 1969), p. 313.

5. Ezer Weizman, *On Eagle's Wings*, (New York: MacMillan Publishing Co., Inc., 1976), p. 223.

6. U.S. Strategic Bombing Survey, *Japanese Air Power*, (Washington, D.C.: Military Analysis Division, 1946), p. 14.

7. Maj. Gen. Haywood S. Hansell Jr., *Strategic Air War Against Japan* (Maxwell Air Force Base, Ala.: Airpower Research Institute, 1980), pp. 76–80. Albert Speer, *Inside the Third Reich*, trans. Richard and Clara Winston (New York: Avon Books, 1971), pp. 365–367.

8. During American planning and execution of the bombing campaign against Germany, some of the planners maintained that there were single-target systems which, if destroyed, would win the war. Critics of this approach disparagingly referred to these target systems as "panaceas." In retrospect, the petroleum, transportation, and electrical generating systems might have come close to qualifying as real "panaceas."

9. A. J. C. Lavalle, ed., *The Tale of Two Bridges and The Battle for the Skies over North Vietnam—USAF Southeast Asia Monograph Series* (Washington, D.C.: Government Printing Office, 1976), p. 151.

10. Williamson Murray, *Strategy for Defeat: The Luftwaffe 1933–1945* (Maxwell Air Force Base, Ala.: Air University Press, 1983), pp. 274–76.

11. It is the operational commander's duty to ensure that he masses superior forces at a particular time and place. That he is inferior in the theater does not relieve him of this duty. In fact, it is the essence of generalship.

12. U.S. Air Force, Assistant Chief of Staff for Studies and Analysis, *The Relationship Between Sortie Ratios and Loss Rates for Air-to-Air Battle Engagements During World War II and Korea—Saber Measures (Charlie)* (Washington, D.C.: U.S. Air Force, 1970), p. 15.

13. J. F. C. Fuller, *The Decisive Battles of the Western World, Vol III* (London: Eyre & Spottiswoode, 1963), p. 471.
14. Benjamin L. Lambeth, *Moscow's Lessons Learned from the 1982 Lebanon War* (Santa Monica, Calif.: Rand Corporation, 1984), p. 8.
15. John H. Morrow, *German Air Power in World War I* (Lincoln, Nebr.: University of Nebraska Press, 1982), p. 109.
16. Bekker, *The Luftwaffe War Diaries*, p.31.
17. The Insight Team of *The London Sunday Times, The Yom Kippur War* (Garden City, N.Y.: Doubleday & Company, Inc., 1974), pp. 161, 204.
18. Ibid., pp. 182–183.
19. Telford Taylor, *The Breaking Wave* (New York: Simon and Schuster, 1967), pp. 99, 135, 138–139, 151–159, 163–165.
20. Adolf Galland, *The First and the Last*, trans. Merwyn Savill (New York: Ballantine Books, 1963), pp. 240–241.
21. Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (New York: Cambridge University Press, 1980), pp. 213–216.
22. Wesley J. Craven and James L. Cate, eds. *The Army Air Forces in World War II*, vol. 2 *Europe: TORCH to POINTBLANK, August 1942 to December 1943* (Chicago: University of Chicago Press, 1949), pp. 428–430.

The Air Commander's View

Charles L. Donnelly, Jr.

The operational level of war has been with us in various forms since the beginning of military history. However, in my experience there is not a wide understanding of this particular art. There are many reasons for this, the primary one being that the operational level is difficult to express unless there is a war in progress. In time of peace, military leaders are deeply involved in the training of their people for the eventuality of war. Given the complicated equipment military people now use and maintain and the inherent capabilities of those weapon systems, training and readiness is a full time job. Also, it is not until the military officer attains high rank that he is assigned to an operational level of command. It is at this point, however, when the reality of responsibility for this level of command has to be faced.

Some years ago when I first took command of the Fifth Air Force in Japan I was thinking strictly as a tactical commander, deciding where and how I would operate in today's battle, planning for tomorrow's battle, and maybe even giving some thought to the day after tomorrow's battle. Soon, however, it became obvious that thinking this way simply would not work. For me to try to fight today's battle would be fatal because the people who are fighting that battle in the squadrons and the wings are well trained and highly qualified to do their jobs. They are the ones in charge of daily tactical operations, so for me to sit back in the command center and try to move flights of airplanes around the battlefield would be counterproductive.

The responsibilities of command at the operational level really came home to me when I arrived in Europe. As commander of U.S. Air Forces in Europe (USAFE), I was also the NATO commander for Allied Air Forces, Central Europe (COMAAFCE). This forced me to readjust my thinking to accommodate the fact that there were two tactical air forces under my command and a variety of national air forces in the Central Region. With forces of that size and the accompanying command and control complexity, I really could not interfere with today's war or even tomorrow's war. As a senior commander at the operational level of war I had to look well into the future.

The senior commander at the operational level must always look at the larger picture. He is not only responsible for prosecuting the campaign in his area of responsibility, but he also must have a working knowledge of the political factors which affect and impact on the conduct of the war. He must be conscious of the goals and problems of the theater commander and be able to adjust campaign plans accordingly. The operational level commander simply does not have all the details of intelligence and communications to let him know what a squadron, for example, is doing. This is not the business of operational art. The operational level commander must be able to guide his staff in such a way that they operate at his level of responsibility and make no attempt to micro-manage the lower echelons of command.

NATO's Central Region is perhaps the best example of the various levels of command responsibilities. CINCENT (the Commander-in-Chief of Allied Forces in the Central Region) is the operational level commander reporting to the theater commander, the Supreme Allied Commander, Europe (SACEUR). CINCENT commands two army groups: Central Army Group (CENTAG) and Northern Army Group (NORTHAG). The Allied Air Forces Central Europe (AAFCE) is his air component. The two army groups have four corps each and COMAAFCE has two allied tactical air forces (ATAF), the 2d and the 4th, under his command. Echelons below these commands are the army divisions and the air tactical operations centers (ATOC).

One can now see the enormity of the tasks at hand in NATO's Central Region. The divisions and the ATOCs prosecute today's battle, maneuvering their forces for the best effect. The corps are following today's battle while at the same time planning and preparing for tomorrow's battle. Their need for support such as air, intelligence, and logistics are all considered and prioritized by the army group and ATAF sitting together, trying to marshal their resources for the most telling effect on the enemy. CINCENT, having allocated forces for today's and tomorrow's battle, is making plans and establishing priorities for the battles which will occur some days or even weeks into the future.

This planning takes many forms. Where best to use ground reserves and where and how to delay and disrupt the enemy's second echelon forces are two of the most important considerations. CINCENT approves or disapproves recommendations for counter-

attacks considering the commitment of scarce resources necessary for the attack, decides the best missions for air and establishes priorities accordingly, and ascertains the region's logistic status. He must ask himself if he has adequate intelligence on enemy formations to make timely decisions and how the predicted weather will impact on future plans. CINCENT has all of this information available, but to bring it all together so his decisions can be made and his guidance sent to his subordinates is a large task. But he cannot possibly try to effect today's or tomorrow's battle through detailed instructions and directives from his level of command.

Throughout all these events, COMAAFCE, the air component commander in the Central Region, is developing plans to support CINCENT's guidance and issuing air directives to the ATAF commanders. In the air directive, COMAAFCE moves air power between the ATAFs, redirects critical logistics and weapons and establishes priorities for the future air effort such as air defense, offensive counter air, and air interdiction. COMAAFCE must be ever mindful that air power is a support element, and that air units must be in the right place at the right time to affect the land battle. Air intelligence must be collected, analyzed, and disseminated in such a way that a synergy exists with the ground intelligence and provides a complete picture of the battle CINCENT's forces will have to fight. Air command and control must understand events as they unfold and translate them into effective use of air power. Finally, COMAAFCE must ensure that he does not interfere with the ATAFs and their ATOCs as they fly and fight their battles.

Collocated with CINCENT, COMAAFCE has minute-by-minute access to the discussions, planning, and intelligence which go into CINCENT's guidance. His recommendations on air support will influence the decisions for future battles and campaigns. Thus, this air component commander must have all the attributes of an operational level commander in his thought process and in his actions. Both headquarters will be waiting for the movement of the enemy reserve forces forward. They will want the intelligence which can tell them where the choke points are so that air can slow the enemy second echelon by disrupting and destroying them. Air power generally cannot do everything at the same time on the same mission, but it is possible with intelligence to locate potential choke points. Air power is about the only thing that has the capability to reach and hit choke points deeper than about

thirty kilometers, generally the maximum range of field artillery. There will be plenty of targets, but the actual selection of specific targets must be left to the tactical level commanders.

Intelligence agencies generally like to have about a 90 or 95 percent assurance that they are correct. Unfortunately, commanders cannot always afford that luxury. A commander might have to accept a 60 percent assurance, for example, and then evaluate the risk. Even with the significant intelligence capabilities available today, gathering enough information for the command to make a decision with 90 percent assurance takes too long. In spite of the fact that there is very rapid, almost instantaneous, collection, it still takes humans to collate and analyze the information. There is virtually no system that can show an enemy force with 100 percent accuracy. Other things associated with intelligence have to be assessed before the commander can make a proper decision. If the intelligence system can give a 50 to 60 percent assurance that an air attack delayed and disrupted the enemy, then that may be enough. We cannot afford to keep going back to one target just to be sure that it has been reduced by 80 percent. It is a waste of sorties going after that target again just to try and get it up to an arbitrary goal of 80 percent or higher destruction.

I cannot stress enough that the operational level commander cannot worry about today's battle. He can be concerned about it but he should not try to make any decisions about it. The information will simply not be available at the operational level to make timely decisions on today's battle. An operational level command center simply does not have the kind of detailed information that the ATOC and the army group will have. That is by design since a headquarters can flood itself with so much information that it will drown. There is no need to have a large staff when the people to whom you have given the tactical responsibility are the ones who are going to make the critical and timely tactical decisions.

At the tactical level commanders have well-defined problems, but at the operational level such matters are less clear. Revelation of the difference comes by being in an operational level headquarters and comparing the enormity of its job with that of a tactical unit commander. Operational level headquarters staff officers are trying to set up priorities and they are just as dedicated as tactical commanders to successfully completing the mission. As we progress in rank and command we all try to keep the higher headquarters peo-

ple off our back so we can do our job. All of a sudden, however, when you are the higher headquarters person you can begin to recognize the pressures of the operational level headquarters.

Up to this point, I have used the NATO battle to describe the art of the operational level of war. But any conflict, from low-intensity conflict to a strategic nuclear exchange, will always have a senior level commander who must operate at the higher level of thinking and planning. Certainly the Grenada operation had such a commander as did EL DORADO CANYON, the joint Air Force and Navy air raid on Libya. To bring to this operational level of responsibility the kind of tactical thinking better suited to wing or air division command would be a disservice resulting in a fractured command structure, confusion in mission execution, and perhaps most importantly, lost battles. The operational level of war will never change, because there will always be a senior operational commander to coordinate the activities of various military forces in the campaign. The only thing the operational level commander can do is look at the big picture and give guidance. He cannot give specific tactical orders even though he may enjoy making such decisions.

From the time you are a lieutenant until you are a three- or four-star general, being with the troops and learning how to employ them is the enjoyable part of the military. But when you get to the operational level of war it is more like playing chess. You have to observe, and sometimes you have to bite your tongue and understand that tactical level commanders have their problems, too. Certainly you can help them, but they must also learn by themselves. I have always been a very heavy reader of World War II history, and that was my education to command at the operational level. There was no formal education, but rather an accumulation of experience throughout the years. There is no way in peacetime you can ever simulate war totally. However, you can get your troops and your airmen much better prepared than we have ever been prepared before to go to battle. But until that first shot is fired, no one will know how he or she will react once the battle has been joined.

Operational Art in a Continental Theater

Hans Henning von Sandrart

A popular topic for discussion in military circles, the term "operational level of war" has raised the question of whether there really is a need to identify the domain that interrelates strategy and tactics and if so, what exactly is its focus? But perhaps a more important question is whether it is necessary to revitalize operational art in a climate of rapprochement and arms control in Europe.

I believe strongly in the development of operational art that translates the objectives of our NATO strategy of maintaining peace and stability into operational concepts. These concepts then serve to guide the course of military action during times of peace. In times of crisis and actual conflict they frame our deployment preparations and movements and, ultimately, our tactical engagements and supporting operations under the same unified, governing operational idea. The application of operational art is timeless and is as important in peace and crisis as in war, especially if we are no longer limited mentally by fixation on a confrontational strategic situation. For example, in the rapidly developing security environment since the breakdown of the Berlin Wall in November 1989 the exercise of this art was essential in translating a revised NATO strategy into new security concepts for the purpose of protecting peace.

Carl von Clausewitz included a chapter on "The Art of War" in his book. The principles he outlined are still applicable to modern warfare. However, Clausewitz did not know how technical and involved war would become. Since he did not live in the nuclear age, the concept of deterrence, or dissuasion in its present form, was unknown to him. His writing did not analyze the role of military forces in maintaining peace and stability or the range of graduated military responses which could be provided to political leaders as options for crisis management. These aspects also lend themselves naturally to the application of operational art.

Far from being something new or revolutionary, examples of the use of operational art can be found throughout history. It has always been the task of operational leaders to link the principles and con-

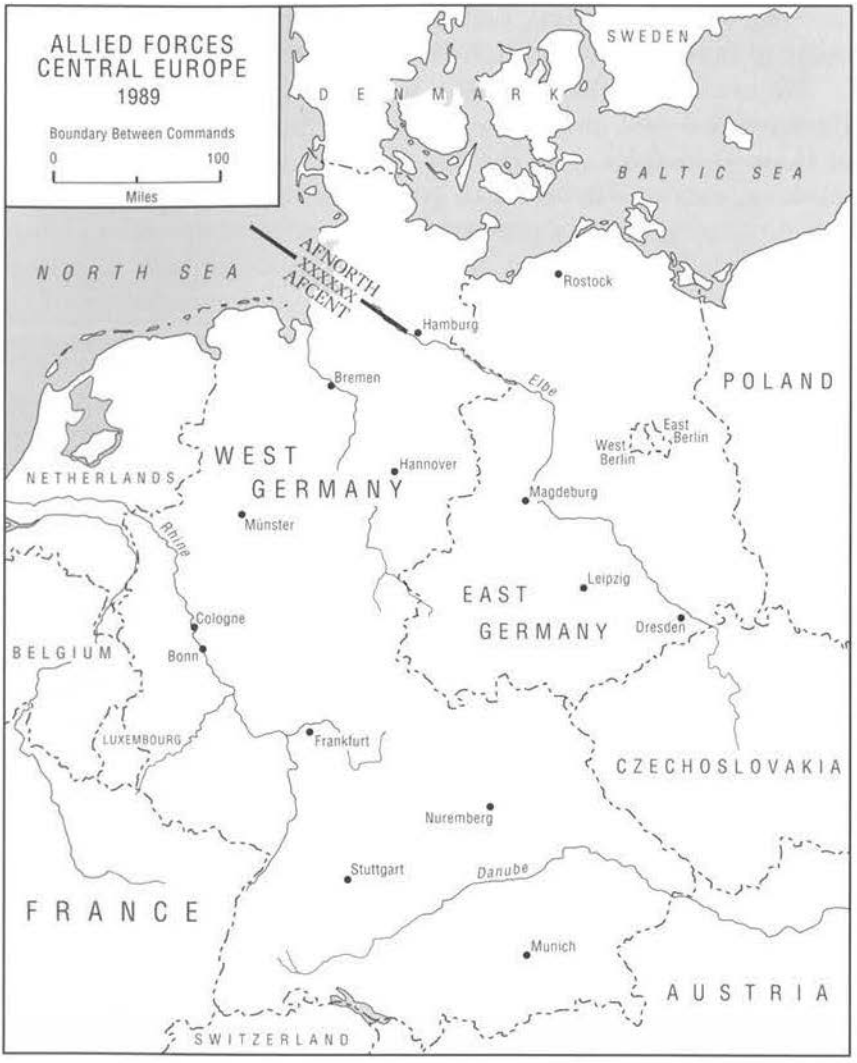
cepts for the use of military forces to the political and technological conditions of the period, and current times are no exception.

For several years, discussions have been held on the apparent operational gap between NATO's strategic objectives on the one hand and its tactical doctrines on the other. The operational level is not a new phenomenon, but in recent times it has been largely ignored in formal Western publications and when it has been addressed, it has not been approached jointly.

As the only "joint" commander in the Central Region, I am particularly keen about operational art being practiced in peacetime as part of NATO's peace-keeping strategy. The prevention of war is the only possible strategic objective in the nuclear age, in the context of competition between highly developed industrial nations or coalitions which have nuclear capabilities. In addition to war prevention, stability must be sought, and we must also prepare to assist in the political management of crises. (*Map 1*)

The operational level of command provides the link between the strategic and the tactical levels. Military headquarters at this level convert military strategic goals into an overall operational concept which then forms the basis for the employment of forces. In peace and war an operational level headquarters should coordinate and direct all large-scale activities, to include high-level peacetime training, planning of graduated options for political use in crisis management, preparing for the build-up and deployment of forces, and planning for the execution of major joint and combined operations should hostilities occur. This level is responsible for integrating the various functions in support of its concept of operations. The operational level of command strives to achieve the best blend of the operational factors of time, space, and force capabilities to achieve operational objectives within the parameters of the overall strategy as agreed by the NATO governments in a process of mutual harmonization. The understanding of operational principles and consequences is also the basis from which to design and negotiate sensible and realistic arms control options, including verification and stabilizing measures.

The operational level of war serves as the link between strategy and tactics. But the complexity of operational level functions underline the requirement for maintaining a multinational, integrated command and staff structure even in a changing environment. As long as there is the political will to maintain NATO and



MAP 1

its integrated military component this need will exist. To manage such complex operations as deployment, movement, and operational maneuver in a coalition structure, both in planning and especially in execution—which increasingly will rely on force generation—trained multinational, integrated staffs must exist. Their members must know each other as individuals and understand each other's national peculiarities and sensitivities. To attempt

creating or reconstituting such staffs during a crisis demanding a range of military options is a formula for operational disaster.

We are all familiar with the fundamental principles of war. However, less well understood is that the imaginative application of these principles is at the core of operational art. Dogmatic thinking, narrow adherence to general defense plan perspectives, and sticking rigidly to a pre-planned sequence of operations must be avoided. The principles of war must guide the basis of operational planning, but flexibility, initiative, and concentration of forces are also vital; these latter aspects also apply in peace and war. Gaining the initiative is almost always a precondition for success. The opponent must be forced into a situation where he has to react. It is just as important for crisis management as for campaign planning to preserve freedom of action, or room to maneuver, and to keep available reserves in the form of alternative options, resources, time, and space.

In war, the tactical level controls engagements and battles. The operational level aims at conducting campaigns successfully. Tactics aim at destroying enemy forces with fire and maneuver. The primary emphasis of the operational level goes beyond this and aims at disrupting the plans of enemy higher commands. Whereas the tactical level deals with current and short-term enemy capabilities, the operational level is interested in the mid- and long-term theater-wide enemy intentions and environment.

If we accept that operational art is something between the tactical and strategic levels and that the operational principles at both levels are basically similar, it is very difficult to provide a clear definition of the operational level. As a consequence, there is a particularly gray area between tactics and operational art. In my mind, the operational level is indicated by a situation in which factors outside the purely military framework strongly influence the commander's decisions. This creates a somewhat controversial debate about the operational levels of command. Is the corps at the operational or tactical level? Under certain circumstances, a corps may be involved at the operational level, especially in a coalition environment like NATO, where the corps currently represents the highest national command level in the Central Region. As can be seen in the "layer cake" deployment of the national corps in the old interpretation of forward defense, the corps is the linchpin between the operational and tactical levels. It is my personal belief

that, in certain circumstances, the corps represents the lowest operational level in the Central Region, even if it very often acts tactically. This is especially true in times where we get away from rigid general defense plan thinking and begin preparing for emergencies which may come from many directions.

There is often a tendency to think of operational art on too narrow a basis. Either one thinks of the classic definition of the movement of large forces in the wider dimensions of time and space or, more often now, to identify operational art with decisive counterattacks by army group or regional reserves. Both are examples where operational art should be applied, but they do not alone encompass it. The dimensions and geographical features of the Central Region, the forces available at a critical moment, the availability of reserves, and the overall logistical situation will determine how forces will be deployed, whether they are spread out or concentrated.

More important, such factors as the full integration of land and air, the integration of highly technical supporting operations—such as wide-ranging surveillance and reconnaissance, electronic warfare, and suppression of enemy air defenses—as well as cover and deception, only develop their full meaning at the operational level. The fact that these crucial areas have been somewhat neglected for so long is partially rooted in a lack of attention at the operational level. These factors do not make much sense at the brigade or divisional level.

In addition, mobilization, deployment, logistics in its widest sense, and civil and military cooperation under coalition warfare conditions, can only be properly assessed and integrated at the operational level. In an ever-shrinking and progressively media-influenced world, public information is also a factor of major operational significance in peace and crisis as well as in war. National positions, capabilities, and sensitivities have to be considered as well as the impact of operations on the psychology of allies and neutral neighbors. Examine your own thoughts of Vietnam, the Falklands, Northern Ireland, Beirut, South Africa, the Iran-Iraq War, Panama, and the 1990 invasion of Kuwait by Iraq. Almost certainly you will conjure up images derived from television or newspapers. Virtually every major disturbance and conflict comes into the focus of press camera lenses and is thereby directly transported into peoples' homes throughout the world. The management of this impact becomes more and more a part of operational

art. Another aspect of our relations with the public is the need to carefully choose the right definitions and professional wording when describing our actions and expressing our thoughts to the media. For example, as the so-called Cold War winds down it is particularly important to avoid too much warrior terminology, as at the wrong time this can have an adverse effect on the perceptions of our citizens and undermine the support being sought.

Obviously, more than just military factors influence the commander's decisions in the planning and conduct of campaigns at the operational level of command. Therefore, it is important to bear in mind that the operational level can usually be identified more clearly by the kinds of decisions to be taken rather than by relating them to any specific command level. It is virtually impossible simply to link a specific type of headquarters to the application of operational art.

