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Influences on U.S. Army Divisional Organization in the Twentieth Century

John B. Wilson

This article is derived from an information paper Mr. Wilson prepared in December 1995.

In military parlance "division" means different things at different times. In the U.S. Army in the twentieth century, however, the term has been applied to a unit made up of various arms and services, capable of sustained independent operations. The characteristics of those combined arms and services and their ability to conduct sustained operations are key to understanding the nature of the division.

Following a dismal showing in the Spanish-American War of 1898, the Army reexamined its organizations and developed plans for permanent combined arms divisions. These new units were to aid in training (particularly for senior officers) as well as in mobilization. The planners relied heavily on European experiences, even though European nations conducted their training at the corps level. Judging a 35,000-man corps too large an echelon, U.S. Army planners instead designed a division consisting of three infantry brigades, a cavalry regiment, an engineer battalion, a signal company, and four field hospitals. Nine field artillery batteries, organized as a provisional regiment, were also included. To attain a self-sufficient combined arms team, these planners then added an ammunition column, a supply column, and a pack train—all to be manned by civilians. The division had no fixed strength, but in march formation was estimated to use fourteen miles of road space, a distance that represented a day's march for troops and the distance that the last soldier in a column had to cover to reach the battlefront. The limiting factors of the day clearly were those of time and distance.

As plans for the division evolved, the General Staff pioneered tables of organization for all types of units. Forerunners of those used today, the 1914 tables brought together for easy comparison a mass of information about unit personnel and equipment. These data, which previously had been buried in various War Department publications, greatly eased the task of determining mobilization requirements. In addition, the tables served as doctrinal statements and provided a systematic method for introducing new equipment into units. The *Field Service Regulations* that accompanied the tables defined the division as "a self-contained unit made up of all necessary arms and services, and complete in itself with every requirement for independent action incident to its operations." As war raged in Europe in 1917, the War Department revised the structure of the division, but retained a triangular configuration to provide two combat teams for maneuver and one for reserve.

British and French experiences in World War I, however, revealed that the American division lacked firepower and presented command and control problems because of its many small units. To overcome these difficulties, a division was created comprised of two infantry brigades, each having two large infantry regiments (as a means of reducing the span of control), light and heavy artillery, signal and engineer troops, and service units. Such a division presumably would allow greater mobility, enhance the commander's ability to exchange units in the line, and maintain battle momentum. The French and the British had found that for each unit in the line—army corps, division, brigade, regiment, battalion, or company—a comparable unit was needed to relieve it without mixing organizations

from various commands. The new division appeared to ease the difficulty of exchanging units on the battlefield. On 8 June 1917, the Army's first permanent division, the 1st Expeditionary Division, was organized.

Before the organization of the 1st Expeditionary Division had been field tested, two new groups initiated additional studies. Maj. Gen. John J. Pershing, who had been appointed commander of the American Expeditionary Forces (AEF), headed one group, and Col. Chauncey Baker, an expert in military transportation and a West Point classmate of Pershing, headed the other. During the course of their work, Pershing and Baker reversed the rationale for the division. Instead of a mobile organization that could easily move in and out of trenches, the division was to field sufficient men to fight prolonged battles; that is, seize and hold ground and continue the advance. Both planning groups sensed that the French and British wanted that type of division, but lacked the resources to field it because of the extensive losses after three years of warfare. To sustain itself in combat, the division needed more—not less—combat power. When their recommendations reached Washington in July 1917, the Chief of Staff (CSA) acquiesced because Pershing would command the divisions sent to Europe. The lack of experienced staff officers for divisional units and staffs also made a smaller number of large divisions more practical. The new divisional structure, officially adopted on 8 August 1917, was known as the "square division". It eventually consisted of about 28,000 officers and enlisted men.

Designed to conduct sustained frontal attacks rather than to maneuver, the square division was thought to possess tremendous firepower and endurance. The division's firepower, however, proved ineffective. The lack of reliable communications equipment, and the difficulty of identifying the continual movement of infantry units in the offensive, hindered coordination between infantry and artillery, thereby slowing or halting the offensive. Furthermore, the French transportation network was overwhelmed by the logistics requirements for a square division. American divisions in the line suffered from shortages in food, ammunition, and other supplies. Part of the logistical problem also rested with the division's lack of combat service

Contents

troops to carry rations, bury the dead, and evacuate casualties.

Despite these difficulties, World War I demonstrated the need for greater coordination among the arms and services. Infantry could not advance without support from engineers and artillery; artillery could not continue to fire without a constant supply of ammunition. Transportation and signal units provided vital materiel and command connections, and medical units administered to the needs of the wounded. The complex type of combined arms unit integrating these features became possible because of advances in technology, weapons, communications, and transportation.

Following World War I, the Army leadership reevaluated the divisional organization. Officers from the AEF endorsed the World War I square division and recommended that it be organized to meet varying combat and terrain conditions encountered in maneuver warfare, but with only those elements it customarily needed. Who the next foe might be—and where—posed a problem that haunted divisional planners then, as today. They envisioned a square division numbering 29,000 officers and enlisted men. Although Pershing temporarily shelved the report, Congress and the War Department continued to explore postwar Army organizations. One of their findings was that when the Army was stationed at small, scattered posts, officers had no occasion to command brigades or divisions, thereby gaining experience in managing large troop concentrations. They proposed permanent divisions in which officers could have the opportunity to command large units and to train combined arms units for war, thus correcting a major weakness of past mobilizations. To improve mobilization, Congress required that the Army, as far as practical, be organized into brigades, divisions, and army corps.

To execute the congressional directive a General Staff committee examined the structure of the division and prescribed a square organization patterned after the unit of World War I. Pershing objected, wanting a more mobile division with a single infantry brigade of three infantry regiments, an artillery regiment, a cavalry squadron, and combat support and combat service support units. Pershing felt the AEF officers undertook their work too soon after the close of hostilities and that their report suffered unduly from the special circum-

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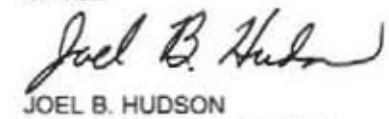

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stances of the Western Front. Summarizing the requirements for the infantry division, he wrote: "The division should be small enough to permit its being deployed from...a single road in a few hours and, when moving by rail, to permit all of its elements to be assembled on a single railroad line within twenty-four hours." Again, time and distance factors, expressed in tactical terms, determined his concept of the future division.

Ultimately a compromise emerged. The argument for three versus four infantry regiments in the division focused on the division's probable area of employment, North America. Experts deemed another war in Europe unlikely and doubted that the Army would again fight on a battlefield like that seen in France. They felt technological advances in artillery, machine guns, and aviation made obsolete stabilized and highly organized defensive lines whose flanks rested on impassable obstacles, such as those encountered on the Western Front. Because of the poor road network and broken terrain of North America, the committee insisted that only the square division had sufficient mobility and striking power to fight in such an environment, although acknowledging such a vast formation lacked the flexibility of Pershing's suggested unit. Divisional support troops were reduced, but were included at the corps and army levels.

January 1929 marked the beginning of a ten-year struggle—dictated by events in Europe—to reorganize the infantry division. General Staff members reported that European countries were conceptualizing armies that could trigger a war of greater velocity and intensity than anything previously known. The British, French, and Germans were engrossed with "machines" to increase mobility, minimize losses, and prevent stabilization of the battle front. The British concentrated on mechanization and the French on motorization, while the Germans developed concepts that combined aspects of both. In the United States, the Army Chief of Staff agreed to a new divisional study, but because of the vast number of weapons and equipment left from World War I and because of a lack of other resources, the planners were limited to using approved standard infantry weapons, animal-drawn combat trains, and motorized field trains for their design. No restriction was placed on road space, a principal determinant of divisional size before and immediately after World War I. Several proposals surfaced for a triangular infantry division, which promised greater maneuverability, better command and control, and simplified communications and supply. Because of resource constraints, however, no divisions were reorganized.

In 1935 the General Staff revived the idea of examining the division. The Chief of Staff canvassed senior commanders regarding organizational issues, noting that the infantry division had foot, animal, and motor units, all with varying rates of speed, which did not meet the demands of modern warfare. Lacking consensus, the CSA created the Modernization Board to examine the organization of the Army. Despite a broad charter, the board addressed only the infantry division, concluding that the formation of higher commands rested upon the structure of the infantry division.

The end result of this study was the replacement of the square division with a triangular one. An infantry division with three combat teams simplified command structure and provided more flexibility. The elimination of the brigade echelon for infantry and field artillery enabled the division commander to deal directly with infantry regiments and field artillery battalions. The artillery consisted of three direct support battalions of newly-developed 105-mm. howitzers and a general support battalion of 155-mm. howitzers. To assist in moving and operating on a broad front, a cavalry reconnaissance troop equipped with lightly armored cross-country vehicles was assigned to the division. Engineer, signal, quartermaster, military police, medical, and maintenance resources were organized to support the arms. Modern technology brought about significant changes in divisions, one of the more obvious being the elimination of all animal transport, except in a few specialized cases. The newly-developed airborne division was also based upon triangular structure, but fielded fewer men and lighter equipment to accommodate existing aircraft—a variation of the space, distance, and time factors.

The triangular division did not prove to be completely satisfactory during World War II because it lacked all the resources regularly needed to operate efficiently, particularly tank, tank destroyer, and anti-aircraft artillery battalions. Although the Army's goal was to pool these resources at corps level for attachment to division as required, shortages in tank and tank

destroyer units made them unavailable to serve regularly with the same division. This resulted in considerable shuffling of attached units, which in turn diminished effective teamwork. Divisional reconnaissance suffered because the armored cavalry troop lacked sufficient strength and its vehicles were too lightly armored and armed for its mission.

The quick success of the German *Blitzkrieg* into Poland in 1939 had a profound effect on the adoption of a new type of division. Testing of mechanized cavalry and tanks had been ongoing throughout the interwar years on a limited level, but German successes and the U.S. Army maneuvers of 1939-40 resulted in the adoption of true armored divisions. The division was designed as a powerful striking force to be used in rapid offensive action, and its ability for sustained action was an important feature. The first concept saw the division divided into five elements: command, reconnaissance, striking, support, and service. Based upon combat experiences, it was reorganized in 1942 with two armored regiments under two combat commands, with a division artillery similar to that in the infantry division. Another reorganization in 1943 eliminated the two armored regiments, leaving it with three tank battalions and three infantry battalions. A third command was added to control the division reserve on the march, but eventually came to be a third combat command. The heavy division of 1942 was capable of more sustained action, but weak in infantry. The lighter division of 1943 was more balanced in infantry, but needed an additional rifle company to form balanced tank-infantry teams.

Following World War II the Army again examined the infantry division, raising many of the same weaknesses identified during the war. Nevertheless, the division's three regimental combat teams were preserved, with the addition of those units regularly attached in combat. One controversy that affected the development of the infantry division was the postwar battlefield's greater depth and breadth. This "modern" battlefield made conducting reconnaissance and collecting intelligence much more difficult. The answer seemed to be aerial reconnaissance, and indeed ten airplanes had been assigned to the division artillery in 1943 to direct artillery fire. The Army Air Forces opposed the idea of organic aviation units in the division. Airmen argued that all air units had to come under their jurisdiction. No aviation unit was assigned to the postwar division, although ten planes were authorized for the field artillery and eight to the division headquarters company. The modified division structure of World War II was retained and increased to above 19,000 officers and enlisted men. The U.S. Army fought the Korean War with the modified World War II infantry division structure.

In the early 1950s several Army planners thought a general war would be too costly to wage by conventional means because the Communist bloc could field more men and resources than the United States and its Allies. Firepower appeared to be the answer for overcoming the enemy. The Army, however, was hampered in its effort to understand the effects of tactical nuclear weapons because of the lack of data. Studies suggested that nuclear weapons could be used much like conventional artillery. To achieve increased firepower with decreased manpower, the Army created the "pentomic" division.

In the pentomic infantry division five small battle groups (headquarters and service company, five infantry companies, and one mortar battery each) replaced the three infantry regiments. Conventional and nuclear artillery, tank, signal, and engineer battalions, and a reconnaissance squadron with ground and air capabilities were added to the division. The division was also authorized trains, which included a transportation battalion, an aviation company, and an administration company. The transportation battalion was to have sufficient armored personnel carriers to move an entire battle group at one time. The aviation company, the first of its type, was to be placed in the trains for better supervision of its maintenance. The span of control was optimized in the division by giving each commander the maximum number of subordinate elements that could be controlled effectively. The pentomic division was authorized about 13,500 men of all ranks—a reduction of nearly 4,000 from the 1955 infantry division.

While the smaller battle groups were seen as more effective organizations to operate on a widely dispersed nuclear battlefield, there were other reasons for the Army's adoption of the new structure. The postwar defense budget concentrated on new weapons, aircraft, and ships rather than on soldiers. The Army's conventional rifles, machine guns, and trucks had little appeal.

