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MASTER OF MILITARY STUDIES

The Schlieffen War Plan: What Impact did Logistics contribute to the Plan's Failure?

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Executive Summary

Title: An Analysis of the Schlieffen War Plan: What marked this plan for failure?

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Thesis: Despite operational adjustments to the original Schlieffen plan, the strategic failure of the plan was its logistical inadequacy to support the plans operational goals and tactical requirements. The logistical inadequacy prevented the German army from using speed and maneuver to achieve success, elements that the Schlieffen plan relied on heavily.

Discussion: The Schlieffen plan, as designed by Count Alfred Von Schlieffen, Chief of the German General Staff from 1891-1906, would serve as Germany's World War I strategy or blueprint of action in attempting to quickly defeat the French army in 1914. Schlieffen's successor Helmuth von Moltke (the younger) would execute the basic tenets of this plan in 1914. The Schlieffen plan was designed to be a simple, flexible strategic concept designed to address an envisioned two-front war, using the large right wing of the German army to envelop the French army and annihilate them quickly. This envisioned six week campaign would then be followed by a repositioning of German forces to face and defeat Russian forces before they mobilized. Regardless of the many tales which make up the Schlieffen myth, it is clearly evident that Schlieffen gave little attention to logistics or the sustainment of his forces, instead choosing to focus on the technological linkages such as railroads and timetables. Schlieffen relied heavily upon rapid mobilization so he could move his large army faster, however, in doing so, Schlieffen exposed a weakness in his plan by creating a conflict between strategic and logistic considerations. Schlieffen resolved this conflict in favor of strategy. With railways unable to keep up and vehicle transports clogged on roads, the throughput of supplies would rely on horses. The German armies would sustain themselves from conquered territory, for there was no seamless distribution system only inflexible and unresponsive logistics

Conclusion: The Schlieffen plan's design from the opening moments of WWI was an inflexible course of action, based upon tenuous logistical assumptions. Schlieffen and Moltke were acutely aware of the supply problems in supporting this campaign, but chose to ignore them. It is crucial for future planners to be cognizant that the planning and employment of flexible logistics system, must match the planning and employment of operating forces. In the current security environment, it is prudent for planners to remember that logistics will establish the limits of operational success.

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Preface

Military history books are filled with examples of large or small armies being victorious in battle or accepting defeat. These same texts are filled with examples of outstanding leadership, tactical genius, and individual courage, but what is often overlooked is the role or review of how logistics impacted these armies in their success or failure. As a Marine Logistics Officer, attending the Marine Corps Command and Staff College, I have attempted to focus particular essays on the role logistics played in historical campaigns and their applicability for future planners.
As a logistician, I was interested in how Schlieffen had planned to support nearly one million men, fighting a two-front war over great distances.

While the Schlieffen plan has been considered both a political and tactical blunder, most of the writing addressing the plan's failure has focused on strategy and tactics; little has been written on the role logistics played in Schlieffen's grand strategy.

Several people are responsible for assisting me in the completion of this project. I would first like to thank Dr. Richard DiNardo and LtCol Pete Yeager for their guidance and advice. Second, Dr. Patrice Scanlon and Ms. Andrea Hamlen from the Leadership Communications Skills Center, who assisted me more than anyone can imagine. My family has been a great source of support, and has provided me the necessary quiet time needed to finish this paper, and I cannot thank Yevette, Alexis, Taylor and Justin enough.

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The Schlieffen plan was completed in December 1905, and has been described as the most ambitious project ever undertaken for controlling the immediate future of so many people.[1] Count Alfred von Schlieffen, Chief of the German General Staff (CGS) from 1891-1906, was convinced that a fundamental change in strategy was needed. Schlieffen believed that Germany could not successfully wage an extended war on two fronts, and spent his time as the CGS continually developing a plan to deal directly with the strategic issue of fighting a two front war. The Schlieffen plan was designed not merely to defeat Germany's opponents, but at their total annihilation.[2] In 1904 the Anglo-French Entente was signed, and with the Franco-Russian alliance already a reality, Germany was now threatened with isolation and encirclement.

In 1914, the Schlieffen plan would serve as Germany's operational plan, or blueprint of action, to quickly defeat the French army, followed by a repositioning of German forces to face and defeat the Russian Army before if would be able to mobilize.[3] A relatively small German force in the East would hold off the Russian threat in the East, because it was believed it would take the Russians six weeks to mobilize. By quickly defeating the French army and capturing Paris, Schlieffen believed the British would not intervene. Schlieffen knew his plan would be costly, but worth the risk in avoiding a prolonged war with Britain, France, Russia combined against Germany and (possibly) Austria-Hungry.[4]

This paper will demonstrate that despite operational adjustments to the Schlieffen plan, the strategic failure in the plan was its logistical inadequacy to support the plan's operational goals and tactical requirements. The logistical inadequacy prevented the German army from using speed and maneuver to achieve success, elements that the Schlieffen plan relied on heavily.

For generations the Schlieffen plan has stirred controversy among military planners and historians and embodies one of the great mysteries of World War I, raising many questions of "what might have been" in modern history.[5] The Schlieffen plan has been praised by some admirers as the quintessence of strategic brilliance, and castigated by some critics as a bold and rash gamble in violation of sound military principles.[6]

Regardless of the many tales which make up the Schlieffen myth, when writing the Schlieffen plan, it appears that Schlieffen gives little attention to logistics, outside from his focus on railroads and timetables, instead choosing to focus on the technological linkages which allowed him to manage actions through time and space for the German forces. In 1914, the Schlieffen plan would be executed by Schlieffen's successor, Helmuth von Moltke (the younger), who would be blamed by generations of historians, first for tampering with the master's design, (by making changes in the strength of the right wing), and then for lacking the resolution to carry it out.[7]

Moltke would execute the basic tenets of Schlieffen plan and set the pattern for the opening battles of World War I (WWI). There are indications that because this plan was written by Schlieffen, who was held in such high regard due to the tremendous respect of his true military genius, the plan was infallible. The confidence in Schlieffen's planning ability and Moltke's failure to offer alternatives, influenced decisions made by Germany's political and military leaders, and served as a major factor in the chain of events that plunged Europe into war.[8]

Official histories written by retired WWI German Army officers Colonel Wolfgang Foerster, and Generals Herman von Kuhl and Wilhelm Groener, maintained this '*Denkschrift*', or study written by Schlieffen, provided Germany with a nearly infallible war plan: all that

Moltke needed to do was to execute the Schlieffen plan, and Germany would have been practically assured of victory.[9] These officers squarely put the blame on Moltke, for failing to properly execute the plan Schlieffen had envisioned.

