INNOVATION AND EXPERTISE: SOME CHANGES IN GERMAN TACTICAL DOCTRINE DURING WORLD WAR I

A Thesis
Presented in Partial Fulfillment of the Requirements for the Degree Master of Arts

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1981

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ACKNOWLEDGEMENTS

I would like to thank my adviser, Prof. Williamson Murray, for his help throughout my work on this thesis, from the selection of a topic through the research and writing stage.

My thanks also go to Prof. Alan Beyerschen, for his careful reading of the text and many helpful criticism's of my arguments and writing style.

Finally I would like to thank Capt. Timothy Lupfer, who generously loaned me a copy of a manuscript he was preparing for publication: "The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War." I understand this paper will soon be published. In accordance with Capt. Lupfer's wishes, I have not used his paper directly, but it was most helpful in pointing me to relevant sources. More importantly, I was able to avoid duplicating Capt. Lupfer's work, as I had originally intended to write a straightforward account of the development of German infiltration tactics, which Capt. Lupfer covered thoroughly in his paper. The thesis which follows examines instead the role of experts in tactical change and innovation.
CHAPTER 1

THE GENERAL STAFF AND CHANGE IN TACTICAL DOCTRINE

INTRODUCTION

We will make the observation that changes in tactics will occur not after the introduction of new arms as is necessary, but also that the period of time between the two changes is relatively very long; this, undoubtedly is caused by the fact that the improvement of arms has its origin in the skill of one or two individuals, while for the change in tactics the inclination to stick to customs on the part of an entire class has to be overcome, which class endeavors to adhere to what exists now.  

Thus naval historian Alfred Thayer Mahan accounted for the notorious resistance of military organizations to tactical change. This thesis considers the exception which proves Mahan's rule. The exception occurred in the German army in World War I, when two German officers each introduced important tactical innovations almost single-handedly. Colonel (later Major-General) Fritz von Lossberg developed elastic defense tactics, while Colonel Georg Bruchmüller perfected the "hurricane" artillery bombardment which preceded the great German 1918 offensives. The German General Staff gave each enough de facto command
authority to override "the inclination to stick to established customs on the part of an entire class [i.e., the "officer class"]." Each man both developed and implemented his tactical ideas, saving a great deal of time. Lossberg and Bruchmüller perfected the elastic defense and the hurricane bombardment in less than two years--quickly enough to affect significantly the course of the war.

Tactics depend fundamentally on the technical characteristics of weapons. But many other factors come into play: terrain, communications, troop training and morale, leadership and battle psychology. The interaction of such factors can make tactical solutions quite complex. Even such primitive weapons as the smoothbore musket, smoothbore cannon and bayonet of the Napoleonic era required very sophisticated tactics for effective battlefield use.

An army's tactical doctrine represents an agreed solution to common tactical problems. If there is a best solution to a given tactical problem, then obviously the whole army should act on it. Tactical doctrine manifests itself in common procedures, equipment, organization and training. Orders, regulations, manuals, courses of instruction, and common experiences help determine tactical doctrine. In
any case, an army's tactical doctrine represents an enormous human investment, since every fighting soldier to some degree must understand and act upon it.

Formation of tactical doctrine takes place in a three step process, all three of which are difficult. Someone must solve the tactical problem. The high command must recognize this solution as correct and authoritative (often from among several competing tactical theories). Then the army command must see that the relevant parties implement the new tactical solution.

Thus tactical doctrine represents a complex organizational response to a given weapons technology. Weapons technology can change practically overnight. By its very nature, tactical doctrine cannot. There is something more involved than what Mahan called "the inclination to stick to customs," although that can certainly play a part.