The pentomic division became a means by which the Army could stake a claim to a share of the nuclear arsenal. The pentomic division achieved that goal, but proved ill suited for the requirements of the conventional battlefield, given the communications technology of the late 1950s.

Although assigned nuclear weapons, the armored division did not adopt the pentagonal structure and instead served as the basis for the next divisional reorganization in the 1960s. Since World War II armored divisions had infantry, tank, and artillery battalions, along with support units that could be organized into task forces. The ROAD organizations (Reorganization Objective Army Divisions) called for a division base consisting of a headquarters element; three brigade headquarters; a military police company; aviation, reconnaissance, engineer, and signal battalions; division artillery (105-mm. and 155-mm. howitzers, Honest John rockets, and 8-inch guns); a support command (headquarters; administration company; band; and medical, supply and transport, and maintenance battalions); and maneuver battalions (infantry and armor). Like combat commands in the armored division, the brigade headquarters had no permanently assigned units, but operationally controlled from two to five maneuver elements and support units as the tactical situation dictated. The unwieldy battle group was eliminated. Basic "building block" organizations were used to tailor task forces as required. To aid in organizing the task forces, units in the support command were designed so that their elements could be attached where needed.

Using flexible ROAD concepts, the Army has reorganized various types of divisions to meet opponents on real and potential battlefields. For the European theater, armored and mechanized infantry divisions were established. Infantry divisions were tailored for Korea and, later, for Vietnam. The airborne division was designed as a contingency force. The concept also accommodated the airmobile division, with its extensive use of helicopters for transport and tactical weapons platforms, and later the light division. With minimal adjustments to the ROAD base, by increasing and decreasing the number and types of maneuver battalions assigned to it, divisions achieved greater flexibility.

Both the devastation of the 1973 Arab-Israeli War and the Vietnam experience spurred Army thinkers to develop the AirLand Battle doctrine, which in turn introduced new weapons and technology into the divisions in the early 1980s. Without sacrificing the flexibility of the twenty-year-old ROAD concept, modern tanks, fighting vehicles, and field artillery weapons were assigned to the divisions. Building upon the airmobile concept and combat experience in Southeast Asia, more helicopters were introduced to the division. An aviation brigade was assigned to the division for command and control purposes. Under the "come-as-you-are, fight-as-you-are" approach to war, combat service support had to be immediately available in the battle area. Therefore, units in the division support command were reorganized to include three support battalions, one for each brigade to "arm, fuel, fix, and feed forward," and a main support battalion to provide additional logistical support and health services for the entire division. Each combat arms brigade headquarters also received a dedicated engineer battalion. Within divisions, the trend was to provide more specialized units, which could then be attached to the brigades to form combined arms task forces. Unit training, the formation of combined arms task forces, and their employment and sustainment in combat required the division to be a structured, but flexible organization based on modular, interlocking building blocks. Commonality in doctrine, organizational procedures, and force design were essential for combined arms task forces.

In sum, the U.S. Army has had almost a century of experience in creating divisional organizations. Originally, time and distance as tactical factors determined division end strength. Later, concerns about strategic mobilization requirements dictated the size of divisional organizations. Combat operations and the nature of a future enemy, especially the location of the next war, were especially influential considerations in the 1920s and 1930s. As a large standing Army emerged from the ruins of World War II, the existence of a known potential enemy led to divisional reorganizations, first the pentomic, and later the ROAD organizations.

Divisional organizations have fluctuated widely over the past century. It appears, with some variation, that the trend is toward smaller self-sustaining units. Sustainment was the reason for the huge square divi-

sion of 1918, while mobility and the demands of a two-front war in vastly different terrain mandated the more mobile triangular division, which also fought independently, augmented by corps and army assets. The smaller pentomic division was an attempt at mobility and dispersal that overreached itself. Lacking appropriate technology (communications and air mobility), the division could perform neither function. The more flexible ROAD division has proved extremely adaptable, not only to changing battlegrounds,but to major advances in doctrine, technology, and weaponry. Indeed, its success now enables divisional brigades to operate independently on the battlefield.

Besides these considerations, technology and the changing nature of 20th century warfare have altered divisional structures. Technology, especially improved communications and weaponry, have enabled smaller units to execute missions previously thought suitable only for divisions. It may be no exaggeration to say today's infantry battalion is the equivalent in firepower of the World War II infantry division. Distance and space factors hold less meaning today, when structuring divisions, because flexible designs and improved technologies enable forces to be tailored to meet specific missions.

The trade-off, of course, is that highly trained, long-term professional soldiers are expensive to train and equip and heartbreaking to lose. When armies relied on brute force, true of armies until the 1980s, casualties, often in appalling numbers, might be considered the cost of doing business. That is no longer true, at least in the United States.

Finally, although small units now are capable of conducting sustained operations, these units require an overarching structure to give cohesion to their parts. Independent brigades, for example, might become much like the fabled Army regiments of the late nineteenth century: individually magnificent, but, as demonstrated in the Spanish-American War, incapable of operating together. Therefore, the division likely will remain the basic warfighting organization, but its structure and organization must continue to be reassessed in terms of future battlefield innovations, as well as with an eye on the lessons of the past.

Mr. John B. Wilson is a historian in the Center's Organizational History Branch of the Field Programs and Historical Services Division. He compiled the volume Armies, Corps, Divisions, and Separate Brigades *in the Army Lineage Series, and currently is working with the Production Services Division on a forthcoming volume to be entitled "Divisions and Separate Brigades."*

Editor's Journal

In this issue, we highlight John Wilson's excellent review of Army divisional development during this century. In addition, Mason Schaefer takes a look at the World War II surge at the San Francisco port of embarkation, and Prof. Marvin Gordon provides a new frame of reference for considering military campaigns with an eye to terrain conditions.

I would like to thank two individuals, who contributed their expertise to the publication of this particular issue: Dr. Judith Bellafaire, of the Center's Field and International Branch, who assisted in editing the text, and Ms. Beth MacKenzie, of the Graphics Branch, who helped with the layout work.

Arnold G. Fisch, Jr.

The Chief's Corner

John W. (Jack) Mountcastle

Hope you are enjoying what passes for autumn in your part of the world! Here in the Washington, D.C., area, the fall season brings with it a number of opportunities to support the Army-wide history program, the annual meeting of our Department of the Army Historical Advisory Committee (DAHAC), and the start of what will surely be a very busy Fiscal Year 1997 for all of us at the Center of Military History. And, I suppose I should add—renewed hopes for the Redskins winning some football games!!

I am more impressed than ever by the tremendous talent that resides in the Army's historians throughout the total force. We have gotten excellent coverage of the Army's role in Operation JOINT ENDEAVOR from the Army Reserve and National Guard Military History Detachments (MHDs) that have deployed to Europe. These fine soldiers truly represent a cross section of our Reserve Components. They have worked side by side with the active duty 44th MHD. Led by MAJ(P) Bob Leach, the 44th MHD deployed from Headquarters FORSCOM to Heidelberg, Germany, to digitize the material collected in the field by the Army Reserve's 48th, 49th, 90th, 317th, and 326th MHDs and the National Guard's 102d, 126th, and 130th.

Of special note is the superb work of the Army Component Command Historian, LTC Walt Kretchik. Thanks to the support of the Combined Arms Command, the Command and General Staff College, and COL Jerry Morelock (his boss in the Combat Studies Institute), Walt turned over his heavy teaching load and deployed to Europe right after Christmas. Operating from USAREUR's forward base at Taszar, Hungary, Colonel Kretchik ensured that the whole field history operation performed at maximum efficiency. His work was not concluded until August, when he turned over his responsibilities to Major Leach (44th MHD), who voluntarily extended his tour of duty in Europe. Thanks are due here to the support of Bill Stacy, the FORSCOM historian. Bob is holding the history fort in Taszar until we can deploy another officer from the States to carry on this effort for USAREUR and the rest of the Army.

I'd like to mention here that some very, very solid work is being done right here at CMH in support of the field historians. Linked by e-mail, fax, and phone to Europe, historians in the Field and International Branch and the Research and Analysis Division are working with Bruce Siemon's staff in Heidelberg to accomplish as much as possible. Bill Epley has assisted in predeployment training of MHDs. Charles Hendricks is assisting in the final review of the USAREUR history of that command's support of Operation DESERT STORM. And, across the Army, historians are able to call upon Ted Ballard for support with developing staff rides and lessons.

With regard to CMH's written products, I'd like to note that we will publish the Collected Works of General Gordon Sullivan this fall. This collection of speeches and essays will be most valuable to a host of students and staff officers seeking to better understand how the former Chief of Staff guided the Army through one of its most difficult transitions and turned over a viable, confident, and competent force to his successor.

I am looking forward to meeting with the exceptional body of advisers that we rely upon to keep us heading on the best azimuth. The composition of the DAHAC changes over time

as new members accept their appointment by the Secretary of the Army to replace those who have served so well in the past. This committee's annual report, which is sent to the Secretary of the Army, provides members of the Army Secretariat and the Army Staff with an appreciation for what the Army's history program has to offer. As you know, many of our DAHAC members have assisted us in visits to field locations and in the review of manuscripts that form the basis of our publishing program.

Now, for a few closing thoughts. Once again, I'd like to make a pitch for the CMH homepage. Try it; you'll like it. You can find us at **http://www.army.mil/cmh-pg.** Secondly, for those of you who have not yet joined the Army Historical Foundation (AHF), I hope you'll do so. The excellent articles, written by CMH alumnus, COL (Ret) Ray Bluhm of the AHF, that have appeared recently in the magazine *ARMY* are "must" reading for those of us who care about the future of the National Museum of the U.S. Army! Lastly, I would like to salute one of the finest members of the CMH staff—Mr. Billy Arthur. Upon his retirement this summer, he ended an epochal series of extraordinary educational experiences for literally thousands of people who had tramped the battlefields of the Civil War with him. We will surely miss him and wish him all the best in the future. And that same wish goes to each of you reading this column. Thank you for all you do for the Army and for Army history!

Defense Technical Information Center Annual Users Meeting and Training Conference 4-7 November 1996

The Defense Technical Information Center (DTIC) is presenting its Annual Users Meeting and Training Conference, 4-7 November 1996, at the DoubleTree Hotel in Arlington, Virginia. The theme of the conference is "Meeting the Challenges of Changing Technology."

The gathering provides an opportunity to explore in detail new developments at DTIC and throughout the federal information network. The conference organizers have arranged for a number of speakers and exhibitors from other federal agencies, including the Department of Defense. Speakers will acquaint conference attendees with the latest policy and operational developments, and will provide practical details on valuable and diverse domestic and foreign information resources, security issues, the World Wide Web, copyright issues, and the storage and dissemination of electronic documents.

For further information, consult DTIC's homepage at http://www.dtic.mil, or contact Ms. Julia Foscue at (703) 767-8236 or by e-mail at jfoscue@dtic.mil.

Surge at San Francisco
A Port After Pearl Harbor, 1941-42

Mason Schaefer

This paper is an extended excerpt from Mr. Schaefer's larger paper, "The San Francisco Port of Embarkation in World War II: Command and Control," presented at the June 1994 Conference of Army Historians. It includes considerable additional material not included in that paper, as delivered.

During its twentieth century overseas deployments, the United States relied on its major ports to sustain overseas battlefronts. In the Spanish-American War and World War I, the initial rush of supplies to the docks momentarily overwhelmed the U.S. Army's logistic system. At the start of World War II, the post-Pearl Harbor surge strained, but did not collapse, American ports. The San Francisco Port of Embarkation (SFPE) not only met the challenge, but emerged, revitalized. Did crisis management, however, also ensure the most efficient logistics system?

As historians have discovered, wartime surges follow a familiar pattern. As cargo innundates once-sleepy terminals, deploying units pressure port commands to load and ship their gear immediately. Masses of supplies quickly strain rail facilities meant for a fraction of the volume. Shipments of rations, aircraft, vehicles, and ammunition flow in from all directions simultaneously. The War Department's (and, later, the Defense Department's) rush of ships and supplies to beleagured ports complicates matters enormously. Port commanders must master traffic control quickly or risk congestion and chaos.

