



(Photo by Erich Borchert, Propagandakompanien der Wehrmacht — Heer und Luftwaffe)

A column of Panzer 35(t) and Panzer IV tanks make their way through France circa 1940.

1930s German Doctrine A Manifestation of Operational Art

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Although many years have passed since German operations at the outset of World War II, academics are still divided in defining the essence of German doctrine: the *blitzkrieg*.¹ Was it a tactical doctrine that emerged as a response to technological advances, namely mechanized warfare and radio communications? Or, was it a strategic doctrine? Or, was it perhaps a philosophy born of Germany's geo-strategic state that mandated

avoidance of a simultaneous, two-fronted war, thus requiring the quick defeat of one enemy in order to allocate all resources to face a second?² Robert Citino, noted *Wehrmacht* historian, leans toward the latter, asserting that German military philosophy had not changed during the interwar period. Rather, it was an extension of historic tradition of German military theory, dating back to Friedrich II (“the Great”).³ Either way, the nature of German doctrine

remains hotly debated among military historians, as can be observed from the vast amount of literature available. The final word on the matter is yet to be said, and this article will not attempt to claim it.⁴

However, one oft-contested issue stemming from debate and discussion of blitzkrieg is whether the German doctrine was conceived as a construct at the operational level of war. It is this narrower issue which is the subject of this article.

Shimon Naveh, a well-known Israeli military historian, disputes the assertion that blitzkrieg was a manifestation of operational art. Instead he describes it as a concept that “not only lacked operational coherence but ... its actual formation dictated relinquishing a systemic approach to military conduct,” and that between 1933 and 1938 the Wehrmacht underwent a process which systematically destroyed operational awareness.⁵ He goes on to assert that the essence of the blitzkrieg was mythicized in the wake of the German army’s incredible victories at the outset of the war, which distorts clear analysis. Thus, Naveh maintains, discussion of operational thinking is irrelevant in regard to World War II German military thought.⁶

This article will attempt to refute Naveh’s misguided (and misleading) thesis by discussing the theory and practice of the German army during the 1920s and 1930s, proving that both operational thinking and emphasis on joint operations were very much existent in German thinking that led to formulation of blitzkrieg. Moreover, the article will clearly show that recognizable operational-based theory was converted into practice during the campaigns to conquer Western Europe.

Operational-Level as Paradigm

One can assert that the very basis for modern campaign planning and execution lies in developing doctrine that requires operational thinking and joint operations. Such doctrine was, in fact, developed during the second half of the 1930s, the very period when, per Naveh, the Germans deserted operational thinking. Before detailing the development of operational thinking in German military philosophy, it is necessary to first provide a short and simple overview of the *operational level of war* and *joint operations* as concepts. Later we shall examine the emergence

of German doctrine especially during the period between the close of World War I and outbreak of World War II.

Operational Level of War Definition

The U.S. Department of Defense *Dictionary of Military and Associated Terms* defines the operational level of war as one at which “campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives” as defined by the political echelon.⁷ Thus, the operational level can be understood as a methodology of command aimed at executing strategic directives; it is not detached from the strategic level, but rather is subject to it. Moreover, it is at once the bridge between strategy and tactics, as well as a stage within the stages of war. Also, as art, it should be noted that the operational level cannot be analyzed via mathematical or physical means (i.e., the complex systems theory or chaos theory).⁸

Operational Art as Complex Endeavor within War

War is a national effort that requires coordination from the highest level of policy makers to the lower levels of tactical execution. This coordination is effective when every level of command understands it and does not operate outside the hierarchy, or province, of its own prescribed level.

The strategic level is born of the complex elements of national power that includes political, economic, social, psychological, and technological domains. Under that construct, military strategy should be defined as the art and science of using a country’s military forces to achieve national goals through the use of force, or threat thereof.