The accelerated technological change of the 19th and 20th centuries showered armies with militarily important inventions. In 1883 Hiram Stevens Maxim produced the world's first practical machine gun. Thirty-one years later its concentrated firepower deadlocked the world's greatest armies for four years and shaped the destinies
of nations. The development of high explosives (chiefly by Swedish inventor Alfred Nobel) vastly increased artillery firepower and compounded the battlefield deadlock imposed by increased infantry firepower. Other inventions had a profound impact on the military environment: railroads, telegraph, radio, the magazine rifle, aircraft, and the internal combustion engine, to name but a few.

Civilian institutions can usually adjust to technological change by slow stages. Business adjusted to such innovations as railroads, interchangeable parts and the assembly line over the course of decades. Technological pressures operate continuously in civilian society. For instance, a business must compete with its rivals every day. A firm which exploits technology in a superior fashion forces its competitors to keep up, or go bankrupt.

But military organizations really only feel the effects of technological change during intermittent and relatively short periods of actual warfare with foreign nations. Garrison duty, civil disturbances, colonial wars, or frontier warfare rarely require the most advanced technology. In fact, very often an army must adopt technologically primitive methods to cope with these roles. Only
a foreign war with an army of like size and caliber tests an army's tactical adaptation to new weapons technology. It is extremely difficult to change military tactics during peacetime in ways that realistically account for new weapons developments. The effects of new weapons can be incalculable when they interact with existing weapons and complex battlefield conditions. The existence of other new and untested weapons tends to complicate the situation even further.

In an age of rapid technological change (such as the 19th and 20th centuries), an army which can adapt its tactical doctrine quickly has an enormous advantage over more inflexible opponents. Speed in itself becomes an important aspect of doctrinal change. Being prepared for the next war does little good. In 1939 the French army still had not digested the tactical lessons of World War I (although they were prepared to re-fight the battle of Verdun.)² The German army had solved the tactical problems of World War I by 1917, and after the war went on to apply the solutions to mechanized warfare. This state of affairs largely explains the calamitous defeat of France in 1940.

Wars are relatively short when compared to the amount
of time required for changes in tactical doctrine. Given enough time and combat experience, most armies can adjust tactical doctrine to battlefield reality. But time is in short supply during war, while fresh combat experience vanishes during peace. A war can be over before appropriate tactical changes are conceived, recognized and implemented. Wartime is the least convenient time to change tactical doctrine, because warfare puts so many other pressures on an army's organization. But incorrect doctrine can lose a war. An army which waits for peace may come out second best. Besides, technological changes will probably outpace peacetime doctrinal changes, and the next war presents the same pressure to adjust outmoded tactical doctrine.

THE SPECIAL ROLE OF THE GENERAL STAFF IN THE GERMAN ARMY

In the German army, the General Staff was the organization most directly concerned with wartime changes in tactical doctrine. In particular, General Staff officers recognized Lossberg and Bruchmüller as tactical innovators, and made sure they had the power to carry out their ideas. The functional role and organizational goals of the General Staff provide the necessary background for any study of Lossberg and Bruchmüller's tactical innovations.
Lossberg and Bruchmüller needed practical power to put their ideas into practice. The German command system gave them this power through staff positions. These staff positions constituted a mechanism that gave these two tactical innovators effective power in a flexible fashion. The chief element in that flexibility was mobility. Both Lossberg and Bruchmüller moved between various commands, wherever the high command thought they would do the most good.

Lossberg, himself a fairly senior General Staff officer, operated as a chief of staff to armies engaged in heavy defensive fighting. As such, he issued the orders which implemented the elastic defense, in cooperation with various army commanders. Bruchmüller served as artillery adviser to several commands, a staff position analogous to that of a chief of staff, though limited to the artillery sphere. He and his subordinates planned artillery bombardments for major offensives.

In the German army, the chief of staff of a large unit (always a General Staff officer) was almost as important as its commander in chief. Friedrich von Mellenthin, a World War II General Staff officer, described the
position of a chief of staff as follows:

[This translation uses British army terminology.]
Until 1938, in the old Imperial German Army as also in the Reichswehr, it was considered that an officer holding the appointment of a corps chief of staff or upward shared responsibility for steps taken by his GOC[General Officer Commanding]. If the chief of staff held an opinion fundamentally different from that of his superior officer, he had to submit his views in writing. However, if the GOC stood by his own decisions, then the chief of staff had to carry them out in complete loyalty.