During the Spanish-American War, for example, the Army's initially unsystematic cargo discharge at ports resulted in backed up shipping and idle military freight. As Erna Risch has pointed out, ship embarkation for the 1898 Cuban expedition revealed the "surge" syndrome's worst aspects. The War Department "advised" the Army Quartermaster to dispatch supplies as soon as they reached the depots. Such an outflow quickly swamped the modest Port of Tampa, Florida, the Cuban Expedition's embarkation point. With limited rail input and scant storage facilities, Tampa could not handle the mass of undocumented freight. The Army needed a system to handle the surge. Captain James Bellinger established such an orderly approach, which included documenting cargo, procuring more wagons, and methodically unloading railcars as they arrived. He quickly ended the congestion. (1)

James A. Huston has described World War I's even more overwhelming congestion. A few months before the U.S. entered the conflict, foreign munitions orders almost swamped U.S. ports. President Wilson's declaration of war merely accelerated the rush. The Army's supply bureaus sent uncoordinated masses of supplies to American terminals, with all cargo boasting high priority. As a result, 200 ships ended up waiting for stores at New York Harbor, while 44,320 railcars piled up rail depots as far inland as Pittsburgh. The War Department at last blocked, or embargoed, all freight from the ports until the terminals could move it. It also abolished the many competing supply bureaus. The newly appointed Director General of Railroads established a committee for government coordination which quickly systemized the inflow. These methods foreshadowed the reaction to the World War II surge. (2)

Indeed, as Huston has argued, many of the same factors that plagued Army port operations in the Spanish-American War and World War I came into play during the Second World War. Again, the War Department and supply depots overwhelmed the ports with undifferentiated cargo. As before, the Army built up an orderly system to meet the flood. Fortunately, American logistic officers drew on the past to avoid the chaos of previous deployments. A major U.S. port, the San Francisco Port of Embarkation's response to the initial World War II surge would prove decisive.

A case study of San Francisco's response to the initial World War II surge allows insight into issues that face the U.S. Army's logistics system today. What pressures does a Port of Embarkation face after the immediate outbreak of war? How did San Francisco

bring order out of chaos and allow an orchestrated cargo flow? How do modern ports manage the uncontrolled traffic into their piers by warfighters bent on dispatching their unit equipment to the front? As will be seen, the SFPE used dynamic leadership, close and immediate cooperation with civilian transportation authorities, and direct action (specifically, embargo) to halt the uncontrolled surge. The Port also created an orderly system for processing cargo. But, does successful surge strategy ensure effective battlefront resupply? In effect, is crisis management enough?

The Surge Begins

According to an Army chronicler, "the difficulties under which the Port operated in those early days seemed insurmountable." Historians Robert W. Coakley and Richard M. Leighton underline the gravity of the situation during the initial surge, as "the whole future of the ports came under review." As the military reinforced Hawaii and Australia, SFPE rail traffic increased to "several hundred times normal peacetime flow." The War Department also clogged the port by ordering seaborne ships to return for reloading.

To compound the confusion, Washington officials changed priorities frequently. SFPE traffic managers could not determine the consignee or destination of many poorly marked shipments. The Port lacked both the warehouse space and labor to accommodate the mammoth inflow. As Coakley and Leighton have argued, unit commanders regarded the POEs as "cornucopia[s] from which they could obtain whatever they needed." Such attitudes merely escalated the crisis. "These conditions soon produced a terrific overcrowding of the port," stated an SFPE analysis. "Decisive action was needed." (3)

General Gilbreath Takes Control

The SFPE's commander, Brig. Gen. Frederick Gilbreath, did not shrink from decisive action. (4) A native of Dayton, Washington, the 53-year-old Gilbreath took over the Port only a month before Pearl Harbor. His varied background included much transportation and logistics experience. General Gilbreath spent four years at West Point before fighting in World War I. After the United States entered that conflict, he served as a disbursing officer in Britain and then as Army Transport Service (ATS) superintendent in St. Nazaire, France. Between the world wars he commanded Fort Bliss, Texas, and other posts along the U.S.-Mexican border. The strong-willed Gilbreath's organizing abilities won him respect throughout the Army. "He knew what he wanted and went after it regardless of obstacles that might be placed in the way," stated Port historians William Bolce and Capt. James W. Hamilton. Such determination served him well as he shaped the port operations, but eventually caused friction with the Chief of Transportation in Washington. (5)

Immediately after Pearl Harbor, General Gilbreath met with important Bay area civilian transportation officials. He consulted American-Hawaiian Lines' John Cushing, who suggested forming a committee with American President Lines and Matson Navigation Co. executives. Very receptive to this idea, Gilbreath also hired a civilian aide, Lewis Lapham of American-Hawaiian Lines. The Port commander found the committee's help "beyond calculation." (6)

Having secured the maritime community's support, General Gilbreath turned to the railroads. He first contacted John Sullivan, head of the Southern Pacific, who quickly brought in other rail companies. Civilian executives helped manage rolling stock by providing schedules, railhead capacity, and other information. Gilbreath's coordination with transportation executives did much to contain the SFPE's first major wartime surge. (7)

Even before Pearl Harbor, rumors of port congestion at San Francisco rumbled into Washington. As the Army geared for possible war with Japan, the SFPE's workload increased, then exploded after 7 December 1941. On 2 January 1942, for example, General Gilbreath reported 2,987 loaded cars in the Bay Area, with 1,056 more expected the next day. "Such a condition cannot go on much longer without danger of clogging the rails to such an extent as to interfere with the offshore movement of troops," warned the Port Commander. (8)

To cope with this influx, Gilbreath directed the SFPE to unload and store shipments that could not be immediately lifted. Although the situation was not yet critical, he expected a crisis if unregulated cargo flow continued. Above all, the port commander needed more ships, for incoming freight could quickly fill the

available storage facilities. If necessary, he could use additional piers for temporary storage. Gilbreath also urged the Army to establish holding points outside the port to take on overflow cargo. A few months later, the Office of the Chief of Transportation (OCT) established such stations at Tracy, Lathrop, and Pasco, California, and at Yermo, Washington. However, the general now confronted an endless parade of wheeled cargo. (9)

The Vehicles Pour In

Immediately after Pearl Harbor, the SFPE faced an avalanche of vehicles for overseas shipment from several directions. Most task forces arrived by rail from field organizations. At the same time, new vehicles streamed in from various manufacturers. The War Department replacement pool at Stockton, California, also dispatched regular convoys.

Though railcars transported most trucks and tanks, such vehicles arrived on several different lines. Once the wheeled cargo rolled into port, longshoremen unloaded it at many separate San Francisco and Oakland yards. When these facilities filled up, the Port placed the overflow at any available space.

As convoys arrived from the field, the drivers parked their charges at various locations. Often, units would drive trucks, jeeps, and other conveyances directly to the piers, where they joined the general mass of cargo. This uncoordinated influx caused "confusion and loss of time in locating and centralizing specific task forces just prior to their embarkation for overseas destination."

Often, vehicles needed extensive repairs or other modifications. This situation also existed at the Port of New York, where up to 13 percent of rolling stock needed overhaul. In San Francisco, overworked mechanics could not service some battered vehicles in time for dispatch to the Pacific. During the first weeks after Pearl Harbor, no single maintenance center existed. As the massive 1942 surge continued, General Gilbreath took action. Clearly, he decided, all vehicles should go to a central dispatch point where trained technicians could inspect and prepare them for operations.

After some study, SFPE officials selected a site at 52nd and Green Streets in Oakland's Emeryville section. All rail traffic from the east and north converged at that point, then paused for twenty-four to thirty-six hours until the SFPE could ferry cars across San Francisco Bay. The Ordnance Division and other divisions drew up plans for a depot and repair facility at the Emeryville location, a concentration point with extensive rail yards. When technicians finished servicing and testing vehicles, they would place them in the depot's capacious outbound parking lot. For incoming traffic, Ordnance personnel also planned two smaller parking areas on either side of the inspection zone. However, as the SFPE mastered the motorized parade, it also faced an influx from the air. (10)

A Thousand Planes Arrive

In addition to mountains of rations, fleets of vehicles, and tons of ammunition, major aircraft shipments arrived in port, after Pearl Harbor. To dispatch these badly-needed planes to Hawaii and Australia, San Francisco adopted new loading methods. The SFPE at first lacked the detailed expertise to load out the fighters and bombers flowing into the port. Where it had once processed the occasional squadron of aircraft, the SFPE now dealt with swarms of planes "needed yesterday" by the U.S. Army Air Forces.

In early 1942, a shipment of fourteen SFPE-dispatched P-40 fighters arrived in Hawaii, somewhat the worse for wear. This effort underscored a need for improvement, which spurred SFPE action. Among other things, San Francsico personnel sprayed planes with antirust compounds and itemized extra aircraft parts. SFPE officers also supervised the aircraft during assembly, loading, and shipment. (11)

During the first four months of war, from December 1941 to March 1942, a thousand fighters and bombers passed through the SFPE. "Experience gained ...has shown a marked improvement in loading methods and more improvement is expected," reported General Gilbreath in mid-March. During these early days, port personnel developed many new techniques, mentioned above. Though at first almost overwhelmed, the SFPE's crew quickly adapted. The spirit of Captain Bellinger, the officer who rescued the Spanish-American War deployment, stayed within them. However, the SFPE needed to take major steps to relieve the overall congestion. (12)

The Embargo Breaks Port Congestion

During early January, the influx of troops and freight continued unabated. "The Supply services were being pressed to make shipments and gave little heed to conditions at the port," explains historian Chester Wardlow. On 12 January alone, for example, 3,208 loaded railcars chugged into the San Francisco Bay area. (13)

General Gilbreath needed to halt the inflow until the SFPE established traffic control. The specter of World War I congestion hung over him. As James Huston noted about that conflict, "It was futile to rush supplies to the ports faster than they could be loaded." Halfway through January Gilbreath asked Washington to embargo San Francisco. If the War Department approved, no supply services would ship cargo from factories or depots to Pacific terminals (14) without the SFPE commander's permission. As for shipments already en route, General Gilbreath wanted to hold them at regulating stations until further notice. Such methods had helped clear congestion during World War I. (15)

The next day, 17 January 1942, the Army's Adjutant General took action. "Serious rail congestion now exists in the San Francisco Bay area," he informed all corps areas. Without a release from the Quartermaster General, no factory or depot should dispatch supplies to the SFPE. Accordingly, Brig. Gen. Brehon B. Somervell, a War Department General Staff officer, officially diverted military supplies from San Francisco. Only cargo specifically earmarked for the SFPE would reach the Port. A few months later, General Somervell was assigned to head the Army Service Forces, which oversaw the Quartermaster and Transportation Corps. (16)

These directives effectively embargoed the SFPE. "...the port's rail terminals were jammed with boxcars and overflowing with piles of shipments; a 'breather'...was needed to catch up with the sudden flood of supplies," wrote Bolce and Hamilton. All available employees now cleared supplies from the docks. The SFPE first hauled nine hundred cars to interior locations. Stevedores then unloaded remaining cars and warehoused their contents "irrespective of contents, consignee or destination." (17)

Such bold actions relieved the backlog in two days. Port workers emptied all cars and cleared the railyards for regular traffic. After one week, General Gilbreath ended the embargo and permitted railcars to enter the Port. The SFPE also unloaded the rolling stock at holding points. Thanks to the embargo, the SFPE had survived its first major surge. However, the crisis revealed a need for expanded Port facilities, traffic control and Port reorganization. (18)

Expansion to Oakland

As relations with Japan worsened during 1940-41, Port commanders had extended San Francisco's facilities to outlying suburbs, particularly Oakland. In January 1941, Brig. Gen. Eugene Reybold, assistant chief of staff, called Fort Mason a "constricted area with no room for expansion." Its unfavorable tide conditions, and a single-track railroad, also precluded new facilities. Oakland, a large suburb across the Bay, looked more promising. That city's port area and Army base boasted ample land for warehouses, offices, and piers. Brig. Gen. John C.H. Lee, then SFPE commander, aggressively expedited the Oakland expansion efforts. (19)

General Lee (20) first appointed a Board of Officers to evaluate sites for projected SFPE offices and warehouses. Unsurprisingly, this group recommended leasing or building more facilities at Oakland, whose Army base and nearby property bulged with available space. Under General Lee's direction, the Army leased two warehouses and a cannery, with much more to come. The SFPE also constructed four additional berths in Oakland's outer harbor. By 15 November 1941, the Army held 431 acres of land and 1.5 million square feet of warehouse space at the suburb. His assignment at San Francisco completed, General Lee made way for General Gilbreath. (21)

The 1942 surge accelerated port expansion. General Gilbreath enhanced Lee's efforts by leasing more warehouses, piers, and office space. As the 1942 surge neared its peak in early January, he suggested a further major expansion into Oakland. This ambitious effort would add marine repair facilities, transit sheds, dockage for eight transports, and three general warehouses, totalling 702,000 square feet. Indeed, by February 1942, the SFPE had completed a headquarters building for several port divisions and soon erected seven additional warehouses. The Overseas Supply Division and technical services moved to Oakland in mid-1942. On

29 June 1942, the Office of the Chief of Transportation named the suburb an official SFPE branch. As the Port rapidly expanded facilities, it needed to revamp its vital rail system. To manage further surges, the SFPE moved in all directions at once. (22)

The Rail Traffic Control System

The Port took three steps to improve rail traffic control. First, the SFPE added two switch engines (one for Fort Mason and one for Oakland), whose added power moved trains more rapidly from one track to another. Second, the Port expanded rail yards and built additional trackage in the Oakland area. Third, the SFPE established an elaborate control system. As mentioned, General Gilbreath set up a rail traffic control office (RTCO) to direct movements of SFPE-bound freight.(23)