In contrast, the tactical level of war narrowly focuses on execution of those actions taken by tactical units or task forces to conduct actual combat. The operational level can be viewed as an intermediary one that links the two others into a coherent process. Concurrently, the operational level can also be defined as the mechanism for focusing the strategic perspective on one geographically defined theater in order to achieve strategic, and, subsequently, national goals by using tactical operations.⁹

Consequently, for the operational level to be effective, preparation for war requires a thorough understanding of what the strategic objective is and complete understanding of the tactical level, which refers to the intricacies of face-to-face confrontation with enemy forces.

The operational level accomplishes its role of achieving strategic military goals by delegating tactical tasks to the combat forces; its essence is to translate strategic targets into achievable tactical goals. Simply put, management on the operational level boils down to management of a series of battles fought by the tactical forces to achieve a strategic objective.¹⁰ This can be even further simplified. If the strategic level is the art of war management and the tactical level is the art of battle management, then the operational level is the art of campaign management, (i.e., managing a collection of battles).¹¹

Additionally, the operational level can be understood as the complex of military actions within a given theater. Therefore, operational thinking provides the theoretical foundation and logic for joint operations, defined as cooperation between two or more of the arms of the armed forces to guarantee optimal operational efficiency.¹² Such cooperation requires unity of all efforts. This logically demands unity of command under one senior headquarters for the purpose of achieving better command, control, and coordination of all forces and efforts, including the non-combat logistics system.

Operational Art and Joint Operations in the German Military in the Interwar Period

With the above understanding in mind, analysis of the early World War II German campaigns in conquest of Western Europe has proven valuable for researchers of operational art. Planning and execution of German operations appear to demonstrate the kind of relationship one should expect between the operational and strategic levels, as well as the key importance of joint operations within operational thinking, thereby making them relevant to this day. Thus, attempts to identify the principles behind, as well as the theoretic and practical essence of, German doctrine continue to interest American military theorists who, since the latter half of the 1970s, have

been trying to define and delineate future American warfare doctrine.¹³ Nevertheless, the theoretical framework asserted for German thinking continues to engender an intense debate—as exemplified by Naveh’s objections—regarding whether there actually was conscious employment of something akin to operational art behind the blitzkrieg concept and the occurrence of joint operations.¹⁴

German Operational Warfare in Practice

During a preponderance of its early World War II campaigns, it is unquestionable that Germany used both its *Heer* (army) and *Luftwaffe* (air force) together in combined arms teams, supported by various other support arms, to simultaneously attack a vast number of targets while advancing along several routes.¹⁵ Additionally, in the occupation of Norway (Operation *Weseruebung*), the *Kriegsmarine* (navy) was also involved in an integrated scheme of coordinated operations with the air force and army. The German campaigns manifest identification of strategic objectives as they involved intensive planning aimed at identifying a country’s weaknesses, which then became principal targets for the unified German armed forces (*Wehrmacht*). Additionally, the campaigns themselves were executed using a highly flexible, non-central system of command and control.

Study of these campaigns reveals that a mission-command-like (*Auftragstaktik*) structure clearly existed within the German system. This contributed to the operational and tactical flexibility accorded to commanders in the war theater, who were required to achieve the general targets defined by the strategic plan, but left in large measure to their own initiative to develop and execute their portion of the campaigns.¹⁶ The concept of a mission-command-like component signifies operational thinking, since conceptually the operational level operates almost independently within the general guidelines defined by the strategic level.¹⁷

This schematic description of operational thinking illuminates questions such as: Were early German blitzkrieg successes accidental, or were they the outcomes of carefully applied theory put into practice? To elaborate on answers to such questions,

we must examine whether there was something like a concept of operational art involving recognition for the need of coordinated joint operations organized in a campaign plan among German armed forces prior to the campaigns in the West.