The commander retained final authority: "He [the chief of staff] is and remains the assistant of his commanding officer, whom he helps by expressing his considered opinions and by relieving his GOC of all staff work." 4

Ideally, the relationship between a commander and his chief of staff constituted a useful division of labor:

With the multiplicity of tasks with which a general will be faced in any future war, and with the abundance of subjects to be mastered, any single man will unquestionably be overloaded. An intelligent commander will therefore always pay attention to his senior staff officer and will gladly share responsibility with him ..." 5

The special position of a chief of staff had its origin in the Prussian army reforms of the Napoleonic era. One of the leading reformers, August von Gneisenau, served as Chief of the General Staff. Historian Gordon Craig noted that:
[Gneisenau] insisted that staff officers must share the responsibility for operational decisions made by their commanding officers. This insistence, and Gneisenau's readiness to support his staff officers in disputes with the commanding generals, strengthened the position of the General Staff and gave it an esprit which it was not to lose until the days of Hitler.6

The teamwork of some commanders and their chiefs of staff became the stuff of legend in the German army: Blücher and Scharnhorst, Kleist and Grolman, Yorck and Rauch, Prince Frederick Charles and Moltke, Hindenburg and Ludendorff.7

The staff of all armies grew in size and importance during the First World War. Static warfare increased the importance of staff functions: planning, coordination, movement of supplies and reinforcements. Quick decisions by commanders were no longer at a premium, as in mobile warfare. The extraordinary prestige of the General Staff exaggerated this tendency in the German army.8

During World War I the German army often dismissed chiefs of staff for operational blunders, while leaving unit commanders in place.9 This is itself spoke volumes concerning the real distribution of power and responsibility between commanders and their chiefs of staff. It was as if to say the unit commanders did not really make the important decisions. Although one might consider such
selective dismissals an abuse of the system, they did point out the critical role played by a chief of staff. The post involved a great deal of power and responsibility. A chief of staff like Lossberg could have a real impact. The German army high command replaced four army chiefs of staff with Lossberg. In each instance the army commander remained in place, as seen below.

There was an institutional basis for the influence of chiefs of staff. The German army actually had something of a dual chain of command. Just as unit commanders reported to their immediate superiors, chiefs of staff reported to the chief of staff at the next highest level. Ultimately the Chief of the General Staff controlled all General Staff appointments, while the Chief of the Military Cabinet controlled appointments and postings for the rest of the army. The Chief of the Military Cabinet, the Chief of the General Staff, and the War Minister (who handled army administrative matters) were all direct advisors of the Prussian King (also German Emperor), and therefore equal in status.

Thus no officer who was not a member of the General Staff had any control over a General Staff officer's career. Unit commanders did not evaluate the performance
of their chiefs of staff. A corps chief of staff answered to the army chief of staff, not to the corps commander nor even to the army commander. This institutional arrangement made staff independence of thought and action a practical matter.

Staff officers sometimes used "staff channels" to discuss matters of operational significance:

Under this setup [staff channels], general staff officers of the German army could report direct to their immediate superior general staff officers on questions of command and personnel. They were thus in a position to pass on to their formation commanders information on those points as and when they deemed it necessary. 12

Of course the use of staff channels could and did lead to abuse. Staff officers would reach decisions among themselves, undercutting their unit commanders. 13 Even such violations of command principle testified to the power of the General Staff.