Background of the Schlieffen Plan

With Germany surrounded by its enemies to the East and West in an apparent encirclement, it had now become evident for Schlieffen and the German General Staff (GGS) that they needed to be prepared to fight a potential two front war. The much quoted and famed military theorist Carl von Clausewitz wrote, "no one starts a war-or rather no one in his senses ought to do so, without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it."[10] Although Schlieffen would not execute his plan in 1914, he clearly incorporated some of Clausewitz's most basic ideas on war, but neglected an equal number of concepts such as friction, military subservience to political objectives and the culminating point of the offense.

The origins of the Schlieffen plan can be traced back to nearly 50 years prior to the start of WWI. Therefore to fully grasp the Schlieffen Plan it is helpful to trace the evolution of the war plan(s) from whence it derived. During the period in which Field Marshal Helmuth Graf von Moltke (the Elder), who served as chief of the German General Staff, from 1857-1887, much of Germany's war planning effort was directed towards preparing for an eventuality, being a two-frontal war with France and Russia.[11] Moltke did not believe that his rapid victory over France in 1870 could be duplicated, and Germany's future operational plans reflected this caution.

During his time as the CGS, Moltke (the Elder), developed his war plans in close consultation with his Austrian allies, and garnered a close relationship with his Austrian

counterpart, Field Marshal Friedrich Baron Beck-Rzikowsky. Moltke's plan called for a defensive stand in the west against France, while an Austro-German offensive should be prepared for an offensive to the east against the Russian army in Poland.[12]

The proposed defensive stand against France was due to the large chain of French fortresses which were aligned between Belfort and Verdun. It would have served Germany well to pay attention to Moltke, for he had studied history and the lessons from the American Civil War and predicted the eventual deadlock of 1914-1918. In a speech to the Reichstag in 1890, Molke (the Elder) forecast another seven years' war, with the following speech:

> If that war should break out which hung like a sword of Damocles over the head of the German nation, then no end to it could be foreseen; for the strongest and best equipped powers in the world would be taking part in it. None of these powers could be completely crushed in a single campaign...' And woe to him that sets fire to Europe'. [13]

In stark contrast to Moltke's (the elder) foresight, when Schlieffen became Chief of the General Staff in 1891, he inherited these two-front war plans, which had been developed by Moltke the Elder, and immediately embarked on making changes. In 1905, when Schlieffen finalized his strategy, part of his rationale in taking the war plan in a different direction was that the recently defeated Russians (from Russo-Japanese war) posed little threat and would be slow to mobilize- for Russia was known as the "clay-footed colossus".[14]

Schlieffen therefore, gradually committed himself to a strategy against the West, for he believed the French army was much improved from the Franco-Prussian war in 1871, and perhaps had the second best army in the world. Schlieffen saw Germany's best chance of victory in a swift offensive in the west against France.[15]

In addition, the availability of a good road and rail network in France supported his design of a plan which depended heavily on speed in mobilization, deployment and execution. With the presumed superiority of the German army over the Russians, Germany would initially

be on the defensive against Russia, which would serve as a delaying action and provide an economy of force. Russia would be dealt with fully, after France had been delivered a decisive blow. This would have the effect of turning a two-front war, into two, one-front wars.[16]

Schlieffen also recalled what had happened to Napoleon Bonaparte when he invaded Russia in 1812, and feared that an German offensive against Russia would founder against their defenses and the Russians would merely withdraw into their interior.[17] What made Germany such a feared and powerful military force was the Army's history of thorough military training and the GGS's reputation for thorough and detailed planning. The perceived power and prestige of the Germany army was able to hold both Russia and France in check, thereby maintaining peace in Europe. Although Germany was a participant in the Triple Alliance, which provided a relative counterbalance to the manpower superiority of France and Russia, but this assumption was based on Italian participation which would send forces (3 Corps) to the Rhine to re-enforce the German left.[18 and 19]

In 1893 when the Russian-French entente became reality, Germany believed that war would be fairly certain if France were to assume reliance on Russian assistance. The time for a fundamental change in Germany's strategy was apparent, and Schlieffen began drafting the first concept for a new war plan. Schlieffen and his successor Helmuth von Moltke (the younger), have been accused of formulating a purely military plan and ignoring the political dimension, but Kaiser Wilhelm must bear some of this responsibility as well.[20]

The Kaiser abdicated his responsibilities as the political leader by not demanding subordination of the military goals to his political ones. He failed at his most fundamental responsibility when he allowed Moltke to carry through with the Schlieffen plan, developed for no particular political objective, but to drive the nation into war.[21]

Gerhard Ritter, in noting the decisive difference between the German war plans of 1892-99 drafted by Moltke the elder and that of 1905 (Schlieffen), says that the period after 1899 marks a sudden and radical change, which points to the central issue in the historical understanding of the Schlieffen plan.[22] Schlieffen drew upon his reading and knowledge of history to answer the strategic challenge he now faced. He searched the annals of historical precedents, which might offer guidance in the achievement of his goal, and Schlieffen became enamored with Hannibal's classic victory at Cannae.[23]

At Cannae, the Carthaginian army outnumbered almost two to one, virtually annihilated a larger Roman force by moving around the flanks into their opponent's rear. In what has been described as the "Cannae conception," Schlieffens critical analysis of this battle was what he regarded as the supreme example of a battle of annihilation.[24] Schlieffen believed that in order to duplicate Cannae, the formulation of his plan should closely mirror to that of the great commanders of the past, and Germany must strive to duplicate Cannae in their war against France.[25]

This evaluation levies another criticism on Schlieffen for his misreading of military history. Schlieffen assumed that success could only be achieved by the flanking or enveloping of an enemy.[26] By basing the overwhelming German strategy on a maneuver used over 2000 years prior, Schlieffen prescribed a strategy, which was to become an inflexible course of action against a resourceful, resilient enemy. However, Schlieffen immediately recognized that a double-envelopment would not be feasible against France due to insufficient maneuver space and Germany's shortage of troops.