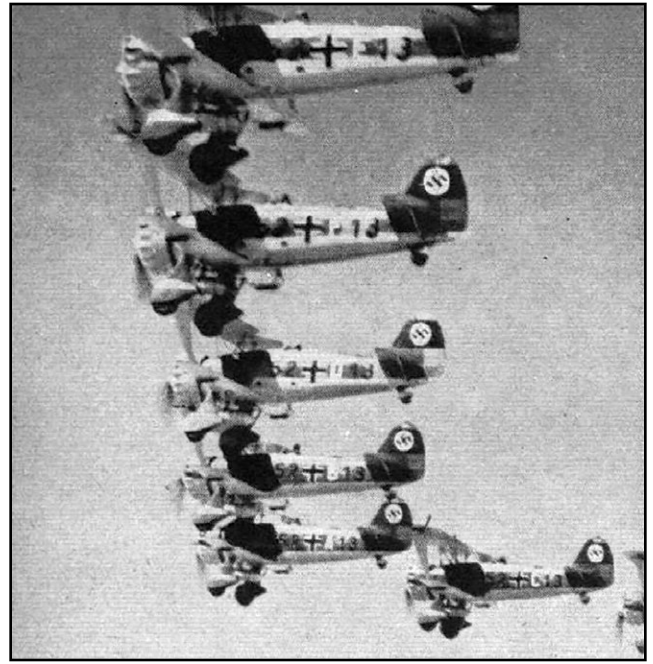
Roots of Operational Art in German Military Theory

The concept of one campaign manager operating according to a set strategic idea while constantly adapting his actions to the ever changing military-tactical reality of the campaign appears prominently in the observations of Helmuth von Moltke, the Elder.¹⁸ He had come to his conclusions in large part by meticulously studying the campaigns of Friedrich II and Napoleon. He subsequently used his research, while serving as chief of staff of the Prussian army, to adapt management of war in a manner that successfully led to the unification of Germany.¹⁹

Following the triumph of the Prussian state in unification of the German states, von Moltke's immense influence on German military thinking continued to spread, and indeed shaped the plans of the German army leading up to World War I as well as those during the war itself.²⁰

After World War I, the German army continued to promote operational thinking as one means to effectively rebuild and restructure its forces in the face of strict limitations placed on it by the Treaty of Versailles. In part to circumvent strictures placed upon German armed forces, German Chief of Staff Gen. Hans von Seeckt ordered a systemic study of World War I in an attempt to create a modern warfare theory. A key subject of study was determining the appropriate relationship of aerial forces to land forces: Was the Luftwaffe by its nature an independent arm, or should it be subordinate and subject to the ground forces?²¹

Dominating the debate, Gen. Walther Wever, prominent aviation theorist and the Luftwaffe's first chief of staff, asserted that the aerial force was only a portion of a greater whole, counting for but one-third of Germany's total military power.²² Therefore, it alone could not win future battles by itself, but had to be integrated into a system of cooperation with ground forces (and the navy, to some extent).²³



(Photo courtesy of the Flight Global Archive)

A squadron of German Luftwaffe Henschel Hs 123A aircraft fly through the skies before the Second World War circa 1939.

Consequently, he asserted that the air force was not an independent arm, but one which would amplify the overall power of the German army if used appropriately. In this regard, Wever's theory is representative of, and differs little from, broad agreement among military thinkers on the proper role of aerial forces during that period. This view of the Luftwaffe's relationship with the other arms of service had its following, even among German aviation officers.²⁴

Such theoretical military thinking, along with "war games" with the Soviet Union, produced Germany's aerial doctrine in 1926. It specified the two main roles of the air force. The first was providing close air support (CAS) in support of the other arms. The second was strategic bombing of enemy cities.²⁵

The order to establish the Luftwaffe proves that Germany intended to create a unified military force under one command that would coordinate the operations of all three arms, which were viewed as dependent on each other. According to Luftwaffe Regulation 16, only a joint operation of all three arms could achieve the operational goal (i.e., breaking the enemy's will to continue fighting).²⁶

In 1935, the Luftwaffe updated its 1926 doctrine, *Die Luftkriegsfuehrung*, incorporating some



(Photo courtesy of the German National Archives)

Ruins of destroyed buildings barely remain standing in the aftermath of a German Luftwaffe offensive in Guernica, Spain, circa 1937.

