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Military commanders and their staffs face an increasing deluge of quantitative information in an increasingly complex decision-making environment. The nature of the present-day military information environment disincentivizes the need to gain a qualitative appreciation of the battlefield situation. The US Army general officers serving in the US 12th Army Group in World War II provide a relevant operational example of balancing this information. Generals Hodges, Patton, and Simpson of the US First, Third, and Ninth Armies each commanded with their own style and emphasis, showcasing the impact of command style not only on how they approach the enemy but also how they and their staff's approach information for decision-making. This study does not seek to determine the success or failure of these individuals' decisions. Instead, it aims to examine how they sought and considered information to support their decision-making in information saturated environments.

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MASTER OF MILITARY STUDIES

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BALANCING THE COMMANDER'S INFORMATION NEEDS

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

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EXECUTIVE SUMMARY

Title: Balancing the Military Commander's Information Needs

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Thesis: Operational decision-makers seeking to counterbalance an abundance of quantitative, objective reporting with a qualitative, subjective perspective can learn from World War II American field army commanders' training and education in the lead up to the Second World War and operational and decision-making experience in that war to identify effective methods for the present-day to command and control multiple elements in multiple domains.

Discussion: Military commanders and their staffs face an increasing deluge of quantitative information in an increasingly complex decision-making environment. The nature of the present-day military information environment disincentivizes the need to gain a qualitative appreciation of the battlefield situation. The US Army general officers serving in the US 12th Army Group in World War II provide a relevant operational example of balancing this information. Generals Hodges, Patton, and Simpson of the US First, Third, and Ninth Armies each commanded with their own style and emphasis, showcasing the impact of command style not only on how they approach the enemy but also how they and their staff's approach information for decision-making. This study does not seek to determine the success or failure of these individuals' decisions. Instead, it aims to examine how they sought and considered information to support their decision-making in information saturated environments.

Conclusion: Contemporary commanders must lead their staff in developing a balanced perspective of all available information. There are three critical points. It is vital that commanders develop a personal, qualitative understanding of the battlefield. It is equally important that their staff works tirelessly to develop an objective, qualitative, impersonal assessment. Finally, commanders and staffs must create the time and opportunity to gain a qualitative perspective. There are valuable lessons to be learned from the Second World War Generals Hodges, Patton, and Simpson. The commander that uses these lessons will succeed. They will create the processes to successfully receive and consider objective and subjective information before making a decision.

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If you expect a wise answer, you must ask a sound question.
- Johann Wolfgang von Goethe

Introduction

The military commander is the center of operational decision-making. The commander is a knowledge worker applying their education and experience to the battlefield. To accomplish this task, the commander must have a contextual and subjective understanding and consider the situation's measurable and objective aspects. The ability to do this is what the historic theorist Clausewitz called the “genius of command.”¹ Present-day command and control systems have intensified the commander's dilemma of balancing subjective, intangible information against objective, tangible battlefield information. It is difficult and time-consuming to discern subjective information such as intent, morale, competence, and understanding. Simultaneously, a commander's staff and command and control systems produce even more numerical, objective data; for instance, the total numbers of known and suspected enemy and friendly elements, known static locations, numbers of killed or wounded in action, etc. Staffs use this information to produce a deluge of reports. There is no shortage of objective reporting, especially at operational commands and above. However, if subjective and objective information is out of balance, the commander may have a single-lensed view of the battlefield. This myopic view can lead to poor choices.

The deluge of information creates a more complex decision-making environment for the commander. This growing problem is due to information overload, too much information, without enough time to process it. For instance, the Royal Navy staff aboard the Flag Ship HMS Hermes in the 1982 Falklands War received more messages than the staff could process daily.² During the 1992 Gulf War, US forces similarly faced a similar situation. The Air Force's Air Tasking Order was so large because of the size of coalition air forces that the operators could

only concentrate on their part of the mission. As a result, air units were unaware of other air missions operating in the same area.³ In 2011, information overload again was blamed for the accidental killing of 23 Afghan civilians by US forces. This incident resulted from drone operators failing to pass the message that they assessed the group to be civilians because it was only one of the multiple drones they were operating.⁴ The difficulty with handling so much information is increasing over time.

A commander now can access seemingly infinite quantities of information from their command and control systems and staff. Often, the one chance a commander has to grasp the current situation is at a daily operations and intelligence brief.⁵ At best, however, this brief provides a synthesized view of the command's objective reporting. This brief contains the compiled perspectives of objective information by individuals who are neither in the fight nor directly commanding those who are. There is little to no subjective voice providing a contextual understanding for the mounds of objective data in this circumstance. This excess of information makes it hard for the commander and their staff to recognize what matters, does not matter, is a distraction, and, most importantly, is missing.

Metrics-based information and impersonal assessments increasingly dominate the commander's information feed. It is not that the commander does not have a subjective perspective, only that the objective information drowns it out by sheer quantity. Imbalanced qualitative or quantitative information can bias a commander's situational awareness resulting in an incorrect assessment of the situation. This bias encourages a single-domain view of a multi-domain problem. Today's situation is complex, as it was during the Second World War. That war's operational-level commanders started their careers in an environment with drastically less information and came to appreciate the most salient points. Because of this personal experience,

they were better prepared to recognize what mattered most when faced with a deluge of information.

American operational commanders in the Second World War European Theater of Operations experienced an unprecedented command situation for that period. There were nested army groups, field armies, corps, divisions, battalions, and companies operating at greater speeds and distances than any previous wars. Additionally, overhead air groups and squadrons were providing even more reporting to commanders. Army field commanders received intelligence and operational guidance from their higher headquarters while also receiving even more information from lower echelons down to the platoon level and in-between. These American commanders were largely successful as the first to face so many simultaneous sources of information. These lessons learned from these American commanders' successes in managing information overload during the Second World War are salient to the present day.

The operational experience of World War II commanders operating in the first modern information-saturated environment and its application to command and control highlights the significance of where decision-makers place their focus. The goal should be to gain a contextual, intangible, and subjective understanding of the situation, reviewing well-prepared objective, tangible, numerical information about the enemy, and determining how to consider that information in order to make the best decisions. Operational decision-makers seeking to counterbalance an abundance of quantitative, objective reporting with a qualitative, subjective perspective can learn from World War II American field army commanders' training and education in the lead up to the Second World War. Their operational and decision-making experience in that war to identify effective methods for the present-day to command and control multiple elements in multiple domains.