In World War I, the dual chain of command ran all the way up to Kaiser Wilhelm II. In theory, the Chief of the General Staff was simply the chief of staff to Wilhelm II, the commander in chief. So long as the Kaiser did not intervene in military affairs, the Chief of the General Staff commanded the army. Wilhelm did not choose to intervene in military operations:
The Kaiser was an amateur strategist, not a professional soldier like his grandfather; he had the wisdom and self-control, remarkable considering his temperament, to refrain from all intervention in the strategic direction of operations.14

General Erich von Falkenhayn, wartime Chief of the General Staff until July 1916, described in his postwar memoirs the position of the Chief of the General Staff.

In order to facilitate, or, rather, to render possible a regulated business procedure, the Emperor had conceded to the Chief of the General Staff the right to issue operative commands in his name. As result of this, and still more by historical development, the Chief of the General Staff had become the actual bearer of the authority of the Supreme Command, and in any case the only person who was responsible for its actions or omissions.15

Helmuth von Moltke (Chief of the General Staff 1857-1888) established the principle of wartime command of the Prussian (later Imperial German) army by the Chief of the General Staff, subordinate only to the monarch.16 In 1883 the Chief of the General Staff received the right of direct access to the Prussian King. Prior to 1883 the Chief of the General Staff was formally subordinate to the War Minister.17

The German constitution left coordination of the military and political aspects of German strategy in the hands of the Kaiser. With the complete abdication of
responsibility by Wilhelm II, the Chief of the General Staff naturally tended to formulate strategy on a purely military basis.\textsuperscript{18}

The wartime Imperial Chancellor until 1917, Theobald von Bethmann-Hollweg, was "acutely conscious of his incompetence in military matters" and could not be of much help.\textsuperscript{19} By way of contrast, Otto von Bismarck as Chancellor had always been willing to question the decisions of the General Staff, even on the most technical military matters.\textsuperscript{20} Only thus was he able to ensure the subordination of military means to his political ends.

Subordination of military goals to political ends did not mark Germany's conduct of World War I. The invasion of Belgium and unrestricted submarine warfare constituted prime examples. On November 11, 1917, General Erich Ludendorff (First Quartermaster General and chief subordinate to the Chief of the General Staff) met at the Belgian city of Mons with the Western Front army chiefs of staff. There they decided how to use the forces liberated by the collapse of Russia. They could stand on the defensive in a war that had thus far notably favored the defense, and sue for a compromise peace. Or they could attack and
gamble on total victory. They decided to attack. The German 1918 offensives failed, exhausting the last strength of the German army, and the war ended with revolution in Germany. The interesting thing about the Mons Conference was all the people who did not attend. Neither the Kaiser, the Crown Prince, the Western Front army commanders, nor Ludendorff's nominal superior and Chief of the General Staff Paul von Hindenburg participated in this pivotal strategic decision. The power of Ludendorff and the army chiefs of staff was far-reaching.

Despite its enormous power and influence, the German General Staff was a small and select body. At the outbreak of World War I there were only about 650 General Staff officers in the entire German army of 800,000 men. In such a small body of career officers it is likely each member knew personally or by reputation a significant fraction of the entire group. General Staff officers posted to new assignment often knew other staff officers at their new billets. For instance, in August 1914, Ludendorff was suddenly assigned Eighth Army Chief of Staff. Ludendorff and the Eighth Army operations officer, Lieutenant-Colonel Max Hoffman, had shared living quarters as
staff officers in pre-war Berlin. As a result Ludendorff already knew his chief subordinate on a personal basis.

Selection for the General Staff was a rigorous process. Training of a General Staff officer began at the Kriegsakademie, which admitted officers on the basis of competitive examinations. Prior to 1914, about 1,000 officers applied each year. However, only about 150 were admitted, of whom only a fraction completed the full three year course. The General Staff itself ran the Kriegsakademie after 1871, which allowed the instructors to select the most promising students for future service on the General Staff. Success or failure at the Kriegsakademie was only the first hurdle for a prospective General Staff officer:

This selective process was continued at the end of the three-year training period at the War College [Kriegsakademie], since only about half of the students were found fit to be accepted by the General Staff school. Of these again only half were transferred into the General Staff after two years of training. Consequently, of roughly 1,000 officers starting out in the contest at the end of five training years only some fifteen or twenty were left who had reached their goal. A former General Staff officer described the two foundations for the General Staff system as "painstaking selection and thorough, carefully-conducted training." Obviously the 15-20 men who became fully fledged General
Staff officers each year were a highly selected group. The red trouser stripe which marked a General Staff officer's uniform was not a common sight. The rigorous training of General Staff officers had a specific end goal: military excellence at the operational level. Right at the beginning of General Staff training, the Kriegsakademie emphasized operational proficiency:

Training in the War Academy lasted three years. Its purpose was to produce operational experts qualified, above all else, to occupy the post of chief of staff cum operations officer (Ia) in a division. Tactics and military history accordingly formed the principle subjects, followed at quite a distance by all the rest; staff work and army organization, intelligence, supply, transport, weapons—technology and interservice cooperation, all taught in such a way as to emphasize the over-riding importance of tactics.29

New General Staff officers worked with the Grosser Generalstab (or Great General Staff) for a few years to complete their education. The Grosser Generalstab was an "inner ring of selected staff officers working in Berlin ... directly under the Chief of the General Staff."30 It had both a functional and an educational role in the General Staff system. Like the Kriegsakademie, the Grosser Generalstab emphasized operational proficiency.

In time of peace the Chief of the General Staff did not command or inspect a single unit of the German army.
His sole duty was to plan for war and act as "chief and disciplinarian of the Grosser Generalstab"—about 120 officers in 1914. As head of the Grosser Generalstab, a chief of the General Staff could shape the outlook of a whole generation of General Staff officers. Count Alfred von Schlieffen in particular decisively shaped the character of the General Staff in his 15 years as Chief of the General Staff (1891-1906).

In peacetime the Grosser Generalstab drew up detailed mobilization plans and studied every aspect of military aspects, operations, and strategy. In a sense it acted as the German army's "think tank." Unlike most military think tanks, the members of the Grosser Generalstab implemented in war the plans conceived while at peace. Service as staff officers with various German army units followed service on the Grosser Generalstab. Such staff officers constituted the Truppengeneralstab, which included the bulk of the General Staff. Their presence on the staff of every unit of division level or higher assured dissemination of the Chief of the General Staff's ideas throughout the army.

Even within unit staffs, General Staff officers
constituted a select caste. They worked almost exclusively on operations, tactics, intelligence, order of battle, and training. An inferior class of Adjutantur officers handled such more mundane matters as pay, leave, decorations, supply, etc. For the most part Adjutantur officers had graduated from the Kriegsakademie but had not ranked high enough for appointments to the General Staff. The existence of these second class staff officers allowed the Truppengeneralstab to continue the emphasis on operational efficiency fostered by the Kriegsakademie and the Grosser Generalstab.

The process of selection on the basis of operational competence continued throughout a General Staff officer's career. His early training sought to make him a capable operations officer (Ia) for a division.

Then the process of selection again began to function. Not all General Staff officers were considered qualified to take over the functions of a Ia at corps headquarters, and only a small number of those who were so considered ... were judged qualified for duty as chief of staff of an army corps or as a section chief in the Greater General Staff. From these section chiefs there were appointed four or five chief quartermasters (Oberquartiermeister) of the ... Great General Staff who then stood between the Chief of the ... General Staff and his division chiefs. Thus the General Staff officer corps formed a pyramid resting on a broad base but tapering off rapidly toward the top.
The General Staff exerted a great influence on the army's entire command system. At least until 1943, training at the *Kriegsakademie* was almost a prerequisite for promotion to high command. Apart from royalty and members of the high nobility, every German commanding general in World War I (except General Alexander von Kluck) had served for longer or shorter time on the General Staff. Of course royalty sometimes held high commands. For instance, Crown Prince Wilhelm of Prussia and Crown Prince Rupprecht of Bavaria each commanded an army group on the Western Front during World War I. This system of command by royal princes was traditional. Royal princes might or might not be good commanders, but in any case their chiefs of staff had enough influence to prevent serious mistakes.