The joint nature of exercises and operational planning in the Central Region is the hallmark of our successful security arrangements. To this end my joint headquarters, Allied Forces Central Europe (AFCENT) and my air component headquarters, Allied Air Forces Central Europe (AAFCE) are always collocated for exercises, and would be in the event of direct defence of the region. Only in this way is it possible to make the necessary operational level decisions.

The effective integration of land and air operations is an essential operational principle. Effective integration does not require all Central Region air forces to be continually employed in direct support of ground forces, nor does it mean that joint commands are needed at all echelons, but it does require the philosophy of joint planning to be applied at all levels of command. This focuses both services' efforts on the operational objectives. Because of their inherent characteristics of speed, range, and flexibility, the air forces are essential resources for the operational commander. These characteristics allow the rapid application of concentrated firepower over great distances to produce a wide range of effects. They also permit the achievement of region-wide operational objectives in a matter of hours, compared to the days required for the employment of large land formations.

The main goals of the land and air campaign are to neutralize or destroy an opponent's combat capability, to limit his freedom of action, and to disrupt his scheme of operations while, at the

same time, enhancing our own capabilities and providing friendly forces with the opportunity to seize the initiative. Air forces would be employed across the spectrum of conflict in both offensive and defensive counter-air operations to allow friendly forces freedom to operate; and in offensive air support and air interdiction to defeat the leading echelon and to delay, disrupt, and destroy enemy follow-on forces. Which follow-on forces will be attacked, and when and where to attack them, must be decided at the appropriate levels of command.

It must be emphasized that follow-on forces attack, FOFA, should not be considered as an independent operational concept. On the contrary, tactical engagements by land forces and FOFA would be governed by one operational campaign plan. The FOFA battle, as part of the general interdiction battle, requires close coordination and cooperation between land and air forces at all levels. FOFA is the direct application of force against specified ground forces and their supporting structure. Therefore, the key role in determining the operational FOFA objectives in the context of the land forces scheme of maneuver rests with the land force commander, mainly at army group level, but in close coordination with the appropriate allied tactical air force (ATAF) commander. However, our FOFA capabilities, especially our air attack assets, are scarce; therefore, the operational FOFA requirements have to be balanced against other operational tasks in the mission framework of offensive air support, air interdiction, and most importantly, offensive counter-air. The balancing of these competing requirements as part of a coordinated region-wide land and air campaign plan is my main task as the joint commander.

There are many sources of information of military interest. At the operational level, all information systems must be integrated not only with our combat troops but also with other electronic systems in the Central Region. In this way a loop is established which provides the commander with the right sort of information to enable him to decide the best course of action. The information-gathering systems can provide an enormous amount of material; however, what is relevant for the tactical commander is not necessarily relevant for the operational commander, each having his own intelligence requirement. Therefore, defining this requirement is an important part of operational art. The operational commander must concentrate on his opponent's future intentions

while keeping one eye on current activities, and his supporting intelligence systems have to be configured accordingly.

Maintaining effective surveillance and reconnaissance systems in peacetime is, for me as CINCENT, one of the most important priorities. The systems must be able to warn of any events which threaten peace and stability, providing details of intentions and capabilities as early as possible. This becomes even more important in light of the current arms reduction proposals which, when implemented, will markedly reduce force levels and thereby render the earliest possible warning critical to NATO's preparation of an appropriate response.

In times of crisis, it is vital to find out as early as possible about a potential adversary's military preparations. Information systems must provide the political leadership with the information necessary for crisis management to enable timely and soundly based political decisions for the implementation of appropriate measures, including military measures. The military contribution to crisis management can help maintain dissuasion and deterrence. A well informed political and military leadership with a range of graduated military options would not only be better prepared militarily, but would also be more flexible and therefore more able to respond to events at a critical moment.

During a transition to war we must be able to identify the principal characteristics of the expected aggression. We cannot expect an opponent to concentrate all his forces close to a border, because his operational flexibility would be lost if he did. In addition, a high concentration of forces would present a lucrative target array. The early assumptions regarding enemy activity and probable courses of action must be verified as quickly as possible to enable plans to be made and to deny the enemy the chance of operational surprise. A surveillance system for use by, or in support of, NATO in this situation must therefore have wide-ranging coverage, and must be able to identify reliably the areas and nature of major enemy effort. This will assist in the efficient use of NATO forces.

The distinction between situation intelligence and target acquisition should also be noted. Situation intelligence is formed from general surveillance, detailed reconnaissance, and careful collation and interpretation; it provides the relevant intelligence for an accurate commander's evaluation of the situation. Target acquisition is real-time intelligence linked into the command and control and fire systems to enable identified targets to be engaged

rapidly and successfully. At the operational level, the big picture resulting from situation intelligence is used, as an example, to determine which of several follow-on forces is most dangerous to our own plans or most critical to the enemy's and therefore to establish objectives for FOFA. At the tactical level, target acquisition is used to locate the specific critical elements of the designated follow-on force which, when attacked, will accomplish the operational objectives. Both types are necessary, but each may have different system requirements working at different speeds. Situation intelligence and target acquisition complement and support one another. Situation intelligence may be used, for example, to focus target acquisition sensors on a particular location to find a specific target. In turn, target acquisition information contributes to and updates the larger intelligence picture.

In times of crisis and war, deception will be an important part of planning any aggressive action against NATO territory. By misleading NATO as to his own intentions, preparations, and capabilities, the opponent's surprise would be assured. Extracting the information of vital intelligence interest from the huge volume of information being collected, both deliberate disinformation and information which is real but not relevant, is a task which must not be underestimated. Three different sorts of intelligence are needed at the operational level. First, in peacetime, NATO commanders need to know what a potential opponent is doing—in terms of political intentions, military capabilities, exercises, and deployments—and to have early warning of any indicators which might show a concealed build-up of offensive capabilities. Second, in times of crisis, near real-time situation intelligence and analysis about changes from the peacetime situation become the main priority. Third, as has been seen, the accurate identification of enemy formations and positions is required so that NATO can concentrate its own forces to deal with the threat; this extension of situation intelligence is itself a form of target acquisition.

Consequently, any NATO strategic or operational surveillance system of the 1990s must be geared to accommodate a revised NATO strategy for peace, crisis, and conflict; new operational concepts; and the eventual force structures resulting from arms control negotiations and NATO defence planning. Apart from its operational value, such a system would also increase NATO's contribution to verification and confidence-building measures.

With the rapid advance of technology, speed of reaction and reliable communications become ever more important. In the event of armed conflict, the effective defense of the Central Region would depend on timely political decisions. This, in turn, is linked to identifying the indicators of a potential aggressor's intentions and then conveying their interpretation to political leaders. This process will become even more significant as arms control measures, demographic trends, and reduced defense budgets lead to a growing reliance on mobilizable forces and external reinforcements, in order to form an operationally viable defense posture. The trust and confidence built up in peacetime between the military and political establishments, in both national and international communities, will influence the political perspective of the credibility of the military assessment. It is therefore important to have a regular and wide-ranging dialogue between the military leadership and the governments of the Central Region. This is a classical aspect of operational art.

Modern weapon systems are very powerful but they can consume enormous quantities of ammunition and fuel. Personnel need water and food. A huge range of defense stores and other materiel is needed for the successful conduct of defensive operations. Supplies and reinforcements from the United States, the United Kingdom, and other Central Region nations require close coordination and channelling along designated supply routes on a very large scale. At the operational level, a long-term perspective on logistics support is essential to ensure that highly sophisticated equipment and scarce but critical reserves can be used to the best effect. In this context we must be aware of our continuing need for greater interoperability and better standardization. Our new systems must all follow existing NATO standards, and new standards should be created for areas not yet covered. To have options for the employment of forces reduced because of a lack of interoperability detracts from the conduct of operational art. Therefore, in the search for the best technological systems for our national forces we must not lose sight of the operational level logistic implications in their widest sense.

Greater multinational integration within NATO, as called for by the NATO Summit in July 1990, will extend the need for higher levels of interoperability and standardization beyond the crucial areas of equipment and logistic support. For the effective exercise

of operational art, forces must have common concepts, doctrine, and tactics; standardized operating procedures; and effective interpersonal communication, which is best achieved by a common language at and above the level where different nationalities have to operate together. These aspects have far-reaching training implications. For NATO to be ready to fulfill its mission in the Central Region, the training of high-level multinational headquarters is already a vital task at echelons above corps. As multinationalization is pursued, these aspects of training will have to be applied down to multinational corps headquarters.

Host nation support, the care and control of refugees in case of armed conflict, casualty evacuation, traffic control, access to local resources, and the maintenance of communication networks and main supply routes are all part of civil military cooperation. In this context, frequent operational level coordination with the various national commands and organizations produces the best results. The operational level commander should be aware of the wide implications of his decisions in political, social, environmental, and financial terms, in peace, crisis, and war. Such considerations are an integral part of operational art in our successful coalition of free nations.

To maintain peace and stability and to deter any aggression, we are tasked by our political authorities to maintain a credible defense posture at lower levels. We are also tasked with being able to react to any kind of military aggression and to sustain operations as necessary. In this way we provide the capability to restore deterrence if aggression occurs, as well as providing the time and the necessary platform for our governments to terminate a war on political terms.

In peacetime we must demonstrate vigilance, determination, and cohesion, and in times of conflict we must retain the capability to conduct large-scale, combined land and air operations after sufficient preparations. These requirements call for a minimum but credible and ready multinational peacetime presence in the Central Region. They also necessitate the ability to contribute to crisis management and reconstitute our main defensive capabilities in time of war and the ability to conduct two interrelated campaigns from the outset of hostilities: the combined land and air campaign and the related counter-air campaign. Finally, provision must be made for de-escalation and conflict termination.

The imaginative application of the principles of war is the core of operational art. Synchronization of the operational factors of time, space, and force capabilities, consistent with the operational objective, is the goal to be achieved. Operational art is much more than a bundle of plans in secure containers. To plan only to counter potential enemy actions at the brigade, division, corps, or air sortie level is to misunderstand the NATO mission. Our mission exists in peace, crisis, and war. To be able to react appropriately to any security challenge requires an imaginative, educated, and flexible mentality.

The security challenges of the future may be quite different from those for which NATO has been preparing during its first forty years. The Iraqi invasion of Kuwait in August 1990 and the consequences of that act of blatant aggression, have given early signs that, as the balance of forces in the Central Region is improved by an agreement on conventional forces in Europe, NATO forces assigned to the Central Region may have to plan, for the first time, deployment options to NATO's flanks. This will be a demanding requirement, one that will require many improvements within the forces and, above all, commanders with the right mentality and a firm grasp of the principles of operational art.

Looking with hope towards a future European environment of peace, security, stability, reduced political tensions, and solely defensive military doctrines, there is the notion that operational art is superfluous. In some circles, the revived emphasis on operational art in the military arena is considered inappropriate. Such thinking can only arise if operational art is taken as synonymous with offensive military doctrine; however, this is clearly not the case. The exercise of operational art is every bit as important in peace and crisis as it is in war, for military defense planning as well as for arms control.

Even in an environment of conventional military parity at reduced levels, NATO's mission will remain the same. We must continue to maintain security and stability in peace and freedom, and to prevent any political intimidation by military power. The composition and structure of NATO's military forces will change to reflect the developing security environment, as stated by the NATO Summit in July 1990. However, the operational dimensions of the Central Region mission will not change, although the influence of political and strategic factors on military operations will increase. It therefore becomes more important to develop the right military assessment of

the security environment and of operational capabilities so that NATO can formulate the appropriate force requirements.

Agreement on conventional forces in Europe and other arms-control negotiations will increase mutual security. A progressive institutionalization of the Conference on Security and Cooperation in Europe process and an increased involvement of the European Economic Community in security perspectives will have the same effect. NATO has a role to play in all these processes, acting as the expression of the cohesion and common purpose of the alliance members, while linking North America—necessary for the maintenance of a balance of power in Europe—into European security arrangements.

However, beyond a first agreement on conventional forces in Europe, future negotiations should concentrate on force-generation capabilities and the establishment of confidence-building measures. These are classic ingredients of operational art. Therefore, it is not a contradiction to revitalize and develop operational art in moving towards a more stable and safer Europe. It is the duty of the military leadership to do this to fulfill NATO's mission and to ensure that the lengthy peace and stability in Western Europe is maintained and enjoyed by the entire European community.

Operational Art in a Maritime Theater

William Small

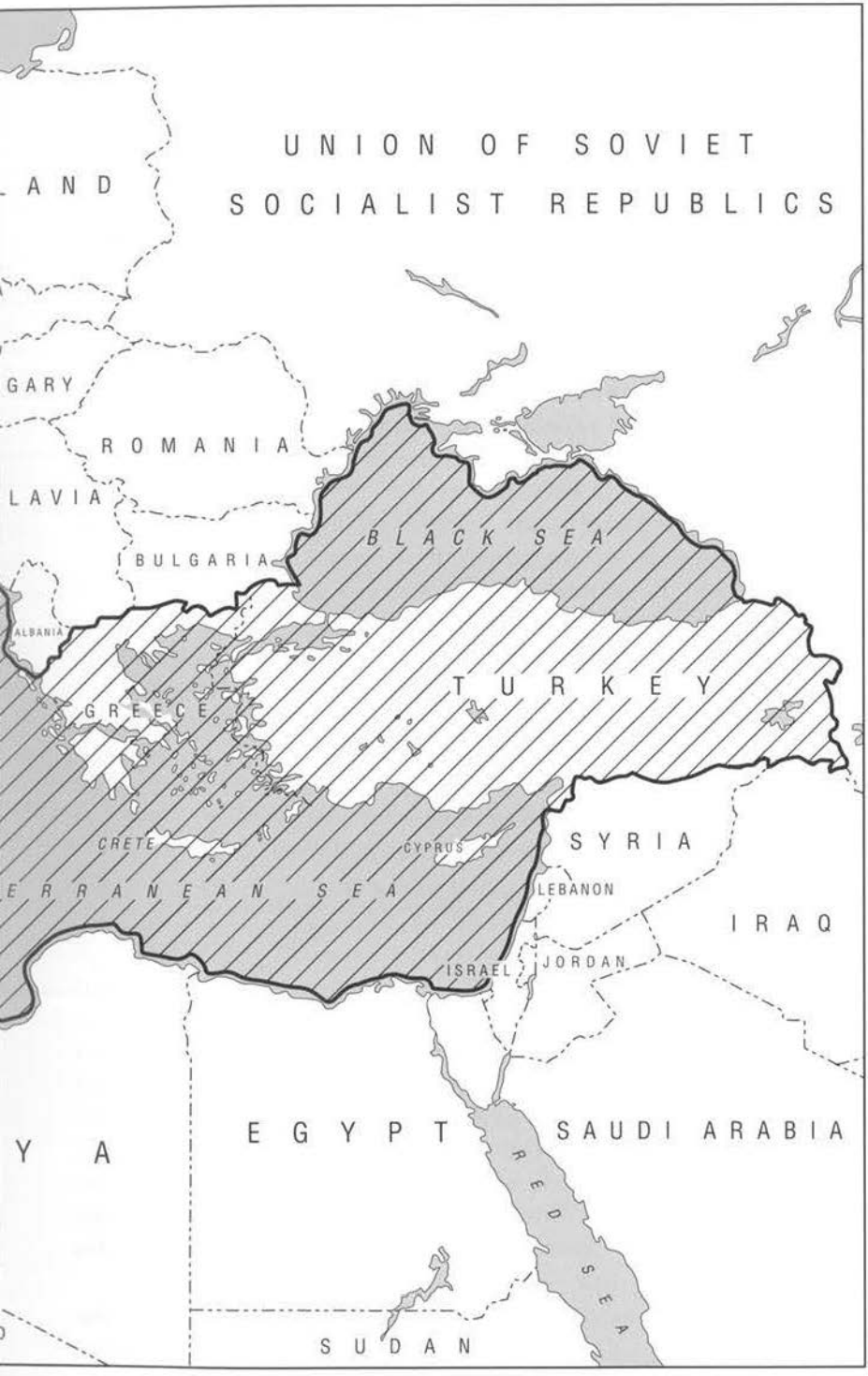
Although the concept of operational art grew out of continental warfare, it applies to maritime theaters as well. The Southern Region of the North Atlantic Treaty Organization (NATO) is an excellent example of an established maritime theater which can provide useful practical lessons in the application of operational art. The Commander-in-Chief, Allied Forces South (CINCSOUTH), must prepare for war from the operational perspective with a wide variety of joint and combined forces.

The southern flank of NATO is large. This theater, or area of responsibility, encompasses the Mediterranean and Black Seas, Italy, Greece, Turkey, and some military facilities elsewhere in the region, such as Gibraltar, which are committed to NATO in time of war. There are twenty-three countries within and immediately abutting the CINCSOUTH area of responsibility, two-thirds of which belong to neither NATO nor the Warsaw Pact. This is important since NATO does not plan or rationalize force requirements for contingencies involving other than Warsaw Pact threats, although a prudent commander must keep such possibilities clearly in mind in developing a concept of operations for the theater.

The Southern Region has some significant differences when compared to the usual NATO perspective of Central Europe. (*Map 2*) Since the land areas are not contiguous, it is clearly a maritime theater. For example, the defensive area of northern Italy is separated from that of Greece by Yugoslavia and Albania, while the land areas in Thrace and eastern Turkey are even farther apart. The link between these national land areas is the international sea lanes. Another factor in which the Southern Region differs from Central Europe is that only small areas of the NATO countries and portions of their forces are committed to the alliance in time of war. In Italy, for example, the NATO-defended area is only that territory northeast of the Po River valley; the remainder of the country, including the NATO headquarters at Naples and the major U.S. and NATO facilities in Sicily, is within the Italian national area of responsibility.


DENMARK
EIRE
UNITED KINGDOM
NETHERLANDS
EAST GERMANY
WEST GERMANY
BELGIUM
LUXEMBOURG
CZECHOS
FRANCE
LIECHTENSTEIN
AUSTRIA
SWITZERLAND
ITALY
SAN MARINO
ANDORRA
CORSICA
PORTUGAL
SPAIN
SARDINIA
SICIL
MALTA
TUNISIA
MOROCCO
ALGERIA
NIGER
ALLIED FORCES
SOUTHERN EUROPE
1989
Area of Responsibility
0
400
Miles

MAP 2


UNION OF SOVIET
SOCIALIST REPUBLICS
AND
GARY
ROMANIA
LAVIA
BULGARIA
BLACK SEA
ALBANIA
GREECE
TURKEY
CRETE
CYPRUS
SYRIA
E R R A N E A N S E A
LEBANON
IRAQ
ISRAEL
JORDAN
Y A
EGYPT
SAUDI ARABIA
RED SEA
SUDAN

Traditionally, the Mediterranean Sea has been the glue that holds this fragmented NATO command together. Maintenance of the sea lines of communication (SLOC)—on which reinforcement and resupply of the region depend—is vital. Should Allied dominance of the Mediterranean fail, the land and air concept of operation for defending continental Europe would eventually fail. NATO sea control of the Mediterranean is the cornerstone of the CINC's theater concept of operations, and it is presumably the recognition of this priority that causes CINCSOUTH to be a naval officer.

The traditional view of the Mediterranean's importance also highlights changes affecting current perspectives of this sea. First, the completion of oil pipelines from Iran and Iraq through Syria and Turkey to the eastern Mediterranean and across Saudi Arabia to the Red Sea, have dramatically re-directed the flow of oil. Completion of second phase of the Suez Canal improvement program, which straightened out the kinks and increased its depth to 53 feet, has also altered the routing of other strategic materials throughout the region. The dominant sea line of communication from Asia to Europe no longer rounds the Cape of Good Hope, and it is the eastern Mediterranean, rather than the Straits of Gibraltar, to which European nations now look when concerned about the maritime security and the price stability of essential goods. Second, the Turkish Straits have become more important in the expansion of Soviet world trade; almost 60 percent of Soviet non-bloc exports and imports flow through the Bosphorus and the Dardanelles.

The traditional view of maritime strategy for the Mediterranean Sea held that NATO naval forces could fall back into the Western bastions in the early days of war, defending the approaches to Gibraltar and fighting their way eastward to extend the sea lines of communication as the correlation of forces and logistics "tail" permitted. This concept of naval operations is no longer viable, if it ever was. NATO navies must remain in control of the entire sea from the first indications of war. To do this, NATO ground and air forces must maintain control of the exit from the Black Sea. Defense of the Turkish Straits is therefore the second linchpin of Southern Region defensive plans. From the naval perspective sea control must receive high priority across the region, and there must be early air support provided to Thrace.

The basic concept of operations for the land campaigns in the theater is to hold those points where the terrain favors the defender.

This historic concept explains why national borders so often conform to natural barriers. In Italy, the northeast invasion routes are limited by the Alpine ranges. The Gorizia Gap immediately north and west of Trieste is the most vulnerable pass, since the few passes farther north generally turn the invader into Germany in the Central Region of NATO. Immediately west of this coastal pass lie a series of major rivers, each of which provides a line of defense. Seasonal rains and Alpine drainage make invasion even more difficult, and a defender-to-attacker ratio of one to three has a good chance of containing the current Warsaw Pact threat within a short distance of the Italian border. The likelihood of success in this area increases as Italy continues to modernize forces in comparison to Warsaw Pact regional counterparts. The probable success of the Italian campaign has been heightened as well by political events within Yugoslavia, which clearly will act against any invader, including a request for military assistance from the Italians if a Warsaw Pact invasion occurs.

In eastern Greece, the mountain range forming the border with Bulgaria is formidable. Although NATO maneuver space to the south is severely limited, the historic invasion routes, such as Roupel Pass, are well defended, and in recent wars the invaders have had to go west through southern Yugoslavia to penetrate these mountains and reach the Grecian plains. As elsewhere, local air superiority is of critical importance to the ability of the NATO armies to hold important ground.