Additionally, due to the recent French fortifications of the Nancy-Epinal-Belfort area and terrain of Switzerland, an envelopment of the French flank in eastern France was too difficult,

and ruled out.(See Appendix 1) Therefore, Schlieffen decided to adapt the Cannae principle by substituting a large single envelopment in place of Hannibal's double envelopment.[27] Although the operational tactics would be under Schlieffen would change, the pattern of inferior forces defeating a surrounded enemy, this would meet the requirements in terms of Schlieffens *total victory* against France and achieve success.

Schlieffen Plan

The Schlieffen Plan of 1905 was actually the sixteenth plan Schlieffen had devised against France and the nineteenth he had made for a two-front war.[28] Although the modified plans are relevant, the intended focus of this paper is on the logistical inadequacies of the plan, so the reference will be on the plan of 1904-1905, for this was the last operational plan prepared in detail by the General Staff under Schlieffen's guidance.

The essence of the Schlieffen study or *Denkschrift* involved having the bulk of the German forces comprise his right-wing armies or '*verwasserung*', which would account for approximately 86-91 percent of the of the total German army.[29] The remaining army units would compose the left wing to guard the Alsace-Lorraine region against the anticipated French counterattack.

The right wing armies were to deploy in the Aachen-Trier region in a west/southwesterly direction turning through Luxembourg, Belgium and Holland to envelop the left flank of the French Army. (See Map 2). While the strong right wing of the Germany army was to sweep around to catch the French armies from the rear in a counter-clockwise, scythe-like action, the weaker left wing in Lorraine would fall back under pressure of the expected French attack.[30]

The expected French attack would actually facilitate the German right-wing sweep, and draw French forces away from the areas of strategic importance in northwest France.

Schlieffen also clearly respected the 'colossal fortress of Paris' and proposed that the German right wing flank should extend as far as the mouth of the Somme, in order to envelop Paris from the west and south.[31] The planned German maneuver intended to surround and destroy the French Army in a *kesselschlacht* or 'decisive battle of encirclement and annihilation.'[32]

The success of the Schlieffen plan relied heavily upon rapid mobilization, as well as operational speed and concentration of the German forces to resolve the issue quickly. Graf Von Schlieffen was well grounded in the Prussian Operational Art, and this may explain much about his emphasis on speed to destroy the French. As noted author, William Lind writes:

> How does one fight effectively in the chaos of combat? is thus answered, "By consistently being faster than the enemy." But that raises another question: "How can one consistently be faster?" The answer is through practice of the operational art.' [33]

Schlieffen's emphasis to maximize speed for his attacking forces surmises that the operational art and speed appear to be directly proportional.[34] With the question of whether to attack East or West resolved, the remaining question now centered on what size and structure of forces would be required.

A plan which depended on speed and mobilization, deployment and execution, all to be completed in a total of forty-two days, required a technological development to overcome a deficiency in the throughput of manpower and supplies. The introduction of technology such as efficient, high-capacity railroads would offer a solution to Schlieffen, by moving and supporting this mass army. However, by attempting to employ the railroads as a strategic solution to offer quick transport, Schlieffen tied the German army to an inflexible mode of transportation. Further, the railroads became strategic targets themselves, creating a new strategic vulnerability.[35]

With the development of high-capacity railroads, this relatively new technology significantly influenced Schlieffen's operational design, which involved the moving of massed forces over greater distances. With the advantage of utilizing these efficient trains to move large armies, the prime considerations governing the evolution of the Schlieffen Plan up until 1905 was not logistic but strategically focused.[36]

Schlieffen was acutely aware of the enormous supply problems that could embarrass his right wing, but these technical details were left out of the Schlieffen plan.[37] The failure to address these supply concerns became further exacerbated by the Belgian army which put up an unexpectedly sturdy defense, along with destroying railroads and bridges. These broken bridges and destroyed railroads meant no supplies, and the German army was forced to conduct foot-marches and fight, while attempting to live off the land, which was not remotely capable of supporting the quickly moving right wing.

A reasonable amount of literature written on military history from ancient to modern times, fails to address the means by which armed forces are equipped and supplied in war. Logistics is often simply ignored or, at best, treated only in a fragmentary fashion.[38] The Schlieffen plan serves as yet another example of logistics being neglected as an integral war fighting function intended to support the German WWI strategy.

Schlieffen- A failed Logistics strategy

Before making the argument that the Schlieffen plan was a failure in logistics, it would be prudent to define logistics to create a basis of departure. Logistics is defined in the Marine Corps Doctrinal Publication of the same name (MCDP 4), as "the science of planning and carrying out the movement and maintenance of forces".[39] Famed military theorist Jomini defined logistics as,

"the practical art of moving armies and keeping them supplied."[39][40] The definitions above on logistics' terms defined above, will serve as baselines in the following analysis.

In Schlieffen's personal essay known as the *Der Krieg in der Gegenwart* published in 1909, he stresses the value of motor transport for ammunition supply.[41] However, as of the plan's completion in 1905 and in the later on modifications, Schlieffen failed to address any comprehensive logistics strategy regarding the provisioning of his Army. His acuteness to detail in regards to railways and timetables merely aimed to solve the issue in the echeloning of his army forward. In doing so however, Schlieffen immediately exposed a weakness in his plan by creating a conflict between the strategic and logistic considerations, and Schlieffen resolved the conflict in favor of strategy.[42] Additionally, in order for the German army to advance quickly to debarkation points without creating areas of congestion, the violation of both Dutch and Belgian neutrality would be required.