General Staff officers received accelerated promotion, especially as lieutenants and captains. Staff officers usually reached the grade of major about six years ahead of ordinary officers. Promotion in the army as a whole was by regiment up to the rank of major (which could hold up an officer's career if few vacancies appeared in his regiment). General Staff officers were exempt from this
rule, as they had no regiment. These policies meant that General Staff officers eventually tended to reach higher rank than ordinary officers, as a result of their head start.

An emphasis on the exercise of initiative by lower level commanders marked the German army. Helmuth von Moltke as Chief of the General Staff did his best to inculcate this attitude throughout the army. Moltke preferred even uninspired action to vacillation and inactivity. Despite popular misconceptions, the German army did not insist on rigid adherence to orders, if the orders were not in accordance with the situation. Nor was there a strict adherence to the chain of command. The dual chain of command and the peculiar role of the chiefs of staff certainly did not constitute a "rigid" chain of command. As one commentator on the General Staff wrote:

To make perfectly clear that action contrary to orders was not considered either as disobedience or lack of discipline, German commanders began to repeat one of Moltke's favorite stories, of an incident observed while visiting the headquarters of Prince Frederick Charles. A major, receiving a tongue-lashing from the Prince for a tactical blunder, offered the excuse that he had only been obeying orders, and reminded the Prince that a Prussian officer was taught that an order from a superior was tantamount to an order from the King. Frederick Charles promptly responded: "His Majesty
made you a major because he believed you would know when not to obey his orders." This simple story became guidance for all following generations of German officers.44

Both the General Staff's emphasis on operational competence and the army-wide tradition of initiative by lower level commanders formed important elements of the military environment in which Bruchmüller and Lossberg operated.

THE IMPORTANCE OF LOSSBERG AND BRUCHMÜLLER'S INNOVATIONS

During World War I the German army completely changed both its offensive and defensive tactical doctrine. Together offense and defense cover just about everything an army does on the battlefield. The German army adopted "infiltration" tactics for the offense and "elastic" defensive tactics. These innovations have been justly called "the principle progressive tactical achievements of the Great War of 1914-1918."45

Lossberg's elastic defense and Bruchmüller's hurricane bombardments were workable, sometimes brilliant solutions to complex tactical problems. That much has been widely recognized.46 But the rapid pace of their innovations was equally significant. Bruchmüller's development of the hurricane bombardment began at Lake Narotsch
in the spring of 1916. Its development was essentially complete by the time of the great German spring offensives in 1918. Lossberg perfected the elastic defense in four great battles between fall 1915 and fall 1917. Each tactical innovation took about two years time, fast enough to affect the course of the war. This rapid development was no accident. Bruchmüller and Lossberg short circuited the three stage process of innovation in tactical doctrine. They both conceived and executed their tactical ideas. Still, someone had to recognize the tactical value of their ideas. But to a large degree the German army high command recognized Bruchmüller and Lossberg as complete masters of their field of tactical expertise, able to evaluate on their own the worth of potential innovations. They, and not the high command, were the authoritative experts in their tactical fields. Once the German command system recognized Bruchmüller and Lossberg as authoritative experts, it gave them enough command authority to carry out their ideas. Then it did not need to recognize the worth of individual tactical innovations. Thus the process of recognition was automatic, once Lossberg and Bruchmüller had been recognized as authoritative experts and granted
sweeping authority.

It seems obvious that combining conception and implementation of tactical change in the hands of one individual would speed up the whole process. In the case of Lossberg and Bruchmüller it certainly did. This was particularly striking with Lossberg, who conceived, recognized, and implemented his tactical ideas during the course of actual battles, sometimes in the course of a single day. These tactical innovations then substantially aided the German defenders in that same battle.