The Lead-up to the Second World War

The future general officers who would command the operational-level armies in the European Theater of the Second World War started their military careers in the early 1900s, many having graduated from the service academy at West Point. In the years before their commission and the Second World War, they experienced a technological explosion in the information available to them on the battlefield—quantities of information that transformed the context of war at the operational level in headquarters separated from the battlefield. As so many general officers served in the Second World War, it is necessary to focus on only a few.

Three general officers who commanded US Field Armies in the European Theater provide the necessary relevant example: Generals Courtney Hodges, George S. Patton, and William Simpson. They served in similar conditions, with similar objectives, military commands, and for the same 12th Army Group commander, General Omar Bradley. General Hodges, US First Army, enlisted in the Army after failing out of West Point in 1906 and competitively commissioned in 1909.⁶ Generals Patton, US Third Army, and Simpson, US Ninth Army, both graduated from West Point in 1909.⁷ These officers witnessed the technological developments that transformed battlefield understanding in the decades leading up to the Second World War. Their military education commenced in an era when communications imposed more significant limitations on a commander's understanding of the battlefield if they could not be physically present on the battlefield. However, by the time they commanded field armies in the Second World War, commanders operated tens of miles, or more, from the battlefield, commanding units spread over hundreds of miles.

In their Second World War experience as field-army commanders, they faced a more complex battlefield than commanders preceding them and, in many ways, more complex than the

battlefields that American commanders have confronted for the past two decades. Generals Hodges, Patton, and Simpson commanded multiple army corps that were, in turn, commanding multiple army divisions and battalions. And they faced unprecedented amounts of information along with a high demand for timely decision-making. When compared to previous wars, these commanders had a greater ability to communicate to forces moving more rapidly spread across larger distances in the same way that current and future commanders will experience expansion from previous conflicts. For instance, during the First World War, in which all three served in various capacities, radio was an impractical novelty, and timely long-range communications relied on telephones and telegraphs.⁸ This initial technological difference makes their experience that much more valuable to identify what information matters most in a command post.

Second World War Command Posts

A guidebook common to these commanders and their staffs is the 1930 provisional *Manual for Commanders of Large Units*. This manual stresses the staff's importance as an aid to the commander, providing the commander with "the basic information and technical advice"⁹ to make decisions and translate the commander's plans into orders. The commander was, and is, responsible for leading the conduct of the battle. What was not specified was specifically how or from where; the commander was made responsible for how they accomplished this.¹⁰

Between the First and Second World Wars, the US and other militaries developed new technologies and matured other technologies to extend their use into more areas of warfare. In addition to improved telephone networks, the US military in 1940 had the added advantage of reliable radio communications. Army training maneuvers in Spring 1940 in Louisiana and Texas provided the first real test of Army communications since the First World War. This training incorporated the 1930s developments of frequency modulation and crystal push-button control,

allowing for reliable communications on specific communications channels over a greater distance.¹¹ These developments enabled, for instance, the SCR-300 manpack radio, which had a range of up to five miles.¹² Thanks to radio communications, commanders increasingly were able to gain information about the operational and tactical fight in real-time. This surge of information allowed operational and strategic commanders to set up map plotting tables, much like a modern Common Operational Picture (COP), that provided the current status and location of friendly and enemy units.¹³ The era of near real-time tracking had begun.

This tracking was necessary because of the immense size of these armies. A field army headquarters command element was generally responsible for three army corps, each composed of two to six infantry battalions and one to two armored divisions plus their separate support battalions.¹⁴ Each field army ranged from 100,000 to 300,000 men depending on the assignments to it at the time.¹⁵ While initially reliant on laying wired communication lines, units increasingly relied on radio through the war.¹⁶ These communications were critical not just for the commander but even more so for the staff providing him information.

Each commander operated his staff according to what worked best for them. There were commonalities, such as the use of staff sections G-1 through G-4.¹⁷ And for instance, General Patton believed in the personal aspects of command and devoted significant time to visiting subordinate unit command posts when in command of the US Seventh Army in Italy. Other field army commanders outside of this study, such as General Mark W. Clark of the US Fifth Army, relied more on liaison officers and operational reporting to provide him information.¹⁸ The commander as an individual was and still is responsible for comprehending the war and acting as the “controlling and responsible head” of the unit. They are responsible for using their staff to extend their ideas, desires, energy, and methods to accomplish the mission. In World War II,

commanders were encouraged by their training to discuss operational plans with their subordinate commanders personally.¹⁹ This recommendation was borne out by history.

The US First, Third, and Ninth Armies in the European Theater of Operations

Within this context, this study seeks to focus on learning from the operational experience of General Courtney Hodges of the US First Army, General George S. Patton of the US Third Army, and General William Simpson of the US Ninth Army in the Western European Theater in World War II. Each of these commanders experienced war in a new way. Their experiences are relevant today with lessons for the future. These three field army commanders each served in the European Theater, primarily under the US 12th Army Group command led by General Omar Bradley and in a similar battlefield context. All three commanded field armies in the Battle of the Bulge. For context, this review will discuss the education, experience, and command style of each commander. It will then discuss how they gained a contextual understanding of the battlefield, how they gained an objective understanding, and the process they used to consider this information and make a decision.

The US First Army and General Courtney Hodges

The US First Army landed at Normandy under General Bradley's command, and then General Hodges took command on 1 August 1944. General Hodges failed out of West Point before enlisting and eventually earning a commission in 1909. Early in his officer career, he served in the American southwest, the Philippines, and in the 1916-17 US expedition into Mexico. In France during the First World War, General Hodges served temporarily as a battalion and eventually a regimental commander.²⁰ While considered a competent commander by many, he lacked the command presence and influence above his headquarters that General Bradley had. General Hodges ran a collegial-style headquarters. Consequently, his corps

commanders, notably General Joseph Collins, were able to exert more influence on the direction of the US First Army.²¹ This speaks to his style in decision-making by his emphasis on personal discussion. For example, he sent the VII Corps into the Hürtgen Forest when Generals Collins and Gerow convinced him to do so.²²

His leadership style was to give his chief of staff latitude to conduct day-to-day operations while leaning on his subordinate commanders. Much of his time was devoted to the situation map in his command post, discussing operations with his chief of staff, operations officer, artillery officer, logistics officer, intelligence officer, and the IX Tactical Air Command commander. General Hodges wanted detail.²³ For instance, one corps-level operations officer remarked that in briefing General Hodges, one had to brief to the platoon level.²⁴ In practice, while General Hodges trusted his staff to make decisions, he wanted to know, in detail, what was happening on the battlefield. This style undoubtedly shaped the information he sought, received, and prioritized.