An explanation as to why the Schlieffen plan failed to quickly route the French forces, despite operational changes or the failure in attending to political considerations, was Schlieffen's failure to prepare a supportable logistics strategy. Both Moltke (the younger) and Graf Schlieffen made brash logistical assumptions that would attempt to support the two right-flank armies. These two armies which consisted of approximately 940,000 men, which greatly exceeded the technical capabilities and logistic capabilities of the German Army early in the twentieth century.[43] In other words, the Germans could make a large army, but they were unable to logistically support it.

Schlieffen clearly understood this deficiency early on as the CGS, and began to make preparations for what he refers to as a "new stage in the evolution of warfare" by gaining a decisive technological advantage through the use of the railroads.[44] The industrial revolution

would bring about a revolution in logistics and the railroad would be utilized to move men, equipment and supplies over distances and at speeds never before possible.[45]

The Schlieffen plan involved moving several million men in a campaign area covering nearly 40,000 square miles, where even the smallest delay might lose the war. Only railroads offered the possibility of guaranteeing the speed, volume, and dependability needed to succeed. These railroads would provide the catalyst Schlieffen required to create the modern Cannae he sought.[46]

The Reich Railroad System (RRS)

In 1904, Germany had nearly 35,000 miles of track and 20,000 locomotives within its borders. In attempting to exploit this technological advantage, Schlieffen went about reorganizing the GGS along with the Reich railroad system (RRS). Through this reorganization, Schlieffen was able to better integrate the two staffs into his plan, through the sharing of information and creating interagency cooperation. Therefore, any changes Schlieffen sought were captured through his staff and received by the RRS. This allowed changes in one section to immediately bring about changes in the other. The RRS became the GGS's most important integrating mechanism for war planning and mobilization.[47]

By 1900 the Prussian State Railroad was the largest bureaucratic organization in Germany with the greatest number of employees, the broadest span of control, and received largest amount of investment capital. As railroad technology became relevant to Schlieffen and the German Staff, the potential of the railroads to support military operations began to influence the German General Staff's ideas and planning. [48]

Inside the RRS, Schlieffen also created a new branch of service: the railroad engineers whose principal mission was to keep railroads operating as close behind the front lines as

possible, so that fighting troops would not have to be dependent on slow wagon trains.[49] As the German forces were advancing, the railroad engineers were prepared and equipped to repair tracks destroyed by the retreating French forces.

As previously discussed, the railroads were the lifelines of the German Army and these railroads had to stay operational at all costs. The railroads represented a logistical throughput mechanism for German forces, but as designed by Schlieffen, these railroads would create the modern day equivalent of a strategic distribution system. To further support his strategy and capitalize on this emerging technology, Schlieffen would require tactical success at key nodes and infrastructure such as; railheads and facilities to allow for disembarkation within France and Belgium to utilize their existing railroad networks outside the German boundaries.

One motivation for such a quick and decisive victory over France and Belgium were that both of these two countries held an extensive railroad network inside their borders. These railways were important for two reasons: First, the railheads would provide initial movement to staging areas and provide follow-on sustainment of needed supplies to the fast moving German Army. Second, these railways would allow German forces to quickly retrograde and shift their armies to the eastern front for the anticipated Eastern front war with Russia.

Schlieffen's operational goal was not achieved, rather it was the French and Belgian forces that capitalized on and utilized the strategic mobility provided by the interior railways to bring up large reinforcements, thus enabling the French to stall the German turning movement. The Schlieffen plan called for the use of Belgian railways to extend the German lines of communication north of the Meuse River, and would thereby form the best possible connection between the German and French rail systems.[50]

The noted historian Martin Van Creveld writes, "there are no exact details known", but the Germans appeared to be counting on four distinct lines to supply their five right wing Armies.

> The first one would follow General Alexander von Kluck's first army through Liege, Louvain, Brussels and Cambrai to provide logistics support to the 1st Army and the right-wing of the 2nd army under General Karl von Bulow.[51] (See Appendix 3)

The operational significance in using these railways, as a logistics consideration, was the presumption that these railways would not be in the control of French or British forces and would allow uninterrupted throughput of supplies and manpower to front line battles. The result of this assumption would prove detrimental for Gen. von Kluck's right wing army, for the farther distance that the German armies advanced into Belgium and France, the railroads and railheads were being destroyed by the Belgian, French and British forces quicker than the German railroad engineers could repair them.

Another assumption which proved to be damaging in executing the Schlieffen plan was the presupposition that German forces would prevail over the Belgians and the British Expeditionary Force (BEF). Because of the German army's significant advantage in relative combat strength, and Schlieffen's personal belief and lack of respect in the fighting ability of the BEF, he summarily dismissed the BEF as a significant fighting force.[52] However, because of the German violation of Belgian neutrality, the British Expeditionary Force embarked nearly 100,000 men to further strengthen Belgian resistance, creating lengthy delays from the Schlieffen plans prescribed six week movement.

With little data available on consumption rates at the time, it has been estimated that the supplies needed to support a German Army Corps 1914, was nearly 300 tons of supplies per day.

Much of this had to be delivered by horse-drawn wagons that were normally expected to march only twelve miles a day.[53]

The First Army under Gen Kluck, which would serve as the famous '*Verwasserung*' or far right-wing army in Schlieffen's wheeling movement, was the most significant, because the 1st Army was projected to travel nearly 400 miles in the forty-two day swing below Paris, creating the encirclement Schlieffen planned for. The logistic arrangements of the 1st Army was to be accomplished by Schlieffen writing into his plan that the troops of the right wing would have to make "very great exertions".[54] The sustainment planning for the right wing army, consisting of nearly 250,000 men, was for the army to essentially survive off of the conquered country.

Although each numbered army was assigned its own organic transport columns, these columns were unreliable, thereby having to rely on logistics support coming from ineffective railroads, which were being destroyed and unable to keep up with demand. This supply point type of distribution, where armies are tied to specific line of communication (LOC's) can be a benefit to the overall strategic distribution system, but is counterbalanced by placing a burdensome requirement on the supported force. This force must dedicate elements for security and use its own organic transportation assets to transport supplies from the railheads to its quartermaster element.