In Turkish Thrace, which abuts the area defended by Greece, the terrain is less charitable. Rolling hills dominate the region and the high ground is generally to the north. It is ideal tank country for invading forces, and the Turkish defenders must be mobile to react to maneuver tactics. But Thrace is absolutely essential for the defense of the Turkish Straits and to block the Soviet route into the Mediterranean. Additional threats to the defenders are posed by the possibility of amphibious operations along the Black Sea coast near the mouth of the Bosphorus and by airborne assaults along the Marmara littoral.

Finally, in eastern Turkey, one of two places where NATO forces directly confront those of the Soviet Union, the terrain is mountainous with vast, high, unpopulated plains. Here territory can be traded for time in order to stretch an invader's logistical support. This strategy has worked in sixteen past wars, and previous invaders have never made it west of Erzurum in east central

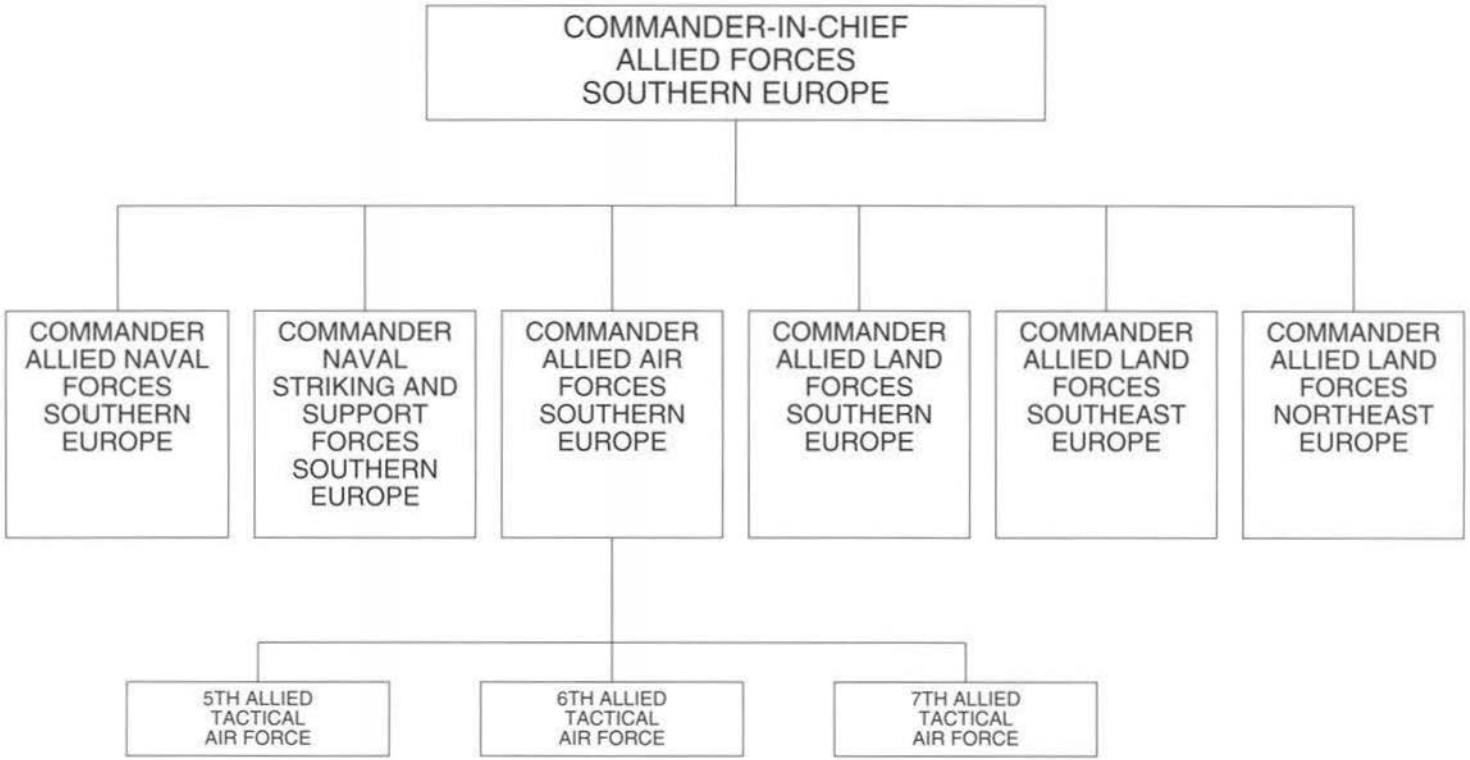
Turkey. This is tough land—more than 50,000 Turkish troops once died here in a week from cold alone. It is also isolated—there are few roads and even fewer POL pipelines.

The nominal threat in all these areas is about three division equivalents to each defending one. This is a manageable ratio if the forces are comparably equipped. Such comparability has not historically been the case, but the political and economic strengths of NATO and corresponding weaknesses on the other side are clearly evening the disparity and in some cases tilting the balance in our favor. These trends are particularly important to the CINC in the Southern Region, because he must increasingly base his theater concept of operations on the premise that a general war with the Warsaw Pact nations will remain conventional—initial stockpiles and logistical sustainability must be based on an extended campaign. (*Chart 3*)

In the Southern Region, if not in all of Europe, nuclear weapons are more a political than a military force. Tactical nuclear weapons are of short range, generally artillery, and when employed will usually fall on NATO soil. Longer range theater nuclear weapons are generally targeted beyond the areas of tactical concern. Possible requests from tactical commanders for the use of such weapons would probably result more from anxiety or frustration rather than from valid tactical needs. Theater nuclear weapons are clearly deterrents, but we would do well to minimize their use as a remedy for conventional deficiencies. Some will not agree, but I believe that one element of operational art the CINC in this theater must apply is the recognition that theater nuclear weapons are not a solution to tactical problems. The political clamor about the presence and potential use of such weapons is almost totally lacking in the Southern Region. Even in Greece under Papandreau, agitation by a few for nuclear-free-zone agreements was largely ignored. But that apparent lack of political interest does not make it a military solution.

In theater campaign planning, the importance of air power is vital. COMAIRSOUTH, the NATO regional air commander whose headquarters is collocated with CINCSOUTH in Naples, has responsibility for standardizing air crew training and maintenance procedures, qualifying personnel and certifying aircraft, logistic and infrastructure planning, and force readiness. He is not an operational commander in the sense of directing employment or exercising tactical control, and he has little opportunity to affect in-

CHART 3—AFSOUTH ORGANIZATION



dividual campaign tactics. These functions are performed by the allied tactical air force (ATAF) commanders, collocated with the regional ground commanders at Verona in Italy, Larissa in Greece, and Izmir in Turkey.

Every CINC, based upon his personal experiences with tactical air, has an opinion regarding how such forces are best employed. My own view is that of a naval aviator whose background has been in attack aircraft. I concluded during my tenure as CINCSOUTH that the primary importance of tactical air in the Southern Region, particularly in the early days of war, is to achieve and maintain a degree of air superiority over the critical battle areas, with a secondary objective of selective deep interdiction against follow-on forces and lines of logistic supply. My own assessment of close air support and similar evolutions in which free-fall ordnance must be dropped within the forward tactical area is that technology has changed the risk-to-reward ratio for high performance aircraft so much that ground commanders are generally better served through a greater commitment to air superiority. Man-portable surface-to-air missiles have become more cost effective than air-dropped munitions, and whatever morale value may have been historically derived by ground forces from close air support by high-performance tactical aircraft is outweighed by projected attrition rates which must be realistically calculated at 3 to 5 percent per day.

The management of such dual-mission aircraft is an important issue in this theater because land and air commanders are collocated in their NATO war headquarters. The army commander is always one rank senior to the air commander, and there is inevitable pressure to change the role of dual-mission aircraft from air superiority and interdiction to the support of tactical ground forces. The proper employment of aircraft in such a construct is truly a crucial element of operational art, and the CINC can contribute through frank discussion of these issues, listening carefully to his local commanders and accommodating their views in the allocation of forces and reconciliation of regional plans. In such discussions, it is critical to consider regional air as a maneuver force which potentially transcends individual tactical areas; it is an operational asset which must be played in the larger game of overall theater defense.

In this general discussion of air employment, it is important to outline another CINC concern. The ATAFs have traditionally been based on national borders, which makes little sense in time

of a NATO war. Fighters at Izmir, Turkey, for example, under Commander Sixth ATAF authority, are only a mile and a half from the former Greek (Seventh ATAF) air boundary, since the territorial limits of these countries by international law coincide with the midpoint between the Turkish coast and the Greek islands immediately offshore. The Greek insistence on the continuation of these national borders as boundaries for the ATAFs has been a major cause for the delay in the formal reintegration of Greek forces into the NATO structure.

Of equal concern is the proximity of Warsaw Pact airfields to NATO borders. A Soviet Backfire bomber, for example, taking off from a Crimean airfield (one of the more distant cases) would be over the Turkish border before the NATO radar warning system could provide enough warning time to put an interceptor on the scene. This is no secret; it's a simple matter of time and distance flown when normal detection, reporting, and command and control delays are considered. To this must be added the problem of transient air control of, for example, Greek aircraft trying to cross Turkish airspace, carrier-based aircraft overflying for interdiction purposes, or cruise missiles launched from a variety of places and platforms moving through the area. Even with a NATO-wide IFF (identification friend or foe) system, the de-confliction problem is serious, and without constant practice it is impossible to solve in the early days of war.

Fortunately, technology and commitment have provided a partial answer. NATO AWACS (the NATO version of an airborne warning and control system) is a godsend to the Southern Region. Instead of a mountain-top radar reporting to a command post via fragile land lines about the approaching Backfire and the subsequent relays to base and pilot, AWACS can see the Backfire take off in time to scramble and vector an alert fighter directly; it matters not to the AWACS airborne battle manager whether the alert fighter is on a Greek or Turkish airfield, or on a catapult at sea. AWACS brings great relief to both military and political problems in regional air defense and provides a logical basis for eliminating the artificialities that have so long constrained effective use of airspace and aircraft. It is a perfect case in which employment doctrines can be adjusted to the reality of evolving technology, at least if the difficult problems associated with relinquishment of local command can be resolved.

With respect to sea-based air, I continue to believe that the primary role of the carrier is to support the land campaign. This can often be done by moving in close, allowing the air superiority components of the carrier battle group to be integrated into those of the supporting ATAF. The needed coordination of strike forces is thus simplified, and the synergism of support functions, often resident only in the carrier air wing (e.g., standoff jammers) is magnified. While the top naval priority remains sea control, this is largely a matter of antisubmarine warfare, and carrier aircraft are not well suited to that task beyond the initial necessity of local defense.

The use of sea- and land-based NATO air power in the context of operational art is complex; it is difficult to conduct appropriate training, and in some respects it defies the planning process. As has been noted, one must create a set of regional plans in which it becomes clear to local commanders that tactical initiatives must be seized by them, based upon their evolving comprehension of the course of their campaign, within a broader concept of operations. A menu of forces and capabilities can be provided, but the choices often cannot be predetermined. One will never know the magnitude of the threat until it materializes. In the Southern Region tactical commanders will thus never be sure of the availability of reinforcements until they actually arrive.

I believe it should be clear by now that CINCSOUTH is not a tactical commander; he is an operational commander in peace and a mentor for the plans that serve NATO's political objectives and yet assure a coherent, unified response to hostile events. He has an operational perspective of war. In the Southern Region national forces committed to NATO will largely conform to national war-fighting policies and will coordinate their actions with other national forces in the surrounding areas. CINCSOUTH's relations with the various national ministers of defense and chiefs of defense staffs must therefore be as good as those of the Supreme Allied Commander, Europe (SACEUR). During the period I was CINCSOUTH, the minister of defense in Greece was also the prime minister, and the chief of the Turkish general staff was also the president of Turkey, which helped a lot.

Only at sea does CINCSOUTH have an opportunity to direct forces in traditional ways, but here too the problem is complicated by organizational realities. There are two subordinate naval commanders in the Mediterranean. On reporting to NATO control,

Commander U.S. Sixth Fleet (COMSIXTHFLT) becomes Commander, Striking Forces, Southern Europe (STRIKEFORSOUTH). Commander, Naval Forces Southern Europe (COMNAVSOUTH), an Italian admiral, commands the remainder of NATO naval units, which are principally suitable for sea control (anti-ship and antisubmarine warfare). At the time of this transition, COMSIXTHFLT relinquishes his submarines and maritime patrol aircraft to COMNAVSOUTH, recognizing that those forces may be critical to the defense of the carrier battle groups and amphibious forces as they take their power projection positions. Very close liaison is required during this critical period by these commanders, and in my opinion the commands should be more closely unified before the onset of war. In any event, the responsibilities for day-to-day direction of forces afloat pass to these commanders, even though logistic support of the individual units remains a national responsibility.

This is an appropriate place to comment on the contribution of France and Spain to the Southern Region's operational concept, since the forces involved are primarily naval in character. French land-based air on the Riviera and in Corsica can support the Italian land campaign, but the dominant forces are French naval units based at Toulon and Spanish naval forces at Cadiz and Cartagena. French naval forces in the Mediterranean are well versed in NATO doctrine and integrated into NATO operations. Although Paris reserves their overall direction, the French admiral at Toulon who commands French naval forces in the Mediterranean has a great deal of discretionary latitude in their operational employment, including full integration of the carriers *Foch* and *Clemenceau* into STRIKFORSOUTH battle groups and the employment of French nuclear submarines in coordination and with the clearance of COMNAVSOUTH. To improve interoperability, French and U.S. naval aircraft often conduct "cross-deck" exercises in which planes take off from one carrier and land on the deck of another, an especially noteworthy achievement when the planes and ships are from different countries.

The Spanish Navy significantly augments British Royal Air Force (RAF) aircraft at Gibraltar for surveillance and control of the approaches to the Straits. While the status of Gibraltar remains a thorny political issue between the two countries, there has been little adverse impact on the coordination and control of combined naval forces operating in the area. Spanish vessels are

good at the type of antisubmarine warfare required in the straits. The collective sea power of NATO Mediterranean allies is truly overwhelming. The difficulty is in employing it effectively at the earliest possible time to thwart Soviet initiatives.

Sea power is the one discretionary element of military power available to the theater CINC of a maritime theater. It can be committed where the need is greatest if the forces are made available in a timely fashion. Since employment concepts are discretionary and must be based on the opponent's own concept of operations, a specific discussion of any plan is not possible. It has already been noted that the "fall-back-West, fight-East" theory for the Southern Region is outmoded and that control of the Turkish Straits is the key to sea control; thus carrier support to the Thrace campaign is a likely priority. But specifically how the sea campaign will actually play out depends on reinforcements, and it is time to briefly summarize that plan.

The U.S. commitment to NATO in terms of land reinforcements is currently the rapid reinforcement plan. This plan puts U.S. Army troops in Italy and Thrace and U.S. Marines in Greece; when and how they will arrive depends on the scenario development. In all cases, it must be assumed that the arrivals take place in friendly territory and that the reinforcements are assimilated into the existing chain of command. This poses a unique problem for the Marines, who are organized and trained to fight as an autonomous air-ground team; their capabilities could well be diminished if this hard-earned teamwork were broken up through assignments to the separate NATO gaining commands.

NATO policy does not countenance formal planning for "out-of-area" threats. While awareness that Libya, Syria, or some other regional state could become a co-belligerent exists, NATO planning for such eventualities must first take place at the national levels. Presumably, in time of real crisis these will be overtly accommodated in NATO planning, but in the interim the CINC must take a public position that out-of-area (non-Warsaw Pact) threats do not exist in describing his concept of military operations. NATO strategy is simply to defend NATO territory without a major war; because NATO is a defensive alliance, attacking into Warsaw Pact territory is not a strategic option. It is reassuring that such a defensive orientation is increasingly reflected as well in Warsaw Pact planning.

NATO responds to clear member needs within NATO territory. Attacks on members outside the defined area, and hostile acts which are not clearly of Warsaw Pact origin are less forthrightly considered. It is important to note that an overt Warsaw Pact attack on NATO is the least likely scenario. A political eruption within a NATO country in which a Warsaw Pact member is peripherally involved is the far more likely genesis for a confrontation in which real hostilities might break out. This is important because it suggests that a major war will not start with a coordinated preemptive strike of classic proportions; it is more likely to be a series of ragged volleys involving increasing numbers of people over a substantial period of time. In any event, time and technology are on the side of increased warning. This favorable trend is heightened by the increasing disarray of Warsaw Pact leaders and forces immediately confronting the Southern Region nations. In Europe on both sides, the monolithic nature of national authorities is breaking down. Bulgarians watch Turkish television, and smuggling knows no borders. The distinction between "stay-behind forces" and foreign labor is increasingly less clear. These are important and encouraging events, because they increase the probability of warning and decrease the possibility of a NATO war.

Before we shift to a discussion of operations, it is worthwhile to mention the problem of rules of engagement (ROE). ROE bridge an almost irreconcilable gap between the desires of the political authorities to avoid war and the needs of a unit commander to defend his force against a hostile act. The basic peacetime ROE for most national forces is that "Every commander and individual has both the right and the responsibility to defend his command and himself against a hostile act." This ROE has no direct application for CINCSOUTH in most peacetime situations, because NATO forces do not exist until time of war. As forces change operational command to NATO following the appropriate degree of alert, they generally encounter NATO ROE which are generally more restrictive than the national rules they relinquish. This accounts for some of the delays in changing operational command imposed by NATO member nations. In Italy, for example, troops which may have taken defensive border positions under national standards for readiness may have to be recalled to their garrisons when the NATO ROE for the same condition of readiness are put into effect. Any NATO theater CINC must understand such nuances relating to changes of command

and operational control and reach understandings (often informal) with those concerned well in advance of their need.

Maritime ROE are particularly troublesome, because unlike ashore, the open sea belongs to no nation. Troops can commit a hostile act simply by crossing a border; ships are free to threaten one another by maneuvering close to each other without regard to location, if outside national territorial limits (usually 6 to 12 miles in the Southern Region). Naval commanders often want authority to preempt an attack on the basis of hostile intent; that is, freedom to shoot first when they believe an attack on them is imminent. This authority is certainly preferable from the unit commander's tactical perspective to the alternative of always absorbing the first blow, but it tends to assure that the side with the loosest ROE will start the war. It is important to think ROE out ahead of time and have them clearly understood at all levels; in many cases it is also a good idea for the enemy to know and fully understand your ROE, so that actions will not be taken as a result of misread intent. But NATO ROE are cumbersome from a management and review perspective, and it is often difficult to see how effective action can be approved in the time available. SACEUR is the key to this system, and perceptive ROE management is a major one of the arts he must employ in his dealings with the NATO secretary general and the Defense Policy Council.

To ensure that all these issues are well understood, the Southern Region commanders meet frequently with CINCSOUTH. Besides the discussions at the Naples headquarters, the CINC spends at least a third of his time in the field. Visits to the armies and air squadrons committed to NATO are useful in assessing the degree to which NATO views and policies have trickled down into national doctrine—the answer is often "not far!" Opposing views about the use of air and a better understanding of defensive positions are gained, and the Allied Command Europe perspective on larger events shared. I always felt that NATO commanders enjoyed a special intimacy in this regard; national information was shared through such associations that was never available through the national chains of command. NATO forces are proud of their commitment and proficiency and pleased to let others share their pride. Often an assessment of true capability is best gained in this way. In the case of national logistics, no other source exists.

NATO exercises are surrogates for war. Although they reflect actual war plans, they are conducted sequentially across the

Mediterranean from Gibraltar to Saros Bay to allow naval forces to operate in each of the theaters of operations in the Southern Region. Such exercises have repeatedly demonstrated the inadequacy of NATO ROE and Southern Region communications; if ground and sea commanders had to await approval of every request, NATO would be doomed. UNODIR is a ploy learned early in naval careers often used to circumvent communications delays. It means "unless otherwise directed I intend to . . ." and is a diplomatic way of taking an initiative during crisis that is normally reserved to a higher authority.

Campaign guidance is provided by the CINC in terms of prioritized objectives such as: destroy the Soviet Mediterranean Squadron, support the land campaign, give first priority to defense of Thrace, conventional strike target list "A" approved, and so forth. There are no surprises in such guidance for anyone, since most instructions have been reviewed in Brussels, London, Rome, Ankara, Washington, and Athens. This guidance is routinely exchanged between naval forces as they relieve each other in the Mediterranean, as are NATO ROE, target lists, intelligence information, and items of theater supply.

Logistics is seldom realistically played in these NATO exercises, and for obvious reasons; only limited consumption rates are generated and thus local supplies are not exhausted. Intra-theater and inter-theater air lift demands and transhipment requirements are noted artificially, but the resultant stress is never applied to the real movement system. In an actual war, it is clear that the CINCSOUTH must compete with other NATO and national commanders for a share of both supplies and lift, and prospects for either are not particularly rosy. This lack of logistic mobility makes an understanding of regional national stocks very important. Neither Greece nor Turkey, however, report their munitions and other war reserve status to NATO, so visits and informal discussions are the key to appraisals. Reinforcements, unlike the U.S. prepositioned stocks in the Central Region of NATO, must bring their own supplies. For U.S. Air Force and U.S. Marine Corps air units, these stocks are often repositioned afloat to reduce delays. Logistics readiness within the Southern Region has improved over time, and we need not be as worried about logistic asymmetries as we once were. In wartime the key to correcting any logistic imbalance is through destruction of the Warsaw Pact resupply train.

This would be accomplished in the Southern Region by interdiction of the Black Sea lines of communication from the Crimea to Bulgarian and Rumanian ports of entry.

This overview perhaps finishes appropriately with a discussion of the Black Sea itself. If one looks out to the West from Moscow, perhaps toward the Iberian peninsula, there is some solace to be taken from the layered Warsaw Pact defense. The Soviets have their client states on the initial battle line, supported by deployed Soviet units. There are layers of defense to the Russian border itself; even at sea, the imaginary lines of defense are drawn, at which changing military postures and tactics increasingly confront the intruder. Only to the viewer's center left is there an anomaly in this Soviet defensive perimeter—the Black Sea across which NATO and the very heartland of Russia confront each other directly.