General Hodges' Command style

General Hodges moved his command post twenty times between 9 June 1944 and 24 April 1945.²⁵ The frequency of these moves enabled General Hodges' First Army headquarters to maintain close proximity to subordinate commanders so that General Hodges could visit corps and division command posts, something he did near-daily at times early in the war, but less so later on.²⁶ General Hodges kept his G-3 aggressively driving the corps and divisions' headquarters to ensure they were adhering to his intent.²⁷

While General Hodges may have aggressively enforced his intent with his commanders, he also wanted them to make decisions on their own to include coordination with adjacent corps. For example, on August 31st, 1944, while pushing toward the German border, General Bradley

ordered the First Army to swing north knowing little about the German disposition. General Hodges ordered General Collins' VII Corps, his easternmost corps, to turn. General Hodges took intelligence with a balance of his corps-level commanders' perspective. The commander asked who would fill the gap between VII Corps and Third Army – General Hodges responded, “Joe, that is your problem.”²⁸

When the First Army held a position to close the Falaise Pocket on a German advance, intelligence reports indicated that the Germans would continue attacking. However, General Hodges knew from discussions with his corps commanders that the Germans had suffered heavy casualties. Therefore, because he trusted his commanders' perspective, he believed – correctly – that his forces would be able to hold their position against the Germans and kept them in place.²⁹

How General Hodges Gained Battlefield Understanding

At the start of the Battle of the Bulge in December 1944, General Hodges faced conflicting perspectives from his G-2 and G-3. According to post-war accounts from the First Army's G-2, Colonel Dickson warned about the possibility of a German Ardennes offensive based on prisoner interrogations, aerial reconnaissance reports of increased vehicle and rail traffic, and captured orders showing plans for English-speaking raiding units. He allegedly made this warning just before going on leave. The G-3, Colonel Thorson, disputes that the G-2 ever reported such indications to General Hodges. Regardless, until the German attack began, the First Army responded to German preparations as mostly routine German unit rotations.³⁰

For the first full day of the German attack in what became the Battle of the Bulge, General Hodges believed that it was a limited offensive. This misbelief was partly due to the artillery bombardment cutting telephone lines and units being slow to report their status by radio. It was not until the next morning that he realized the scale of the attack.³¹ Primarily, it was due

to General Hodges and his staff's disbelief that the Germans would execute such a large-scale attack. Consequently, they discounted reports received throughout the day that indicated its scale.³² General Hodges and his staff demonstrated a heavy reliance on reporting from a few trusted individuals, who he could not reach, instead of the reporting from frontline units.

How General Hodges Considered Information and Made Decisions

General Hodges and the First Army staff, like many others, failed to recognize what the Germans were doing in the Battle of the Bulge. Regardless of whether the G-2 indicated an attack was imminent or not, the First Army headquarters was evidently not expecting an attack. A German artillery barrage cut communications lines to the US First Army Headquarters, which exacerbated this lack of communications. Consequently, to gain situational awareness beyond the reporting he was receiving from his subordinate commands, General Hodges sent staff officers to the frontline corps and divisions to gain a better understanding for him.³³

However, his inaction may also be attributable to him likely feeling ill, possibly with the flu, during the attack. As more information trickled in, such as captured orders and increased reports of attacks, the original First Army headquarters' view of the attack as a spoiling effort was supplanted by the realization that it was a major offensive. By the time General Hodges and his staff realized what was happening, they had to withdraw their headquarters and subsequently lost much of their already degraded communications.³⁴

Why did this result in a slow reaction by the commander historian Carlo D'Este described as "stolid, dependable, and utterly uninspiring?"³⁵ General Hodge's slow response to the German offensive in the Battle of the Bulge demonstrates his stolid and uninspiring nature. This slow reaction was most likely due to General Hodges's heavy reliance on trusted subordinate commanders' opinions. As noted previously, he allowed his corps commander significant

influence over his operational direction. However, General Gerow, the V Corps commander, repeatedly tried to inform First Army headquarters to the attack's extent. Still, neither the First Army staff nor General Hodges believed him.³⁶ His dependence on trusted subordinate commanders was evident before starting operations into the Hürtgen Forest when he ordered a two-day operational pause for much-needed maintenance and regrouping. General Collins of VII Corps and General Gerow of V Corps convinced him to press the attack.³⁷ General Collins was evidently one of the few General Hodges trusted. In another example, General Hodges sought the opinion of a personally trusted assistant division commander, General Davis, to confirm Davis' division and corps commanders' recommendation.

Consequently, General Hodges was a commander who tended to make significant decisions based on highly trusted subordinates' opinions. During the Battle of the Bulge, he could not easily reach them at first and so sent in his trusted staff members before coming to a conclusion. On the one hand, General Hodges demonstrated neither decisiveness nor sound staff practices in command when under pressure, such as demonstrated by the Battle of the Bulge. On the other hand, General Patton was very decisive.

The US Third Army and General George Patton

General Patton held all those around him to high standards and presents a competent combat leader whose perspective is invaluable to study. This applied even at West Point, where, as a cadet leader, he squashed what he considered foolish behavior. To many of his peers at West Point, Patton's disciplinary ethic was excessive and stressful.³⁸ In 1904, George S. Patton started at West Point, which accepted him to the school following his completion of one year at the Virginia Military Institute. Graduating from West Point in 1909, he soon became a cavalry officer. The young Patton worked for General Pershing during the Mexico expedition. In 1917,

he became the first US Army tank officer, where he fought in the Argonne for the first time, again working for General Pershing.³⁹ A prolific writer, Patton published his thoughts on tanks, cavalry, armored cars, General Pershing, strategy and victory, what motivates men to fight, weapons of war, mechanization, motorization, and even the use of federal troops for domestic security.⁴⁰

At times, overly zealous, Patton landed himself in hot water more than once. The most famous occasion occurred when he slapped a soldier in a moment of anger; that soldier was likely suffering from post-traumatic stress, something Patton did not believe was genuine. The uproar from the American public nearly cost Patton his career.⁴¹ Instead, this error cost him a critical role in the cross-channel invasion of Normandy and his chance at a fourth star. The position commanding the Normandy invasion instead went to General Bradley.⁴²

General Patton took command of the 2d Armored Brigade in the summer of 1940, and I Armored Corps in April 1942. By the 1942 North Africa landings, he commanded the American force of 24,000 troops.⁴³ As discussed above, he was previously the favorite to lead the Normandy invasion. General Eisenhower thought that General Patton was too valuable to the war effort to relegate stateside.