Civilian rail company representatives kept the RTCO up to date on movement schedules and priorities. The RTCO in turn communicated with Army-manned "regulating sections" located at nationwide strategic rail terminals. With these methods, Fort Mason orchestrated railway cargo movements. "This system controlled and eventually eliminated the causes which had produced the freight congestion in January, 1942," stated an official report. However, the SFPE now needed to free its wharves and depots for export cargo. (24)

Closing Down the General Depot

Before Pearl Harbor, the San Francisco General Depot stored supplies for the neighboring military commands. Modest military import and export traffic enabled the Port to retain long-term stockpiles without reducing its own export storage capabilities. However, the Depot hampered operations after Pearl Harbor. As General Gilbreath quickly discovered, the storage facility attracted domestic supply shipments like flies to jam. Such shipments devoured space needed for export materiel. Port personnel found themselves storing equipment for the Western Defense Command (WDC) in the depot while supplies needed for Hawaii and Australia remained in boxcars. (25)

General Gilbreath took immediate action. Due to excessive rail congestion, he wrote, the SFPE should accept only overseas supplies. The WDC should use its own storage facilities outside the Port for domestic shipments. Well aware of San Francisco's difficulties, the WDC's commander removed his stocks from the Depot. Back in Washington, General Somervell accepted Gilbreath's judgment. On the last day of January 1942, he ordered general depot activities at San Francisco and Oakland closed down. Such an action, Somervell stated, could assure the SFPE enough storage space to plan for future surges. No longer would domestic supplies pile up in space needed for overseas shipments. (26)

Lessons of the First Surge

Thanks to General Gilbreath's firm direction and his staff's inventive improvisations, the SFPE survived its first test. As Chester Wardlow has observed, lack of central control over supply movements caused congestion at most American ports. At Philadelphia, Pennsylvania, for example, unchecked Lend-lease shipments clogged the piers in early 1942. Using methods similar to General Gilbreath's, the Port agency head embargoed further freight movements and moved railcars to various reconsignment points until stevedores cleared the docks. (27) The nationwide 1942 surge underscored the pressing need for military traffic management. No military planners wished to repeat the experience of World War I, when rail congestion overwhelmed the ports. To avoid such congestion, all port commanders established a control system. In turn, the War Department and Quartermaster Corps Transportation Branch (later the OCT) provided overall control. (28)

The SFPE effectively managed the 1942 crisis. However, as will be seen, efficient traffic management at domestic ports often merely pushed congestion into the theater ports. As U.S. terminals continued to pour out supplies without carefully worked out priorities, logistic difficulties ensued.

Aftermath of the 1942 Surge

After the 1942 surge, the San Francisco Port of Embarkation continued expansion of its facilities and reorganization. The Port established a large troop staging area at Camp Stoneman, leased additional piers at San Francisco, and added more warehouses, offices, and piers to the Oakland Branch. The War Department created the Army Service Forces, which in turn directed the Office of the Chief of Transportation (no

longer would the Quartermaster Corps direct port operations). Once outranked by General Gilbreath, Maj. Gen. Charles P. Gross became the former's superior officer. The two enjoyed a usually cordial, but increasingly volatile relationship as the Pacific War escalated.

As the dust cleared from the 1942 surge, then-Colonel Gross (29) acknowledged General Gilbreath's achievement: "I realize you were being urged to greater and greater speed in January when the vessels in questions were being loaded." As he admitted, the Port could not make up stowage plans fast enough to match the uncontrolled shipments. However, he stressed the "extreme necessity" of quick ship handling in port so that scarce available tonnage could "handle as large a quantity of freight as possible." (30)

General Gilbreath had already suggested a structured cargo layout on piers to prevent congestion. Gross accepted this idea, but urged the port commander to follow a specific movement control plan. In later years, General Gross consistently emphasized advance planning for crisis management. To his frustration, General Gilbreath and his successors did not always follow his suggestions. (31)

As usual, Gross closed his missive cordially: "We are...appreciative of the very fine work being carried out by the port." His letter revealed his particular management style, which contrasted with General Gilbreath's blunter, more emphatic manner. Gross's genial words did not entirely hide the firmness that lay beneath them. He made it clear what he wanted done and the means to do it. Under the steady pressure of Pacific war operations, OCT and SFPE priorities and perceptions eventually diverged and caused severe strains between the two commands. (32)

Conclusion

The San Francisco Port of Embarkation mastered the seemingly overwhelming Pearl Harbor surge with forceful and often ingenious action. In doing so, the SFPE proved the U.S. Army had learned the lessons of World War I in avoiding congestion. General Gilbreath's leadership proved a decisive factor. Cool in the face of crisis, he took the right measures at the right time, including embargo. That particular measure halted congestion in its tracks. However, the port commander did not simply block cargo from the port, but cleared the backed-up freight as quickly as possible. He also used the time to divert excess cargo to holding and reconsignment points. Thus, Gilbreath allowed new inflow of cargo into the Port within a week.

The SFPE commander developed new systems for rail traffic and vehicle processing and quickly established teamwork with civilian transportation executives. This last initiative showed that officials in Washington, D.C., had learned lessons from World War I, when the executive branch at first tried to run the railroads itself. When this effort caused greater congestion than before, Washington returned the rails to civilian control, with some government oversight. After Pearl Harbor, General Gilbreath immediately teamed with commercial transport companies instead of taking over their assets. This move allowed an orderly transition from peace to war. Significantly, he moved the large general depots out of the SFPE. His terminal would not use valuable storage space for cargo not destined for overseas. The Port also took definite steps to expand into outlying areas, specifically Oakland. Lastly, the OCT acted presciently in accepting Gilbreath's recommendations. Teamwork, in port and out, helped the SFPE overcome the crushing 1942 surge. However, as the Port faced surges during the rest of the war, this teamwork declined. Though General Gilbreath thoroughly developed the Port's infrastructure and staff organization, he allowed its individual divisions to operate autonomously, often without regard to other organizations. This practice reduced the Port's efficiency as the war escalated. Though effective in surges, crisis management did not always work in sustainment, a more difficult and grueling phase.

The Army's recent deployments in Desert Shield and elsewhere reveal many of the same problems faced by the SFPE in World War II. During Desert Shield, for example, surges almost overwhelmed several terminals, including Wilmington, NC. Though no port commander resorted to embargo (33), all needed to improvise and stem the uncontrolled cargo traffic. Often starting with very little, they needed to build infrastructure and systems in a hurry. Like the SFPE, they regulated rail inflow, set up orderly documentation procedures, and shifted cargo to the assigned storage areas. When some terminals filled up, they

transferred shipments to other ports. Reaction time to surges decreased with each conflict. After the initial burst of cargo, the ports of embarkation sustained a more regular system. However, freight flooded the American rear areas in Saudi Arabia. As in World War II, oversupply proved the rule. The Army could control the surges at ports, but sometimes not in the theaters. The military's overall "push" system, which thrust vast amounts of supplies at a battlefront, made for ultimately inefficient logistics.

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Notes

1. Erna Risch, *The Quartermaster Corps*, (Washington, D.C.: Office of the Chief of Military History, 1966), pp. 539-42.
2. James A. Huston, *The Sinews of War*, (Washington, D.C.: Office of the Chief of Military History, 1966) pp. 342-45.
3. "Historical Record, San Francisco Port of Embarkation, 1941-2," RG 336, Suitland (MD)Federal Records Center (Hereafter SFRC); Robert W. Coakley and Richard M. Leighton, *Global Logistics and Strategy, 1940-43* (Washington, D.C.: Office of the Chief of Military History, 1955), p. 342..
4. As the war escalated during 1942, Colonel Gilbreath soon became a major general. General Gross, Chief of Transportation during World War II, was also a colonel until mid-1942.
5. William Bolce and James W. Hamilton, *Gateway to Victory: The Wartime Story of the San Francisco Port of Embarkation*, (Stanford, CA: Stanford University Press, 1946), pp. 197-98.
6. Ibid., pp. 5-6.
7. Ibid., p. 6
8. Wardlow to Superintendent, Army Transport Service, SFPE, 12 Nov 41; Gilbreath to ACofS, G-4, Washington, D.C., 4 Jan 42, RG 336, SFRC.
9. Ibid.
10. San Francisco Port of Embarkation Rpt, 25 Nov 42, sub: "Improvements of Methods," RG 336, SFRC; Coakley and Leighton, *Global Logistics*, p. 342..
11. Memo for the Record, General Gilbreath, 14 Mar 42.
12. Ibid.
13. Chester Wardlow, *The Transportation Corps: Movements, Training and Supply* (Washington, D.C.: Office of the Chief of Military History, 1954), p. 269.
14. In early January 1942, San Francisco controlled all Pacific ports, including Seattle, WA, Los Angeles,CA, and Portland,OR. Seattle became an official Port of Embarkation on 17 January 1942, while Los Angeles remained an SFPE subport until September 1943.
15. Gilbreath to Supply Service Commanders, 16 January 1942, RG 336, SFRC; Huston, p. 348.
16. Adams to CGs of all Corps Areas, 17 Jan 42; Somervell to AGl, 18 Jan 42, RG 336, SFRC. Large quantities of supplies for Western Defense Command (WDC) installations had also arrived at the SFPE for storage and/or shipment. These were now to be sent directly to those installations and not the port.
17. SFPE Rpt as of 25 Nov 42, RG 336, SFRC.
18. Ibid.
19. Reybold to Chief of Staff, 7 January 1941, RG 336, SFRC.
20. He took command of the SFPE on 18 October 1940.
21. SFPE Rpt as of 25 Nov 42; Col F.W. Hoorn to Chester Wardlow, 17 Feb 44; "Special Reports on Administrative Developments," OCT Control Division, 3 Nov 42, RG 336, SFRC.
22. Gilbreath to AG, 9 Jan 42; Bolce and Hamilton, *Gateway to Victory*, p. 17; "Special Report, November 3, 1942", RG 336, SFRC. Each warehouse stretched three city blocks in length.
23. Oliver to Gilbreath, 26 Jan 1942; SFPE Rpt as of 25 Nov 42, RG 336, SFRC.
24. Ibid.
25. Report of the Chief of Transportation, Army

Service Forces, World War II," 30 Nov 45 (Washington, D.C.: War Department), p. 31.

26. Gilbreath to Record, 3 Feb 42; Somervell to Commander, SFPE, 31 January 1942. RG 336, SFRC.

27. Report of the Chief of Transportation, Army Service Forces, World War II," 30 Nov 45, p. 31. Other congested ports included New Orleans and New York.

28. Huston, *The Sinews of War*, pp. 342-43.

29. He became transportation chief and major general in July 1942. Up to that time, he headed the Quartermaster Corps' Transportation Branch.

30. Gross to Gilbreath, 9 Mar 42. RG 336, SFRC.

31. Ibid.

32. Ibid.

33. According to some observers, port commanders at Wilmington, NC, and Bremerhaven, Germany, "embargoed" their ports when congestion became excessive. However, they actually diverted excess cargo to other ports or found extra storage space.

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Physiography and Military Perception
The Cases of Plan XVII, the Ardennes, Caporetto, and the Taebaek Split

Marvin F. Gordon

William Blake, the mystic eighteenth-century poet, once wrote that "Great things are done when men and mountains meet." (1) The latter, it is assumed, would serve as an appropriate venue in which the former's fortitude, courage, enterprise, and ingenuity would be challenged. In a military frame of reference, the examples of Hannibal's and Napoleon's crossings of the Alps and Simon Bolivar's crossing of the Andes come to mind.

Presumably these campaigns are more the exception than the rule: areas on which steep slopes predominate do not, *ceteris paribus*, generally favor offensive operations. This tendency holds doubly true for the modern, mechanized army, whose overland capabilities—however impressive—are not without certain limitations. Indeed, one distinguished historian warns that "an army that depends for superiority on its mobility, firepower, and technology, should never voluntarily give battle where these assets are at a discount." (2) Physiography, and other natural phenomena, it appears, can play a vital and pivotal role in determining the outcome of military ventures.

Many modern military leaders, however, have at times opted to conduct major operations in something less than optimally beneficial surroundings. Compounding this inclination is the tendency for some army leaders to become more involved in operational- rather than in strategic-level activities. Lt. Gen. George C. Patton, for example, commented that senior officers often "get themselves enmeshed in (small area, division-to-corps-level) terrain conditions....Army level...commanders (should)...not be interested so much in how to beat the enemy from a tactical standpoint as to where to beat him." (3)

The March 1918 campaign led by General Erich Ludendorff is an example of this focus on decisionmaking at the tactical or operational level. His plan was based on the premise that the offensive would focus on an Allied area where a significant tactical breakthrough occurred. The Germans were indeed skilled in taking advantage of favorable terrain when the occasion warranted (for example, as witnessed in their selection of favorable tactical sites in their 1914 race to the sea). But such a skill, as Patton later warned, could be carried too far by army-level commanders. Thus, Ludendorff made the incorrect assumption that "tactics were more important than strategy." (4) Karl von Clausewitz would have been less than delighted with this innovative approach to military theory.