Even during the early days of the campaign, the massive first army under Gen. Kluck, lost contact with its organic transport, and it became readily apparent that any sustainment planning done for this main effort army was hopelessly inadequate.[55] With the railways unable to keep up with supply requirements, and both the heavy and organic motor transport clogged on roads attempting to conduct the throughput of supplies and equipment, the ability to support and sustain the German armies would rely on horses.

Although the German soldiers were able to survive somewhat off conquered territory, the French harvest in 1914 proved unable to provide the total required fodder needed for the masses of horses that these armies required. The fodder requirement for horses in 1914 for just the 1st Army (which had 84,000 horses), was nearly two million pounds per day.[56]

A modern day example from the above illustration would be a logistics plan relying solely on an invaded country's resources, or host nation's support. Since the Schlieffen plan failed to account for requisite sustainment, Germany entered WWI with little or no arrangements to feed these horses; when acceptable fodder was unavailable, the horses were fed green corn, which made them sick.[57] In the midst of horses being deprived of adequate feed and forage, horse-drawn artillery fell behind, and the mounted cavalry lost their mobility, becoming combat ineffective. In one instance a cavalry division had to be pulled from the line due to exhausted and starving horses.

Additionally, further combat power was reduced to the German right wing due to a cavalry unit having to halt just two weeks into the offensive because of supply and ammunition shortages.[58] This is yet another example where the inability of the Schlieffen plan to establish a responsive logistics system negated the speed and operational tempo from the right wing, a capability that Schlieffen had deemed so prudent.

To further compound the logistical strains the Germany army was facing, the use of railways, which were significant to the offensive success, could only be used to the point at which the Belgians or French had disabled their railroads. From these points the German army was forced to move by roads. The very speed of the advance, which constantly brought the troops into impassable areas, meant that wagons could not move quickly enough to meet the extraordinary demands for ammunition.

To compensate for the shortfalls of ammunition being dispensed, a small number of German transport trucks, which were cobbled together with requisitioned motor vehicles, were able to minimally provide the required ammunition to the front line armies. For the most part, however they proved wholly inadequate, due to negligible command and control of the convoy's and frequent mechanical failures.

Each numbered German army had its own provisional depot, but the supply of ammunition was centralized under the German High Commands, *Oberste Heeresleitung* (OHL).[59] The OHL at times was unwilling to distribute the quickly diminishing stores of ammunition, most likely a result of an inflexible and unresponsive supply system. History has shown repeatedly, that support personnel are unable to prioritize requirements long distances from the combat troops requiring the support. A stove-piped supply system, created by the Prussian Military and employed by Moltke (the younger) only created unnecessary internal friction on an army whose focus should remain solely on war fighting.

Due to the lack of communications capability in 1914, many times, the only way to contact these motor vehicle convoys was to send out hordes of staff officers to find and redirect them. Vehicle drivers would work around the clock to keep up with demands, but fatigue, accidents and a shortage of repair parts was common. The end result was that by the time of the Battle of the Marne on 9 September 1914, only thirty-six days after the war began, nearly sixty percent of the motor vehicles had broken down, and were the casualties of hard usage.[60]

Moltke and Logistical Considerations

Asserting that Schlieffen was solely responsible for failing to apply a sound logistics strategy, would be inaccurate. Evidence suggests that Moltke (the Younger) was fully aware that the logistic underpinnings for the potential western campaign against France were inadequate.

Even after becoming the CGS in 1906, Moltke had ordered a number of logistics and communication exercises, which confirmed his view that there were problems in regards to supply issues.[61] In *Makers of Modern Strategy*, author Peter Paret contends that it was only because Moltke paid any attention at all to the logistic arrangements within the Schlieffen Plan and because of the preparations he initiated, it allowed Germany to even make the advance to the Marne possible.[62] This assertion should give pause to any reader as to why Moltke whom was aware of logistics and supply problems during his tenure as the CGS would further exacerbate logistic shortfalls in changing Schlieffen's original plan.

When Schlieffen retired in 1905, the General Staff consisted of one Quartermaster-General and four *Oberquartiermeisters*, one of whom was Moltke, the future Chief of the General Staff.[63] Given the fact of Moltke's familiarity with the operational design and logistic aspects of the Schlieffen plan, in his capacity as a quartermaster, Moltke upon appointment as the CGS initiated a study to be conducted which looked at the supply and transportation problems of the Schlieffen plan. This study was conducted and authored by LtCol Wilhelm Groener, head of the railway section, and the results of this study presumably made Moltke aware and mindful of the fact the Schlieffen plan stood little chance of success.

Moltke, who in 1914 would execute the basic tenets of the Schlieffen plan, should have emphasized much more of an appreciation of the significant role logistics would play in maintaining his combat forces. The following analysis will attempt to offer further emphasis on the key relationship between logistics and military operations.

Moltke made a number of changes in the German Army during his time as the CGS including; promoting the study and training of officers in the *technics* of warfare, creating a

previously non-existent supply system, and creating and establishing heavy motor-transport companies, which allowed the German armies to move as far as they did.

It is difficult to infer, from a historical perspective, how Moltke's strategic decision to abandon Schlieffen's projected attack through Holland would have affected Germany's opportunity for victory. However, from a purely logistical viewpoint, this decision is one of the most significant. Moltke made this decision not to violate the neutrality of Holland, for what appeared to be both a political and strategic decision. In his Memorandum drafted in 1911, Moltke declared "that a hostile Holland at our back could have disastrous consequences for the advance of the German army to the west".[64]

Moltke's decision to respect Dutch neutrality would negatively alter the already fragile logistics distribution system designed for the right-wing armies. Schlieffen had planned for the 1st and the right-wing of the 2nd German armies to pass north of the Meuse river and utilize the extensive railways in Holland to maintain their LOC's, and to provide the necessary time and space for these armies to maneuver. Moltke's modification, however, would require the immediate capture of the fortified town of Liege, prior to the large scale mobilizations of the German army.