General Patton's Command Style

His temper aside, General Patton valued the opinions of his staff. General Patton listened to his staff's viewpoints which had a real chance of becoming action. In planning, he consulted in detail with his commanders. General Patton checked on the men to the lowest level. In walking the lines, Patton once pulled a lieutenant out of a ditch he hid in when an enemy aircraft flew over.⁴⁴ This is borne out clearly in his posthumously published journal, *War as I Knew It*, with numerous references to visiting subordinate corps, division and battalion commanders,

troops on the line, and even forward observation posts.⁴⁵ Furthermore, demonstrating the emphasis he placed on such visits, in his published writings, he recommended that any command post be positioned near road networks specifically to enable visiting the frontline.⁴⁶

In his personal reflections, General Patton emphasized the need to maintain communications with advancing units. He believed in knowing the troops' condition. Orders should be given in person, if not in person, then by phone.⁴⁷ Despite this close contact, he trusted his subordinate commanders to make decisions. The same officer who remarked that General Hodges wanted detail to the platoon level said General Patton wanted it to the regimental level.⁴⁸ Thus, while General Patton wanted the very best out of soldiers, he also trusted them to lead. This high level of trust required a broader perspective of the friendly and enemy situation. However, General Patton also saw the individual soldier as representative of the larger unit. Consequently, General Patton sought exceptional detail about the readiness and welfare of the individual soldier. General Patton recognized that broad information about units and intentions are far easier to assess and report than the individual soldier's morale and its impact on the battalion, regiment, and corps.

How General Patton Gained Battlefield Understanding

General Patton once wrote that the relationship between the operations and intelligence officers must be "most intimate."⁴⁹ He saw the intelligence officer as a journalist publishing the stories that matter to the G-3 and the brigade, regiment, and battalion commanders.⁵⁰ He further believed that staff officers should visit the field, much like the commander should, and then factor that perspective into the decisions and recommendations for and to the commander.⁵¹ As discussed, General Patton proved true to his word in his frequent visits to subordinate

commanders and the front lines. More than anything, this was how he gained an understanding of the battlefield – through his own eyes and ears and his personal intelligence unit.

General Patton redesignated the 6th Cavalry Group as his ‘Army Information Service’ and transformed it into an intelligence unit with reconnaissance platoons that fed information to his G-2 and G-3, colloquially known as Patton’s “Household Cavalry.”⁵² When General Patton wanted to know where enemy armor was, he asked the XIX Tactical Air Command to put up fighter-bombers to find them.⁵³ If General Patton wanted to know something, he used his authority and force of personality to find out. And he wanted to know quite a lot.

This combination of reliance on intelligence and personal observation was attributable to what the Supreme Headquarters G-2, US Major General Kenneth Strong called Patton’s “extraordinary desire for information of all kinds.”⁵⁴ General Patton clearly sought to build a comprehensive picture in his mind of the conditions of friendly forces, enemy forces, and their support apparatus. For instance, General Patton’s observations toward the end of the Battle of the Bulge that German POWs had not eaten in three to five days convinced him that the German attack was culminating. General Patton’s conclusion turned out to be accurate.⁵⁵

How General Patton Considered Information and Made Decisions

General Patton’s driver once remarked that the general did not need a staff because General Patton and his driver had been running the Third Army all day. General Patton responded that the Third Army Staff had actually done remarkably in moving the army.⁵⁶ As a leader, “General Patton typified the tenets of daring and dash” and he also expected and trusted his subordinate leaders to do the same, expecting them to “exercise independent judgment and tactical daring.”⁵⁷ Despite this, General Patton, like General Hodges, initially thought that the Germans were conducting a spoiling attack during the Battle of the Bulge. However, he and the

Third Army staff quickly redressed this misconception because of his aggressive desire for information.⁵⁸ True to form, once he understood what was happening, he fully committed his forces to the offensive. The Third Army was not, however, as fast to respond as the Ninth Army. This slower response was likely due to General Patton's tendency not to delegate decision-making to his staff.⁵⁹

General Patton was the undisputed authority of his command, he held many decisions to himself. As a result, Third Army responses could be choppy at times, such as during the Battle of the Bulge when the Army started in motion following Patton's personal direction. Unlike the First and certainly unlike the Ninth Army, the Third Army did not follow detailed staff processes for decision making.⁶⁰ For the Third Army, the staff focused on the army's movements; decisions were for the general. In the US Ninth Army, the staff was more involved in the decision-making process.

The US Ninth Army and General William Simpson

General Simpson was soft-spoken and well organized. While Patton is said to have been his own operations officer, General Simpson gave much latitude to his staff. When given a mission, General Simpson called on his intelligence, operations, and logistics officers to develop and present him three plans. He would select and combine these as he saw fit. General Simpson would then consult with his corps commanders on executing that plan before issuing the order. In conducting operations, he demonstrated a preference for developing detailed plans in advance to the point of near-perfection. Once complete, these plans were implemented.⁶¹ As a commander, General Simpson trusted his staff and wanted detailed plans.

Graduating number 101 of 103 in 1909 from West Point, General Simpson, like Hodges and Patton, participated in both the US's 1916-17 expedition into Mexico and the First World

War. In the First World War, he served as a general's aide de camp and division operations officer. During the interwar period, he served twice as an instructor, first as a Professor of Military Science and Tactics at Pomona College in Claremont, California, and second as an Army War College instructor then in Washington, D.C.⁶² Finally, he commanded the Infantry Replacement Training Center during the initial build-up for the war.⁶³ His extensive instructor experience significantly impacted his command style.