additional concepts advocated by Italian theorist Julio Douhet, who asserted that the opening act of a conflict must be the destruction of the enemy's aerial forces. However, unlike Douhet, who claimed that the aerial arm should exclusively run the war because of its superiority over other arms, German thinking continued to maintain that aerial forces were not superior to the other arms, but coequal, and codependent.²⁷

Between 1933 and 1934, the *Truppenfuehrung*, the official doctrine of the German army for the first years of World War I, was published. It clearly asserted that the aerial forces played a major role in land battles, and that aerial assistance to ground forces would improve the combat efficiency of military operations (synergism). To achieve the requisite mind-set, it enjoined commanders of land forces to obtain a thorough understanding of the different types of aircraft and their capabilities.²⁸ Consequently, the *Truppenfuehrung* can be generally viewed as a document praising and promoting joint operations.²⁹

Studies examining how the German army progressed during the second half of the 1930s show that the German high command made plans and conducted training that was aimed at ensuring officers from one arm trained with officers of the others to promote familiarity and a penchant for cooperation.³⁰ Additionally, starting in 1937, German armed forces started a series of large-scale maneuvers incorporating the three arms.³¹

Though the navy was often incorporated into this process, jointness was best practiced between the army and air force. The main reason for this was Germany's tradition of land force orientation, with the aerial force viewed as merely an extension of ground warfare.

Other reasons can also be found. The first two relate to the Luftwaffe's officers: the vast majority of them had served in the army prior to being transferred to the air force; additionally, the two arms very early began exchanging senior officers.³² A third reason was that ground force military tactics were taught in Luftwaffe academies. Also, a fourth

reason was that Luftwaffe squadrons were routinely allocated to the ground forces for CAS purposes. This resulted in German training that emphasized cooperation between the Luftwaffe and the *Panzers* (German armored vehicles).

The link between the army and the air force was further promoted by the emergence of mobile warfare theory, which had a profound influence on German ground warfare theorists. As dictated by British theory—specifically theory developed by Sir Basil H. Liddell Hart—the air force was to act as “flying artillery,” providing assistive fire for rapidly advancing maneuver forces. This was a novel concept when first introduced since it was a time when the majority of maneuver forces were still horse-drawn and unable to keep up with the fast-paced armored units under development.³³ However, as Azar Gat proves, Hart greatly influenced the architects of German armored forces, especially Gen. Heinz Guderian.³⁴ Guderian agreed with Liddell Hart that the tank was the main war platform when it came to future ground battles, but it could not operate alone. A tank had to be assisted by other mobile forces, especially aircraft.³⁵

In his book *Achtung Panzer!*, Guderian laid out a vision that incorporated large formations of rapidly advancing tanks, then a new form of warfare, with cooperation and direct support from aerial forces in jointly coordinated attacks. He concluded that such cooperation would enhance combat efficiency in both arms, and neither should be favored over the other to achieve a new level of battlefield superiority. One must look “beyond the interest of an individual arm of the service,” Guderian exhorted.³⁶

Operational and Joint Theories Tested during the Spanish Civil War

Theories of warfare and training developed in Germany after World War I were tested during the German intervention in the Spanish Civil War.³⁷ The use of German forces in the Spanish Civil War, specifically the Luftwaffe, demonstrated quite well Germany’s operational thinking and joint operations. Between 1936 and 1939, some 20,000 German soldiers were sent to Spain for periods ranging from six to twelve months. Upon their return to Germany, they imparted their experiences and lessons learned

to their home units, which soon incorporated and refined them in practice.