The town of Liege was significant due to its four separate rail systems, all of which were required to move German forces farther into Belgium. Liege would further serve as a forward operating base. In addition, this modification would eventually create a log jam of nearly 600,000 men, horses, and equipment as these forces flowed through a narrow twelve mile wide corridor.[65]

As noted by historian Paul Kennedy, Molke's decision to respect Dutch neutrality, and push two German armies through the bottleneck at Liege, aggravated the supply and logistics

balance for these two armies. From the start of the German offensive, the army faced chronic supply problems which would not have occurred had the roads and railways been made available in Southern Holland. [66]

History has often proven unkind to military leadership in evaluating decisions made before and during specific campaigns, and Moltke is criticized as well. Interestingly, the men who assisted Moltke in this decision (Generals Ludendorff, Groener and Stein), would become Moltke's most outspoken post-war critics. Through their writings and analysis of WWI, Moltke would become the convenient scapegoat for tampering with the Schlieffen Plan.[67] Historian Martin Van Creveld offers a similar review by stating, " Moltke did make beneficial changes logistically, but most were harmful."[68]

Conclusion

The outcome of the Schlieffen Plan as a strategic failure is not at issue, but the reason for its strategic failure lies with Schlieffen and Moltke for failing to prepare a supportable logistics strategy to compliment the plans operational design of encirclement and annihilation. The Schlieffen plan was an audacious risk based on speed and timing, whose medium was the railroad. Schlieffen intended to use the railroads to echelon his forces forward create speed and surprise. The railroads offered a modern day equivalent theatre distribution system, the large German field army would require, but the follow-on sustainment of these forces was ill-conceived.

Schlieffen clearly thought at length in regards to the detailed planning of combat operations, creating the strategic and operational design of a two front war for Moltke and the GGS. However, the lack of attention given to sustainment operations once combat forces were staged, appear to be greatly neglected by both Schlieffen and Moltke. Both Schlieffen and the

RRS were very much consumed with the details of railroad operations and timetables in planning how to move his forces, but beyond this detailed planning, the Schlieffen plan appears to only offer generalities in terms of logistical sustainment. In the current military environment, the responsibility for detailed logistical planning in regards to the moving, and sustainment of forces would fall on logistics planners. However, given the rigidity in which the German General Staff operated, and the very centralized Command and Control used by the Germany army may have allowed a lack of responsive logistics.

Both Schlieffen and Molke failed to fully recognize how detailed logistics planning may have allowed them to extend the German army's operational limits, faster and more efficiently, elements on which the Schlieffen plan was based. The annual German army war games which were led by the CGS offered the opportunity to allow principle planning agencies to conduct exercises with troops to determine logistical shortfalls and erase any planning assumptions.

The recommendation for current and future logistics planners would be to ensure that flexible logistic plans are fully integrated with the concept of operations or operational plans. Schlieffen understood the art and science of warfare, and applied numerous scientific methods in planning to move the German army through detailed planning in railroad timetables. However, the Schlieffen plan was impacted by logistic failures, as logistics is defined less by a set of activities, than by its results.[69]

In the current security environment, the ability to create logistics plans which offer simplicity and flexibility, allowing for uninterrupted support in the current environment are crucial to success. Logistics by itself cannot win wars, but the Schlieffen plan executed by Moltke in WWI, is an example of logistics being a contributing factor in Germany losing its speed and momentum which stalled at the Marne.

Notes

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2. Martin Van Creveld, Supplying War-Logistics from Wallenstein to Patton, (Cambridge: Cambridge University Press, 1997), 114.

3. Gerhard Ritter, The Schlieffen Plan, (New York: Prager, 1958) 37.

4. Trevor N. Dupuy, A Genius for War, The German Army and General Staff, 1807-1945, (Fairfax: Hero Books 1989),131

5. Ritter. 3

6. Dupuy, 135

7. Van Creveld. 118

8. Paul M. Kennedy, The War Plans of the Great Powers, 1880-1914, (London: George Allen & Unwin, 1979), 199.

9. Terrance Zuber, The Schlieffen Plan Reconsidered, War in History, (Arnold Press, 1999), 262.

10. Clausewitz, pg 607

11. Rothenberg (makers of modern strategy from Machiavelli to the nuclear age, pg 306

12. Richard L. DiNardo, Germany and the Axis Powers from Coalition to Collapse, (Lawrence: University Press of Kansas, 2005), 7

13. Kennedy, 200

14. Annika Mombauer, Helmuth von Moltke and the Origins of the First World War, (New York: Cambridge University Press 2001) 77.

15. Mombauer, 75

16. Mombauer, 76

17. Kennedy, 201

18. Dupay, 118: The Triple Alliance was the alliance between Germany, Italy and Austria-Hungary which provided guarantees to support Italy should that monarchy become involved in war against France, in return for Italian commitment to neutrality in the event of war between Austria-Hungary and Russia.

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21. LtCol. Philip Exner, Technology and Friction in the Schlieffen Plan,(National Defense University, National War College, 1996) 7.

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26. Dupay, 141

27. Holmes, 13

28. Dupay, 135

29. Holmes, 13

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33. William S. Lind, The theory and Practice of Maneuver Warfare, in Richard D. Hooker, Jr., Maneuver Warfare: An Anthology, (Novato:Presidio Press, 1993). 9

34. Walters, Pg 3

35. Exner, 3

36. Van Creveld. 114

37. Kennedy, 202

38. John A. Lynn, Feeding Wars, Logistics in Western Warfare from the Middle Ages to the Present, (Boulder: Westview Press,1993). 3.

39. Marine Corps Doctrine Publication 4, Logistics (February, 1997). 3.

40. Van Creveld, 1

41. Ritter. 51

42. Van Creveld, 115

43. Dupay, 141

44 Bucholz, 146

45. Lynn, 10

46 Bucholz, 210

47. Bucholz, 165

48. Bucholz, 149

49. Dupay 131

50. Van Creveld, 117

51. Van Creveld, 128

52. Bond, pg 92; Schlieffen had no respect for the British Expeditionary Force (which, he remarked sarcastically, could be "securely billeted" in Antwerp).

53. Richard Brooks, Atlass of World Military History, (Harper Collins, 2000), 156.

54. Van Creveld, 116

55. Van Creveld, 123

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57. Van Creveld, 125

58. Van Creveld, 126

59. Van Creveld, 125

60. Brooks, 157

61. Peter Paret, Makers of Modern Strategy, from Machiavelli to the Nuclear Age, (Princeton: University Press, 1986), 321.