Lossberg's contribution to the development of German defensive doctrine is evident. Lossberg personally conducted four of the great German defensive battles on the Western Front: Champagne in 1915, the Somme, Arras, and Passchaendaele. Each battle saw the introduction of tactical innovations. At least until 1939, German defensive manuals copied verbatim Lossberg's nomenclature for defensive zones.

In a less obvious way, Lossberg contributed to the development of new German offensive tactics. His defensive organization was built around the systematic use of counterattacks to regain lost ground. "Storm troops" trained in infiltration tactics made ideal counterattack troops, and
Lossberg used them as such. His defensive system relied on both immediate and deliberate counterattacks. The deliberate counterattacks, launched by Sturmmänner after careful planning and artillery preparation, were dress rehearsals for the 1918 German offensives. Those offensives have been aptly described as a Lossberg defensive organization in forward motion. The 1918 German manual on offensive operations stated that there was no difference between deliberate counter-attacks and full scale offensives.

The importance of artillery in World War I made Bruchmüller's changes in artillery doctrine especially significant. To a large extent, the First World War was an artillery war. Artillery and not machine guns caused the most casualties:

Here we come on another fallacy: that the machine gun was the biggest killer. The means by which one died were not recorded, but the means by which they were wounded were, by the British medical services. The shell accounted for over 50 per cent of the wounds. Now the bullet came from the rifle as well as from the machine gun, and especially in the early stages of the war when there were only two machine guns per battalion, vast losses were caused by rifle fire. Again, common sense tells us that men hit by a shell or a fragment of shell are more often killed than those hit by a bullet. Therefore the proportion of killed to wounded must be considerably higher from artillery
than from machine guns and rifles combined. Artillery was the biggest killer, but at the start of a great offensive, when a high proportion of the defending artillery had generally been knocked out, the machine gun, being harder to knock out, was the best defensive weapon. 53

The 1918 German offensive tactics relied on a combination of Bruchmüller's artillery tactics and the new infiltration tactics. The two innovations complemented each other. Bruchmüller's hurricane bombardments attempted to disrupt rather than destroy the enemy defenses (which was impossible anyway), enabling the Sturmtruppen to fight their way through the enemy defenses. 54 Thus both Lassberg and Bruchmüller played an important part in the development of new tactics for the German 1918 offensives.

During its 1918 offensives, the German army solved the tactical problems created by modern weaponry. It achieved the first operational breakthrough on the Western Front since 1914. In many ways, the 1918 offensives provided the basis in tactical doctrine for the great German armored breakthroughs of World War II. Lassberg and Bruchmüller's tactics played an important role in the future tactical doctrine of the German army, in both the offensive and defensive spheres.
Endnotes


4 Ibid.

5 Ibid., p. 276.


9 Ibid., p. 145.

10 Ibid. Rosinski cited this practice as an abuse of the German command system.


12 Mellenthin, p. 276.
Endnotes cont.

13 Rosinski, p. 145. Interestingly enough, Adolph Hitler tried to abolish these staff channels. They violated the Führerprinzip, the National Socialist principle of undivided power in the hands of a responsible leader at each organizational level of the party and the state.

14 Ibid., p. 141.


16 Craig, p. 193.

17 Ibid., p. 229-230.

18 Rosinski, p. 141.

19 Ibid., p. 142.

20 Craig, p. 201.


23 Parkinson, p. 48.


25 Ibid.

27Waldemar Erfuht, Training and Development of German General Staff Officers, German General Staff Project, vol. 5 (Headquarter, United States Army, Europe: Historical Division, 1954), (Typewritten.), p. 34. Erfuht served as a General Staff officer in the Imperial German Army. He knew personally all the Chiefs of the General Staff from the Younger Moltke to Guderian. This document is also known as MS # P-031b.

28Ibid., p. 28.

29Van Cleved, p. 172.