There is a valid reason for the dramatic size of the Soviet Black Sea Fleet. More than 100 naval combatants are stationed here, under the umbrella of hundreds of tactical aircraft ringing the littoral. Vital as is the sea line of communication from Russia to the Balkans, the dominant reason for this fleet is to ensure control of the Black Sea against transgressors, since loss of Soviet control would open a potential soft underbelly to the motherland. An irony in this respect is that NATO and the Warsaw Pact have similar plans to mine the Bosphorus to prevent its perceived use by the naval forces of the other.

We have discussed the Southern Region from the operational perspective of the CINC with respect to overall objectives, how the theater is viewed as a political and military entity, the broad concept of operations, maneuver plans to the extent such plans are relevant to the small, reasonably independent engagement areas, the integration of forces and reinforcements, the problems of reserves and logistics, and considerations relating to delegation of command. It is now appropriate to summarize the more important issues in philosophical terms, because philosophy is perhaps what separates strategy from operational art, or perhaps more accurately, it is the philosophy—or operational art—that separates strategy from tactics and doctrine.

The work of the CINC starts with the need to convince an ever-changing chain of command, often interspersed with young officers whose military career goals are subordinated to political and economic objectives, that national views and objectives must be

subordinated, at least in the military sense, to those of the alliance. This is not normally a very difficult task, since the political posture of the Southern Region nations is strongly supportive of the need for common defense. Even in Greece, where military careers were for a period heavily influenced by political concerns, support for full reintegration into the NATO military structure remains alive and well. The growth of Europe into a common market and supra-state is highly supportive.

War planning is less important than having a war plan, even though the latter is more a testimonial to alliance solidarity than a real game plan for the actual conduct of war. At least the principal objectives are laid out, and the skeleton for execution, in terms of common doctrines, communications, rules of engagement, language, and standardization are in place. The planning process, involving all levels of the Southern Region chain of command, serves mainly as a tutorial for the legions of young people who serve their countries in uniform for a few years and pass on into their civilian careers. In such a process, their democratic ideals are strengthened and their understanding of, and reliance on, political solutions to social and economic problems, expanded.

The CINC, while conforming to strict interpretations of the NATO charter, must consider the realities of life in a complex region. Out-of-area threats definitely exist, and how to deal with them must be discussed off line with the Allies involved. National policies and contingency plans operative outside NATO must be understood and accommodated. National forces of NATO nations not integrated into regional plans must nevertheless be considered, if only through side-letters and memoranda of agreement and understanding.

At the tactics and doctrine level, real work must be done to ensure regional standardization. Forces must be able to operate together on call, using joint force employment procedures, such as antisubmarine search tactics and submarine movement clearances and coordination, to minimize communications and confusion. Two major annual NATO exercises within the region and a myriad of smaller bilateral and trilateral training events provide the basis for this critical element of alliance unit training and force readiness.

The CINC must finesse the national character of logistics through advocacy of a regional logistics plan, to which member nations contribute stockpiles for redistribution based on NATO

demands. Still in its infancy, such a plan is very important to the Southern Region, where sustainability and readiness budgets are often subordinated to other national needs.

The CINC must keep in mind the duality of the chain of command, recognizing that in this region, the campaigns will be essentially national in character and forces. Close ties with the national ministries of defense in the region and an understanding of national plans will do much to ease this burden and add confidence regarding the viability of overall campaign planning in the theater.

Finally, the CINC must keep abreast of the real nature of the threat. Technology can accelerate the rate of change in subliminal ways. Today, the factors that change the threat— economic, social, and technological events—are working in our favor. They can be exploited even further to enhance the alliance's strength and deterrence value.

I have discussed the complexities of the Southern Region and the role of the CINCSOUTH in planning for its defense. Since the deterrent value of NATO depends to a significant degree on the credibility of its military forces, the CINC must exercise his operational art to rationalize regional objectives in the context of assigned forces and probable threats. The Southern Region is only a part of a larger whole, and the importance of achieving local goals can only be appreciated through understanding the situation in the entire European region. Holding the Turkish Straits, for example, exerts tremendous strategic leverage on the Central Front, and achieving sea control in the Black Sea exposes the Soviet heartland directly to devastating attacks. War is ultimately the battle of logistics, and maintenance of the Mediterranean Sea lines of communication enables the alliance to fight on at a far more effective level.

Convincing NATO forces that a conventional defense can succeed is an important first step in persuading any threatening force it cannot win. Bringing superior technology to the region, as in the case of NATO AWACS, is an important element of operational art, because the improvements it brings in the correlation of forces cannot be denied. I am convinced that the dedication NATO has demonstrated over the last decade in the improvement of force capabilities, together with the articulation and demonstration of how they can best be employed, are largely responsible for the clearly discernible disintegration of the Warsaw Pact commitment in both political and military terms. Ten years ago it would have been unthink-

able that NATO could win a conventional war in Europe. Today, that eventuality has been openly discussed by the Soviet general staff.

How these planning efforts will pay off in the event they must be implemented is uncertain, but the main ingredients have been exercised, and the importance of operational goals have been underlined. A dedicated corps of intelligent, committed personnel—more than one million strong—are constantly replenished and are surprisingly well versed in the matters discussed in this paper.

Operational Art in a Low Intensity Theater

Paul F. Gorman

The term operational art, when applied to the commander in chief (CINC) of a unified command, remains ill-defined, despite the outpouring of manuals and articles trying to clarify the definition. It is particularly elusive when the CINC is operating in circumstances amorphously labeled "low intensity conflict," peaceful competition, or a situation short of war. Such was my lot as the CINC of the U.S. Southern Command (USSOUTHCOM) during the second half of President Reagan's first term.

It does not help much to compare my undertakings as a CINC with the Army's three levels of war—tactical, operational, and strategic—because on any given day I dealt with matters which were tactical in focus and I could rely on someone in Washington to involve me in strategy as well. As for the theater—that too was blurred. I had a substantial intelligence staff in the Pentagon, and I spent almost as much time in Washington as I did in my headquarters in Central America.[1] Nonetheless, I herewith apply for credit from the U.S. Army War College by contending that from time to time I did practice operational art: I disposed of forces within my theater, selected objectives and provided guidance for subordinate and supporting commanders, and influenced allies and adversaries to act in ways conducive to achievement of my strategic mission.[2]

The substance of that mission, taken from my prepared statement to the Senate Armed Services Committee, was to:

> Exercise operational command over U.S. forces on the land mass of South America and Central America less Mexico, and act therein as the principal agent of the Department of Defense for implementing national security policy and military strategy. Prepare strategic assessments and contingency plans, and conduct training or operations as directed by the Joint Chiefs of Staff to include coordinating the activities of service components and supporting maritime forces; supporting other unified and specified commands; disaster relief, search and

> rescue, or evacuation of U.S. citizens from endangered areas; strategic and tactical reconnaissance; countering international terrorism, subversion, and illegal traffic of arms and drugs; and fulfilling provisions of the Inter-American Treaty of Reciprocal Assistance and other mutual security pacts.
>
> Support and assist U.S. Country Teams in the theater.
>
> Monitor security assistance programs in South and Central America, including Mexico, and command the Military Assistance Advisory Groups, Military Liaison Offices, and Office of Defense Cooperation.
>
> Promote mutual security among the nations in the theater and develop operations to maintain peace, strengthen democracy, and advance economic and social well-being; counter the Soviet and Cuban military build up and other de-stabilizing undertakings; encourage standardization and rationalization among prospective allies of the region; provide access to, or acquire as needed for U.S. forces, support facilities, communications systems, and operating, transit or overflight rights; and safeguard U.S. access to raw materials and energy resources.
>
> Provide for the defense of the Panama Canal and for other Department of Defense obligations per the Panama Canal Treaty of 1977.[3]

When I undertook those myriad responsibilities, I had the distinct advantage of having been the assistant to the chairman of the Joint Chiefs of Staff for two years, a back-bencher in the highest councils of the government. As a result of that experience I had a firsthand appreciation of how the president and his principal counselors viewed Latin America and their intentions in the area. They were gravely concerned over the deterioration of democracy in Central America. El Salvador's weak interim government and ineffective army was about to crumble before the attacks of Communist guerrillas being aided by Nicaragua and Cuba. Nicaragua, supported by lavish Soviet military and economic aid, was rapidly being transformed into a Communist garrison state in which thousands of Cuban military personnel occupied key positions under a regime determined to surround itself with other Communist governments. To their north, the Sandinistas were stepping up military attacks along the Honduran border both to intimidate the government in Tegucigalpa, and to curtail the activities of the rapidly growing Nicaraguan resistance movement. To their south, the Sandinistas menaced the defenseless Costa Ricans with Soviet tanks and armed

helicopters. The shaky democracy in Honduras was threatened from within both by radical leftist terrorists and by a nationalist military. Costa Rica seemed unable to cope with hundreds of thousands of Nicaraguan refugees, and was vulnerable to mounting terrorism. Guatemala's repressive military government was internationally isolated, and under attack from Communist-aided guerrillas. Cuba's Castro, having succeeded after two decades of failures in gaining a foothold on the continent, had spurned U.S. overtures and warnings. Therefore, Nicaragua had to be contained, and the Soviet-Cuban strategic design for the region frustrated. If there were differences among the president's advisers on these matters, they probably were mainly over the degree to which the situation in Central America should be understood and addressed in East-West terms, as opposed to treating it as a regional crisis in which Soviet involvement was but one, not necessarily the decisive, factor.

After I took command, I quickly determined that the situation in the theater had to be treated as a regional crisis. Many Central American leaders I talked to in my initial visits evidently wanted the United States to announce that the troubles of their country were manufactured in Moscow and to intervene directly and massively to foil the Russians. But it became clear to me that most of those troubles stemmed from indigenous failures, especially the unwillingness of those very leaders to recognize their internal weakness and to accept the need for reform. Thereafter, I deliberately down-played the Soviet role, and in dealing with Washington and with Latins I stressed the necessity for vigorous responses by the Central Americans.

In preparing a strategy for implementing U.S. policy in Central America I was not allowed much time to form or present my estimate of the situation because events simply moved too quickly. A few days after I assumed command, an American journalist was killed in Honduras on the Nicaraguan border, bringing the media out in full cry. In a rapid series of secure voice conferences and face-to-face meetings in Washington a strategy was adopted which I have subsequently described as "discriminate deterrence." It was predicated upon a substantial increase in U.S. involvement in Central America to forestall regional conflict. USSOUTHCOM was to act toward two goals: inducing a heightened awareness of the risks and costs of continued aggression in Managua, Havana, and Moscow; and strengthening the democratic governments in

El Salvador, Honduras, Costa Rica, and Guatemala. U.S. forces would conduct a series of exercises in the region to convey our military strength to all observers, while at the same time through diplomacy and security assistance the U.S. would bolster the democracies there against internal and external enemies.

Once strategic decisions had been made in Washington to increase U.S. military activities in Central America, I, as the theater CINC, practiced operational art in proposing how, where, and when to provide military support for the strategy. I had to synchronize operations with scheduled elections in El Salvador, Costa Rica, the United States, and Honduras with schedules for Soviet reconnaissance satellites, and with public affairs activities. To illustrate some aspects of operational art in a low intensity theater I have selected three examples: intelligence, training exercises and security assistance, and combined planning.

My foremost concern was providing the strategic and tactical reconnaissance required in my mission. In 1983 the USSOUTHCOM theater was virtually undeveloped as far as coherent collection or dissemination of useful intelligence was concerned, and I knew from my previous assignment that the intelligence on Central America provided to top officials of the U.S. government was both scanty and unreliable. Yet key strategic decisions concerning whether it was in the U.S. interest to act, and if so, when and how, depended crucially upon the cogency of that intelligence. Moreover, the credibility of U.S. intelligence would influence how well the leaders of American opinion, members of Congress, the public, and allies or friends abroad, could be persuaded to support initial commitments and to sustain policies over the longer term.

Since strategic intelligence provides early warning of impending threats and enables reappraisals of American policy in the context of all our interests worldwide, the U.S. intelligence community should have been able to provide such strategic intelligence on Central America from its day-to-day posture. That region, however, had not been very high among its worldwide priorities. The Central Intelligence Agency encouraged some of its foremost experts on Central America to accept early retirement during the 1970s, and in 1979 closed its station in San Salvador. In 1981 the chairman of the Joint Chiefs of Staff had asked me to survey the capability of U.S. intelligence to assess what was going on in Central America, and I discovered each of the intelligence agencies involved was

constrained by a shortage of qualified personnel. With the chairman's backing an interagency recruiting and training program had improved that position, but intelligence capabilities were still far from robust when I assumed command in 1983.

Tactical intelligence required new collectors and new communications in the theater. The U.S. Atlantic Command had helpfully maintained a ship off the Salvadoran coast since 1982, supported from USSOUTHCOM's minuscule naval component in Panama. But the extensive, timely, precise information I sought could not be provided from such a platform alone. I was determined to acquire a capability to illuminate all the principal actors in Central American political violence, their operational methods and means, their capabilities, and their plans. I asked the chiefs of each of the services and the secretary of defense to approve diversion of military collection systems—aircraft, ships, computers, communications equipment, and personnel—from other missions and to redirect analytical resources from other targets to exploit the resulting data. The cries of pain from my fellow CINCs were heart-wrenching, but by and large I got what I asked for, and ultimately USSOUTHCOM was able to produce tactical intelligence products useful for each U.S. country team it was supporting and for its host government and its security forces.

Unfortunately, some of the intelligence assets dispatched to the theater had to be positioned extremely close to my areas of interest. For example, certain of the collection systems most useful to me were mounted, by inter-service agreement, on short-range aircraft—they still are as far as I know. Others functioned on line-of-sight. I decided that Honduras was the pivotal territory for such purposes and personally selected the sites for each collector. Then I had to persuade the Honduran government to allow us to station a sizeable contingent of U.S. troops in their country—to build cantonments, to erect microwave communications sites, and to operate helicopters at low level throughout the country. Burdening President Roberto Suazo Cordoba with such a politically onerous American presence was a distinct risk, but Ambassador John Negroponte charted a course through the reefs of Honduran politics, and I obtained strong support from the Honduran high command by promising them—and, more importantly, actually delivering—much enhanced intelligence on their neighbors.[4]

Some U.S. practitioners of human intelligence (HUMINT) worked assiduously in Washington to portray the whole USSOUTHCOM undertaking as futile, asserting that no intelligence worth gathering on insurgents or terrorists was likely to proceed from a technology-based collection effort. This canard caused me unnecessary delays and occasioned several bothersome trips to Washington, but ultimately all the high-technology collectors I sought were deployed to the theater. Once in place, we were able to cross-cue collectors of various types, which, together with an appropriate massing of interpretative talent, promptly produced a new, tactically significant understanding of what was happening in the theater.

While I was entirely supportive of HUMINT, I was not convinced that its quality was high enough or its quantity so satisfactory that added U.S. technological collection would have been superfluous. Moreover, I was wary about information from the intelligence services of our beleaguered regional friends; their plight was attributable to a combination of inabilities of those services to collect and analyze information concerning internal and external enemies, their defective view of the effectiveness of their own government, and their armed forces. Most importantly, my tactical intelligence requirements extended to both friend and foe; that is, I directed that USSOUTHCOM collect information on all the protagonists, for otherwise I could not assess risk or detect vulnerabilities. In both the short term and the long term, I believed that U.S. tactical intelligence was essential to assess the situation and make decisions from the operational perspective. Events in the theater proved me right.

El Salvador provides a useful example of the relationship of tactical intelligence to operational art. From the outset of his administration, President Reagan faced daunting obstacles in El Salvador. The Sandinista-backed guerrillas seemed to have military victory in their grasp; most analysts in Washington believed it likely that the Salvadoran Army would collapse within one year. American opinion-makers saw the violence as a local matter, accepted the view that the Salvadoran government was beyond help, and expected the Salvadorans running the interim government to go the way of Somosa. The American public, to the extent it was even aware of El Salvador, opposed U.S. involvement. Congress reflected these opinions, and doled out aid in driblets, hamstringing the ability of the U.S. country team and USSOUTHCOM to work with the Salvado-

rans on a long-range national plan for countering the insurgency. In two years, however, the situation was transformed. By 1985 there was a constitutional government in place, with a popular president elected under dramatic circumstances. Moreover, there was support within the U.S. Congress for broad, multi-year assistance to defend that fledgling democracy. The major difference between 1983 and 1985 was the contribution of tactical intelligence.[5]

USSOUTHCOM, with plenty of outside help, put together a system which collected, analyzed, and distributed timely tactical intelligence. It was a system capable of storing, sorting, retrieving, and collating large amounts of precise information concerning personalities, organizations, locus, time, and activity; maintaining surveillance over large areas day or night, regardless of weather or terrain; performing in-theater all-source intelligence management, including tasking of collectors, first-order interpretation of results, and timely cross-cuing of other collectors; exploiting, minute-by-minute, the sources of national intelligence in Washington, D.C., as well as theater intelligence, utilizing a combination of unconventional organizations and communications responsive to the needs of USSOUTHCOM and the country teams it supported; and producing intelligence understandable by lay persons for use in informational programs. For rural insurgency—classic guerrilla warfare by organized bands using terrain and vegetation to conceal their base of operations—obtaining useful tactical intelligence meant not only adroit use of human intelligence, but broad use of imagery, electronic intelligence, unattended sensors of various types, and unobtrusive collection platforms. Urban terrorism or insurgence—conspiratorial paramilitary groups, often clandestine, which operate in cities and towns—required a different approach which featured hyper-efficient, police-type intelligence to obtain large-scale data collection by human and electronic means, sifted frequently for indications of presence and warning of attack.

Tactical intelligence provided both a prod for Salvadoran political and military action and assurance that the Salvadorans, when they acted, did so prudently, with due respect for human rights. It furnished the country team and USSOUTHCOM important rationale for our entire aid program, helping to underwrite a significant shift of opinion in Congress in favor of aid. To be sure, there were other factors, such as the favorable impression of President Jose Napoleon Duarte formed by members of Congress after his

meetings with them. Yet Duarte used talking papers based on USSOUTHCOM intelligence in those meetings. Other USSOUTHCOM intelligence products presented to Congress in mid-1984 played an important role in convincing members on both sides of the aisle to support the administration's proposal for a long-term aid program underwriting the Salvadoran national plan.

I suppose that some readers will react to the foregoing with the conviction that intelligence planning is not a proper focus for a CINC's efforts and might better be left to his J–2 intelligence staff or to intelligence agencies in Washington. To them I say simply that intelligence underwrote my personal relations with ambassadors, with my superiors in Washington, and with members of Congress. It was central to my exercise planning and provided the basis for combined planning with allies. I simply could not leave so important an activity to the staff, let alone to Washington agencies—although I believe I used my J–2 and the intelligence community to advantage. Intelligence may well be the single most important element of operational art in a low intensity theater.

The next example of how I practiced operational art in a low intensity theater is the use of exercises and security assistance. Perhaps the most controversial aspect of USSOUTHCOM's operations under my command was using exercises for U.S. military forces as legitimate occasion for them to deploy to the theater and to perform useful missions. One of the difficulties I faced is that USSOUTHCOM had virtually no resources of its own, and responding to the requirements of the national strategy meant that I had to use forces from other commands. I believed that U.S. military exercises were a quick, direct, cost-effective way to provide economic, humanitarian, and military assistance to allies and friends In Central America. At the same time, I knew that the exercises would give very valuable, virtually irreplaceable, training to the U.S. forces involved. But almost immediately I ran afoul of bureaucratic resistance, as well as laws and regulations, in making good use of this tool.

The bureaucratic resistance came chiefly from within the Army, and mainly from senior personnel who viewed my requests for the use of Army forces as an unprogrammed, unapproved intrusion into their domain. Some of that opposition no doubt included concerns that the Reagan administration was skirting the provisions of the War Powers Resolution, or that forces were being

diverted into a theater of tertiary importance. There were few precedents for what I proposed, and there was some risk. But I acted with confidence that I was following the guidance of the president and the secretary of defense, and that my requests had all been properly submitted through the Joint Chiefs of Staff.

The major legal constraint I faced was the so-called anti-deficiency provisions of law that meant that Security Assistance could not be funded from money appropriated for U.S. military operations and training exercises.[6] The law has been interpreted to mean that U.S. armed forces could provide assistance to a foreign nation in the course of a training exercise only if that assistance were incidental to the original purpose for which the exercise was funded. Disputes arose about what constituted assistance, about the definition of incidental, and about how much the host nation should be charged for assistance that was considered a marginal addition to the exercise. The controversy extended to whether a country's participation in combined exercises with U.S. forces should be paid for by U.S. exercise funds, or by the country's Security Assistance funds, or—as was often the case—by some combination of both.

One such heated discussion arose over an exercise in which a light artillery battalion of the 101st Airborne Division (Airmobile) deployed from Kentucky to Honduras and conducted combined training with a Honduran artillery battalion. On the USSOUTHCOM side of the ledger the Hondurans were provided a superb role model of a wholly professional American outfit that could move, shoot, and communicate flawlessly and, more importantly, conduct its activities with esprit, discipline, and cohesiveness. On the other side of the issue the Hondurans, who had been equipped with mortars, had not yet received the howitzers they had purchased with U.S. Security Assistance funds, and in training with the U.S. unit they used the U.S. guns, ammunition, and other materiel. I found out that new howitzers were available in the U.S. for issue to the 101st Airborne Division, so I ordered the Americans to turn over some of their howitzers to the Hondurans, rather than wait for the Security Assistance system to fill their order. But ultimately the Hondurans had to pay for my expedient through deductions from their Security Assistance funds.

I argued vainly that such legalisms confuse bean counting and strategy, and I told a congressional committee that any exercise I conducted was designed to meet three criteria: the exercise must provide sound training for all U.S. participants, advancing their

readiness for their assigned missions better than any other uses of the same training time and dollars; the exercise must meet the requirements of the host country—after all, they provide the territory, airspace and waters upon which the exercise takes place, it is their populace who must suffer the inconveniences and dangers inherent in all military maneuvers, and it is their government who must bear the political consequences of accepting a U.S. military presence—and the exercise should contribute to U.S. theater strategy. If the exercise met the first and second criteria, then any benefit which accrued to the host government ought to be considered incidental. In fact, little of the cost of exercises so planned underwrote foreign participation, but the effectiveness of the training was often crucially determined by the extent of the non-U.S. participation.