62. Paret, 322

63. Walter Goerlitz, History of the German General Staff, (New York: Barnes & Noble Books, 1995), 139.

64. Kennedy, 212

65. Mombauer, 97

66. Kennedy, 213

67. Mombauer, 99

68. Van Creveld, 138

69. MCDP 4, 10

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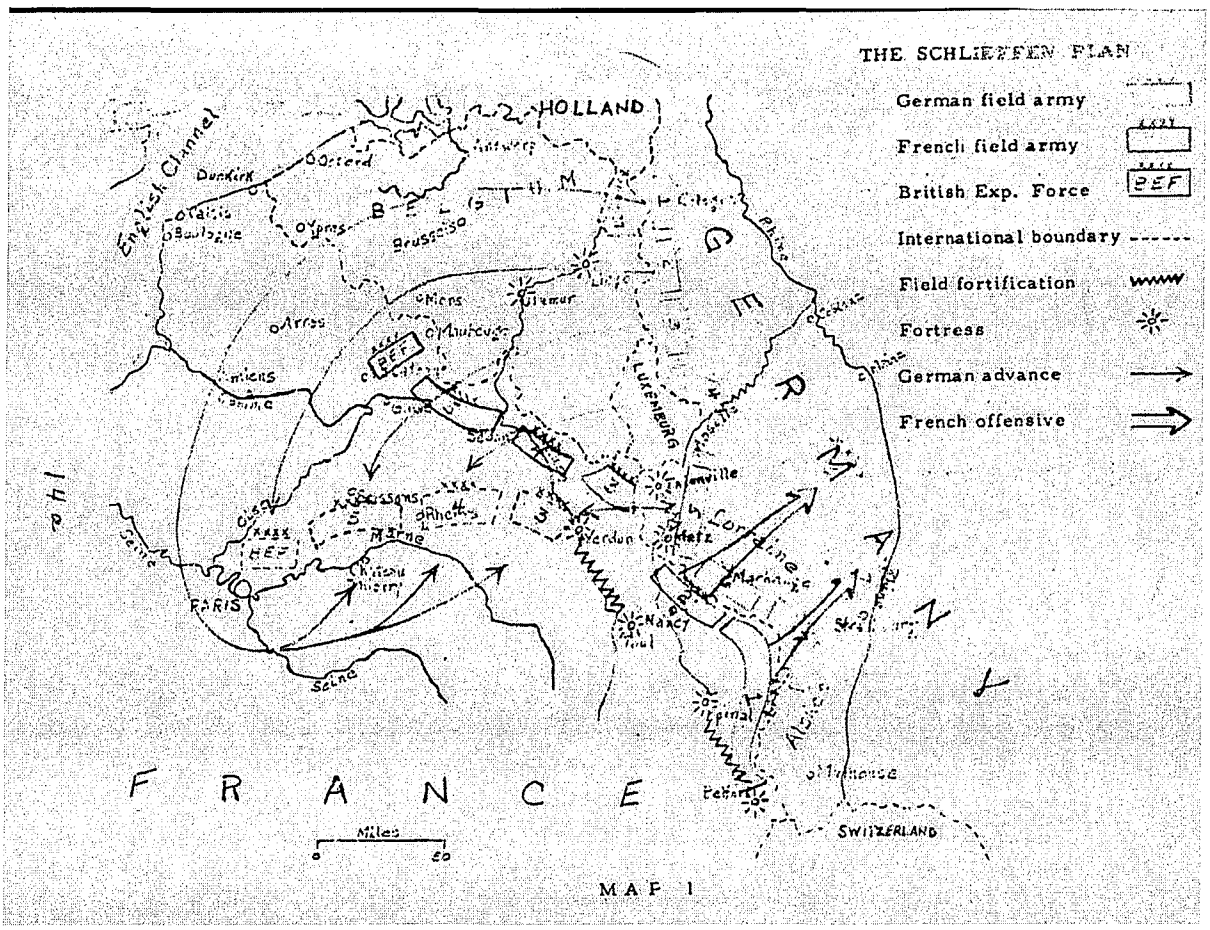
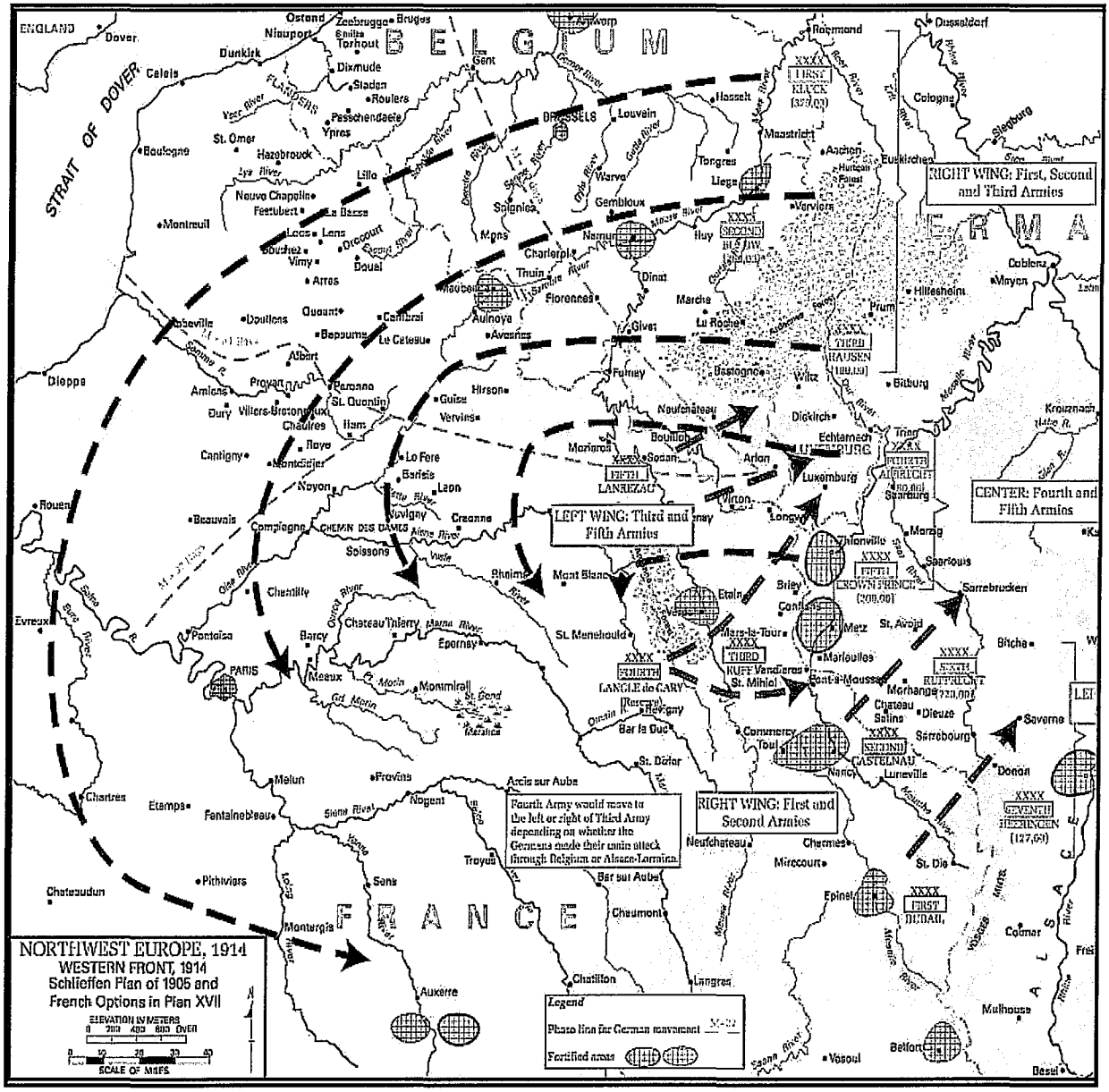
Appendix 1