General Simpson's Command Style

In many regards, the Ninth Army benefited from its three months of additional time training in England while the First and Third Armies were already on the continent. This time gave General Simpson, the professor-instructor, the opportunity to shape the headquarters to his style.⁶⁴ Once in England, the Ninth Army added a G-5 Section with Civil Affairs and Military Government and augmented the G-3 with Air Sections and Office of Strategic Services detachments. Additionally, they implemented an evening school program for the staff to focus on current operations in theater.⁶⁵ General Simpson's headquarters had a reputation for a strong work ethic. General Bradley described the Ninth Army headquarters as "uncommonly normal" compared to "the noisy and bumptious Third and the temperamental First."⁶⁶ General Bradley further noted that the Ninth Army under General Simpson was dependable and disciplined.⁶⁷

General Simpson's evening school program included several critical functions. Observers from the front in France returned and briefed the staff on procedures in use. Additionally, the staff ran simulated map exercises involving the staffs of major subordinate commands. The staff used these exercises and reports from France to update their standing operating procedures. A poignant summary of General Simpson's perspective on training comes from his own words,

“the battle is won by the trained and resourceful soldier who has complete confidence in his weapons and in the skill and ability of his leaders.”⁶⁸

In the execution of significant operations, General Simpson demonstrated a similar hands-on approach to General Patton. During the Battle of the Bulge, having put the field army on a course of action, he spent much of his time away from his command post visiting the troops and gaining an appreciation for the situation. Prior to Operation Grenade, the 1945 attack into Germany, General Simpson took the opportunity to visit commands at the division and regimental level. These visits allowed him the opportunity to stress his emphasis on exploiting German weaknesses and a rapid advance because that is what he needed from the operation.⁶⁹ Furthermore, General Simpson employed his staff to gather and confirm information for him when he could not do so himself.⁷⁰ Multiple times General Simpson demonstrated that the Ninth Army headquarters was not about him but about accomplishing the mission. To accomplish the mission, General Simpson built and followed staff processes and trusted his staff and commanders to take action.

General Simpson entrusted his subordinates with the responsibility to act in his absence. In one instance, General Simpson’s G-3, Colonel Mead demonstrated his commander’s trust in him to make decisions. He changed the boundary between XIII and XIX Corps to accommodate the changing situation without having to consult the general.⁷¹ While it is a brief example, it is illustrative of the rest of General Simpson’s behavior. His trust enabled his staff and him to grasp the importance of the situation during the Battle of the Bulge more quickly than either the US First or Third armies.

How General Simpson Gained Battlefield Understanding

On the first day of the Battle of the Bulge, Colonel Mead noted in his after-action that “a major German attack began in the First U.S. Army zone in Luxembourg and Belgium... Ninth U.S. Army immediately began to regroup its forces in order to release elements for movement to the south to aid First U.S. Army in holding the German advance.”⁷² Thus, the Ninth Army understood that a major attack was underway and responded. This is reflective of the command’s abilities to put together what was happening, follow its processes, draw conclusions, and decide on action. The headquarters used its operational reporting and intelligence apparatus to build an understanding to make decisions.

How General Simpson Considered Information and Made Decisions

General Simpson was, in many respects, the quiet professional, underestimated because of his lack of self-promotion. While not boisterous like General Patton or temperamental like Hodges, he managed to be accomplished without drawing attention to himself. General Simpson’s demonstrated his humility and excellence by his emphasis on creating and following headquarters’ staff processes and working as part of the team to accomplish the mission. Reflecting after the war, General Bradley said, “General Simpson was just as good as Patton or Hodges, either one.”⁷³ In effect, what Bradley called “uncommonly normal” was humble effectiveness. As a point of fact, General Simpson was far less outspoken than his peers about his substantial accomplishments.

More so than his peers, General Simpson fought the war in terms of the big picture and without self-aggrandizement. Instead of making a headquarters that relied on his personality, General Simpson trained a headquarters as an effective organization. Upon recognizing the Bulge offensive’s extent, General Simpson offered divisions to his fellow field army

commanders where needed, eventually providing five divisions to the First Army.⁷⁴ General Simpson led an Army staff that was truly outstanding in its ability to unpretentiously do the right thing, demonstrated by its model staff functioning and devotion to the overall effort.⁷⁵ At the start of Operation Grenade, the push into Germany in early 1945, he instructed his corps commanders to plan for contingencies and simultaneously consulted his peers and higher for options before making a decision.⁷⁶ General Simpson was thorough and process-driven in his decision-making. The US Ninth Army's behavior and successes reflected General Simpson's style.

Lessons from the World War II Experience

In these three Army commanders – Hodges, Patton, and Simpson – there are three broad command perspectives. While they overlap, they are also distinct. Each provides insights into effective and ineffective practices. Most importantly, for this study's purposes, they each had their own way of gaining contextual understanding, gathering measurable indicators of enemy activity, and considering that information to make a decision.

As demonstrated through these three generals' experiences, the most challenging perspective to gain is a contextual, subjective understanding. Often, these generals visited the battlefield personally. They spoke with subordinate and adjacent commanders as well as troops on the ground. Patton even took the opportunity to view an enemy forward observation post. Each had his own way. General Hodges gained subjective context through trusted subordinates, Patton through his own eyes and personal intelligence, and Simpson through a combination of personal observation and staff processes. On the whole, Generals Patton and Simpson came across as more successful in their endeavor to command their armies, and both were known for being out of their command posts more frequently than was Hodges.

The command post was, and is, often the most fruitful place to gain an impersonal, measured understanding of the battlefield. Reports, numbers, charts, and maps dominate the information space that the command post physically portrays. Of these three commanders, General Hodges spent the most time in his command post and Patton the least. It is essential to strike a balance between the two, and General Simpson did that quite well.

Concerning decision-making, none of the three commanders was more decisive than General Patton. While he relied heavily on his subordinate commanders, intelligence apparatus, and staff to provide him information, he made decisions personally. General Hodges appeared to be the least decisive leader of the three. For example, during the Battle of the Bulge, all three generals did not realize what was happening at first; however, it took General Hodges the longest despite the reports he was receiving. In many respects, General Hodges relied too much on the decisive recommendations of his subordinate commanders. Again, General Simpson struck a balance in being decisive; he frequently asked for choices and selected or mixed those options to create what he believed to be the best solution.