There was another major furor surrounding landing strips for C–130 cargo aircraft scraped out of fields and forests in Central America by U.S. Army engineers. U.S. accountants held that these were airfields usable by the host nation after U.S. forces departed, and therefore chargeable as Security Assistance. The fact is that the engineer units participating had wartime missions of constructing exactly such emergency strips for another U.S. theater CINC, and that the Environmental Protection Agency and other constraints on training in the United States foreclosed practicing for such missions there. USSOUTHCOM had a contingent need for C–130 crews and logistic forces trained to use a similar hasty infrastructure. The CINC's training requirements neatly matched requests from the host country that the exercises train its forces in strategic re-deployments from one section of the country to another, using fixed-wing aircraft. Far from the United States charging the host country's Security Assistance account for the airstrips, which were usable only a few weeks at best without engineering maintenance, the host country might well have submitted a maneuver-damage claim against the United States for the physical disruption of, and noise pollution in, its countryside, or charge us for the use of its airspace.[7]

The armed forces of Central America learned a great deal by participating in combined exercises with U.S. military forces. The exercises did much to dispel ghosts of the gringo invaders of yesteryear. Central American military forces acquired the attitudes and demeanor of military professionals, as well as specific military skills. But there can be little doubt that U.S. troops usually benefitted far more than host nation forces, receiving realistic training

under conditions that would be impossible to duplicate in the United States. Exercises rewarding for both parties were designed for U.S. combat service support units as well as combat support and combat units; combat service support units could both train with corresponding units of the host country military and, as an incidental by-product, they together could provide politically remunerative humanitarian assistance to the people of the host country.

Part of operational art for a CINC in a low intensity theater is coordinating military activities to attain politically useful goals, and combined exercises accomplished that. I directed four types of exercises in the theater: interoperability exercises, training for special operations forces, medical exercises, and construction exercises. At times all four types of exercise were going on concurrently.

Since one of my missions was to ensure that the United States and its allies are prepared to fight as coordinated partners in the event of war, interoperability exercises were critical. We needed to evaluate host nation forces in the field so we knew how to tailor Security Assistance for them, and we needed to teach them techniques which would enable them to take advantage of our help in an emergency, such as using airlift or ingesting tactical intelligence.

Training non-U.S. forces in unconventional warfare is a specified mission of U.S. Army Special Forces, and one wartime mission of U.S. Air Force and U.S. Navy Special Operations Forces (SOF). The Central Americans well understood that U.S. SOF could impart a wide variety of military skills, and they were therefore sought after as trainers particularly knowledgeable in subjects of interest. By actually training foreign troops, U.S. SOF participants were required to work through linguistic barriers and past cultural inhibitions to communicate skills and knowledge. They thereby practiced in a realistic environment the very skills they would be called upon to use in a wartime emergency. U.S. SOF personnel operating as trainers were totally immersed in the host culture—an experience impossible to replicate in the United States.[8]

U.S. military medics with firsthand experience with battlefield trauma, or indeed with tropical medicine, have all but passed from the ranks of our armed services. Exercises in Central America provided unparalleled training opportunities for U.S. military medical personnel and units. Most countries found it easier to accept combined training with medical units than any other type. In U.S. efforts to help Guatemala back into the Central American

mainstream, only medical exercises were initially permitted by our government, but these provided USSOUTHCOM opportunities to assess the situation in Guatemala and to contact key military leaders. Invariably, the people of the countryside enjoyed having U.S. medics in their midst, because for many, being treated by a medical professional is a once-in-a-lifetime experience. In one combined medical exercise in Honduras, for example, U.S. helicopter-borne medics, in all instances accompanied by officials of the Ministry of Health, inoculated over 100,000 children against five basic diseases. In any country facing an active insurgency, military medical training can provide immediate vital benefits. Usually the entire system of combat medical support needs to be revamped, and there are few easy fixes. U.S. Security Assistance in training medics, aidmen, nurses, surgeons, and medical administrators, and in improving the evacuation system, demonstrably made a major difference in El Salvador, and soon other Central Americans began to seek similar training.[9] USSOUTHCOM found that the El Salvadoran Army did not have a military medical service system that could provide early care and evacuation for combat casualties. The result was very high combat mortality, which greatly reduced morale and combat effectiveness, and which imposed grave political and economic costs on the government in raising and training replacements. In 1983, Salvadoran mortality from injuries sustained in combat was above 45 percent. The problem was neither the lack of good doctors, nor of excellent hospitals, but the absence of a military medical service corps to provide first aid, stabilize the wounded, and move them rapidly by helicopter to professional medical treatment. After the U.S. introduced a Security Assistance program to train company-level aidmen and to develop a battlefield evacuation chain, combat mortality was reduced to 5 percent of overall casualties, a proportion comparable to U.S. results in Vietnam. In effect, U.S. aid presented President Duarte with a brigade's worth of trained troops.

In Central America, U.S. military engineers obtained training otherwise denied them by building roads and airstrips, digging wells, assessing and upgrading water supplies, and controlling flooding. Each such exercise was responsive to the host government's interests and consistent with the country's American ambassador's general plan for developmental assistance. The legal thickets surrounding

such exercises included the numerous laws and regulations bearing on military construction, as well as the Security Assistance system.

It is possible that the exercises I directed would have occasioned less debate had USSOUTHCOM not used units from the reserve components of the U.S. armed forces. Reliance on reservists was nothing new to USSOUTHCOM. For years, the bulk of its inter-theater and intra-theater airlift had been flown very competently by reservists on two-week annual training tours. Over the past decades force-structure decisions have allocated to the reserve components a progressively larger portion of combat engineers, construction battalions, medical service units, and civil affairs detachments—the very sort of units which fit well into my exercise plans. Hence, it was to be expected that the armed services would task reservists to meet USSOUTHCOM exercise requirements. But since President Reagan's Central American policies were not universally popular, in a few states objections arose to sending reservists into what some termed a war zone, others an incipient Vietnam.[10] As a result I found myself dealing with governors to reassure them that, should they concur in the deployment of their guardsmen to my command, the units would be well and securely employed. As an example, I directed my Army component commander to devise an exercise with the Honduran Army designed to raise their competence and confidence in antiarmor tactics and techniques. The trouble was the Hondurans had no tanks, at least no vehicle which could simulate the Soviet T–55 tanks arrayed across the border to their south. To show the Hondurans what a comparable tank looked like, how it operated, its strengths, and its vulnerabilities, I wanted the exercise to include, as an opposing force, a contingent of M48 tanks. The Army selected the Texas National Guard for the mission, and I ended up having to assure personally the governor of Texas that his guardsmen would not be used to attack Nicaragua, or to defend Honduras, but only as a training aid to instruct Hondurans to defend themselves. I told the governor that I thought the Nicaraguans would leave the unit strictly alone, but I also pointed out that they would be very respectfully watchful to see whether any of those M48A5 tanks remained behind in the hands of Hondurans. The Texans came, accomplished their mission with style, and took all their tanks home with them.

A feature of operational art in a low intensity theater is combined planning. A concomitant of combined exercises was close,

continuous interaction between USSOUTHCOM staffs and the commanders and staff officers of Central American armies in planning and conducting the exercises. Beyond that, in Honduras and in El Salvador, we organized periodic meetings in which the ambassador and I, with a few key subordinates, would meet with the minister of defense and his subordinates. On occasion, the president himself would join us. These meetings usually had an agenda set in advance, with a combined staff study of some significant problem set for presentation. But the real value of the meetings were in the discussions which ensued—frank, pointed, comments and questions were the norm, and both sides welcomed the meetings as an opportunity to raise tough issues. It was in such a meeting that I could present my critique of operations, training, or force structure, and recommend ameliorative action, or that the ambassador could analyze regional political developments, or discuss reactions in Congress and the American media to recent events. Our hosts could vent their ire at this or that aspect of our policies, or this or that American visitor. Those meetings showed our hosts how the ambassador and I related to one another, providing an example of U.S. civil-military relations which we felt was beneficial for the local military. Moreover, the meetings led to our planning together, thinking ahead, fashioning strategy, allocating resources, and producing answers to thorny questions. For me the payoff was being able to elicit feedback on the overall effect of my operational art on specific strategic objectives. They convinced me that we achieved much of what we set out to accomplish in both countries.

My ability to assess the impact of our operations on the Salvadoran guerrillas or the Sandinistas was one advantage of our improved intelligence. Ernesto Sandino won his fame in warfare against U.S. Marines in the 1920s; many Central Americans, and more than a few U.S. experts, had been convinced that there would be a major political convulsion when again Marine boots trod Central American soil.[11] The Sandinistas of the mid-1980s were, I had reason to believe, more than a little disquieted over the reappearance of the U.S. Marines in Honduras. In one exercise in 1983, a Marine battalion landing team and a Honduran infantry battalion made a combined landing on the north coast of Honduras, and the commandant of the Marine Corps visited one U.S. Marine position within sight of Nicaragua. The Sandinistas were even more dismayed, knowing the deep-seated enmity between

Hondurans and Salvadorans since the Soccer War of 1969, to witness Honduras acceding to training Salvadoran Army units at the Regional Military Training Center in northern Honduras, a Honduran military facility manned in part by U.S. SOF trainers. And when Costa Ricans and Guatemalans, as well as Salvadorans, took part in combined exercises with U.S. and Honduran troops, they complained of a regional conspiracy aimed at invading Nicaragua.

USSOUTHCOM's operations during the years 1983 to 1985 met the U.S. policy objectives in the theater by giving the Sandinistas pause, and buying time for the Salvadorans, Hondurans, and Costa Ricans. In closing allow me to quote at some length from a judgment published elsewhere on what transpired in Central America during those years.

> In early summer of 1983, amid doubts about the very survival of fragile democracies [in Central America], many Central American leaders—and a number of U.S. observers as well—had concluded that a regional war was possible. Cubans and East Europeans were pressing construction night and day on a large new air field at Punta Huete, Nicaragua, a very long concrete runway capable of landing the heaviest Soviet aircraft, with extensive fuel storage, and revetments for a squadron of jet fighters. The Sandinista Army was bombarding Honduras with 122mm. Soviet-made artillery and rockets, and had positioned forward Soviet-supplied tanks and armored personnel carriers. One Honduran general expressed the fear that, literally in hours, the Sandinistas could drive along the Pan American Highway through Honduras into El Salvador to link up with an anticipated final offensive by the guerrillas—a replay of Giap's final offensive in South Vietnam. While U.S. estimates assigned a low probability to such an aggression, it is true that such a thrust would have had a decisive strategic impact on Honduras: it would cut that nation off from the Pacific, and position the Nicaraguans to dictate the end of Honduran support for "Contras" and to resolve in its favor long-standing border quarrels. Honduras was on the verge of national mobilization, and the Salvadoran Army was torn between prosecuting its internal war against increasingly powerful guerrilla units and readying itself to defend against a Nicaraguan armored onslaught from the south.
>
> In that circumstance, the United States adopted a deterrent strategy aimed at bolstering our friends and in-

> stilling caution in their foes: a warning was repeated that the United States would not tolerate advanced aircraft in Nicaragua. A U.S. carrier battle group appeared off the Pacific coast, and U.S. Air Force aircraft, specialized for top-down attack of armored vehicles, landed in Honduras. U.S. troops were sent to train Hondurans in constructing anti-armor defenses along the Pan American Highway and to participate in a newly built, regional military training center on the north coast of Honduras. At the highest level, the United Stated provided strong reassurances to both Salvadoran and Honduran leaders, urging on them priority for internal defense and development rather than preparations for regional conflict.
>
> Assessing deterrence is difficult at best, for claims that the strategy succeeded must skirt the fallacy post hoc, ergo propter hoc. But in this case, the Salvadorans turned their attention from the feared invasion by Sandinista armor back to their real war and to the National Plan they had drawn up with U.S. assistance. The Hondurans pulled back from the border and commenced constructive training exercises with U.S. forces. Punta Huete airfield remained unused, and the Sandinista armor withdrew southward. Deterrence, then, seems to have had the effect of limiting the conflict in terms of intensity, and, by narrowing the options for a would-be aggressor, created a context within which U.S. allies could pursue their own strategic objectives—offensive in the case of the Salvadorans, defensive in the case of the Hondurans. Whether or not U.S.actions intimidated the Sandinistas and their communist backers, they had the effect of heartening democratic friends throughout the region.[12]

One of the primary characteristics of operational art is that it attains strategic objectives which support policy. My experience as the CINC in the Central America theater from 1983 to 1985 provides a clear example of some of the considerations for practicing operational art in a low intensity theater.

NOTES

1. My aide-interpreter Maj. Carl Freeman calculated that I flew over 200,000 miles and spent 30 days aloft in doing so.

2. D. L. Adams and C. R. Newell, "Operational Art in Joint and Combined Arenas", *Parameters* 18, no.2: 33–39.

3. USCINCSO, Prepared Statement, U.S. Senate Armed Services Committee, February 23, 1984. Statement was cleared by OSD, but subsequently the Panama desk within the Department of State refused to clear a cable which would have distributed the statement to U.S. country teams within my theater, stating that proper interpretation of the Panama Canal Treaty of 1977 limited USCINCSO's authority essentially to defense of the Canal. But the statement expresses what the President, the Secretary of Defense, and the Chairman of the Joint Chiefs instructed me to do.

4. One key site selected was an austere air base at Palmerola, where the Honduran Air Force gave its pilots their primary training. The United States spent some $40 million upgrading the facility, and it was fortuitous that the strip was located a few miles from President Suazo's home town, where he had been a physician. U.S. forces brought to Palmerola a mobile Army hospital with first-class laboratory and surgical equipment, and erected a sign to its front proclaiming it the "Roberto Suazo Cordoba Hospital Militar"; the president was delighted and spent much leisure time there exploring its medical capabilities and trading professional insights with our doctors.

5. Report by the Regional Conflict Working Group, Commission on Integrated Long-Term Strategy, Supporting U.S. Strategy for Third World Conflict, Washington, D.C., 1988, p.60.

6. Paper of the Regional Conflict Working Group, Commission on Integrated Long-Term Strategy, Commitment to Freedom—Security Assistance as a U.S. Policy Instrument in the Third World, Pentagon, Washington, D.C., 1988, pp. 42–45.

7. Beginning in Fiscal Year 1987, Congress appropriated for Department of Defense between $1 million and $2 million to pay for participation by developing countries in combined exercises. DOD has interpreted this to mean JCS-directed exercises, but for these, the funds may pay for transportation, rations, quarters, food, and ammunition. Something less than $1 million was also provided to conduct seminars and planning meetings, and perhaps twice as much to underwrite humanitarian and civil assistance projects in conjunction with combined exercises. This is a small but extremely useful remedy for the aforementioned difficulties.

8. Recent legislation has eased proscriptions against SOF participating in such training of foreigners abroad, but Security Assistance payback provisions remain that can make it difficult for host countries to support SOF-provided training at the levels desired by the United States. Thus, CINCs walk a legal tightrope as they attempt to give their SOF personnel the fullest possible opportunity for quality training and cross-cultural experience.

9. Recent legislation indicates Congress is more tolerant of extending "humanitarian aid" without incurring Security Assistance charges, but again, U.S. commanders must walk a narrow legal line.

10. Certain governors have since denied permission for their state's National Guard units to deploy to Central America, and the matter has been referred to the courts for adjudication.
11. As recently as 1981, the U.S. Embassy in Tegucigalpa denied liberty for Marines aboard an LST on port-call in northern Honduras on just those grounds.
12. Supporting U.S. Strategy for Third World Conflict, op.cit., pp. 23–24.

Educating and Training for Theater Warfare

L. D. Holder

The armed services projected adoption of operational art as a separate division of military studies is potentially one of the most significant theoretical changes since the formation of the Department of Defense. Adding operational art to joint doctrine will not only represent a unique departure in American military thought but will also align it with joint operations at the theater level. The change will only have real effect, however, when the services individually and the joint force as a whole actually put the theory into practice.

The translation of theory into practice always involves a prosaic but vital education effort. It lies with military educational institutions to teach the principles of operational art to their leaders and staffs and integrate operational thinking into their established training programs and planning activities. To complicate this adjustment, they will have to accomplish the change with men and methods developed in the forty years of the immediate past when theater operations were largely ignored and reputations were made elsewhere. Only by making basic changes in professional education and training can the discipline of operational art really enter into American military practice and contribute to national security.

The U.S. Army and Air Force appear to be committed to this change. But they will only succeed through conscious, competently directed changes to their professional education and training programs. Moreover, their efforts will only succeed if they are paralleled by similar initiatives in the joint education and training structure in the Navy.

Inexperience is one of the greatest difficulties to be overcome. The senior leaders of all services, the men who must train the forces and change the inter-service structure, are tested strategists and tacticians, but they are as inexperienced and untrained as anyone else on active service in the operational level of war. The middle-grade officers who must perform operational staff duties

and eventually grow into positions of theater leadership have also studied and practiced tactical operations throughout their service, but unless they have done it for themselves, they have not been taught or trained for theater operations.

This situation arose from a period of inattention to theater operations that followed World War II. As theater armies and support commands withered away and unified commands became either inactive allied headquarters or service-dominated activities such as the Pacific and Atlantic Commands, the services gradually lost all doctrinal and theoretical focus where theater operations were concerned.

Military men of the 1950s tended to discount the importance of what we now call operational art. Their World War II experience saw them through Korea which they generally regarded as an anomalous local conflict in the nuclear world. Their successors in Vietnam may have operated under extraordinary political constraints but they also deliberately resisted the idea of joint or combined campaign planning. In other words, commanders, force designers, trainers, and military educators allowed training and education for theater operations to slip almost out of existence. And the services generally belittled the value of joint training or education in favor of tactical training in the Army, fleet exercises in the Navy, and strategic studies in the Air Force.

In supporting those priorities the service schools did not trouble themselves much with campaign studies. Nor did they make time for or even encourage professional reading in joint or large unit operations. As a result, the services must now recover a lot of ground if they are serious about converting the ideals of joint doctrine for theater operations—the main subject of operational art—into a real military capability.

Awareness of these shortcomings began in the early 1980s and grew quickly. In 1986 the Army published a "second edition" of its AirLand Battle doctrine. Earlier Army doctrine—the 1982 version of FM 100–5, *Operations*—introduced the operational level of war into American usage but did not elaborate the idea in any detail. The 1986 version of the manual was deliberately written to address the topic more fully. It described the nature of operational art and gave Army commanders and staff officers some general, rather basic guidance on the subject. None of those ideas were coordinated with or accepted by the other services or by the Joint Chiefs of Staff.

Nonetheless, that doctrinal innovation coincided with efforts in the Army schools and at the National Defense University to restore campaign planning and operational subjects to their curricula after a forty-year absence. This broad awakening of interest did not notably affect the training efforts of the services, but it did prompt a flurry of articles in service and civilian journals.[1] Congressional dissatisfaction with the joint operations in Iran and Grenada further sharpened this interest within the military, particularly when it resulted in reform legislation which dictated closer inter-service connections, although that legislation, the Goldwater-Nichols Act, said nothing about operational art as a manifestation of inter-service coordination.

Since 1986 the Congress and the services themselves have noted deficiencies in our approach to theater operations. Civilian writers, officers of several services, and a few influential foreign military writers have sketched the theoretical outlines of operational art. The NATO allies and the British and German armies have followed the U.S. Army in putting the principal considerations of operational art into their doctrines. The problem remaining is to prepare joint forces and their service or functional subordinates to conduct theater operations. How should the services, separately and together, train and educate their leaders and units for effective practice of operational art?

Both education and training will be necessary. Education—disseminating knowledge through formal or informal study—is necessary to explain the basic concepts of operational art, to foster an appreciation of its technique and practice, and to promote informed discussion of related subjects. Training— practicing central activities and conducting exercises designed to improve performance of recognized tasks—must accompany education as the means of preserving and improving the skills necessary to sound theater operations. Training and education together build the vicarious experience that leaders of the future will rely on in the early stages of future conflicts. In developing an advanced military capability the two are interdependent, interactive, and of about equal importance.

The services have not for a long time educated their officers for theater operations—that is, for the planning, conduct and support of campaigns to achieve strategic objectives in a theater of war. The services last treated the subject systematically in the 1930s when the Army's Command and General Staff College

taught theater operations as "military strategy." In the intervening years the Army focused mainly on tactics. The Air Force, having gone its own way, concentrated almost as strongly on strategy. The Navy, with its emphasis on sea control operations, has dealt more closely with the essence of theater warfare than the other services but has at the same time maintained a strong single-service focus.

Fortunately, the structure of U.S. military schools has not changed much over the years. Their arrangement of basic, intermediate, and senior schools supplemented by special courses would certainly support instruction in operational art as it once did in the field of theater strategy.[2] It is the content of general curricula and the need for specialization of some students that require attention.

In view of forty years of neglect, it is not surprising that the body of knowledge that constitutes operational studies is ill-defined and unorganized in the military schools. Although the Army has committed itself doctrinally to the operational level of war, its current doctrine approaches the subject at only the most general level. While the Army's capstone operations manual sets general guides for operations at the theater level, its instructional usefulness is limited by its failure to discuss techniques or organizations in any detail.

The rest of the material available to military teachers consists of the military classics, outdated American texts, Soviet writings that spring from a different set of assumptions and experiences, raw historical data, and the spate of recent writings on the subject in western professional journals. Some first-draft allied writing also exists such as the theater guidance written for NATO's Allied Forces Central Region by German General Hans Henning von Sandrart.[3] But most western military texts and histories are written from tactical or strategic points of view and the field of western operational theory is barren.

The teaching problem is complex in any case, because theater operations fall more clearly into the domain of art than that of science. Below the level of broad principles, each situation varies so strongly in personal, geographical, demographic, historical, and economics details that the teaching of operational art will resemble political science more than small unit tactics. While that kind of approach is common in civilian schools, any such teaching will have to overcome the U.S. military's strong predilection for the scientific, concrete, and demonstrable. The impossibility of developing an operational checklist alienates many officers new to the subject.