One of the major lessons was the value of providing CAS to ground forces, which was the prime mission of the Condor Legion (the German aerial forces in Spain).³⁸ While CAS as a concept had been evolving in other militaries worldwide, author and air power historian James Corum dubs it integral to the development of Luftwaffe doctrine.³⁹ It is salient to observe that German CAS expertise prior to involvement in Spain was due to the Luftwaffe’s early commitment through operational thinking to joint operational planning; the Luftwaffe conducted joint officer training with ground forces as early as 1935.⁴⁰ Subsequently, the Spanish Civil War provided the testing grounds for evaluation and adjustment of CAS in actual conflict, and the results were very positive. For example, during the 1937 battles with the Basques, advancing ground forces received highly effective CAS in place of artillery assistance. With practical experience, the accuracy of ordnance delivery by the Luftwaffe greatly improved, and ground forces learned to efficiently use aerial forces to suppress and destroy obstacles to their forward movement. As a result, Germany’s air and ground forces had already obtained significant experience with joint operations tactics before World War II, learning and improving battle abilities on all levels of warfare.⁴¹ By the outbreak of World War II, it was clear that the lessons from Spain were well learned.

The efficient and deadly assistance supplied by the Luftwaffe for the German ground forces that enabled the rapid advance of forces in the campaigns for Western Europe mirrored to a large extent the joint operations practiced in Spain. Robert L. DiNardo, author of *Germany’s Panzer Arm*, singles out the German army as the one force in Europe that, on the eve of the Poland campaign, practiced a doctrine that combined the operations of aerial forces with those of maneuver divisions, specifically the armored forces.⁴² Williamson Murray, author of *Luftwaffe*, adds that, on the eve of the Norway campaign, Germany’s armed forces had achieved total joint operations capabilities.⁴³ He maintains that the manner in which the Luftwaffe was used demonstrated operational thinking, since on top of CAS, the Luftwaffe was also tasked with deep strategic bombing strikes against

enemy targets such as communications lines, recruitment centers, as well as enemy massing of combat and logistics forces. The purpose of these tasks was to simultaneously destroy enemy forces in close proximity or in contact with German ground forces, as well as enemy forces in depth, to allow maneuvering forces to move rapidly to their objectives.

Additionally, the pre-World War II era saw the emergence of a process of feedback that was the forerunner to what we regard as modern lesson-learned processes within operational thinking. The higher command, *Oberkommando der Wehrmacht* (OKW), required joint operations, which demanded creating a theoretical framework. The resulting theory was tried and tested in training and maneuvers, the lessons from which were used to improve upon joint capabilities, then tested again in maneuvers.⁴⁴ During the involvement in Spain and Poland, German units were repeatedly hit by Luftwaffe-delivered friendly fire. Feedback from such events led to steps taken to mitigate command and control problems resulting in fratricide. Moreover, joint operation capabilities continued to improve through joint maneuvers, with the Luftwaffe fully committed to this task while planning attacks on the West.⁴⁵

Apart from training and doctrine production, one can also note an important organizational change, proof of the German will to improve upon the joint concept. When the OKW was established in 1938, a high command headed by Hitler was formed to coordinate all three arms (Heer, Luftwaffe, and Kriegsmarine).⁴⁶ Ironically, a school in modern American military thinking alleges that in order to achieve full joint operation capabilities and synergic battle efficiency, all American armed forces should be united to form a single arm, which in a way would mirror the OKW concept. Thus, we can view the OKW as the essence and beginning of joint thinking in Germany that continues to influence modern military theorists concerned with optimal orchestration of all arms in a unified effort to achieve strategic objectives.

Conclusion

This article briefly examined salient events in the development of German doctrine in the period prior to World War II, demonstrating that it was grounded

in operational-level and joint operations thinking. Such thinking was rooted in German theory and practical experience dating back to the eighteenth and nineteenth centuries, developed through successive conflicts up through World War I, successfully adjusted and tested during the Spanish Civil War, and then incorporated into the Wehrmacht planning during the first two years of World War II. The observations provided strongly suggest that one of the main causes for the absolute success of the early German campaigns was the use of joint operations as a subset of operational thinking; and, that the speedy conquests during the early part of the war could not have been possible without it.

Moreover, far from lucky improvisation, it was rooted in consciously and carefully constructed doctrine developed prior to the war. This can also be proven by contradiction. After the first two years of the war, massive damages to its aerial forces prevented Germany from conducting joint operations resulting in loss of attack initiative.