In the 1960s, the US Army sought to capture the knowledge and experience of its active and former generals with experience in World War II, Korea, and Vietnam, seeking to understand how to achieve the best battlefield solution. In this study, the researchers identified the same importance to understanding the situation, validating the commander's perspective, and providing a complete order to address it.⁷⁷ It is ultimately the commanders who are at the center of the military decision-making process. They should listen to their staff and subordinate commanders. They must identify what matters most. This focus is part of their command style.⁷⁸ But they must also understand the complexities of their information sources, dependencies, and the layers between them and the information source.⁷⁹ These elements,

command style, information sources and conflicts, decision-making processes, and means to convey information together make up the command and control process.

Present-Day Command and Control Systems, Sources, and Decision-Making

The Second World War ended over seventy-five years ago; however, the perspective provided is as relevant today. The lead up to that war saw dramatic advances in communications technology and broader distribution of forces on the battlefield. These lessons still apply to the present day. There are rapid advances in communications technology and command and control systems, such as developing machine learning or artificial intelligence, the pervasive presence of drones, and the democratization of one or more computers to every combatant. However, subjective and objective information both remaining critically important to decision-making. This dilemma is even more critical as command and control systems become more complex. The sources of information increase, and the operational environment becomes more complicated for the commander and staff operating an operations center to handle.

Command and Control Apparatus

Around one hundred soldiers operated a typical Second World War command post at the field-army level receiving reports. These staffs updated situation maps and passed orders all within proximity to the battlefield. By contrast, the modern command and control system relies more heavily on rear echelon elements to provide command and control support in new ways with hundreds or more support personnel.⁸⁰ The defining characteristic of a modern operations center is a wall of screens. These operations centers are filled with multiple digital maps, charts, video feeds, social media streams, and COP feeds. Much as it was for World War II, the demand for information will remain high relative to the technical ability to provide it, especially in great power conflicts. Because a lack of information is associated with risk, there is an insatiable

desire for more information. The desire for ‘more’ can never be satisfied because it has no endpoint. In an effort to answer this quest for understanding, the command center’s command and control system is the focal point for the commander’s objective, measurable information. The nature of these systems influences the perspective the commander has of the battlefield.

For example, in the US Army’s advance from Kuwait into Iraq in 2003, Army commanders had use of the Army Battle Command System (ABCS), which included technologies like the Blue Force Tracker (BFT) and Command and Control for Personal Computers (C2PC). These systems combined to provide friendly location information to commanders at all levels.⁸¹ This location information was limited to those elements with a BFT and those whose locations were manually updated. In this case, objective information, the specific location of units without a BFT, would either not be on the commander’s digital map or would have to be input manually. The objective information provided by a COP has always only been as good as its input. The modern commander may find themselves ‘flying blind’ if they lose communications with forward units. However, the commander’s success or failure in this situation is determined by how well they respond to this loss of communications. As with the previous examples in the Second World War, General Hodges could have reacted more quickly if he was more willing to accept the limited reports he was receiving during the Battle of the Bulge rather than sending his staff forward to determine the situation for him.

Political and military leaders increasingly seek quantitative information such as the number of missions, enemy killed or captured, troops in contact, etc., from units at every level. As a result, many units build their own databases using software such as Microsoft Excel. While Microsoft Excel is often used to develop unit-level databases, there are larger centralized databases for compiling nearly every byte of battlefield information. One such database is the

Combined Information Data Network Exchange (CIDNE) used by US Central Command to centralize significant event reports.⁸² During the Second World War, no system compiled such information in near real-time as it is today. Instead, commanders at higher levels, such as the Army Group or Supreme Allied Headquarters Europe, relied on information compiled from situation reports. Whether in the Second World War or today, these consolidated reports only serve as a beneficial source of information if they are readily available, searchable, and responsive to provide a meaningful assessment.

Present-Day Sources of Information

A commander still has only two types of information from which to make decisions; objective and subjective. The command and control systems previously described are the dominant source of objective data to the battlefield commander. However, the commander receives so much highly detailed and precise information at a rapid rate that it risks “information overload.” This term, information overload – coined in 1962 – refers to “the overproduction of information relative to the capacity for its storage, analysis, and distribution to the point of need.”⁸³ Storage is less of a concern today; however, analysis and distribution remain highly problematic. Therefore, in the deluge of objective information, the commander and staff's responsibility to interpret information is increasingly difficult because of the surge or requirements to handle the vast quantities of information. Simultaneously, this torrent threatens to decrease the emphasis on subjective, qualitative information. Subjective information is as important today as it was in the Second World War.

Sources of subjective information have changed little, while the methods for getting ahold of them have. Just as Generals Hodges, Patton, and Simpson made battlefield circulations to converse with their commanders and troops and see the battlefield and the enemy, so too must

the modern commander. Today, commanders can see each other face-to-face through video teleconference (VTC).⁸⁴ And the commander that wants to 'see' the battlefield can see it through the eyes of an unmanned aerial vehicle (UAV).

The UAV provides an excellent example of how the commander can see the modern battlefield by offering a view of the distant battlefield. That UAV video feed furthermore requires hundreds of people in support.⁸⁵ However, this UAV video feed provides only a very narrow view of the battlefield. It is possible to miss something that is happening just outside of the picture. Yet, it is better than no perspective. Modern UAVs provide a similar perception to what the XIX Tactical Air Command provided to General Patton about enemy armor formations when he received conflicting reports from his ground commanders. General Patton used airpower for on-call airborne reconnaissance sparingly to avoid interfering with the air plan to the detriment of his ground support from the XIX Tactical Air Command.⁸⁶ A modern commander can similarly request to reassign a UAV to provide on-call airborne reconnaissance.

The commander can only gain a subjective appreciation for the battlefield through interpersonal interaction and personal observation. In the absence of battlefield circulation, VTC and UAV video feeds are the next best thing. While these provide improved perspective over a telephone call and far greater perspective than an email, they also lack context. For instance, a visit to the troops can provide nuanced detail; General Patton frequently visited his junior soldiers for this reason. They may find that the weather is cold and their issued jacket is insufficient. A commander may find something that is otherwise hard to describe. Gaining this intangible and subjective understanding is a time-consuming process compared to collating concrete, measurable, static data. On the one hand, acquiring this type of intangible understanding is impossible to grasp without being there in person. On the other hand, gaining

an objective appreciation is much more about the tedious process of collecting, collating, and analyzing massive quantities of raw data to determine meaningful outcomes.