In keeping with Patton's theme—that army leaders should concentrate on gross features of the landscape—this article will examine five twentieth-century campaigns: French Plan XVII, the invasions of the Ardennes in 1940 and 1944, Caporetto, and the Chinese attack in the Korean Taebaek Range in 1950. These offensives are examined more from a chorographic than from a chronological perspective, given that the focus of this study is military landscape evaluation.

To demonstrate the significant role played by landforms, four physiographic provinces in western Europe bear close examination: the Rhenish Slate Upland, the Paris Basin, the Central German Highlands, and the European Plain.

The Rhenish Slate Upland

The landform centerpiece around which the physical features of central west Europe are grouped is the Rhenish Slate Upland (RSU), located primarily in Germany and Luxembourg. Slope predominates, with a large number of entrenched valleys and steep sided defiles, making a cross-country traverse difficult. (5) It is bisected by the Rhine River, which in this area flows toward the northwest. This part of the waterway is the well-known, castle-studded, and tourist-oriented seg-

ment called the Rhine Gorge, extending from Mainz in the south to Koln (Cologne) in the north. (6) The two segments located in the southwest part of the RSU are known respectively as the Ardennes and the Eiffel.

The Paris Basin

To the south of the RSU is the Paris Basin, extending from the Isle de France, location of the national capital, eastward to Lorraine. The Basin consists of a series of connected steps or plateaus, which gradually ascend in elevation to the northeast as they radiate out from the center at Paris. The features involved generally are similar, in that each segment contains a plateau or "cuesta," with a very gradual rise up to a northeast-facing escarpment or "cote." Each of the cuesta is named (Champagne, Argonne, etc.) as are the cotes (Cotes de Moselle, Cote d'Or, etc.). Rivers cutting through the scarps have created gaps or "charmes," through which transportation routes are funneled naturally; commercial centers such as Nancy and Toul are located nearby.

A German advance toward France in this area has commonly posed problems, since steep ascents up cotes, constricted passages through charmes, and sites for observation, all tended to favor the defense. The French, moreover, had gilded the lily prior to World War II by constructing the Maginot Line in this terrain. (7) It is interesting to note that the Germans never seriously considered attacking those defenses frontally, in force. Since the defenses extended only as far as Longwy, near the French-Luxembourg border, however, the line could be outflanked. In 1940, having penetrated the Ardennes, the Germans subsequently were able to move southeast and to take the Maginot Line from the rear.

Central German Highlands

Between the RSU and its eastern, hilly geomorphic counterpart, the Bohemian Massif—coinciding approximately with the current boundaries of the Czech Republic—lies a fragmented zone of hills and winding rivers known as the Central German Highlands. It extends from Frankfurt-am-Main in the south to the Harz Mountains in the north.

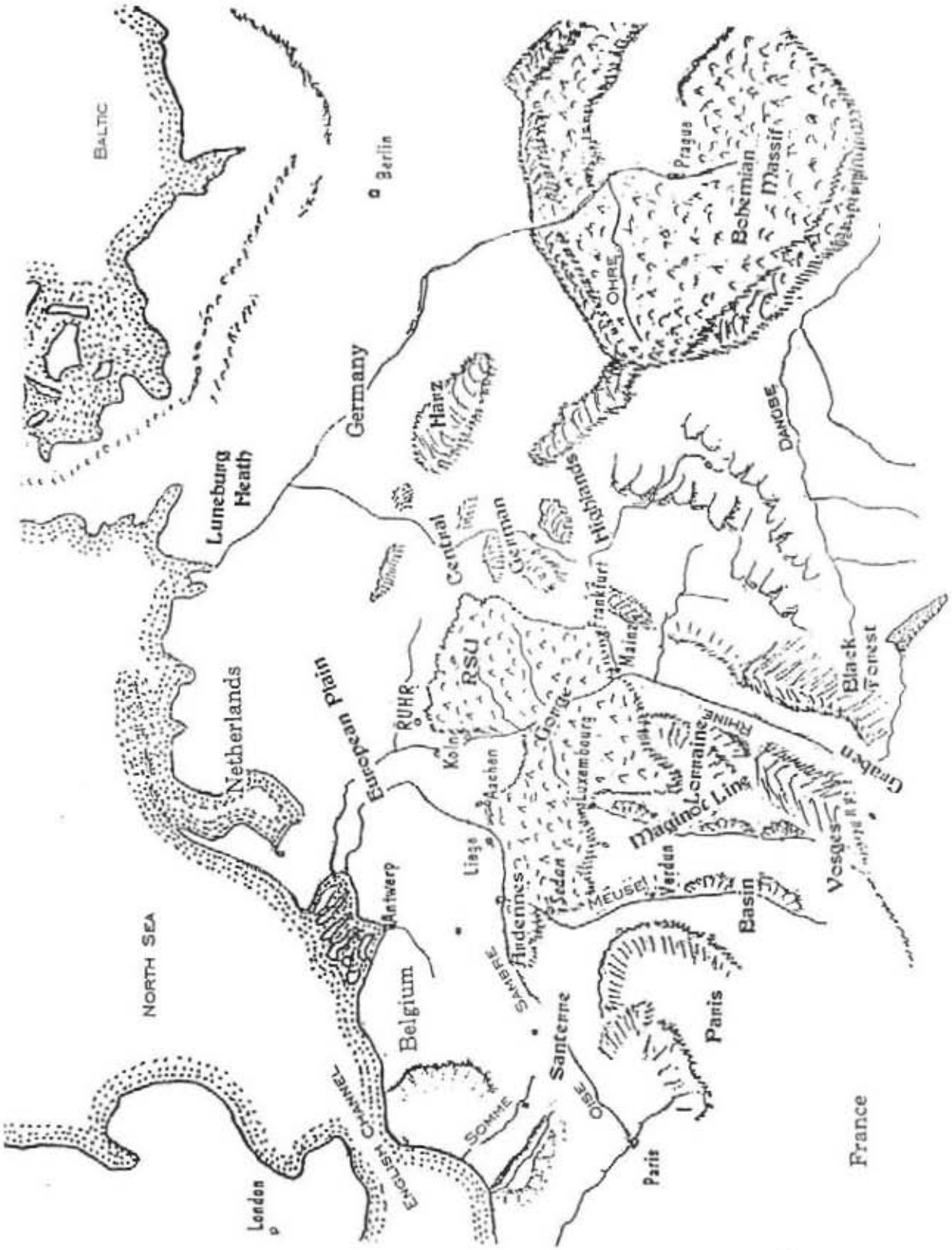
Frankfurt-am-Main has become the commercial and transportation linchpin of this region. From that city it is possible to choose the following routes: down the Main River and the Rhine Gorge to the Ruhr and the Low Countries; southwest across the Paris Basin cotes to the French capital; north, via the Central German Highlands to the European Plain, Hamburg, and Berlin; and south through the Rhine Graben, either to Switzerland or to southern France.

Plan XVII

In 1913, the French High Command adopted Plan XVII, which called for an attack from Lorraine toward the Rhine and the Central German Highlands. No concern was evinced over the possibility of a German advance in the west toward Belgium; that would simply have been perceived by the French as a reaction erroneously taken in response to an enemy initiative. The French put their trust in *cran* ("guts") and the concept of *elan* ("will to win"). "The least display of caution," it was held, would "destroy all efficiency." (8) The French High Command believed that it, not its German counterpart, should be the central controlling force determining the course of operations on the battlefield. The French seemed to adhere to the old Roman dictum, to the effect that "what is permitted to Jupiter is forbidden to cows" (*Quod Licit Jove, Non Licit Bovi*); only the gods on the French General Staff could be allowed to determine the course of a major military action.

General Ferdinand Foch, a stalwart advocate of the Plan XVII, vaguely suggested that the attack be launched initially against Mainz, with Berlin singled out as the ultimate objective. Mainz, located on the upriver end of the Rhine Gorge, is an urban neighbor of Frankfurt-am-Main. From this area, the French presumably could move down the Rhine Gorge to the Ruhr and on north via the Central Highlands toward Hamburg and Berlin. Both routes passed through territory that favored the defense. If the Ruhr was considered the ultimate objective, however, the French did not bother to mention. The Plan, in any event, was not very specific about objectives and means. (9)

One observer has compared the Schlieffen move toward France along the European Plain and the Plan XVII move toward Frankfurt as parts of a revolving door, which was hinged in the RSU and was being turned counterclockwise. (10) The more forcefully the French pushed north, the easier the task would have been for the Germans' right wing moving south.



Major Physiographic Features of Central and Western Europe. (Based in part on A.K. Lobec's "Physiographic Diagram of Europe," © Hammond Inc., Maplewood, NJ). Used with permission.

The European Plain

To the west and north of the RSU is the European Plain, extending from the Urals to the Pyrenees. Although moderately flat, it is not a featureless playing field. For example, having been glaciated during the Pleistocene Period, it contains physical features typical of this type of erosion, such as lakes (famous in two battles: Tannenberg in 1914 in the area of the Masurian Lakes, and Suomussalmi, where the Finns executed a Cannae-like envelopment of Soviet forces during World War II), high rides, and outsized river valleys. There are also large areas with poor surfaces for underground drainage (such as the Lunenburg Heide near Hamburg, the Pripet Marshes in Russia, and the clayey lowlands of Flanders).

The segment of the Plain from Brussels to Paris is probably best known to military historians as the route chosen by Chief of the German General Staff, Count Alfred von Schlieffen, to invade France. One of the region's advantages for the offensive is that there are no large waterways to be encountered along the Koln-Liege-Paris traverse until the valley of the Somme is reached. Between the Ardennes to the east and the chalk uplands of Artois to the west, is a particularly flat area known as the Santerre. Cambrais, where the first tank attack took place in 1917, is located here.

Operation MARKET-GARDEN in 1944 was an effort to advance north on the European Plain, cross the Rhine, and envelop the Ruhr (located along the north central shoulder of the RSU). As one military historian put it, "If the Allies [at this juncture] could quickly capture the Ruhr...the war in the West would be won." (11) When the effort failed, a prolonged dispute arose in the Allied headquarters (SHAEF) as to whether Allied strategy should continue its "Single Thrust" policy, by trying to advance only on the European Plain, or perhaps adopt a more flexible "Broad Front" approach, in which several routeways and penetrations into Germany were attempted. (12)

The British favored the single thrust advance across the Plain, in what Field Marshal Bernard L. Montgomery referred to as the Schlieffen Plan in reverse. The proposal had obvious defensive merit, but it also induced the enemy to concentrate in the very same area. By contrast, the broad approach involved several choices for invasion routes, but each had to contend with the defensible RSU hill country centered around the middle Rhine.

The Ardennes-Eiffel

In formulating his famous offensive plan, Schlieffen had expressed concern that the German left flank, as it wheeled across the European Plain in Belgium, would be exposed to a French attack through the Ardennes. Accordingly, German forces were dispatched into the area in question to discourage any such attempt. In 1914, the French were slow to recognize the danger posed by the Schlieffen Plan, since they wished to pursue their own agenda, which called for an "*attaque brusquee*" through Lorraine, directed toward the Central German Highlands. Moreover, most of the Ardennes was in essentially undefended Belgian territory, and the French were unaware that the Germans had quickly and quietly advanced into the area. When the French finally awoke to the danger and attacked the entrenched enemy in the Battle of Semois, they were bloodily repulsed. The Germans, as one geomorphologist put it, "easily crushed an imprudently conducted advance into a formidable terrain." (13)

In 1940, a very similar situation prevailed; as in World War I, the Belgians preferred to defend Brussels, rather than the sparsely populated Ardennes and had, accordingly, not stationed an effective force there. The French had positioned troops along the Belgian border but, being politically constrained, could not advance into the Ardennes until their neighbor's neutrality had been violated. The French General Staff realistically took the position that it could not defend all its borders with equal force. (14) Since the Ardennes was regarded as an area which would be difficult to traverse or attack, it was, accordingly, lightly defended. (15)

The outcome of the 1940 Ardennes campaign hung on two evaluations: first, whether it was possible to move a modern, mechanized force through the upland and surprise the enemy; and second, whether there was enough time for an uncontested traverse. Initially, both general staffs believed it would take nine days; apparently not much improvement over the ten days it took Julius Caesar's army to cross the area. (16) The Germans, however, revised their plan less than two months before the actual attack.

The new plan was essentially the work of one man, *Generalleutnant* Erich von Manstein. He wrote that, "I found it humiliating...that our generation could do nothing better than repeat an old recipe, even when this

was the product of a man like Schlieffen." (17) Accordingly, the *Schwerpunkt* for the new plan was switched from the European Plain locale to the Ardennes. Careful planning and strict march discipline were in large measure the keys to success; it took the essentially unimpeded *Blitzkrieg* advance only fifty-seven hours to reach the Meuse River at the southern boundary of the upland. (18) Unquestionably, timing was the all-important key to success. As Patton once wrote in his diary, "No one realizes the terrible value of the 'unforgiving minute.'" (19)

At the Meuse, second-rate French reservists managed to repulse three of the six major attempts by the cream of the *Wehrmacht* force to cross the river. (20) After having established bridgeheads on the other side, however, the German armor headed for the Channel ports and was thus able to trap the large mechanized Allied force which had advanced into Belgium. Winston Churchill has made the point that the French failed to assign a strategic reserve to the area, lest a breakthrough occur. (21) In any event, once the German armor neared the Channel, to all intents and purposes, the campaign was over.