The variety of operations that must be considered is also daunting. It ranges from the familiar to the wholly new. Our deployed forces in Asia and Europe, for instance, must now be able to operate as parts of defensive coalitions under unprecedented strategic assumptions. These would be predominately light force operations in Korea and chiefly mechanized operations in NATO. Our open-seas and home-based strategic forces must be able to carry out extemporized offensive operations with or without allied assistance.

Unconventional campaigns—a type of warfare for which there is adequate theory and example but one with which most U.S. professionals actively resist thinking about—seem to becoming more and more important. Guerrilla wars such as Angola and Afghanistan, advisory efforts such as El Salvador, and increasingly important military support to multinational, multi-agency efforts such as the "Drug War" and the effort to secure our own national borders require the same attention and education that more conventional wars presently do. Many will argue that as the emergent dominant form of war, they require more attention than any other type of war.

Education in operational art must be general for most military students and individualized for a select few. Our wide range of national and alliance responsibilities demands that we teach general operational principles to a large number of staff officers and technicians, yet still identify and specially educate experts who will develop into leaders at the operational level. Specialization in both groups for particular regions and forms of war is also desirable.

In terms of general education, the services must provide joint force commanders and theater commanders with a fairly large number of operationally competent staff officers. The service origins of these officers is not important. Indeed, representatives of all services must obviously attend war colleges to represent service capabilities accurately and to work out the practical details of cooperation and command and control. Additionally, foreign service officers, political advisors, police and civilian experts who advise and cooperate with joint staffs, and the journalists and civic leaders who criticize them must be present. These people should be included not only in general instruction at the war colleges as they now are, but also in the concentrated courses on theater operations that must be developed at senior and intermediate schools.

All future theater staff officers must gain a general understanding of military art at the operational level in the schools, es-

pecially while the subject is new to the services. Of greater short-term importance is their practical education in deploying, supporting, moving, and fighting air forces, fleets, and large air-land formations. There is more to the mechanics of this type of activity than most officers know.

Senior officers—older colonels and captains and flag officers—must be taught a great deal more. They must be conversant in the means of establishing practical, meaningful theater objectives; the ways of pursuing them effectively; and the principles of theater maneuver and air operations. These officers will be the "artists" at the operational level for the next decade. Their education should make them comfortable with the subjective nature of theater leadership and realistically confident in their abilities. Since formal instruction for such senior officers is only possible intermittently and for short periods, the present plethora of separately sponsored seminars should be replaced with a unified program directed by the Joint Staff's J–7.

Career management must capitalize on education and reinforce it. While some of the services have regularly sent high quality officers to joint staffs, none can claim to have prepared those officers for their operational duties or to have attached much prestige to their positions. This attitude in part provoked the congressional mandate to show more seriousness in joint matters.

The services could considerably reinforce a policy of improved operational education by encouraging some specialization among the officers they provide to operational staffs. In fact, they would do well to admit that developing effective specialists in operational art is the work of a lifetime, and that dedicating some first-rate men to this duty is not only necessary for sound theater operations but also beneficial to service interests.

To improve the preparation of such officers, the services will have to select them deliberately and fairly early in their careers. The services will also have to educate these officers appropriately in their own schools and track their assignments carefully. Ultimately, the services and the Department of Defense should face up to the necessity of a joint general staff, a notion that is not just repugnant but actually antithetical to the entrenched service-centered way of doing business.

Under those circumstances, the services would also need to take greater care in choosing who they send to the senior courses

of other services and how they employ the graduates of those schools. Officers sent to any concentrated course in operational art should be selected with specific future theater level assignments in mind. The services should regard those officers as their future specialists in operational level staff and command.

Officers chosen to specialize in theater operations should logically be those who show great potential for high level command and staff positions early in their service. Effectiveness in low level command is an important but not infallible indicator of potential. Candidates for joint staff specialization should also show promise for large-scale intelligence, logistics, or operations—all of which differ from their tactical counterparts in scope, complexity, and length of planning horizon. Likewise, and less obviously, officers with the greatest potential should show special aptitude in the study of military history and the theory of theater operations and strategy. These aptitudes need not be the result of formal training nor need they be of a high order initially, but they are necessary. Only through mastery of military history and theory can operational specialists gain the wide frame of reference necessary in planning and directing campaigns. Individual dedication to maintaining and enlarging these talents will characterize the best joint staff officers and can be encouraged but not enforced by the school system. To find these talents, personnel managers must expose all high quality junior officers to formal courses in the service schools and find the self-educated officers who are already present in the middle grades of all services. The service schools should continue to amend their curricula at the high and middle levels to promote better joint staff officer training.

Operations, unlike tactics, vary among theaters of operations. Political organizations differ strongly. Land forms, climatic patterns, and maritime conditions all have nuances that can only be learned over time. Social values affect operations differently. Not least, dominant military and civilian personalities and ideas dominate regions for long periods and are important considerations during campaigns. Military education for operational art should reflect this. Further, the civil schooling programs of the services can support military schools by making scholarships in foreign affairs, economics, political science, geography, and military history available to operational staff specialists.

As part of the educational process, the services should repetitively assign operational specialists to Asia, Europe, Latin America, the Pacific or to contingency-oriented commands throughout their active service. Ideally, selected officers with line experience in a theater would be further taught the principles of operational art in the schools and employed in command and staff positions of increasing responsibility in that theater. With such a program in effect from the tenth year of service, such officers could concentrate on their geographical specialties during both their intermediate and senior service school years. These officers would be the logical candidates to send as analysts following operations in their areas of expertise. We would also benefit by sending such officers to observe foreign conflicts as we did before World War I.

Operational staff specialists should also prepare themselves for repeated duty in the same staff specialty—intelligence, operations, special operations, logistics, or communications. Their repeated field assignments in the same theater would in a short time produce something unusual and valuable: experts in operational staff work useful anywhere but especially well prepared to operate in a particular region.

Concerns about sharing arduous or unpopular duties across the officer corps militates against any such specialization. So does the service bias toward generalists training and against anything that looks like a general staff. Fears of elitism and otherworldly detachment that come out whenever such programs are proposed would have to be allayed. But doing that is not impossible; the Army has had good success with its second year intermediate school and has successfully avoided elitism so far, and the goal is worthwhile. Specialties already exist in strategic intelligence and foreign areas. Creating supplementary specialists in theater operations and logistics could be done inexpensively and would pay great dividends in providing senior commanders with improved staff support. Far from yielding a crop of eggheads and theorists, this kind of education would sharpen the abilities of the best and most mature leaders of all services. It would mold the Marshalls, Nimitzes, and Arnolds of the next generation.

The haphazard growth of campaign studies courses, second year staff college programs, and individual writing projects has produced a wealth of good but slightly divergent thinking. The next step is for the Joint Staff to direct a strong, liberal but unified edu-

cational program for all schools. This will require organizing faculties qualified in operational art—civilian and military teachers with credentials or experience in theater operations. Special schooling and field assignments for faculty are necessary components of this effort, but within a decade the process will become self-sustaining, with students moving up into the ranks of the teachers.

One reservation should be noted. As the schools build up their programs for teaching operational art they should carefully sustain their abilities to develop service specialists in tactics and strategy. The enthusiasm for "jointness" that came with the Goldwater-Nichols Act tolerates strategists but leaves little room for protecting or encouraging tactical expertise; under the new dispensation every excellent officer has to be "joint." As we begin to educate theater operators, we must correct this error and make the point explicit that all operational success depends on tactical excellence.

Balance would be best achieved by leaving a great deal of freedom in curriculum management to the service schools. The Joint Staff will necessarily dictate some subjects, but services should be left great independence at the level of the intermediate schools—the staff colleges—to raise their own candidates for theater and tactical specialization. Staff college commandants can provide well-rounded journeymen in tactics, operational art, and strategy if they are charged with that duty.[4]

Full inter-service education should be the goal of the highest military schools—the war colleges. There, specially selected field grade officers with joint staff experience should concentrate most of their studies on operational art. Rather than being introduced to the subject at that late stage of their careers, those officers should arrive with some experience and depart expecting to serve most of their remaining years on theater staffs. Only a minority of these senior students—the tactical specialists—should be committed to further study of their own services at the war colleges.

Training for operational art is as important as educating for it. In some ways it is the reciprocal of education. Training exercises serve as laboratories for validating ideas imparted during education, and the results of training exercises add to the evidence used by schools to generalize about operations at any level of war.

Specifically, the military use training exercises to test theoretical and doctrinal concepts, to streamline their operating techniques, or simply to develop, sustain, or enhance skill in com-

mand and staff coordination. Only in training exercises can commanders and staff officers put their organizations into operation under conditions replicating combat. Unfortunately, in the area of training for campaigns the military must build on weaker foundations than it can in studying tactics.

There are, simply put, no training centers or even simulations to support campaign planning or execution. Executive crisis games, short-term joint exercises, and even the Naval War College Global Exercise are all means of gathering principal actors to train for major leadership roles, but these rarely deal with theater issues over a long period. Typically, they either focus on a single aspect of high-level decision making, such as gaming the problems of nuclear release, or they emphasize a particular element of theater action. Logistics and deployment are the actions most commonly portrayed.

To train effectively, we need to put commanders of various sized forces into the roles of theater decision makers who must not only make tactical choices but also—in the case of conventional operations—formulate campaign plans, choose to accept or decline battle, decide what use to make of tactical successes and failure, and advise strategic leaders on the long-term needs and prospects of theater operations. In unconventional operations or in situations in which the armed services play a supporting role, military leaders must have the opportunity to make plans and conduct operations over even longer spans of time. In these environments they must be able to practice and observe the inter-workings of political, economic, information, and military policies in complex multinational settings which represent conditions that are "neither peace nor war."

Whatever the operating circumstances, large-unit commanders and their staffs—corps, army, fleet, and air force commanders—should periodically go through exercises designed to improve their abilities to work with elements of other services, other federal agencies, and other nations at the operational level. This training would differ from the unified command exercises presently conducted as deployment drills in scope, duration, and emphasis on the essentials of campaigning. When appropriate, those headquarters might even train under the direction of non-military agencies such as the Department of State, the Department of the Treasury, or the Immigration and Naturalization Service.

Which department conducts the training is not really important. What is essential is that commanders and their staffs practice

designing and conducting campaigns with all of the other likely participants present. They must train to identify means of defeating large, well structured enemy forces economically, speedily, and effectively. They must be able to coordinate air, ground, naval, and special operations actions with strategic efforts in pursuit of operationally effective objectives. They must not only be familiar with the costs, techniques, and timing of such operations but must also have a background of training experiences that assists them in deciding when, where, and how to fight as well as when to avoid combat. Such a background—partly the product of training, partly a function of education—will assist future leaders in setting the terms of battle and in choosing the actions they should take after a tactical decision has been obtained. Lee's decision to fight at Gettysburg rather than maneuvering for a better opportunity, MacArthur's pursuit of the North Koreans above the 38th Parallel, and Giap's choices late in the Vietnam War are all examples of the kind and importance of choices operational commanders have to make. Military men must give those decisions the same attention they devote to tactical or strategic decisions.

Below the level of world historical choices lies a host of routine skills and techniques that theater staffs and support units must master. This set of ordinary activities includes moving, protecting, and supporting theater forces. Since no one in the force has much experience in planning or conducting activities, operational activities such as regional logistics, theater air campaigns, or coordinated long-term psychological, unconventional and conventional operations, the joint force needs to organize training that will replicate full campaigns. Such training will not only refresh lost skills but will also produce the opportunity to adjust outdated techniques.

At the supporting levels, the services need training programs that accustom their officers to developing realistic options for theater operations and evaluating the relative operational value of such options. Even more basically, the services and joint commands need experience in assembling and manipulating the support for campaigns. Today's tools of theater administration, transportation, communications, intelligence, psychological operations, special operations, and civil-military action are a complex mix of high- and low-technology devices operated by civilians in military organizations. Using them effectively in war will depend to a large extent on the quality of peacetime training.

There is also a variety of active, reserve component, and paper organizations designed to serve theater-level needs. These units include military railway battalions, sea and air terminal operating agencies, special transportation and logistics formations, and almost all of our psychological operations and civil affairs detachments. They do not routinely get to train under a single headquarters, for a realistic period of time, or over the actual distances typical of theater warfare.

In more concrete terms, the training challenge is to create an environment that will accustom theater CINCs, theater staff officers, and theater combat and service units to the conditions of operational warfare before they are actually called on to fight. To get operational art out of the realm of pure theory and move it toward actual capability we need to organize and conduct exercises that will require theater commanders to set goals and design campaigns under the constraints of realistic policies and strategy.

Campaign exercises must provide staff officers with enough information and strategic guidance to force them through detailed option development and analysis. All theater operations depend on good staff work. None is more important or easier to simulate than theater logistics. Training for operational logistics, to elaborate on that single example, would present joint logisticians with the problem of not only devising but also conducting supply, repair, and transportation in an imagined theater of operations.

The staffs involved would have to estimate requirements, find and evaluate sources of supply, identify modes of transportation, and determine the relative capabilities of sea, rail, road, and air transport within a theater. They would have to establish manpower requirements, balance those needs among military, U.S. civilian, and local civilian resources and propose deployment or base-development schemes to be carried out during and after deployment. They would further have to provide for the movement of materiel from the theater's ports over realistically limited lines of support in the face of enemy interdiction and under the pressure of changing operational requirements. Projecting such training over realistic periods—years rather than weeks—would differentiate this kind of training from the present deployment drills.

Obvious as all this seems, the joint force and its training bases do not now have simulations or exercises that put operational staffs in those roles today. The unified commands run the best ex-

ercises and staff studies now being performed but they do it with minimal outside assistance or evaluation. In a period in which economies will be necessary, it is scarcely possible to initiate a series of new exercises. There is no reason, however, that the services and unified commands could not modify their existing exercise program to accomplish simultaneous operational training. The REFORGER (Return of Forces to Germany) series of exercises now takes this approach by building full-sized army group problems around a core of tactical field training exercises. With small changes, other fleet-, air force-, and army-level training events could be modified into full-blown campaigns. Such theater exercises would normally begin before troops initiate training, go on during the field training, and continue afterwards. Rather than stipulating a theater situation for forces on exercises, this method would actually evolve operational conditions through earlier simulation. With little change to the central field training exercise, large headquarters would expand their own activities and derive valuable training at their own level.

This would pay a double dividend. It would end the unrealistic years-long preparation for moving and training relatively small forces. More importantly, it would test and strengthen theater capabilities that are untried under current exercise plans. Instead of merely umpiring or observing tactical formations, operational staffs and commanders would be called on to concentrate, fight, and support a larger force than that actually training. They might, for instance, be required to move real and simulated units on short notice from marshalling areas and ports of debarkation while arranging for the support of the entire force, both real and imaginary, throughout the theater. A theater-level umpire would dictate background conditions and provide strategic guidance to the operational commander. He would also intervene occasionally to change missions, national priorities, troop lists, and the enemy situation. In doing this the actual field or fleet maneuver would be easily subsumed and might, in fact, be relegated to a small, relatively unimportant part of the theater of war.

On a more ambitious scale, we might re-create theater exercises—of the scope of the Louisiana, Carolina, and Kentucky maneuvers of the 1940s—both in the United States and overseas. That would entail massing headquarters and some troops from all over the theater to "fight" campaigns of realistic depth and

breadth. Divisions, corps, and air forces would be small players in such exercises and would have only to provide player cells. They would, however, get the benefits of training to meet theater requirements for long-distance movement, changes in mission, and sustained operations.[5]

The main thrust of such exercises would be at higher levels. Tactical players would participate to represent realistic movement rates, reaction times, sustainment needs, and demands for theater staff assistance. The main combatants—armies, army groups, fleets, and air forces—would fight each other over great distances and at the direction of established unified commands or of hastily organized joint task forces. Questions of campaign planning; troop movement and operational maneuver; air-ground cooperation at theater level; command, control and communications; intelligence collection and dissemination; operational logistics; and phasing the campaigns could all be examined in such a command post exercise. Infrequently examined subjects such as operating ports and communications zones, displacing air bases, conducting military government, and managing civil affairs could be examined in the context of a fictional but active campaign. The reserve component organizations responsible for these highly specialized tasks would receive excellent training, even if they could only play for their two weeks of annual training, and the theater commanders would have the opportunity to evaluate the capabilities of those units.

Such exercises should last for months as a combination of port or garrison command post exercises run at a controlled pace and full-speed field phases in which operational staffs actually displace to direct the action. Umpiring such exercises would be a major undertaking but is feasible if the unified commands exchange umpire teams for each other's exercises. Analysis of completed exercises is the natural work of operational staffs and of war college students. Some exercises of this type should be conducted as short-notice training for headquarters with contingency responsibilities. The training sections of the national or alliance joint staffs would spring such exercises on subordinate headquarters to train them in organizing and operating joint task forces under emergency conditions. If any lesson stood out from the 1983 Grenada operation, it is that our joint training should occasionally put ground, air, and naval components together quickly under the pressure of an emerging crisis. Admittedly this kind of training would take a great

deal of time and money. This defect could be offset by playing at a low level for months without disrupting the day-to-day activities of joint headquarters. But it is also possible, and necessary, to provide simulations which permit single headquarters to train their staffs and war game their plans. Such simulations need to be keyed to the peculiar needs of theater operations, however, and unfortunately this is not the case with any of our present games.

Realistic treatment of time is the element missing from all of the many, expensive, and redundant computerized simulations now available to us. Our games are set to represent combat at the system level and to reflect movement in "real time" or in simple multiples of hours. They depict logistics and maintenance requirements for tactical units without addressing theater-level concerns. The simulations the Army uses are that way because they were written to meet that service's specifications. Theater commanders and staffs need self-standing simulations that will generate realistic tactical outcomes over the course of multiple operations. Operational decisions concern what to do before and after major tactical actions; the battles or operations themselves are influenced by what takes place beforehand. Since this is a matter of weeks and months in conventional operations and years in unconventional efforts, our simulations must be able to cut out periods of important but routine preparation. They must be designed to reflect the results of extended staff actions and nation-building programs after short umpired intervals. Their goal should be to confront the operational commander with important decisions that would normally come months apart in the course of a two- or three-week exercise.

Such games must also produce theater-significant data in all fields. Among other things, they should impose the effects of seasonal weather changes; the capabilities of the theater labor force and economic base; the effects of attitudes in the population and alliance leadership; the theater capacity for road, runway, and port maintenance; and the resource situation in and beyond the theater. The U.S. Army Command and General Staff College's School of Advanced Military Studies plays games of this type now. They are based more on subjective umpiring than on computer sophistication but they lead to interesting points about theater operations.

Whatever techniques the Joint Staff adopts, three elements must characterize all operational level training: all agencies and organizations that influence today's campaigns must participate;

employment of forces must be stressed more than simple deployment; and trainers must feed the results of theater-level exercises back to the educational institutions for analysis and study. None of these things now takes place reliably.

The armed services singly and as a joint force stand at a critical point in their development. National strategy, military organization, and technology are all in a period of basic change. The services are already trying to reshape themselves for the future and in the process are making changes to their doctrines, organizations, and equipment. It is vitally important that in doing these things they accurately gauge the nature of future conflict and then raise and train the forces that we will rely on in the years to come.

Nothing now occurring exceeds the importance of reclaiming our capability for operational level warfare. In this environment the addition of operational art as a new division of military science is more than just a minor adaptation of the way we do business. It is, rather, a fundamental change that should help in casting the shape of other changes we will have to make.

Without developing a logic that converts strategic ends to theater goals and gives shape to tactical actions we cannot assure our future success. No legislated level of "jointness" and no administrative rigor in seeing that all professional officers serve on joint staffs will adequately substitute for the need for sound, nonparochial doctrine based on experience. No doctrine can be effective unless its precepts are taught and its techniques exercised.

Some progress has been made in the schools, and we have never completely abandoned joint training. But the mere introduction of operational art into field manuals and allied tactical publications will not fulfill the promise or challenge of operational art. Having opened a few doors by its presence in our manuals, a real understanding of operational art throughout the force could wholly transform our view of war. It is vital that we inculcate the ideas of the subject into the officer corps of all services and that we transmit our vision of theater operations to other non-military agencies whose cooperation is indispensable. Then it remains for the force to train realistically so as to build up an actual capability for effective theater operations. Rigorous training, if carefully analyzed, will disclose the shortcomings of doctrine, establish material and organizational requirements more accurately, and identify the techniques—and the officers—most likely to lead us to operational success in the future.

NOTES

1. Col. Wallace Franz wrote the earliest of these papers for *Parameters* and *Military Review*. He also joined other members of the U.S. Army War College faculty to found "The Art of War Colloquium" which promoted historical and theoretical discussion in general by publishing original papers and by reprinting the classics of military history and theory. On the civilian side, Edward N. Luttwak wrote a clear and influential critique of western indifference to the operational level of war for the journal *International Security* (Winter 1980/81).
2. One of the first requirements for middle-level Army students—captains and majors—at Fort Leavenworth in the 1930s was to plan the movement of the Union Army of the Potomac from its positions around Fredericksburg, Virginia to concentrate near Harrisburg, Pennsylvania. The supplies, routes, formations, and timing of such a move would challenge most staff officers today. If such a problem were set for their successors today (and it should be!), they would also have to account for the additions of air defense, air support, a motorized support base, modern logistics, and theater air and sea support.
3. See the AFCENT Commanders "Operational Guidance", 1987, for General von Sandrart's treatment of the subject.
4. Periodic reviews by visitors from the Joint and service staffs can easily keep this diversification on track. The greatest danger in the practice is the tendency to lose definition between the three specialties. This is not hard to prevent through supervision.
5. Field exercises are still possible in the United States. In 1987 the III Corps supported by the Twelfth Air Force conducted a one-sided cross country command post exercise in Texas. The exercise, named ROAD RUNNER, was well received, highly instructive, and generally problem-free.