The increasing volume of data collected on the battlefield has spurred the need for increasing numbers of highly specialized analysts to parse through the data and identify what matters most. Intelligence analysts reviewing this ever-growing volume of data are progressively separated from the battlefield context geographically and mentally. This separation is happening because modern technology allows for remote analysis, and it is more cost-effective to employ these analysts far away from the battlefield. As a result, the product can often be “less clear, less definitive, and less suitable as a basis for resolute action.”⁸⁷ This perspective, raised in the 1980s, is becoming increasingly problematic over time. More and more, there is a need for a subjective, intangible, and contextual understanding.

While the volume of information is a leading impediment to understanding objective and subjective information, it is not the only interference to understanding the situation. Several other factors degrade information quality, usefulness, and clarity. Examples include the time required to collect and discriminate information for its effectiveness, the risk of being ‘seduced’ by numbers that lack social or historical context, the phenomenon of “garbage in, garbage out” affecting human analysis and machine learning, and poor user interfaces that cause users to get the wrong data unintentionally.⁸⁸

These systems and sources of information and the opportunities and obstacles they create are fundamental components of the contemporary operations center. As always, people staff a command post or operations center. But since at least the telegraph's invention, the people staffing an operations center have been increasingly operating to provide the commander with a greater understanding of the tactical, operational, and strategic situation.

Command and Control Processes in the Operations Center

The military operations center is the hub of objective information for the commander. Regardless of changes in size and composition over time, the operations center's purpose remains to provide the commander with situational awareness through a consolidated view of the perspectives across the headquarters. Ultimately, just as command posts were in World War II, these centers consolidate information.⁸⁹

A combination of people and machines comprise the various aspects of this process of consolidating information. This process is responsible for producing nearly all of the tangible, explicit information available to the commander, but this process does not account for all data. As Martin Van Creveld says in his study *Command in War*, intangible information can include tone of voice, facial expressions, and how people portray the story.⁹⁰ There is no record to date of a command and control system that records, compares, and processes tone of voice, inflection, and facial expressions. Until machine learning has mastered such a task, the commander must decide based on the context provided by the operations center staff and, what some would call, the commander's intuition. Battlefield psychology is part of this intangible understanding. A century ago, after the First World War, a young German Captain, Adolf Von Schell, put it well, the commander "must know the probable reaction of the individual" and how to influence their reaction.⁹¹ This knowing applies to knowing friendly, enemy, and noncombatants' reactions. The same sentiment was reflected far earlier by Sun Tsu, "[I]f you do not know others and do not know yourself; you will be imperiled in every battle."⁹² Therefore, the commander is responsible for understanding both the subjective, qualitative, contextual, and objective, quantitative, measured data about the battlefield. With the combination of these two types of information, objective and subjective, the commander makes decisions.

Conclusion

Addressing the deluge of information that faces the commander requires both technical and philosophical solutions working together. The efforts to develop stand-alone technical solutions to solve these issues will create more problems while creating solutions, as they have in the past. If machine learning becomes the answer to identifying the correct information, how bad will its mistakes be? How long will it take to draw conclusions? Will it be fast enough? These questions matter at all levels of command in counter-terrorism operations and great power conflicts. The solution that allows a commander to make good decisions is more complicated, and history provides practical examples.

The lead up to the Second World War saw dramatic changes in experience, education, and technology, just as are present today. The general officers who led in the European Theater of Operations started their career in a world where the radio was a novelty, the telephone was a recent invention, and airplanes were relatively new. They saw a dramatic expansion of the battlefield as motorization increased mobility, radio signals extended control and reporting, and aircraft increased the knowledge of where and how troops were arrayed. However, these commanders were the first to operate command posts responsible for multiple corps and divisions that were able to move rapidly across vast battlefields while reporting their real-time status. These were the first commanders who might, thanks to aircraft, reasonably expect to better grasp the tactical situation than their subordinate commanders. They were the first to deal with the temptation to direct tactical actions with such an ability to do so. Their experience during a period of transition is highly relevant to the potential battlefields of the future. As the US faces the prospect of great power competition again, it is critical to garnish lessons learned

and their application to present and future information capabilities and demands from each of these three commanders.

General Hodges used the capabilities provided to him by Second World War information systems to manage his subordinate commanders. Yet, he overly sought personal perspectives from his subordinate commanders. When it came to qualitative information, he tended to be too focused on the perspectives of a few. In handling more objective information, he again was inclined to know what a handful of trusted agents considered of that information. While General Hodges tended to rely on others' perspectives for crucial decisions, General Patton undoubtedly held the final decision for himself. He plainly respected the opinions of his staff and commanders but reserved decision-making for himself. When faced with objective information that conflicted with his subjective understanding of the battlefield, General Patton worked tirelessly to ensure he clearly understood the battlefield situation. Finally, General Simpson made the Ninth Army 'uncommonly normal' by focusing his staff on building processes to handle information and decision-making. He sought to lead the Ninth Army as part of the bigger picture instead of for personal glory. More so than his contemporaries, General Simpson built a command system designed to employ the day's command and control systems to make good decisions.

While modern command and control systems have more screens, electricity, and communications systems, they face the same fundamental issues – overwhelming information, conflicting reports, confusion, and risk – that faced field-army commanders in the European Theater of World War II. In many regards, a present-day command center may face more objective, measurable data than any command center in the Second World War. In this environment, the commander must also take advantage of the new ways to gain a qualitative

appreciation of the battlefield while still benefiting from the new ways of building an objective appreciation.

Contemporary commanders must lead their staff in developing a balanced perspective of all available information. There are three critical points. It is vital that commanders develop a personal, qualitative understanding of the battlefield. It is equally important that their staff works tirelessly to develop an objective, qualitative, impersonal assessment. Finally, commanders and staffs must create the time and opportunity to gain a qualitative perspective. There are valuable lessons to be learned from the Second World War Generals Hodges, Patton, and Simpson. The commander that uses these lessons will succeed. They will create the processes to successfully receive and consider objective and subjective information before making a decision.