It bears reemphasizing that the key to the *Wehrmacht*'s stunning victory lay in its ability to cross the basically undefended Ardennes quickly. When this feat was accomplished, and bridgeheads established across the Meuse, the military plight of the Allies could not easily be rectified. Yet, until the 1950s, the view widely persisted that the ignominious French defeat resulted from perfidious actions by a traitorous "fifth column." (22) The focus in recent literature on the subject, however, suggests that German military competence can explain the victory. This may be so, but as noted, two other important factors also contributed to the result: first, neutral Belgium refused to allow French forces into the Ardennes prior to a German invasion; and second, the French did not believe a mechanized force could cross the upland quickly. These points, surprisingly, have not been emphasized in either past or current military or historical coverage of the campaign.

The Battle of the Bulge

In late 1944 the Allied front was located in positions somewhat comparable to those held by the French four years earlier. There was one major exception, however; unlike the French, the American troops actually occupied the Ardennes itself. There were, nevertheless, comparatively few troops stationed there, and they were in the process of reequipping, training, and receiving new reinforcements. Moreover, some inexperienced units also were included in the mix of troops assigned to this quiet sector of the front. (23)

The German attack plan called for the *Wehrmacht* to break through the tissue-thin American defenses in the Ardennes, cross the Meuse, and retake the port of Antwerp. One version of the plan, the "Big Solution" or "Grand Slam" actually envisioned a double envelopment, but was not used because it was considered overly ambitious. (24) As one observer has eloquently suggested, "Germany's political reach [in World War II] consistently exceeded her military grasp." (25) It is interesting to note that the Germans made no mention of additional military-strategic plans once Antwerp was taken. One critic suggested that "Hitler [simply] was trying to resurrect the offensive...of 1940," in which a battle, rather than a war, was won. (26)

The Ardennes attack managed to surprise the American command, but the Germans did not reckon on a determined, stubborn, and tenacious opposition. The element of surprise thus was not sufficient to achieve victory; terrain, military skill, and American "*cran*" brought the experienced and able German forces to a halt.

Slope

During the Cold War, the military historian John Keegan expressed concern about the geopolitical goals of the Soviet Union. Commenting about the Russians' presence in Afghanistan, for example, he wrote: "Perched safely in the Hindu Kush...the Soviets could steal a march through always restive Baluchistan and attain their venerable ambition of a warm water port—one astride the Western oil lanes on the Persian Gulf. To prevent this happening would be worth something to the West." (27) The author, however, has lightly dismissed two significant deterrents to such a move: the political problems to be dealt with in such a scenario (adverse reactions of countries affected by this plan), and a forbidding physical landscape. In so far as the latter is concerned, he blithely proposes passage through a particularly daunting desert and mountain environment. Military cost-benefit ratios, exploitative

possibilities, and armed opposition might, accordingly, prove to be very difficult to deal with or control. It is indeed surprising to find that many competent modern military leaders and observers regard the task of overcoming some of nature's major impediments as something less than formidable.

A somewhat similar strategic assessment involves Suez. In World War II, many observers believed that the Germans were planning a giant pincer movement to cut the British Empire into segments. (28) Accepting this geopolitical perception, General Sir John Hackett, an Oxford scholar, World War II veteran, and North Atlantic Treaty Organization (NATO) group commander, writes that "In 1941, we on the Allied side in the Middle East awaited a powerful German onslaught down through the Caucasus toward the Suez Canal to coincide with the thrust of the Africa Corps out of the Western Desert toward the Nile." (29) An examination of a Caucasus-Suez traverse, however, reveals the existence of the rugged Armenian knot, located in eastern Turkey and adjacent parts of Iran, and of mountain chains in Russia, Iran, and Turkey that are Alpine in aspect. Such terrain should give pause to the most intrepid of offensive-minded leaders. Besides, one of the Axis' prime objectives—cutting the direct Britain-Asia connection—had already taken place. The Suez Canal was rendered inoperable for some time in World War II (indeed, during World War I as well), so that Great Britain's only possible seaward route to the east was the circuitous passage around southern Africa. Middle East oil, another objective, also could not be reached from southern Russia. The known fields of the day, associated with the Persian/Arab Gulf geosyncline, involved a further traverse across difficult terrain. Physiographic considerations, among other factors, seem not to have been seriously vetted. (30)

A lack of critical geomorphic perceptions at both strategic and operational levels has at times characterized recent planning as well. During the Cold War, for example, one distinguished scholar recommended—should war erupt—a strong NATO thrust from the Central German Highlands across the Ohre Valley segment of the hilly Bohemian Massif toward the Prague Basin. (31) As in the case of the Battle of the Bulge, such a scenario might yield territorial gains, but in all probability, they would be achieved only at high cost in men and materiel.

Questionable large-area terrain evaluations can also be cited in other cases. General Charles de Gaulle, for example, claimed that France had few natural barriers between Switzerland and the English Channel that could be used to deter an invasion force. (32) Perhaps he had forgotten about the defensive terrain of Lorraine and the battle of Verdun, in which he was a participant.

In World War II, one final case demonstrates that uninformed physiographic appraisals can be encountered at the highest levels of command. Winston Churchill strongly advocated an Allied attack in the mountainous Balkans, which he referred to as the "soft underbelly" of Europe. (33) His political concern that this area could easily fall into Communist hands was understandable and doubtless justified, but his apparent lack of terrain appreciation, given the military problems and anticipated high casualty rates, is curious, to say the least.

It should be noted that an attack through disadvantageous terrain may at times be the only option open to a military leader. Under certain circumstances, a non-Pyrrhic victory in such a case lies within the realm of the possible. The point to be made here, however, is that high commands often neglect, misunderstand, or simply are unaware of, physiographic constraints, as well as appropriate uses to which landform features can be put.

Of Mountains, Flanks, and Surprises

Plans to outflank an enemy by attacks in mountainous terrain can, as suggested above, reveal a certain lack of sophisticated knowledge of landforms on the part of leaders planning offensive action. Two examples help to highlight this point.

During World War II, the Italian northeast front was based on the Isonzo River, which flowed from the Alps south across the flat Po Plain to the Adriatic. The Isonzo battles had been costly in men and equipment. In more than two years of combat, the Italians had sustained 1.1 million casualties, many at the edge of the Po Plain, in the very forbidding terrain of the Karst (Corso) Plateau to the east. (34)

The Italian left, or northern flank, was lightly defended, since it was located in the mountain fortresses of the Alps. In 1917, the Germans attacked this flank at Caporetto. They surprised and overran the

small Italian defense force, thus compelling the main army stationed along the Isonzo to abandon its positions rapidly, so as to avoid being taken from the rear. This precipitant retreat was carried out successfully; the Germans were unable to move quickly enough through the Alpine mountains to the north and to encircle the main Italian armies on the Po Plain.

It appeared to many observers, however, that the Italians, led by General Luigi Cadorna, were incompetent and militarily doomed. (35) However, other than an impressive but limited success, the Germans had not been able to achieve their goals or reach their objectives on the Po Plain. The inhospitable Alps and a dogged Italian defense had saved the day. Moral: If an army flank is turned in a mountainous area, defeat is not inevitable. (It is worth recalling here that when the Germans broke through and thus turned the Allied flank in the Ardennes in 1940, their mechanized force had by then emerged from the uplands onto the flat routeway to the European Plain and could, at that point, not readily be contained.)

In Korea, a somewhat analogous event occurred in 1950, when a similar misreading of the landscape and strategic options occurred. The United Nations' (UN) command in Korea in 1950 was divided into two areas of responsibility. The Eighth Army advanced toward the Chinese border along the west coast, and the X Corps was assigned to the northeast. Between the two lay a sizeable, undefended upland segment of the Taebaek Mountains (the "Taebaek Split"). The UN attackers thus were left with their flanks "up in the air." Perception of the situation, strategically and operationally, differed. General Matthew Ridgeway, Eighth Army commander, stated that "obvious from a terrain study, was the impracticability of the two forces attacking along an east-west line until they joined." General Douglas MacArthur, on the other hand, agreed with this statement at one time, but differed at another. (36) In any event, the difficulties of advancing on a line in such a rugged, almost roadless environment, even without opposition, clearly posed a host of problems.

The Eighth Army line was based on the western plains. Its right flank, including poorly trained Republic of Korea (ROK) troops, was positioned up in the Taebaek piedmont. (The Korean peninsula is asymmetrically shaped, with the highest peaks in the east, descending gradually to the coastal plains in the west.) In late 1950 the Chinese Army launched a surprise attack in these foothills, and the Eighth Army right-flank forces were driven back in disarray by the Communists' superior numbers. It is easy to understand the alarm and dismay that this event generated.

A comparison of this offensive with those already mentioned reveals similarities. This portion of the Taebaek piedmont, the Ardennes in the RSU, and the Alps around Caporetto have some common characteristics, as do the weak defensive forces assigned to these areas. Even the territorial goals of the enemy forces in these cases are similar: the politically and economically and important flatlands of, respectively, western Korea, the European Plain, and the Po Plain in Italy.

The situation in Korea appeared desperate, given the plight of the Eighth Army, and the brokers of doom were many. One World War II leader, doubtless recalling 1940 and 1944, opined that only diplomacy could save the situation. (37) Phrases such as "unsound deployment" and "momentous blunder" were used by military commentators. (38) The *Times* of London, recalling 1940, stated that the Chinese would almost certainly "wheel westward...[toward the coast] in the rear of the main body of the Eighth Army. It will require great skill...and a large share of good fortune to extricate the Allied forces." (39) The Joint Chiefs of Staff sent a message to General MacArthur on 13 January 1951, stating: "We recognize, of course, that continued resistance might not be militarily possible." (40) Was another Cannae or Dunkirk in the making?

The Eighth Army made good its retreat to the south, to fight another day, for several reasons. First, the rugged terrain and poor roads of the Taebaek piedmont impeded a swift Chinese advance. It was thus not just because the Chinese were poorly mechanized and had an outmoded logistical support system—which they did—rather, because the pace of their advance in a rugged upland area was, of necessity, slow. Accordingly, they were never able to wheel toward the coast behind the rapidly retreating Eighth Army. The mechanized American units, using the plains and better roads in the west, could not be trapped. Ingenious, impressive, and successful as were the attempts to outflank the Eighth Army, the Chinese were manifestly incapable of achieving ultimate victory. General Cadorna, meet General MacArthur. (41)

Of Terrain, Perceptions, and Conclusions

An eminent geomorphologist once posed the question, "Do the mountains defend the army, or does the army defend the mountains?" (42) The answer must be couched in holistic terms; it would be erroneous to assume that only landforms are important, when a whole host of other factors also come into play, to a greater or lesser degree.

What lessons, then, can be learned about terrain analysis and military perception? First, that to conclude that slope only favors the defense is too simplistic, since surprise, morale, critical mass, and other considerations are involved. Second, that a strong defensive posture in favorable terrain, such as the Maginot Line, can prove to be formidable. (The Germans also made enough good use of defensively favorable urban terrain in the battle of Berlin to inflict 100,000 casualties on the Soviet attackers.) Third, that an advance through mountain or hill country has its obvious operational and logistical limitations, even if surprise is achieved—as was the case at Caporetto and the Taebaek piedmont. Fourth, that major strategic goals must take geomorphology into consideration. The French Plan XVII and the German goal to cross the Caucasus and attack Suez clearly are cases in which such considerations were ignored. Last, that higher echelon leadership often seems to lack training in physiographic analysis at a strategic level, while aggregate corps intelligence reports, by contrast, usually do not provide information and insights at the scale needed by army and army group commanders.

It is said that a former chief of the German General Staff, Helmuth C.B. von Moltke, smiled only twice in his entire adult life; once, when he saw how obsolete Danish coastal defenses were and again, when told that his mother-in-law had died. If alive, he might also have smiled when the *Wehrmacht* crossed the Ardennes in 1940. He probably would have frowned four years later when that very same army—misunderstanding terrain and underestimating opponents—tried to cross that very same piece of real estate. The leaders who succeeded Moltke "the Elder" apparently should have learned a little more about the relationship of physiography and military perception. Then again, perhaps the Swiss psychologist Carl Jung—unlike William Blake—got it right when he said that mountains tend to restrict the horizons of the mind.