Additionally, military historian Dr. Roger A. Beaumont ascribes the Western adoption of joint operation tactics as a response to having observed the successes of German joint operations in the West.⁴⁷ In Britain and the United States, joint operations conducted under an operational-level campaign schema developed on a rapid learning curve, beginning with the North Africa campaign and ending with success in the northwestern European Theater. Adoption of such was a key element in the victory over Germany.⁴⁸ Similarly, American forces in the Pacific—and to a lesser extent, the Russian army—underwent a like process.⁴⁹

To conclude, examining the German operations in the West by modern-day terms supports the claim that Germany indeed practiced what we recognize as operational thinking that necessarily emphasized the importance of joint operations. Thus, operations in the early stages of the war were founded on a set theoretical basis, the clearest manifestation of which was the incorporation of an aerial force in German joint operations with the army. The essence of such operational thinking did not come into being by accident with Hitler's command to conquer the West; rather, it was born of theoretical thinking developed since the nineteenth century and updated continuously to accommodate early technological

and theoretical advances in the twentieth century. Therefore, the early success of German operations was not coincidental—it was a result of the

development and incorporation of operational thinking in the Germany army, well established before World War II. ■

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Notes

1. Michael Geyer, "German Strategy in the Age of Machine Warfare, 1914-1945", *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton, NJ: Princeton University Press, 1986), 527-97; G. D. Sheffield, "Blitzkrieg and Attrition: Land Operations in Europe 1914-45", *Warfare in the Twentieth Century: Theory and Practice*, eds. Colin McInnes and G.D. Sheffield (London: Routledge, 1988), 67-76.
2. James L. Stokesbury, *A Short History of World War I* (New York: William Morrow, 1981), 32-34. German war plans on the eve of WWI determined that France must be defeated within six weeks, thereafter diverting the German army to the Russian front.
3. Robert M. Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare* (Lawrence: University Press of Kansas, 2004), 19-20.
4. Stephen Morillo, *What is Military History?* (Malden, MA: Polity Press, 2006), 92-94.
5. Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Art* (London: Routledge, 1997), 105-106.
6. *Ibid.*, 107.
7. Joint Publication (JP) 1-02, *Dictionary of Military and Associated Terms* (Washington, DC: U.S. Government Printing Office [GPO], 2003), 387.
8. JP 3-0, *Doctrine for Joint Operations* (Washington, DC: U.S. GPO, 2011), I-12 – I-14.
9. Frederick R. Strain, "The New Joint Warfare," *Joint Force Quarterly* 2 (1993): 20.
10. Antoine Henri De Jomini, *The Art of War*, trans. G. H. Mendell and W. P. Craighill (originally published in English in 1862; republished by [TX: El Paso Norte Press, 2005]), 140-141; Clayton R. Newell, "What is Operational Art?" *Military Review* 70 (9)(1990): 3-7. See the relevant discussion in Jomini regarding the tension between war and battle. This tension, per Jomini, created a new level he dubbed "Grand Tactics," mediating between the goals of war and battle management.
11. John English, "The Operational Art: Developments in the Theories of War," *The Operational Art: Developments in the Theories of War*, eds. B.J.C. Mc Kercher and Michael A. Hennessy (Westport, CT: Praeger, 1996), 7-20.
12. JP 1-02, 279; JP 3-0, I-1 – I-2; Field Manual (FM) 1, *The Army* (Washington, DC: U.S. GPO, 2001), 19-20.
13. John W. Woodmansee, "Blitzkrieg and the AirLand Battle," *Military Review* 64 (8)(1984): 21-39. This article discusses how German doctrine affected American military theory; Archie Galloway, "FM 100-5: Who Influenced Whom?" *Military Review* 66 (3)(1986): 46-57. As Galloway notes, no one doctrine reigns supreme, and that various military theorists influence American operational art, making it a synthesis of several theories; Shimon Naveh, *In Pursuit of Military Excellence* (London: Routledge, 1997), 250-251. Naveh, an admirer of the Soviet doctrine, dismisses Galloway's essay (although he quotes from other essays in the very same issue). He claims that American military thought was largely influenced by the Deep Battle theory; FM 100-5, *Operations* (Washington, DC: U.S. GPO, 1993), 6-2; FM 100-2-1, *The Soviet Army: Operations and Tactics* (Washington, DC: U.S. GPO, 1984). FM 100-5 tips the scales in favor of Galloway. One can recognize a great number of modern military theories, and even the subtle influence of ancient Chinese philosopher Sun Tzu. Naturally, FM 100-5 holds some original thought resulting from understanding the new political-strategic reality faced by the United States after the Vietnam War (1982 edition), and more clearly with the end of the Cold War (1993 edition). One can say that the American military indeed study Soviet war theory, but as can be gleaned from the FM 100-2 series, *The Soviet Army*, it did so in order to prepare for a future confrontation with the Soviet army in Central Europe, a form of know thy enemy; Walter E. Kretchik, *U.S. Army Doctrine: From the American Revolution to the War on Terror* (Lawrence, KS: University Press of Kansas, 2011), 226-232.
14. Kretchik, 197-217; Adrian R. Lewis, *The American Culture of War: The History of U.S. Military Forces from World War II to Operation Enduring Freedom*, (London: Routledge, 2012), 294-302.
15. Citino, 42.
16. Richard D. Hooker, "Operation Weserübung and the Origins of Joint Warfare", *Joint Force Quarterly* 1 (1993): 110.
17. Michael D. Krause, "Moltke and Origins of the Operational Level of War," *Historical Perspectives of the Operational Art*, eds. Michael D. Krause and R. Cody Phillips (Washington, DC: U.S. GPO, 2005), 134, 140-142.