Endnotes

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 - ² Anno and Einspahr, “Command and Control and Communications Lessons Learned: Iranian Rescue, Falklands Conflict, Grenada Invasion, Libya Raid,” 29.
 - ³ Macedonia, “Information Technology in Desert Storm,” 38.
 - ⁴ Shanker and Richtel, “YOUR BRAIN ON COMPUTERS; In New Military, Data Overload Can Be Deadly.”
 - ⁵ McChrystal et al., *Team of Teams: New Rules of Engagement for a Complex World*, 163.
 - ⁶ English, *Patton’s Peers*, 95.
 - ⁷ English, 137.
 - ⁸ Lavine, *Circuits of Victory*, xx; Bridge and Pegg, *Call to Arms*, 42; Jantzen, “‘Switchboard Soldiers’ of the Great War.,” 18–19.
 - ⁹ War Department, *A Manual For Commanders of Large Units (Provisional)*, 1-Operations:2–3, 21.
 - ¹⁰ War Department, 1-Operations:2–3, 21.
 - ¹¹ Raines, *Getting the Message Through: A Branche History of the U.S. Army Signal Corps*, 240–41.
 - ¹² Rauch, “World War II (1939-1945).,” 29.
 - ¹³ Bridge and Pegg, *Call to Arms*, 79–80.
 - ¹⁴ Greenfield, Palmer, and Wiley, *The United States Army in World War II - The Army Ground Forces: The Organization of Ground Combat Troops*, 368.
 - ¹⁵ Essame, *Patton: As Military Commander*, 119.
 - ¹⁶ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 133–36.
 - ¹⁷ MacDonald, *The Last Offensive*, 26.
 - ¹⁸ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 16.
 - ¹⁹ War Department, *A Manual For Commanders of Large Units (Provisional)*, 1-Operations:1–8.
 - ²⁰ English, *Patton’s Peers*, 95.
 - ²¹ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 149.
 - ²² Hogan Jr., 161–62.
 - ²³ Hogan Jr., 121–23.
 - ²⁴ MacDonald, *The Siegfried Line Campaign*, 22.
 - ²⁵ Sylvan and Francis G. Smith, *Normandy to Victory*, 395–96.
 - ²⁶ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 170.
 - ²⁷ MacDonald, *The Siegfried Line Campaign*, 23.
 - ²⁸ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 143.
 - ²⁹ Hogan Jr., 53, 130.
 - ³⁰ Hogan Jr., 205–9.
 - ³¹ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 169–71.
 - ³² Morelock, 180.
 - ³³ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 211.
 - ³⁴ Hogan Jr., 211–17.
 - ³⁵ D’Este, *Patton*, 468.
 - ³⁶ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 180.
 - ³⁷ MacDonald, *The Battle of the Huertgen Forest.*, 9.

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- ³⁸ D’Este, *Patton*, 95.
- ³⁹ D’Este, 71–77, 164, 194, 205–6, 250–66.
- ⁴⁰ Patton, “Military Essays and Articles by George S. Patton,” 11, 24, 39, 44, 117, 122, 129, 285, 342, 400.
- ⁴¹ Lovelace, “‘Slap Heard around the World’: George Patton and Shell Shock.”
- ⁴² D’Este, *Patton*, 562; Essame, *Patton: As Military Commander*, 110–19.
- ⁴³ D’Este, 378–80; Essame, *Patton: As Military Commander*, 39–43.
- ⁴⁴ D’Este, *Patton*, 91–92, 549–50, 575, 628.
- ⁴⁵ Patton, *War As I Knew It*, 167, 182, 227.
- ⁴⁶ Patton, 178.
- ⁴⁷ Patton, 347, 355–57.
- ⁴⁸ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, 122.
- ⁴⁹ Patton, “Military Essays and Articles by George S. Patton,” 383.
- ⁵⁰ Patton, 383.
- ⁵¹ Patton, 378.
- ⁵² Blumenson, *Breakout and Pursuit*, 349–50.
- ⁵³ Blumenson, 377.
- ⁵⁴ D’Este, *Patton*, 650, 675–76.
- ⁵⁵ D’Este, 692.
- ⁵⁶ Patton, *War As I Knew It*, 196.
- ⁵⁷ Blumenson, *Breakout and Pursuit*, 344, 349.
- ⁵⁸ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 173; D’Este, *Patton*, 675–76.
- ⁵⁹ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 173.
- ⁶⁰ Morelock, 203.
- ⁶¹ English, *Patton’s Peers*, 138, 147–48, 154–55.
- ⁶² Army War College, “Historic Carlisle Barracks.”
- ⁶³ Stone, “He Had the Guts to Say No: A Military Biography of General William Hood Simpson,” 3–4.
- ⁶⁴ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 162–64.
- ⁶⁵ Parker Jr. and Thompson, *Conquer: The Story of the Ninth Army, 1944-1945*, 19–20.
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- ⁶⁸ Stone, “He Had the Guts to Say No: A Military Biography of General William Hood Simpson,” 27–30.
- ⁶⁹ Stone, 125–26, 158–59.
- ⁷⁰ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 207–8.
- ⁷¹ MacDonald, *The Last Offensive*, 174.
- ⁷² Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 174.
- ⁷³ Stone, “He Had the Guts to Say No: A Military Biography of General William Hood Simpson,” 113.
- ⁷⁴ Morelock, *Generals of the Ardennes: American Leadership in the Battle of the Bulge*, 174–75.
- ⁷⁵ Morelock, 208–9.
- ⁷⁶ Stone, “He Had the Guts to Say No: A Military Biography of General William Hood Simpson,” 152–53.
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- ⁸⁰ Hogan Jr., *A Command Post at War: First Army Headquarters in Europe, 1943-1945*, sec. Appendix A.
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- ⁸² Woodward, “Data Exchange Becomes ‘Go-To’ Software for Theater Information”; Lichtblau and Bleach, “US and Coalition Forces Data (Semantic) Interoperability Study,” 15.
- ⁸³ Gross and Gross, “Operation Basic: The Retrieval of Wasted Knowledge,” 68.
- ⁸⁴ Khan, “Liaison Officer’s Observations,” 60.
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- ⁸⁹ Findlay, “Joint Headquarters Organization, Staff Integration, and Battle Rhythm, Third Edition,” 7.
- ⁹⁰ Van Creveld, *Command in War*, 262–63.
- ⁹¹ Von Schell, *Battle Leadership*, 9.
- ⁹² Sun Tzu, *The Art of War*, 53.

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