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Notes

1. Northrop Frye, ed., *Selected Poetry & Prose of William Blake* (New York: The Modern Library, 1953), p. 79.
2. Russell F. Weigley, *Eisenhower's Lieutenants* (Bloomington, IN: Indiana University Press, 1990), p. 315. "Discounted" areas could include urban areas, as well as physical terrain.
3. George S. Patton, Jr., *War as I Knew It* (New York: Bantam Books, 1979), pp. 338-39.
4. Martin Van Creveld, *Command in War* (Cambridge, MA: Harvard University Press, 1985) pp. 172-73.
5. RSU terrain is hilly rather than mountainous. A differentiation should be made between older, eroded hills, such as the RSU or the Bohemian Massif, and the youthful and rugged Alpine mountain ranges. The RSU is sometimes referred to by local people as the "Slate Mountains," although the local relief of truly mountainous terrain is much greater.
6. The Rhine "Gorge" is sometimes confused with the Rhine *Graben*. The latter is the downfaulted central portion of an old domed structure through which the Rhine now flows; it is well upstream of the Gorge. The

river at the *Graben* occupies a rift valley, bordered on the west by the Vosges in France and on the east by the Black Forest in Germany. The use of a physiographic diagram or map (they are not exactly the same) is recommended at this point. One such map can be found in any recent edition of *Goode's World Atlas* (Rand McNally & Co.). The physiographic map of Europe in the 1992 edition (pp. 132-33) was prepared by Edwin Raisz of Harvard University. A more detailed set of diagrams by Armin K. Loebeck of Columbia University was published by C.S. Hammond & Co., but these sheets, unfortunately, are out of print. They are, however, of a scale suitable for analysis and planning on a grand strategy scale.

7. Bernard Brodie and Fawn M. Brodie, *From Crossbow to H-Bomb* (Bloomington, IN: Indiana University Press, 1973), p. 153.

8. Col Loyseau de Grandmaison of the French General Staff, quoted in John Williams, *Ides of May* (New York: Alfred A. Knopf, 1968), p. 19. See also Barbara Tuchman, *The Guns of August* (New York: Dell Publishing Co., Inc., 1962), pp. 48, 50, 53, 58-61.

9. There is, of course, nothing new or unusual about a certain vagueness regarding strategic goals and routeways. In 1870, for example, the Francophile dictator of Bolivia, Mariano Melgarejo, was informed of Napoleon III's defeat by the Germans in the battle of Sedan, and decided to come to his aid. Thoroughly inebriated at the time, he hurriedly marched his troops north from La Paz, until a raging thunderstorm sobered him up—somewhat. The French advocates of *cran* doubtless would have been delighted with such brash leadership, even though he often insisted that, in his opinion, Napoleon III was superior to Napoleon Bonaparte.

10. The military historian, Basil H. Liddell Hart, now with a somewhat tarnished reputation, as noted in Alistair Horne, *To Lose a Battle* (London: Macmillan & Co., Ltd., 1969), p. 138.

11. Weigley, *Eisenhower's Lieutenants*, p. 260.

12. Ibid., p. 576.

13. Part of the greater and more inclusive 1914 battle of the Frontiers. The Semois River flows through the southern part of the Ardennes. Douglas W. Johnson, *Battlefields of the World War* (New York: Oxford University Press, 1921), p. 380.

14. When Napoleon was informed that one of his generals had drawn up a plan to apportion troops equally along the entire length of the French border, he remarked sharply that the *Grande Armee*'s prime function was not to stop smuggling.

15. Peter Spent, *Taking Risks* (London: Penguin Books, 1988), p. 28. The author, professor emeritus of statistics from the University of Dundee, states that "complete elimination of most risks is impossible.... Yet complete elimination is often the aim [of many people]."

16. Robert A. Doughty, *The Breaking Point* (Hamden, CT: Archon Books, 1990), p. 78. See also, Charles Burdick and Hans-Adolf Jacobsen, eds. *The Halder War Diary* (Novato, CA: Presidio Press, 1988), p. 144.

17. Erich von Manstein, *Lost Victories* (Chicago: Henry Regency Co., 1958), p. 98.

18. A point stressed by Gen Gunther Blumentritt, Field Marshal Gerd von Runstedt's operations chief, in Basil H. Liddell Hart, *The German Generals Talk* (New York: Berkley Publishers Corp., 1948), p. 106. U.S. Department of the Army, *Operations* FM 100-5 (Washington, D.C.: Government Printing Office, 1986), stresses that "speed is built into operations through careful planning" (p. 97);
Doughty, *Breaking Point*, p. 72.

19. Weigley, *Eisenhower's Lieutenants*, p. 255.

20. Doughty, *Breaking Point*, p. 164.

21. Winston S. Churchill, *The Second World War* (London: Cassell & Co., Ltd., 1949), vol. 2, pp. 42-43. French troop deployment in 1940 has been roundly criticized. See, for example, James H. Polk (former commander, NATO Central Army Group), "The North European Plain Scenario: Threat or Illusion?" *Strategic Review* 8, no. 3 (Summer 1980):70-71.

22. See, for example, Andre Geraud (Pertinax), *Gravediggers of France* (New York: Doubleday, Doran & Co., 1944).

23. Hugh M. Cole, *The Ardennes: Battle of the Bulge* (Washington, D.C.: U.S. Army Center of Military History, 1965), p. 55.

24. Ibid., pp. 20-21, 27-29.

25. Jeffrey Record, "Operational Brilliance, Strategic Incompetence," *Parameters* 16, no. 3 (Autumn 1986):5.

26. Matthew Cooper, *The German Army, 1933-1945* (Chelsea, MI: Scarborough House Publishers, 1978), p. 519.

27. John Keegan, "The Crisis of Afghanistan," *The Atlantic* 256, no. 5 (November 1985):105.

28. See, for example, Churchill, *The Second World War*, vol 4, pp. 265-66.
29. John MacDonald, *Great Battlefields of the World* (New York: Macmillan Publishing, Co., 1984), p. 9.
30. The important politicoeconomic role played by Middle Eastern oil is somewhat more of a post-World War II phenomenon.
31. Samuel P. Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," in *Conventional Forces and American Defense Policy*, ed. Stephen E. Miller (Princeton, NJ: Princeton University Press, 1986), p. 269.
32. As noted in John J. Mearsheimer, *Conventional Deterrence* (Ithaca, NY: Cornell University Press, 1983), p. 69.
33. Dwight D. Eisenhower, *Crusade in Europe* (Garden City, NY: Garden City Books, 1948), pp. 221-22. See also Bernard Brodie, *War and Politics* (New York: Macmillan Publishing Co., 1973), pp. 40-41.
34. Military-geomorphic aspects of the Isonzo-Corso region are described by Douglas W. Johnson in his monograph, *Topography and Strategy in the War* (New York: Henry Holt & Co., 1917), pp. 136-43. Hanson W. Baldwin, the erstwhile military analyst for the *New York Times*, suggests that General Cardorna "practiced the bloody tactics of attrition more than any other general of World War I" in his *World War I* (New York: Harper & Row Publishers, 1962), p. 87.
35. Ernest Hemingway's distorted impressions to the contrary.
36. Matthew B. Ridgeway, *The Korean War* (New York: Popular Library, 1967), pp. 59, 85-86. See also Callum A. MacDonald, *Korea* (New York: The Free Press, 1987), pp. 63, 65.
37. General Omar Bradley, quoted in Walter Karig, Malcolm Cagel, and Frank Manson, *Battle Report: The War in Korea* (New York: Rinehart & Co., 1952), p. 374.
38. For example, Hanson Baldwin, *New York Times*, 30 Mar 52.
39. *Times* (London), 6 Jan 51.
40. Richard H. Rovere, and Arthur M. Schlesinger, Jr., *The General and the President* (New York: Farrar, Straus, and Young, 1951), p. 162.
41. The retreat of the X Corps in the northeast has received much public attention, possibly because of the ample media coverage of the role of the U.S. Marine Corps elements in the fighting. See, for example, Roy E. Appleman, *Escaping the Trap: The US Army X Corps in Northeast Korea, 1950* (College Station, TX: Texas A&M University Press, 1990).
42. Johnson, *Battlefields of the World War*, p. xv.

Book Reviews

Book Review
by Judith A. Bellafaire

War Dogs: Canines in Combat
by Michael G. Lemish
Brasseys, Inc. 256 pp.,$22.95

In *War Dogs: Canines In Combat*, Michael G. Lemish examines the history of the utilization of "war dogs" by the U.S. military. Lemish demonstrates how the military services too frequently misunderstood the potential of dogs in combat and thus underutilized their dogs throughout World War I and during much of World War II and the Korean War. In Vietnam, Lemish argues, erroneous policy and wrong-headed leadership were responsible for the actual mistreatment of these valuable animals.

Throughout this entire saga, and as an effective counterpoint, Lemish recounts specific examples of the real and significant accomplishments of war dog platoons, as well as numerous dramatic vignettes which demonstrate the frequent heroic actions of individual dogs and the special relationships which often developed between the dogs and their handlers.

During World War II, dogs were used primarily as messengers, scouts, and sentries. While the uses of

messenger dogs and sentries were limited, dogs acting as scouts in a hostile environment proved time and again their value and dependability. The Marines used dogs as messengers and scouts successfully on the Pacific islands of New Britain, Bougainville, Guam, and Peleliu; the Army employed messenger dogs and scouts on Morotai, Bougainville, Biak, and Aitape with the 31st and the 41st Divisions. Messenger dogs were most frequently utilized during initial landings before lines of communication had been established and also during periods of heavy rain or high humidity, which disabled walkie talkies and tube-type radio gear. A collie named Buster, a messenger dog operating on Morotai, was directly responsible for saving the lives of seventeen men of F Company, 155th Infantry. When the patrol found itself surrounded and outgunned, Buster was sent to the rear carrying a message which gave the patrols position and situation and asked for instructions. Buster evaded machine gun fire and completed a roundtrip, returning with a message telling F Company to hold their position and await reinforcements. The reinforcements arrived and quickly routed the Japanese.

Although messenger dogs were important under certain specific conditions, the demand for these dogs declined as soon as dependable lines of communication were established. Dogs truly excelled when employed as scouts for platoons on patrol in a jungle environment. The heavy vegetation and poor lighting provided excellent cover for the small enemy patrols and snipers, which continually harassed the Americans. The function of the scout dog was to alert his handler to the presence of hidden enemy soldiers. The average scout dog located the enemy at a distance of no less than 70 yards; the best dogs often scented at distances of over 200 yards. The Japanese quickly came to understand that, if they wanted to escape detection, they had to kill the scout dog, and the dogs became primary targets for snipers.

Lemish provides several examples of instances when patrol leaders who were unfamiliar with scout dogs chose to ignore the dog's alert and led their patrol into an ambush, which resulted in both dog and soldier casualties. Coupled with numerous examples of the successful work of dogs, such as Andy, a Doberman who participated in the initial landing on Bougainville, it is easy to see why there were never enough scout dogs to go around in the Pacific and China-India-Burma theaters of war. Andy and his handler Pfc. Robert Lansley, were part of the First Marine Dog Platoon, which was attached to the Second Marine Raider Regiment (Prov). Andy worked off-leash 25 yards ahead of a 250-man patrol. Three times the dog alerted them to enemy positions. After the enemy was located, Lansley would wave Andy back, and the patrol attacked the enemy. The Americans routed three Japanese contingents with no casualties. Andy's company penetrated the furthest of any U.S. unit the first day on Bougainville.

In many ways, the use of dogs in World War II was a learning experience for the military. Soldiers who worked with dogs quickly realized they were not indefatigable. After scouting all day, dogs frequently fell into a heavy sleep at night, breathing through their mouths. When this happened, the dog's sense of smell was compromised and he would not necessarily hear or smell an infiltrating enemy.

Some dogs became exceedingly nervous and unable to do their jobs properly when exposed to heavy bombardment or artillery. Although no one could predict which dogs would become gun-shy and nervous during combat and which ones would carry out their duties unconcerned, commanders eventually decided that German shepherds were more reliable and less excitable and nervous than were Dobermans and collies. Dogs also suffered from same type of environmental problems as effected soldiers: heat stroke, parasites, and tropical diseases. Again, the German shepherd was deemed to be the most adaptable to climate extremes. Commanders reports recommended that only German shepherds be used in the future.

The U.S. Army also used dogs in the China-India-Burma Theater. Here sentry dogs were used to guard supply depots, and incidences of theft diminished rapidly. Dogs entered combat in the Burma Campaign as part of the 5307th Composite Unit (Prov) (Galahad Force), and the 5332d Provisional Brigade (Mars Force). A small group of dogs was also attached to the Office of Strategic Services (OSS) Detachment 101 in China and Burma. Twelve men and dogs, assigned to Merrill's Marauders, were flown to Myitkyina and used during the last month of that operation. Dogs again proved themselves extremely successful at alerting soldiers to hidden enemy positions. They located snipers, who

had picked off men with impunity until the dogs were brought in.