Leadership at the Operational Level of War

William Stofft

There is an old adage that unless society educates both its plumbers and its philosophers, neither its pipes nor its theories will hold water. Military philosophers of earlier ages are the forbearers of the intellectual basis of the profession of arms. They developed the theories which educated the great captains of history, and this tradition of leadership whereby senior leaders pass their experience and their theories to their junior subordinates continues today. The proof of any military theory, however, is its success in battle, and translating theory into action requires leadership.

The fundamental requirements of leadership at the operational level of war apply to all services—land, sea, and air. The foundation of leadership at the operational level of war is training, education, and experience, all of which must be linked thoroughly to understanding strategy. A successful leader at the operational level must know and understand theory at all three levels of war. Good leaders are good teachers at any level. The most important leader in a teacher role, however, is generally someone at the operational level of war simply because that is where military forces have the least experience. The operational level is probably also the least understood of the three levels of war, even though it is the key to setting the environment in battle. Leadership at the operational level of war is a fundamental element of operational art.

The most powerful examples of wartime leadership at the operational level of war generally show up in adversity. It requires courage, for example, of a slightly different type than commonly seen at the tactical level of war. Courage in leadership at the operational level is Lee at Gettysburg telling the remnants of Pickett's charge "It is all my fault." It is Grant at Cold Harbor saying "I regret this more than anything I have ever ordered." It is Eisenhower carrying a note for the press in his uniform pocket on D-Day in which he accepts blame for the failure of the assault on the Normandy

beaches. The failure never came, but Eisenhower had the courage to accept it had it been there. Simpkin summarized courage in leadership at the operational level: "The operational commander needs the courage to keep his judgement undoubted when forced to accept short-term setbacks for the sake of long-term aims, or to follow a course which he knows will cause heavy casualties among men who trust and respect him. Above all, he needs the moral courage to make big decisions fast and to stick to them."

Leadership at the operational level requires a comprehensive understanding of war. This requires an active mind, a mind which is open and curious, and one which has more than simply technical competence. War is a human activity which requires human intelligence for success. This is certainly not a new concept; the great captains of history generally have had their greatest successes in leading at the operational level, and they pursued the intellectual side of the profession of arms as well as the practical and technical aspects. The study of the profession of arms is the study of history. If history is the memory of mankind, then military history is the memory of the profession of arms. Without memory, no reasonable perspective on events is possible. Knowing military history is central to truly understanding the profession of arms.

Leadership at the operational level requires both competence and confidence. One must know what to do and be prepared to do it. There is a fine line between risk and gamble, however. The operational level commander must understand both the tactical level situation and the operational level requirements so he can weigh the potential risks. For example, when a CINC complains that artillery ammunition is being wasted in preparatory fires rather than being saved for future use, the ground component commander may explain that the ammunition is not being wasted but being invested in future success; the CINC must be competent enough to understand the answer and have enough confidence in his subordinate to leave the control of the artillery to him. To see not only what will be necessary in the future, but what immediate actions are necessary, requires a vivid imagination and a mind comfortable with change.

While experience is important to successful leadership at the operational level, experience alone is inadequate. Frederick the Great made the point that if experience were all a great leader needed, then all of his pack mules should be generals since they had been on

campaign for years. Plato observed that while experience teaches all the best flute players, it also teaches all the worst ones.

How to best prepare for leadership at the operational level is a blend of learning by education, training, and experience. This learning must occur constantly, for both oneself and one's subordinates. General Marshall conducted seminars at Fort Benning where subordinates were exposed to reading, recitation, and reflection. General Van Fleet spent three tours of duty teaching Reserve Officer Training Corps cadets at South Dakota, Nebraska, and Florida before World War II—certainly not the preparation one might expect for a future great operational level commander for war, but he had the advantage of access to large university libraries, and he had the good sense to use them. Understanding war also requires one to go beyond the classroom and wherever possible to explore past military successes and failures where they took place.

Even as we study the past, however, we must be constantly aware that there is both continuity and change in the profession of arms. Theory and doctrine generally evolve in response to technology and other socio-economic factors, but the fundamentals of war remain more constant. The process of studying the past and developing theory today is healthy; it expands one's knowledge of military theory and history. Military knowledge, however, grows faster than our doctrine can be developed, because doctrine is the result of a synthesis of fundamentals of the past and capabilities of the present. Any modern theory of war must apply to all services jointly, but theorists, after all, are service warriors in most cases and their theories reflect their experience. The continental theorists, Clausewitz and Jomini, were soldiers; the maritime theorists, Mahan and Corbett, were sailors; the air theorists, Mitchell, Douhet, and Trenchard, were pioneers of flight; and the revolutionary theorists who converged military and political theory, Lenin, Mao, and Ho, were themselves revolutionaries. Today's military theorists are developing the doctrine of joint warfare wherein the capabilities of all services complement each other at the operational level of war. Leadership from the joint commander in chief, however, will be required to translate the doctrine into practice.

Modern warfare demands a faster tempo of operations. Forces must move faster through larger areas against more powerful weapons with longer ranges. The higher risk of casualties from friendly fire on a confused battlefield requires that commanders

consider the risks associated with weapons, geography, joint and combined operations, and vision. Commanders leading from the operational level of war must be comfortable with decentralized actions. They must understand that when their demand for information is high, that information will also be scarce. They must be able to tolerate ambiguity and uncertainty and resist the temptation to meddle in tactical decisions.

Leadership at the operational level requires the ability to intuitively acquire the feel of a campaign. Jomini viewed it as being able to mentally shape the battle while avoiding being shaped by the opponent. Clausewitz characterized it as a test of wills where both sides used psychological operations, deception, and feints. The historian J.B. Young, in his history of the battle of Gettysburg, wrote that "The supreme test of a general is his readiness to meet alarming developments which menace all his former calculations, . . . his mastery of emergent circumstances, his poise and behavior when all his plans go awry, his quickness of insight and fluidity of action when confronted by unexpected happenings—in short his ability to face the unexpected."

The most critical element of leadership at the operational level may be the cohesion of staff teams—the groups consisting of commanders and staffs. In the 1945 after-action interviews with captured German officers they agreed that the German Army was shattered after the battle at Falaise Gap, but their staff teams escaped. Their operational teams of commanders and staffs were still viable, and the German Army was able to rebuild its fighting forces around those experienced groups. Allowing the German staffs to escape intact at the Falaise Gap eventually helped the Germans to conduct their counter-offensive in the Ardennes some months later.

A competent staff team is essential to leadership at the operations level of war, because coping with the complexities of modern military campaigning is simply beyond the capabilities of one person. Operational art is sequencing a series of battles and major operations which will constitute a campaign—the goal of the campaign is a strategic objective. The campaign includes conditions, probabilities, risks, and outcomes, and there is a narrow margin for error because once a large campaign is set in motion, it is difficult to halt or change direction. No coherent campaign is possible without a lucid vision of how it should conclude, and the commander at the operational level must provide that vision.

The crux of leadership at the operational level is reconciling tactical events with strategic aims, and the staff must collectively understand that. This is the essence of operational art. Because the strategic aim may often be ill-defined, the commander and his staff must be able to develop and define the appropriate tactical objectives necessary to achieve the strategic aim.

The commander must be able to convey to the staff a clear intent of what he wants to be done. Patton considered his staff to be practically of a single mind. Military planning generally occurs under mental stability, when staff members are lucid and at their best, but the execution of that plan takes place under tremendous stress. Staffs are torn by the need for procedures, but they must allow, indeed demand, flexibility to deal with the unexpected. The staff cannot wait for nor anticipate genius. As Montgomery said, "It will be unusual to find combined in one individual all the qualities needed for successful leadership." Good staffs, however, can complement, reinforce, and enrich the efforts of individual members into something greater than the sum of the parts. They can gain consensus without weakening the product.

The commander at the operational level needs time to think. The staff provides him that time as it communicates information to subordinates and carries out the commander's decisions. The commander uses that thinking time to develop guidance for the staff. Montgomery needed time for quiet thought and reflection; he went to bed at 2130 each night. Patton lived apart from the staff, read daily, and slept soundly. Slim insisted on unbroken sleep; his guidance to his staff was "only awaken me if no one else can handle the problem." Each of these leaders maintained a consistent vision on which the staff could focus its efforts, while the leaders conserved their own personal energy.

The commander, his staff, and his subordinate commanders must have intensity without tension. Nelson advocated his subordinates to "waste not a minute" in driving toward a fixed purpose. All actions of the group must work toward that fixed purpose, but it needs a delicate balance of singleness of purpose without blind obedience. It requires compatibility and immense respect and trust. This becomes increasingly important in joint and combined staffs where individuals will have widely differing backgrounds and experiences.

While staffs are certainly an essential element of leadership at the operational level, there can also be too much of a good thing.

Unnecessary layers of staffs impede the process of control at the operational level of war. There is a useful analogy in comparing the locomotive and the airplane. The locomotive has few controls, perhaps a throttle and a brake; it does not provide many options for the engineer, but it is reliable and strong. The airplane, on the other hand, has a myriad of controls and many options, but it is harder to insure reliability. Once the locomotive is in motion there is a good chance it will reach its destination, but there are few options on the way. The airplane has an almost infinite number of options, but is subject to a wide variety of problems. A railroad needs a smaller staff to operate effectively, while an aviation system demands a relatively larger one. This is another way of saying that simple plans and a minimum layering of staffs are more apt to gain success at the operational level than complex plans which will require large staffs to execute and monitor.

While control is a compensator for unreliability, it also limits speed. The idea is to gain the minimum control necessary to compensate for unreliability. The larger the staff, the greater the control, but the CINC's assurance of his will being implemented is lower. A large staff simply takes more time to do things and the potential for error increases because there are more people involved to make mistakes. The first casualty of war at the operational level should be the size of the staffs. Commanders will have to reduce intermediaries and stabilize staff relationships, because there will just not be enough time to see and talk to everyone on a large staff. Commanders will come to rely on a small core of trusted agents who clearly and intimately understand their will and their vision.

The great captains understood the value of teamwork with their staffs at the operational level of war. Montgomery's advice was to have a good chief of staff, and he followed that advice with de Guingand as his own chief. Patton was generally considered to be unsuitable as a staff officer, but could put together good staffs and get the most out of them. In the end the personality of the leader is indispensable. Men rather than maxims are central to success at the operational level of war. According to Sir John Hackett, "The secrets of success and failure in armies is found in the hands and hearts of men. War is not another engineering problem to be managed." Commanders who are successful at the operational level of war must reconcile competing aims, dominate events, and anticipate, anticipate, anticipate. They must under-

stand the military past in order to reach their goals in the future. They make decisions today for tomorrow.

Among those who have successfully answered the challenge of leadership at the operational level of war and left behind some thoughts on how they did it are Patton ("Step outside the ordinary frame of reference to do something not seen by others."), Wavell ("Intellectual initiative requires a tolerance for deviant behavior."), and Slim ("The highest test of generalship is to hold the balance between determination and flexibility."). Then there is the common soldier who sees successful senior leadership as being able to do something you're not supposed to and having it come out all right.

Creativity is essential to leadership at the operational level. Creativity, however, is a difficult thing to achieve. Charles Mingus, the noted jazz musician, once said that "Creativity is more than just being different. Anybody can play weird; that's easy. What's hard is to be as simple as Bach. Making the simple complicated is commonplace; making the complicated simple, awesomely simple, that's creativity." When we look at the great captains, they were able to make the complicated look simple, so simple that we may overlook just how difficult it really was.

Reading About Operational Art

Richard Swain

Theory, or doctrine for that matter, without a sense of history is a very weak foundation on which to base one's understanding of war. Theory is synthetic, contextual, and hypothetical. It is synthetic in that it is man-made, a *creative* explanation of regularities observed in the nature of things. It is contextual, because the observed regularities are necessarily qualified by their environment, even if it is the condition of "all things being equal," which, of course, they never are. Theories are hypothetical systems, based upon evidence, requiring continuous revalidation, subject always to disproof or modification but never final confirmation.[1] History read, as Sir Michael Howard has proposed, "in width, breadth and context," [2] is both the best source of theory and of the body of evidence by which theories can be tested under varied conditions. Theory, in turn, if used with care, can clarify and illuminate the study of history.

It is necessary to read history in the first place, because that is the only way to deal with the real thing. "A review of strategic theory," as John Keegan points out, "is no more a study of war than a history of political science is a handbook of government." [3] It is an understanding of war or wars that is the object of both theory and military history. The theorist seeks general explanations, the historian specific. But written history, too, is synthetic, contextual, and hypothetical. Unlike the theorist who seeks to explain relationships between general phenomena, the historian seeks connections between specific facts or events. Critical historians seek an understanding of various alternative solution sets as well, although most responsible historians will stop short of postulating necessary alternative outcomes. The framework that results, the telling of the story, consists of a structure of causal relationships, created by the imagination of the historian, always from incomplete evidence. Like a theory it is of necessity a *simplified* vision of reality. If the historian claims less for his re-creation than the theorist for his creation, it is no less subjective in content or synthetic in nature, nor is it any less subject to competition from alternative explanations.

History must be studied in width, depth, and context because, as Professor Raymond Aron has written, "the understanding of history as a train of events obviously implies the retrospective grasp of what was *possible* at the moment of decision but *did not happen*. . . . It implies also the oscillation between massive phenomena tending to push history in one direction and individual acts, minority initiatives, or accidental phenomena (not determined by the whole situation) that straighten or turn back the course of history. History as a train of events belongs by nature to what we have called *probabilistic determinism*."[4] Professor James M. McPherson's history of the American Civil War, *Battle Cry of Freedom; the Civil War Era* (New York: Oxford University Press, 1988), is a brilliant example of the application of the "contingency" theory of history.[5]

Michael Howard's guidelines for the study of history are indicative of the concerns of those who practice what has come to be known as the "new military history," a concept of war that transcends military maneuvers and events to consider social, political, technical, and economic context as well as those other, nonmilitary means of conflict and diplomacy which do not go away upon declaration of war.[6] Howard's personal concern, expressed in 1969, was that post–World War II military historians continued to conform to a model of military history long since rendered obsolete by events. "The heyday of the orthodox military historian," he wrote, "was in fact really over before this century began, and as historiography goes, it was very brief." According to Howard, this traditional view of military history "is concerned primarily with the maneuvers of armed forces within finite and easily comprehensible parameters of space and time, leading to engagements in which is decided the straightforward issue of victory or defeat."[7] This sort of model was obsolete, Howard argued, by the time of the American Civil War. It has been particularly counter-productive since the end of World War II.

John Keegan has picked up this argument in his book, *The Mask of Command* (New York: Elisabeth Sifton Books, Viking Penguin, Inc., 1987), in which he argues that dependence on "the phenomenon of the conqueror—Alexander, Caesar, Genghis, Napoleon, Hitler . . . has led to military academies teaching for 150 years a concept of strategy both "crippled" and of "distorting effect."[8] John Terraine, arguing earlier in 1971 in the *Journal of the Royal United Services Institute* for a clear differentiation of function

between historian and theorist, pointed out that the misreading of history along the lines described by Howard and Keegan led a generation of European soldiers to believe the Napoleonic victory remained possible even after the American Civil War, because they perceived in Moltke's victories its continuation. In retrospect, it is clear that they did so only by ignoring the role played in Moltke's triumphs by enemy errors and the rather salient point that the Franco-Prussian War of 1870–71 did not end on the battlefield of Sedan.[9] Terraine's remarks might lead the contemporary reader to question whether the 1967 and 1973 Arab-Israeli Wars, coming when they did while the U.S. Army was involved in a losing, unpopular, and unheroic war in Vietnam, did not help blind the Army to lessons then being provided. The myopic post-1976 focus on heavy-force war in Europe based upon the conceptual model of *blitzkrieg* (prior to 1942) might be the result.

The great problem with the way military officers have gone to history for lessons about war is that their method has generally been inductive.[10] If they want to learn how to fight outnumbered and win, for example, they search out two or three examples where that was done successfully, look for common threads, and adopt them as principles; those armies which were less successful in such enterprises are simply ignored. Students tend to forget that while they may thus discover the *necessary*, they in no way have isolated the *sufficient*. The study of Jackson's Valley Campaign and Rommel's desert operations have become classics of this sort in military schools at Fort Leavenworth.

What the method of generalizing from the specific to the universal has tended to overlook has been the contribution of the loser (Schlieffin's famous observation that for a Cannae one needed a Varro as well as a Hannibal), the conditions which made the counter-intuitive outcome possible, and the many occasions where smaller forces were defeated by larger ones. Conflicts which illustrate an expected outcome are never as attractive as those whose conclusions appear to defy conventional wisdom. With regard to operational history, it becomes too easy to lose sight of battles and campaigns as means to higher ends and to overlook alternative paths not taken which might have led to very different outcomes.

It is possible for the professional soldier or nonspecialist civilian to read military history in accordance with Professor Howard's strictures and to avoid falling into the errors described. One can even

read and learn about the conduct of campaigns and major operations without reverting to the self-confirming habits of the "Drum and Trumpet" approach for which military officers are so often criticized by the "new military historians." How then does one begin?

The history of the operational art is to be found in the accounts of campaigns and the independent actions of large units within a theater of operations or theater of war. While it is quite true that the concept of operational art is fairly new, the activities it describes have existed in warfare in one form or another throughout history. To say operational art did not exist before the twentieth century would be like saying language did not exist until it had a grammarian.[11] Operational art comprehends battle without being concerned with its actual conduct. Indeed, operational art strives to prepare the way for battle on the most favorable terms and then exploits tactical success, or seeks to minimize the damage of tactical failure, once battle is over. The campaign itself is the sum total of the competing efforts of at least two hostile forces acting in opposition one to the other. Operational art involves the creative use of battle, the threat of battle, or the denial of battle, to accomplish a particular strategic purpose, within a specific context, the most significant part of which is most often the opposing actions of a foe. It encompasses all actions from selection of a suitable military objective through the estimate and planning process, the conduct of operations, to the achievement of that objective or resignation in defeat.

"Read again and again the campaigns of Hannibal, Caesar, Gustavus Adolphus, Turenne, Eugene, and Frederick," wrote Napoleon. Today one must study as well the campaigns and operations of a Mao, a Giap, a Chaim Bar-Lev, a Ridgway, the great commanders of the wars of the industrial era, of the twentieth century age of the radio and internal combustion engine, and of the nineteenth century age of the telegraph and steam engines which preceded it. For war has turned around several times since the age of Napoleon both in means and in content, and the operational art has changed within it.

The beginning student of the operational art, if he is a U.S. Army officer, could do worse than to start with two books by the scholar most entitled to be known as the historian of the United States Army, Professor Russell E. Weigley. The first of Weigley's books thus recommended is *The American Way of War: A History of*

United States Military Strategy and Policy (New York: MacMillan Publishing Co., Inc., 1973). The second is *Eisenhower's Lieutenants; The Campaign of France and Germany, 1944–1945* (London: Sidgwick & Jackson, 1981). Weigley, writing before the popularization of the term "operational art," began the *American Way of War* with a history of the concept of strategy. He makes clear the truth that in the two hundred years of the American Army, the idea of strategy has undergone an expansion of content of which it is only that final extension following the Second World War that ultimately required the adoption of a new notion to fill the ground thus abandoned—the use of the engagement to achieve strategic ends. The *American Way of War* provides a pair of ideal types from the American Civil War which Weigley states have influenced subsequent American military history—Lee's "Napoleonic" strategy and Grant's strategy of annihilation. In following the development and evolution of these conceptual types, Weigley discusses in broad terms the conduct of grand operations in all America's wars, setting the stage for his extraordinary study of America's most successful campaign, the Allied effort in northern Europe from June 1944 to May 1945, the subject of *Eisenhower's Lieutenants.*

Eisenhower's Lieutenants is an exceptionally detailed, critical, and comprehensive study for a single-volume work. It continues the conceptual dialectic begun in *The American Way of War,* arguing, for example, that U.S. equipment, designed for mobility and maneuver, was a bad fit for a U.S. strategy inherited from Grant, based upon raw power and superior resources as the principal means of success. Those who find Weigley too much to start with may prefer Charles B. MacDonald's *The Mighty Endeavor; American Armed Forces in the European Theater in World War II* (New York: Oxford University Press, 1969). MacDonald addresses both the Mediterranean and European theaters in a book of remarkable clarity and economy of expression.

Because much of the design and execution of operational art is focused on the actions of senior commanders, it is worthwhile adding depth to any campaign survey by consulting the biographies and autobiographies of senior leaders. Dwight D. Eisenhower's *Crusade in Europe* (New York: Da Capo Press, 1977) and Omar Bradley's own autobiography, *A Soldier's Story* (New York: Popular Library, 1951), both remain valuable. Nigel Hamilton's three-volume biography of Montgomery offers the vision of the

war as Monty would have had it told. The last two volumes, *Monty: Master of the Battlefield, 1942–1944* (London: Hamish Hamilton, 1983) and *Monty-Field Marshal: The Final Years, 1944–1976* (New York: McGraw Hill, 1986) address the war in northern Europe.

The published papers of major commanders are particularly useful for gleaning insights about how the decision-maker viewed his task at any particular moment. Two important sources of this type are volumes III and IV of *The Papers of Dwight David Eisenhower; The War Years*, Alfred D. Chandler, Jr., ed., (Baltimore: The Johns Hopkins Press, 1971), and Martin Blumenson, ed., *The Patton Papers*, II (Boston: Houghton Mifflin, 1974). Eisenhower's papers are particularly valuable because of his habit of keeping a personal journal dictated to his aide throughout the campaign. Finally, for depth of inquiry, there are the U.S. Army official histories, too many to list here, which still remain models of operational history. Forrest C. Pogue's *The Supreme Command* (Washington, D.C.: Office of the Chief of Military History, 1954) provides an excellent view from theater level. Gordon Harrison's *Cross Channel Attack* (Washington, D.C.: Office of the Chief of Military History, 1951) is very good on the Normandy invasion.