18. Eitan Shamir, *Transforming Command: The Pursuit of mission Command in the U.S., British, and Israeli Armies*, (Stanford, CA: Stanford University Press, 2011), 36-44.
19. Bradley J. Meyer, "The Operational Art: The Elder Moltke's Campaign Plan for the Franco-Prussian War," *The Operational Art: Developments in the Theories of War*, eds. (Westport, CT: Praeger, 1996), 39-43; Dennis E. Showalter, "Prussian-German Operational Art," *The Evolution of Operational Art*, eds. (Oxford: Oxford UP, 2011), 38-48. This leads to the historic debate on when the operational level of war actually began. However, this discussion is beyond the spectrum of this paper.
20. Gür Roth, "Operational Thought from Schlieffen to Manstein," Krause and Phillips, 150-153; Shamir, 44-46.
21. James S. Corum, "From Biplanes to Blitzkrieg: The Development of German Air Doctrine between the Wars," *War in History* 3 (1)(1996): 87.
22. Samuel W. Mitcham Jr. and Gene Mueller, *Hitler's Commanders*, (New York: Cooper Square Press, 2000), 175-177.
23. John Buckley, *Air Power in the Age of Total War*, (Bloomington: Indiana University Press, 1999), 85; Corum, 96-98; Paul Deichmann, *German Air Support Operations in Support of the Army* (Maxwell AFB, AL: Air University, 1962), 9.
24. Williamson Murray, "The Luftwaffe before the Second World War: A Mission, A Strategy?" *The Journal of Strategic Studies* 4 (3)(1981): 263-264; "A Tale of Two Doctrine: The Luftwaffe's 'Conduct of the Air War' and the USAF's Manual 1-1," *The Journal of Strategic Studies* 6 (4) (1983): 86-87.
25. Corum, 94.
26. Deichmann, 12-13.
27. Douhet argued that command of the air is the key to enemy defeat. He also maintained that the ground forces and navy were to protect during an aerial strike until victory is achieved; Phillip S. Meilinger, "Proselytizer and Prophet: Alexander P. de Seversky and American Airpower," *Airpower: Theory and Practice*, ed. John Gooch (London: Frank Cass Publishers, 2003), 15-16.
28. *On the German Art of War: Truppenführung*, eds. and trans. (London: Lynne Rienner Publishers, Inc., 2001), 197. Based on German Army Regulation 300, *Truppenführung*, written in 1933.
29. Robert M. Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920-1939*, (London: Lynne Rienner Publishers, Inc., 1999), 225-226.
30. Deichmann, 153; Brian T. Baxley, *9 April 1940 German Invasion of Norway: The Dawn of Decisive Airpower during Joint Military Operations*, (Maxwell AFB, AL: Air Command and Staff College, 1997), 10.
31. James Corum, "The Luftwaffe's Army Support Doctrine, 1918-1941," *The Journal of Military History* 59(1) (1995): 6; Lawrence B. Wilkerson, "What Exactly is Jointness?" *Joint Forces Quarterly* 16 (1997): 66.