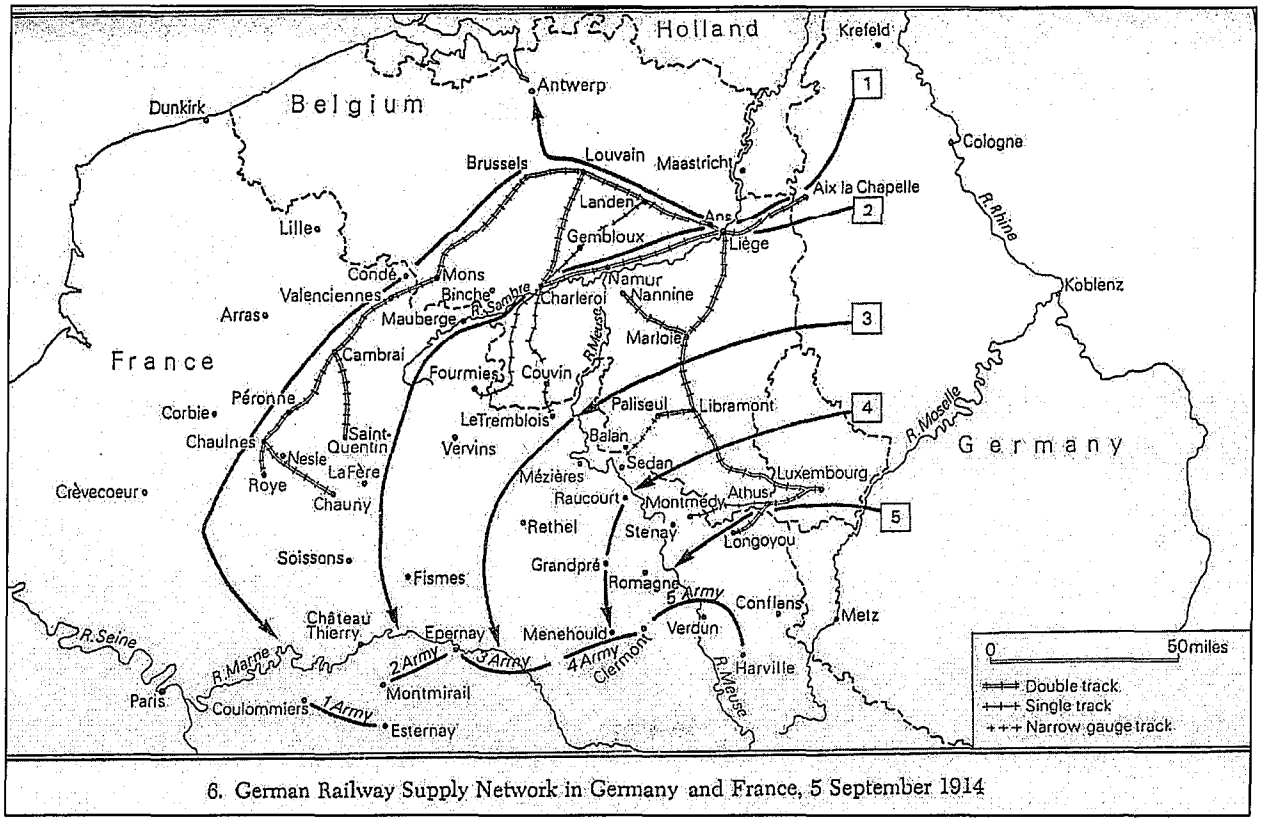


MAP 1

Appendix 2


NORTHWEST EUROPE, 1914
WESTERN FRONT, 1914
Schlieffen Plan of 1905 and
French Options in Plan XVII
ELEVATION IN METERS
SCALE OF MILES
Legend
Fourth Army would move to the left or right of Third Army depending on whether the Germans made their main attack through Belgium or Alsace-Lorraine.
LEFT WING: Third and Fifth Armies
RIGHT WING: First and Second Armies
RIGHT WING: First, Second and Third Armies
CENTER: Fourth and Fifth Armies
BELGIUM
FRANCE
GERMANY
ALSACE
STRAIT OF DOVER
ENGLAND

Appendix 3



6. German Railway Supply Network in Germany and France, 5 September 1914