Of course, Americans were not the only operational commanders in World War II. Indeed, Europe was not the only theater. One would be remiss to omit the accounts of German campaigns and operations which, if they never achieved a strategic objective capable of producing a favorable outcome to the war, remain, in themselves, models of daring concept and execution. Probably the three most popular works by German authors are autobiographical: Erich von Manstein's *Lost Victories* (Chicago: Henry Regnery, 1958), Heinz Guderian's *Panzer Leader* (New York: E. P. Dutton, 1952), and Erwin Rommel, *The Rommel Papers*, B. H. Liddell Hart, ed., (New York: Harcourt, Brace and World, 1953). For the Soviet armies, there are John Ericson's *The Road to Stalingrad; Stalin's War with Germany* (New York: Harper & Row, 1975) and *The Road to Berlin* (London: Weidenfeld and Nicolson, 1983), which unfortunately are cursed with terrible maps.

The single best commander's account from the war comes from an unlikely theater and an entirely different kind of war, Bill [Sir William] Slim's *Defeat into Victory* (New York: MacMillan, 1972). Slim is unique in his ability to convey to the reader a sense of how he thought through his operations, how he anticipated enemy actions, where and how he erred, and why it all worked out the way it did.

It is now fifty years since the beginning of World War II, more than twice the interval between the outbreaks of the two world wars, and six years more than the separation between the Franco-Prussian and the Great War. One is compelled, therefore, to broaden the base of inquiry to compensate for the lack of proximate examples. It is useful to go back in time, staying for now in the western tradition in which the state, or at least the sovereign, exercised a monopoly on the use of military power, to see how the art of the campaign has changed over time. It is useful to pursue Weigley's hypothesis for awhile by examining first the American Civil War. The classic studies of Confederate strategy in the East are still Douglas Southall Freeman's *Lee's Lieutenants* (4 volumes) (New York: Charles Scribner's Sons, 1970), and G. F. R. Henderson's *Stonewall Jackson and the American Civil War* (New York: Da Capo, 1988). Both Freeman and Henderson are gifted critics who discuss operations within both general and specific contexts.

For the Western theater, there is Thomas L. Connelly's *Army of Tennessee*, vol. I, *The Army of the Heartland*, and vol. II, *Autumn of Glory* (Baton Rouge: Louisiana University Press, 1967–71). Two autobiographies address the Union strategy that worked: *The Personal Memoirs of U.S. Grant* (New York: Da Capo, 1982) and *The Memoirs of General William T. Sherman* (Bloomington: Indiana University Press, 1957). A primary document of inestimable value for understanding Grant's view of the campaigns in 1864–65 is his final report to the Secretary of War written in Washington, D.C., on July 22, 1865, "Report of Lieut. Gen. Ulysses S. Grant, U.S. Army, Commanding Armies of the United States, including operations March 1864–May 1865," in *The War of the Rebellion; A Compilation of the Official Records of the Union and Confederate Armies*, series I, volume XLVI, Part I, *Reports* (Washington, D.C.: Government Printing Office, 1894), 11–60. A recent book which addresses the Civil War as the "first modern war" is Edward Hagerman's *The American Civil War and the Origins of Modern Warfare* (Bloomington: Indiana University Press, 1988). In the words of one reviewer, "Hagerman artfully creates a stage that provides a backdrop for the . . . emergence of operational art." Perhaps the most comprehensive Civil War campaign study is Edwin B. Coddington's *The Gettysburg Campaign* (New York: Charles Scribner's Sons, 1984).

Still further back are the campaigns of Napoleon and Frederick the Great, which provided the empirical data for classic military the-

ory. David Chandler's *The Campaigns of Napoleon* (New York: Macmillan, 1966) is the current study of choice, although its use supplemented by the Krasnoborski maps in Vincent J. Esposito's and John R. Elting's *A Military History and Atlas of the Napoleonic Wars* (New York: Frederick A. Praeger, 1964) is even better. Frederick the Great has enjoyed something of a renewed popularity in recent years. The best treatment of his military practice is probably Christopher Duffy's *The Military Life of Frederick the Great* (New York: Atheneum, 1986). Yet another great campaigner, often overlooked by Americans, is John Churchill, the first Duke of Marlborough. The one-volume abridgement of Winston Churchill's four-volume masterpiece, *Marlborough: His Life and Times*, by Henry Steele Commager (New York: Charles Scribner's Sons, 1968), is well worth consideration. One can end this general survey with selected readings from Hans Delbruck's *History of the Art of War Within the Framework of Political History*, trans. by Walter Renfroe, Jr. (Westport, Conn.: Greenwood Press, 1975–1985), especially volumes I and IV, *Antiquity* and *The Modern Era*, respectively. Delbruck could claim with some authority to be the father of "modern military history."

From this survey, one should reverse direction and return to the present, stopping along the way to become familiar with the more famous campaigns on the one hand, and the relatively indecisive ones on the other. It is a capital error to limit one's study only to those campaigns which approximate the ideal, for that overlooks the role that structural imbalance and command error plays in such affairs.

Napoleon's great British rival was the Duke of Wellington. The campaigns of the Peninsular War provide an interesting case study of the relationship of conventional forces in front and irregular forces in the rear. An easy study is Michael Glover's *The Peninsular War, 1807–1814* (London: David and Charles, 1974), supplemented with S. G. P. Ward's *Wellington's Headquarters: A Study of the Administrative Problems in the Peninsula, 1809–1814* (London: Oxford University Press, 1957), a small book that fills in the logistic dimension so often missing from campaign pieces. A more recent and comprehensive book on this vital subject is Martin van Creveld's *Supplying War: Logistics from Wallenstein to Patton* (New York: Cambridge University Press, 1977).

The most famous campaigns of the nineteenth century, after those of Napoleon and the American Civil War, are those of Ger-

man unification and the Anglo-Boer War. Two excellent studies of Moltke's campaign are Gordon Craig's *The Battle of Koniggratz* (London: Weidenfeld and Nicolson, 1965) and, perhaps the best war study by a post–World War II historian, Sir Michael Howard's classic *The Franco-Prussian War* (London: Methuen, 1985). A comprehensive study of the South African war is found in Thomas Pakenham's *The Boer War* (New York: Random House, 1979). The latter conflict has the value of providing examples of both conventional and irregular warfare, albeit in some fairly unique terrain and circumstances.

World War I presents something of a problem to the student of operational art, particularly on the Western Front. Following the failure of the Schlieffen Plan, the front remained stalemated until 1918, and operational art had to do more with orchestration than with maneuver. To observe that this was in some ways inevitable, given the numbers and material basis of armies, does not, of course, mitigate the horror that resulted, nor remove the necessity to study the attempts by the operational commanders of the day to overcome the deadlock. B. H. Liddell Hart's biography *Foch: The Man of Orleans* (Boston: Little Brown, 1932) is one relevant study. John Terraine's *Ordeal of Victory* (Philadelphia: J. P. Lippincott Co., 1963), a biography of Lord Haig, is another. Correlli Barnett's *The Swordbearers: Supreme Command in the First World War* (New York: William Morrow, 1964) provides a story of the war in terms of the attempts of four supreme commanders—Moltke, Jellicoe, Petain, and Ludendorff—to deal with the consequences of tactical deadlock; Jellicoe, of course, at sea. After that, one can select from any number of campaign or battle studies. Perhaps the best is Alistair Horne's *The Price of Glory: Verdun, 1916* (New York: St. Martin's Press, 1963).

World War I was not fought only on the Western Front. Studies of other areas are Alan Moorehead, *Gallipoli* (New York: Ballantine Books, 1956); Cyril Falls, *Armageddon: 1918* (Annapolis: The Nautical and Aviation Publishing Company, 1979) which treats Allenby's campaign in the Middle East; and of course, T. E. Lawrence, *Seven Pillars of Wisdom*, which addresses the problems of fighting a guerrilla campaign in a tribal society. For the Eastern Front, there is the unique memoir of General A. A. Brussilov, *A Soldier's Notebook: 1914–1918* (Westport, Conn.: Greenwood Press, 1976). Finally, there are the superb Australian official histories by C. E. W. Bean and perhaps more general officers' memoirs from all sides than any other war.

Aside from Eisenhower's campaign in World War II, there are a number of other periods worth examination. The campaign in the West in 1940 has become a classic of a sort. Alistair Horne's *To Lose a Battle; France 1940* (New York: Penguin, 1979) is a good beginning. The novelist Len Deighton has written an interesting examination of the same campaign, *Blitzkrieg: From the Rise of Hitler to the Fall of Dunkirk* (New York: Alfred A. Knopf, 1980). Another theater of some popularity with students of operational art, notwithstanding its unique environment, is that in North Africa. Barrie Pitt's *The Crucible of War*, 2d ed., 3 vols. (London: PAPERMAC, 1986) is a thorough treatment. Two additional autobiographical studies of exceptional value are Friedrich Wilhelm von Mellenthin, *Panzer Battles; A Study of the Employment of Armor in the Second World War*, L. C. Turner, ed., (Norman: University of Oklahoma Press, 1962), and Frido von Senger und Etterlin, *Neither Fear Nor Hope* (London: MacDonald, 1963). Both Mellenthin and von Senger fought on several fronts and experienced the operational art in its varied forms. Both sought to write didactic history.

World War II was also fought in the Pacific. D. Clayton James' three-volume study of the enigmatic and praetorian Douglas MacArthur, *The Years of MacArthur*, 3 vols. (Boston: Houghton Mifflin, 1970–1985), is the definitive study of the Southwest Pacific from the commander's perspective. An army likely to begin its next war on the defensive and to fight without the benefit of logistic plenty could do well to consider the implications of MacArthur's problems. There is much to be learned from a study of the defensive operations in the Philippines, not least of which is the example of General Wainwright's classic withdrawal into Bataan. Again, *The United States Army in World War II* series, the so-called "Green Books" are useful, especially Louis Morton's *The Fall of the Philippines* (Washington, D.C.: Office of the Chief of Military History, 1953). Air operations in MacArthur's theater are described by General George Kenney's autobiographical account, *General Kenney Reports*, recently reprinted by the Office of Air Force History.

It is also necessary to escape the mind-set that operational art consists only of a search for the Napoleonic Battle. Sir Michael Howard has presented, in several essays, a picture of war transformed since 1945, in the first place by the threat of nuclear suicide at the top and by the loss of government monopoly on violence and regional instability at the bottom.[12] Operational art—the

conception, design and execution of campaigns and major operations—must go on today in that very different environment.

Since World War II the world has seen a variety of conflicts, none of which has risen to the global scale. Matthew B. Ridgway's *The Korean War* (New York: Da Capo, 1967) is still a classic. For the post-colonial period Bernard Fall's *Street Without Joy* (New York: Schocken Books, 1972) is an extraordinarily sensitive treatment of the French attempt to restore their empire in Southeast Asia. Alistair Horne's *A Savage War of Peace: Algeria, 1954–1962* (New York: Viking, 1977) documents the French experience in Algeria. General Bruce Palmer's *The 25-Year War: America's Military Role in Vietnam* provides a perceptive, if not final, treatment of the American experience which some would maintain was an abandonment of operational art.

Even more than Vietnam and Korea, the Arab-Israeli Wars have left their mark on contemporary operational thinking. It is unquestionable that their conduct had extraordinary influence on the U.S. Army's thinking as it came out of Vietnam. It remains to be seen whether that impact was for good or ill. Perhaps because these wars resembled the armored campaigns of World War II, they convinced a generation of American commanders that they could still usefully play the roles of Patton and Rommel, and ignore Passchendaele, Dien Bien Phu, Khe Sanh, and the battle of Ap Bac. President Chaim Herzog's *The Arab-Israeli Wars: War and Peace in the Middle East* (New York: Random House, 1982) provides an excellent overview and summary as does Trevor N. Dupuy's *Elusive Victory: The Arab-Israeli Wars, 1947–1974* (New York: Harper & Row, 1978). Two very good studies of both sides of the hill in 1973 are Avraham (Bren) Adan, *On the Banks of the Suez: An Israeli General's Personal Account of the Yom Kippur War* (San Rafael, Calif.: Presidio Press, 1980), and Saad el Shazli, *The Crossing of the Suez* (San Francisco: American Mideast Research, 1980).

This brief list is hardly comprehensive; it is just a beginning. Those who would go further might wish to avail themselves of the Combat Studies Institute's Historical Bibliography No. 3, *The Operational Art*, available from the Combat Studies Institute, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 66027; the United States Military Academy, Department of History's *Professional Officer's Reading Guide*; or the U.S. Army Center of Military History's *Guide to the Study and Use of Military History.*

"A soldier in peacetime is like a sailor navigating by dead reckoning," Michael Howard observed. "You have left the terra firma of the last war and are extrapolating from the experience of that war."[13] Reading military history provides the foundation for understanding the concept of operational art, although that reading should not be confined simply to the last war. Extrapolating from past wars the use and misuse of operational art provides an azimuth for planning and conducting future wars.

NOTES

1. A definition distilled from discussions in Raymond Aron, "What Is a Theory of International Relations?," *Journal of International Affairs* 21 (1967): 186.
2. Michael Howard, "The Use and Abuse of Military History", *Journal of the Royal United Services Institute* 107 (February 1962): 7.
3. John Keegan, "Grand Illusions," *The New York Review of Books* 33 (July 17, 1986): 38.
4. Raymond Aron, "Three Forms of Historical Intelligibility," Ch. 1 of *History, Truth, Liberty: Selected Writings of Raymond Aron*, ed. by Franciszek Draus (Chicago: University of Chicago Press, 1985), p.41.
5. See the interview of Professor McPherson by Elizabeth Brown "Writing the Story of a Larger-Than-Life Time," *The Christian Science Monitor* (April 10, 1989): 12–13.
6. See Michael Howard, "The Forgotten Dimensions of Strategy," *Foreign Affairs* 59 (Summer 1979): 975–986.
7. Michael Howard, "The Demand for Military History," *The Times Literary Supplement* (13 November 1969): 1294. Dr. Lorenzo M. Crowell analyzes the concept of Napoleonic victory in "The Illusion of the Decisive Napoleonic Victory," *Defense Analysis* 4 (December 1988): 329–346.
8. John Keegan, *The Mask of Command* (New York: Elisabeth Sifton Books, Viking Penguin, Inc., 1987), p. 7.
9. John Terraine, "History and the 'Indirect Approach'," *Journal of the Royal United Services Institute* 116 (June 1971): 44.
10. See for example the criticism of Bernard Brodie, "Strategy As a Science," *World Politics* 1 (July 1949): 467–488.
11. A simile borrowed from Professor Umberto Eco, "Reflections on 'The Name of the Rose'," *Encounter* 64 (April 1985): 8.
12. Michael Howard, "Changes in the Use of Force, 1919–1969, Ch. 7 of *The Aberystwyth Papers: International Blities, 1919–1969*, ed. by Brian Porter (Oxford: Oxford University Press, 1972), pp. 140–159 and, by the same author, "War and the Nation-state," *Daedalus* 108 (Fall 1979): 101–110.
13. Michael Howard, "Military Science in an Age of Peace," *RUSI Quarterly* 119 (March 1974): 4.

Contributors and General Editors

Lt. Col. Price T. Bingham (USAF, Ret.) is a graduate of the U.S. Air Force Academy and holds an M.A. in military history from the University of Alabama. He is widely published on the subjects of airpower and operational art in professional journals such as *Parameters, Airpower Journal, Strategic Review,* and *Armed Forces Journal International.* A fighter pilot, he served three years in Southeast Asia. At the time of his retirement he was Chief, Current Doctrine Division, Airpower Research Institute, Center for Aerospace Doctrine, Research, and Education (CADRE), Maxwell Air Force Base, Alabama. While at CADRE he helped write the March 1992 edition *Basic Aerospace Doctrine of the U.S. Air Force* (AFM 1–1).

General Charles L. Donnelly, Jr. (USAF, Ret.), is a graduate of Otterbein College, holds a master's degree from George Washington University, and is a graduate of the Air Staff College, the Air War College, and the Royal College of Defence Studies, London. During his career he was the Chief of the U.S. Military Training Mission to Saudi Arabia, and Commander, U.S. Forces, Japan, and Fifth Air Force, Japan. At the time of his retirement in 1987 he was Commander, Allied Air Forces Central Europe, and Commander in Chief, U.S. Air Forces in Europe.

General Paul F. Gorman (USA, Ret.) is a graduate of the U.S. Military Academy, holds an M.P.A. from Harvard University, and is a graduate of the U.S. Army Command and General Staff College and the National War College. As Deputy Chief of Staff for Training at the U.S. Army Training and Doctrine Command, he directed the Army's professional schools and was a delegation member at United States–Vietnam talks in Paris. In his final assignment, he was Commander in Chief, United States Southern Command, responsible for all U.S. military activities in Latin America.

Maj. Gen. L. D. Holder, USA, commands the 3d Infantry Division (Mechanized). He is a graduate of Texas A&M University and holds an M.A. in history from Harvard University. He is also a graduate of the U.S. Army Command and General Staff College and the U.S. Army War College. General Holder has written a number of papers and articles on tactics and doctrine and was a coauthor of the 1982 and 1986 editions of U.S. Army Field Manual (FM) 100–5, *Operations.* During the Gulf War he commanded the 2d Armored Cavalry Regiment, and prior to that he served as Director of the School of Advanced Military Studies at the Army's Command and General Staff College.

Col. Michael D. Krause (USA, Ret.) was the Deputy Chief of Military History. He is a graduate of the U.S. Army Command and General Staff College and holds a Ph.D. from Georgetown University. He served on the faculty of the National War College where he taught the fundamentals of operational art to officers of all services. His article, "Moltke and the Origins of Operational Art," appeared in the September 1990 issue of *Military Review.*

Lt. Col. Clayton R. Newell (USA, Ret.) was the Chief of the Historical Services Division at the U.S. Army Center of Military History. While on the faculty of the U.S. Army War College, he held the General John J. Pershing Chair of Military Planning and Operations. He has published numerous articles on military operations and is the author of *The Framework of Operational Warfare* (Routledge, 1991).

General Glenn K. Otis (USA, Ret.) served over thirty-five years in the Army. As Commander of the U.S. Army Training and Doctrine Command, he was responsible for including the operational level of war in the 1982 edition of FM 100–5, *Operations.* He retired as Commander, Central Army Group, in the Central Region of NATO and Commander in Chief, U.S. Army, Europe, and Seventh Army.

General Crosbie Saint (USA, Ret.) was the Commander in Chief, U.S. Army, Europe, and Seventh Army, and Commander, Central Army Group. He is a graduate of the U.S. Military Academy, and he has commanded at every level from platoon through army group, as well as serving in various staff positions, in Europe, Vietnam, and the continental United States. General Saint has been published in a number of military professional journals, including *Military Review, Army,* and *Armed Forces Digest.*

Professor James J. Schneider teaches military theory at the School of Advanced Military Studies, U.S. Army Command and General Staff College. He holds a B.A. and M.A. from the University of Wisconsin–Oshkosh and a Ph.D. from the University of Kansas. He served in Vietnam as a tank commander with the 1st Infantry Division in 1966–67. He has published a number of articles on operational art including "The Loose Marble and the Origins of Operational Art" (*Parameters*, March 1989). Presidio Press will publish his *The Structure of Strategic Revolution* in the fall of 1994.

Admiral William Small (USN, Ret.) retired as Commander in Chief, Allied Forces Southern Europe. He previously served as Vice Chief of Naval Operations and Commander, U.S. Sixth Fleet.

Maj. Gen. William A. Stofft, USA, is the Commandant of the U.S. Army War College. In a previous assignment as Chief of Military History, he lectured extensively throughout the Army on leadership and operational art, and he is the coeditor of *America's First Battles, 1776–1965*, published by the University Press of Kansas.

Col. Richard M. Swain, USA, is the Director of the U.S. Army Combat Studies Institute, U.S. Army Command and General Staff College. He graduated from the U.S. Military Academy, holds an M.A. and a Ph.D. from Duke University, and is a graduate of the U.S. Army Command and General Staff College. He has published a number of articles in *Military Review, Armed Forces and Society*, and *The Naval War College Review*.

General Hans Henning von Sandrart, Federal Republic of Germany Army, was Commander in Chief, Allied Forces Central Europe. He is a graduate of the Staff College in Camberly, England. In his former assignment as Chief of Staff of the German Army, he was instrumental in introducing the concept of operational art into the German armed forces.

Col. John A. Warden III, USAF, is currently the Commandant of the Air Force's Air Command and Staff College at Maxwell Air Force Base. He was one of the principal architects of the Gulf War. He is the author of *The Air Campaign* and several articles and chapters in various anthologies.

Glossary

AAFCE	Allied Air Forces Central Europe, a PSC of AFCENT
ACE	Allied Command Europe, a NATO Major Command
AFCENT	Allied Forces Central Europe, an MSC of ACE
AFSOUTH	Allied Forces Southern Europe, an MSC of ACE
ATAF	allied tactical air force
ATOC	air tactical operations center
AWACS	airborne warning and control system
CENTAG	Central Army Group, a PSC of AFCENT
CINC	commander in chief
CINCENT	Commander-in-Chief, AFCENT
CINCSOUTH	Commander-in-Chief, AFSOUTH
COMAAFCE	Commander, Allied Air Forces Central Europe
COMAIRSOUTH	Commander, Allied Air Forces Southern Europe
COMNAVSOUTH	Commander, Naval Forces Southern Europe
COMSIXTHFLT	Commander, U.S. Sixth Fleet
FOFA	follow-on-forces attack
HUMINT	human intelligence
IFF	identification friend or foe
METT–T	mission, enemy, terrain, troops available, time
MSC	Major Subordinate Command (NATO)
NATO	North Atlantic Treaty Organization
NCA	National Command Authority
NORTHAG	Northern Army Group, a PSC of AFCENT
POL	petroleum, oil, lubricants
PSC	Primary Subordinate Command (NATO)
RAF	Royal Air Force
REFORGER	Return of Forces to Germany
ROE	rules of engagement

SACEUR	Supreme Allied Commander Europe
SLOC	sea lines of communication
SOF	special operations forces
STRIKEFORSOUTH	Striking Forces Southern Europe
UCP	Unified Command Plan
USSOUTHCOM	U.S. Southern Command
USAFE	U.S. Air Forces, Europe
WP	Warsaw Pact

Index

☆ U.S. GOVERNMENT PRINTING OFFICE: 1994 360–578