32. Von Seeckt preserved operational knowledge by keeping some 180 experienced aviation officers in the German army. Although upon its establishment as a separate arm in 1934, the German air force had some skilled officers; they were unable to serve as staff officers for a broad army. Many ground officers were therefore transferred to the Luftwaffe.
33. B.H. Liddell Hart, *Thoughts of War* (Stroud Gloucester, UK: Spellmount Publishers (1998), 172 (original published in 1943). One of the primary ideas forming Liddell Hart's theory is the formation of a heterogeneous division made up of infantry and armored forces (transported by armored platforms) as well as mobile artillery. The combat forces will be joined by mobilized, non-combat logistics units. Liddell Hart expanded on the heterogeneous division theory in a 1924 *Army Quarterly* 9 essay.
34. Azar Gat, *British Armour Theory and the Rise of the Panzer Arm* (London: Palgrave Macmillan, 1999), 43-90; Brian Bond, *Liddell Hart: A Study of His Military Thought* (New Brunswick, NJ: Rutgers University Press, 1977), 215-235.
35. Heinz Guderian, *Achtung Panzer!* trans. Christopher Duffy (London: Cassell, 1992), 188-189.
36. *Ibid.*, 207.
37. Richard R. Muller, "Close Air Support: The German, British and American Experience, 1918-1941," *Military Innovation in the Interwar Period*, eds. (Cambridge, UK: Cambridge University Press, 1998), 161-162; James S. Corum, *The Luftwaffe: Creating the Operational Air War, 1918-1940*, (Lawrence, KS: University Press of Kansas, 1997), 220-223; Buckley, 86; Deichmann, 10-11.
38. James S. Corum, "The Luftwaffe and Lesson Learned in the Spanish Civil War," *Air Power History: Turning Points from Kitty Hawk to Kosovo*, eds. Sebastian Cox and Peter Gray, (London: Routledge, 2002), 73.
39. Roger A. Beaumont, *Joint Military Operations: A Short History*, (Westport, CT: Praeger, 1993), 69-71.
40. Corum, *The Luftwaffe*, 247-248.
41. *Ibid.*, 83-85.
42. Robert L. DiNardo, *Germany's Panzer Arm*, (Westport, CT: Greenwood Press, 1997), 62; Buckley, 126-130.
43. Williamson Murray, *Luftwaffe*, (Mount Pleasant, SC: Nautical and Aviation Publishing Company, 1985), 21, 38.
44. Tim Ripley, *The Wehrmacht: The German Army of World War II 1939-1945* (London: Routledge, 2003), 19 and 46.
45. DiNardo, 62; Corum, "The Luftwaffe's Army Support Doctrine, 1918-1941", 76.
46. Herbert Rosinski, *The German Army* (London: Pall Mall Publishing, 1966), 262. Field Marshal Keitel headed the OKW throughout the war.
47. Beaumont, 85-86.
48. Richard Overy, *Why the Allies Won* (London: Pimlico, 1996), 208-228. In his discussion of the industrial capabilities of both warring sides, Overy indirectly touches on joint operations, demonstrating how it shaped the outcomes of different battles.
49. Kevin C. Holzimmer, "Joint Operations in the Southwest Pacific, 1943-1945," *Joint Force Quarterly* 38(3)(2005): 100-108.