At the end of World War II, the Army honored its commitment to the American public and returned all healthy war dogs to their original owners. Before this could be done, the dogs had to be retrained to accustom them to civilian life. If the original owner no longer wanted the dog, the Army allowed the dogs' handlers to keep them. The Army spent an enormous amount of time and money retraining its war dogs, locating their original owners, shipping the dogs back to the owners, and as a last recourse, advertising for interested new owners. At some point, a decision was made not to do that the next time around. A new policy emerged which treated dogs as equipment, much like tanks or helicopters. In the event dogs were used in the next war, they were to be disposed of (euthanized) after they were no longer needed. To support this plan, the Army decided to purchase dogs directly from breeders, rather than request them from civilian donors.

Lemish strongly disagrees with this policy. He states, "Although dogs have come to be regarded as equipment in later years, it has to be understood that dogs are living and thinking animals and that each is an individual in its own right. The military, in general terms, has a terrible problem accepting this. All other equipment, be it an airplane or a tank, will act the same and work the same under a given set of circumstances. Within the entire arsenal of the American combat military structure, only two distinct creatures do not fit this profile—man and dog."

The author's concern becomes very clear when he describes the experiences of the American military dog in Vietnam. Before large numbers of troops were sent to Vietnam, the American military supplied the Vietnamese Army with German shepherds trained as scout dogs. Because the Vietnamese culture did not value dogs, Vietnamese soldiers had a hard time understanding their worth and how to treat them. The Army of the Republic of Vietnam (ARVN) had no trained veterinarians on staff, and ARVN commanders refused to provide the dogs with the daily diet recommended by their U.S. advisers, because the calories contained therein were more than most Vietnamese soldiers or civilians received daily. The Vietnamese handlers had a hard time learning to praise their dogs, an integral part of training. None of this boded well for the dogs. Those which were not quickly killed on the front lines succumbed to disease or starved to death.

Dogs used by the American military (the Air Force and the Army) as sentries and scouts fared somewhat better, as long as the Americans remained in country. One evening Nemo, a sentry dog stationed at Tan Son Nhut Air Base in 1966, alerted his handler, A2C Robert Thorneburg, to several Viet Cong (VC) hiding in a cemetery within the base. Thorneburg released Nemo and then heard several shots, and then his dog crying in pain. Thorneburg went looking for him, and killed one VC before being wounded by return fire. Before the reaction team reached them, Nemo had crawled across his master's body and refused to let anyone get near him. Finally Nemo was persuaded to leave Thorneburg so that he could receive first aid. Nemo had been shot in the face and lost the use of one eye. He could no longer walk sentry duty, and was returned to the United States as an Air Force canine recruit. Scout dogs saved lives in the Vietnam jungles, alerting soldiers to enemy infiltrations, encampments, spider holes, and booby traps. There were never enough scout dogs to meet the demand. The scout dog Troubles was airlifted into the jungle with his handler Pfc. William Richardson to support a patrol. Richardson was wounded in a firefight and evacuated to the nearest hospital ten miles distant; Troubles was left behind in the jungle. Three weeks later, Troubles found his way to the First Air Cavalry Division Headquarters at An Khe. The dog, tired and emaciated, would not let anyone get near him. He searched through the tents of the scout dog platoon until he found Richardson's cot, where he curled up beside his master's belongings and fell asleep.

Typically, handlers were deliberately not told what the fate of their dog was to be. These soldiers confidently assumed that their dogs would be returned to the United States, and often speculated about how they might be used there. In 1968, Pfc. James Palmer and Duke, a one-eyed German shepherd, were assigned to Company A, 2d Battalion, 1st Infantry. Duke excelled at locating both buried mortar rounds and snipers, and could scent the enemy at fifty meters. Palmer was extremely proud of Duke. He said to a reporter, "When he leaves Vietnam, Duke will probably be put into public service—they might even make him a seeing eye dog!" Duke never left Vietnam.

The tone of the book changes at some point during

the Vietnam story, as the author suddenly seems unable to separate his emotions from his story. Lemish feels strongly that the policy of refusing to send veteran dogs back to the United States was abominable. He blames American military leadership for the establishment and implementation of this policy, and accuses them of deliberate misrepresentation when the policy became a matter of public concern. When dismayed dog lovers made headlines by writing the president and the Department of Defense about the fate of the Army war dogs in Vietnam, the Army sent fifty dogs home amongst much fanfare, and then "laid low" until the public "forgot" the problem. All the while, the military continued to give excess dogs whose units were being sent home, to the Vietnamese Army, which for the dogs meant certain death by starvation or untreated illnesses. Lemish believes that this was a calculated, deliberate, intent to deceive the American public.

The concluding chapter of the book describes the limited use of military dogs in Panama, Saudi Arabia, and Haiti. This chapter must be read carefully to extract viable facts and information on the continued use of military dogs from the author's rhetorical campaign to see U.S. military dogs retired with dignity and honored with a monument. The emotional tone permeating the last two chapters of this book detracts from an extremely informative and overall worthwhile study.

Dr. Judith A. Bellafaire, a historian in the Field and International Branch of the Center's Field Programs and Historical Services Division, is a frequent reviewer for Army History *and is the owner of two shelties.*

Book Review
by Ted Ballard

Bloody Hill: The Civil War Battle of Wilson's Creek
by William R. Brooksher
Brassey's, 278 pp., $24.95.

On a hot August day in 1861, along a small Missouri stream called Wilson's Creek, two groups of angry men engaged in violent confrontation. Frontiersmen, mountainmen, plantation owners, dirt farmers, cowboys, hillbillies, businessmen, European immigrants, politicians, Jayhawkers, Border Ruffians, and others plunged into the bloodiest engagement—in terms of casualty rate—fought in North America up to that time. By the end of the day over 500 lay dead and almost 2,000 were wounded. The story of how these antagonists came to be at Wilson's Creek, and the result of the fight there, is the subject of William R. Brooksher's recent volume on the Civil War battle.

To Civil War scholars the Battle of Wilson's Creek was one of the first major engagements of the Civil War. But to many of the participants it was simply a continuation of a struggle that had been taking place along the Kansas-Missouri border for many years, a struggle noted for its violence and hatred. In 1854 the Kansas-Nebraska Act created two new territories, repealed the long-established Missouri Compromise, and left the decision whether new territories would eventually be slave states or free states in the hands of its citizens. Prior to this act there had existed a "balance of power" between slave and nonslave states. Now, with Nebraska expected to line up in the nonslavery category, all eyes turned to Kansas. Proslavery and Free State settlers flocked into the Kansas territory, each determined to gain control. Heavily-armed groups from proslave Missouri, known as "Border Ruffians," and Free State groups, known as "Jayhawkers," used lynchings, shootings, and burnings to influence local elections, instill fear, or to reek vengeance. Confrontation between the two sides often led to pitched battles. Soon, civil war raged across "Bleeding Kansas" and the Missouri border.

In a well-written and easy-to-read narrative, the author quickly guides the reader through the years of internecine warfare, setting the stage for the first Civil War battle west of the Mississippi. Commanding the Union forces at Wilson's Creek is 43-year-old Nathaniel Lyon, newly promoted from captain in the Regular Army to brigadier general of volunteers. Lyon, a rabid abolitionist, antagonized not only his enemies, but many Union supporters. A contemporary said, had Lyon lived four centuries ago, "...he would have been burned at the stake as a pestilent and altogether incorrigible person, whose removal was demanded in the interests of the peace of society."

Commanding the Confederate army is Brig. Gen. "Old Ben" McCulloch, a nationally known Texas hero.

McCulloch, originally from Tennessee, had followed his neighbor, Davy Crocket, to Texas, but arrived too late to die at the Alamo. Instead, he lived to become a Congressman, Indian fighter, Texas Ranger, gold miner, sheriff, and U.S. Marshal. Although he had no formal military training (but had always aspired to senior military command) he was commissioned brigadier general in the Confederate Army.

Brooksher's battle narrative, well researched and documented, is filled with first-hand anecdotes and detailed maps. For many at Wilson's Creek, this was their first "battle." Disorganized mobs that had, for years, waged a personal guerilla war were now organized mobs waging officially sanctioned war. In the ranks of the two opposing forces stood such personages as James Butler "Wild Bill" Hickok, Frank James, Cole Younger, William C. Quantrill, some of whom would continue their war into the late nineteenth century. Some were armed with flintlock muskets, long rifles, shotguns, or pistols. A few had no firearms at all. Many had no concept of military tactics. As Lyon's force moved out in a surprise attack, the lead elements of militia led the vanguard loudly singing "The Happy Land of Canaan." At the end of a day of "getting it out of their system," nearly one out of every four Union soldiers and one out of every eight on the Confederate side was either killed, wounded, or missing.

After Lyon received the dubious honor of becoming the first Civil War general to die on the battlefield, his army withdrew and the North was handed it's second major military defeat since the war began (First Manassas had been fought on 21 July).

Brooksher briefly describes the political results of the battle and its effect on military strategy in the region. Although a tactical victory for the South, the Union defeat at Wilson's Creek caused the Lincoln administration to reinforce the area, while the Confederacy spent its limited resources elsewhere. The ultimate result was that Missouri remained in the Union.

With a highly informative and entertaining text, eight pages of illustrations, and an order of battle, this new volume is a welcome addition to any Civil War library.

Larry A. ("Ted") Ballard is a historian in the Center's Field and International Branch. A former archivist, Mr. Ballard is a recognized authority on Civil War battles.

Book Review
by John H. King

The West Point Way of Leadership: From Learning Principled Leadership to Practicing It
by Col. Larry P. Donnithorne, U.S. Army (Ret.)
Currency/Doubleday. 182 pp., $20.00

Historians studying American military operations in the post-Vietnam era, have given—and will to give—considerable thought to the concept of leadership, or the lack thereof, as they analyze various operations. Col. Larry P. Donnithorne, now retired, has written a useful primer to review "leadership" as taught at the United States Military Academy. His primary motivation is to make more widely known the "West Point way of leadership." The author is a graduate of the Academy, and a former instructor at the school of leadership and moral philosophy. Donnithorne writes clearly, concisely, and with an obvious familiarity with his topic.

Donnithorne notes that the cliche "leaders are born, not made," is not true. He says leaders are both, and notes that "The Academy" has been building leaders since 1802, including such notables as Ulysses S. Grant, Robert E. Lee, Douglas MacArthur, Dwight D. Eisenhower, Omar Bradley, George S. Patton, and, more recently, Brent Scowcroft, and Norman Schwarzkopf. The notable list also includes those making their mark as civilian leaders, such as Rand V. Araskog of ITT and former astronaut Frank Borman of the now defunct Eastern Airlines. "[T]his long-term success in developing world leaders—both in the civilian and military orbits—suggests West Point's is a time-tested, integrated model for producing leaders," according to the author. "As a model, it offers numerous insights into the task of developing leaders, as well as in developing active leadership skills in oneself."

Donnithorne's model of leadership training consists of four "passes." The First Pass is the teaching of teamwork and an institutional value system that will strengthen the organization. The Second Pass builds the individual's own leadership voice. The Third Pass adds the skills to lead other leaders, while the Fourth Pass teaches cadets how to act in the organization's long-term interests. The author believes that these four passes not only develop leaders at West Point, but can

also develop leaders in the civilian world.

Practical applications of the skills and concepts abound. For instance, during the Second Pass, cadets learn to "Risk More Than Others Think Safe." Donnithorne illustrates with an example taken from IBM in the days of the legendary Thomas Watson, Jr. When IBM lost $10 million due to a mistake by a Watson subordinate, that unfortunate employee handed in his resignation. Watson rejected it, saying, "Not on your life! You think I'll let you go now after spending $10 million on your education?" Donnithorne points to this as a healthy attitude for leaders: "[s]o long as subordinates learn from their mistakes so the mistakes are not repeated, leaders gain by tolerating honest mistakes." He contrasts this with the Army's unsuccessful involvement with the "Zero Defects" program, which eventually was dropped, at least in part, because it "completely repressed the freedom of soldiers to be adventurous, to be creative, [and] to take risks."

It is easy to overlook the value this book holds. Donnithorne's work has importance beyond the realm of historians and military leaders. It is intended to be used as a model for training civilian leaders in a business or corporate world. This targeting has become somewhat trendy in the 1990s, as Donnithorne and others attempt to apply Sun Tzu's *The Art of War* and other classic military books to the business and corporate world. With more and more authors without a military background writing about military events, a book such as this helps to put things in perspective.

This book is also valuable to historians because it provides a contemporary definition of leadership. One of the greatest challenges facing a historian is understanding actions in terms of the context in which they occur, rather than within some later context. Donnithorne provides a late twentieth-century context that can be used to measure leadership in the 1980s, 1990s, and beyond. And for this reason, military historians should pay careful attention to this book.

Lt. Col. John H. King, a reserve officer, has served in several military historian positions, including as commander of the 51st MHD during Operation DESERT STORM and as Joint Historian for Operation SUPPORT HOPE. He is the Assistant Town Manager for Economic Development for Leesburg, Virginia.

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