30British General Staff, German Army Handbook, p. 39.

31Schmidt-Richberg, p. 71.

32Ibid., p. 72.

33Ibid., p. 71.

34British General Staff, German Army Handbook, p. 40.


36Van Cleved emphasized the primacy of operations within German headquarters Staff, p. 55.

37Erfuht, p. 36.

38Van Cleved, p. 55.

39Ehrfuht, p. 47.


41British General Staff, German Army Handbook, p. 22.

42Ibid., p. 21.
43 Dupuy, p. 116.
44 Ibid., p. 21.
45 Wynne, p. 96.
47 See the two subsequent chapters on Lossberg and Bruchmüller.
48 As at the Battle of Arras. See pp. 64-70.
49 Wynne, p. 291-292.
50 Ibid., p. 148.
51 Ibid., p. 328.
52 Chief of the General Staff of the Field Army (German army), *Manual of Position Warfare for all Arms*, Part 14: "The Attack in Position Warfare," Translated by the Intelligence Section of the American General Staff (Berlin: Issued originally by the Chief of Staff of the Field Army, 1918), p. 1.
53 Falls, p. 12.
54 For a more complete discussion of this issue, see chapter on Bruchmüller, below.
CHAPTER 2

THE DEFENSIVE EXPERT: FRITZ VON LOSSBERG

Just as Georg Bruchmüller was the acknowledged artillery expert of the German army, the master planner of artillery bombardments, Fritz von Lossberg was its expert on the conduct of defensive battles. His specialty was the restoration of a front nearly broken by an enemy assault. He became army chief of staff of the Third, Second, First, Sixth, and Fourth armies in succession, and as such directed their defensive battles. As there were ordinarily about half a dozen German armies in the West at any given time, a single army represented a significant fraction of Germany's Western Front fighting strength. In addition, the German High command always assigned Lossberg to armies already engaged in heavy fighting. In this way Lossberg came to conduct personally most of the great defensive battles the German army fought in the West after the fall of 1915: the fall Champagne battles in 1915, the Battle of the Somme, the Battle of Arras in early 1917, and the Battle of Passchaendaele in
the latter half of 1917.

Lossberg began the war as a career General Staff officer with the rank of lieutenant-colonel. He served as Chief of Staff of the XIII Army Corps from the outbreak of the war until January 26, 1915. His corps first saw action in the Verdun area, as part of the left wing of the Schlieffen Plan. Later it fought in the first battles around the area of Ypres. Then the XIII Corps moved to the Eastern Front, its location when Lossberg left it for other duties.

Lossberg valued his experiences with XIII Corps, as they gave him his first combat experience. However, there is no indication that he was responsible for any noteworthy tactical innovations during this period, so his experiences need not detain us.

In January 1915, Lossberg was appointed deputy chief of the Operations Section of the Oberste Heeresleitung (OHL), the Army High Command. At that time the OHL had its headquarters in the French town of Mézières, and Lossberg would remain there until September 1915. The Chief of the Operations Section and Lossberg's immediate superior was Colonel Gerhard von Tappen. As Chief of the Operations Section in wartime, Tappen was the most important assistant to the Chief of the General Staff,
General Erich von Falkenhayn. When Falkenhayn moved the OHL to the German town of Pless in order to be nearer the Eastern Front, Lossberg and a small group of staff officers remained behind at Mezières to act as a liaison office for the Western Front. There they worked out staff proposals for future operations and handled routine staff work. The power to actually move units remained with the main headquarters in Pless.³

One of Lossberg's chief duties was to transmit the reports of the Western Front units to Pless, if sufficiently important directly to Falkenhayn.⁴ Many of these reports emphasized the tactical advantages of reverse slope defenses, based on Western Front combat experience. Lossberg's exposure to these reports may have played an important role in the development of his tactical thought.⁵ Certainly he made extensive use of reverse slope defenses in the coming years.

There were about a dozen staff officers in Lossberg's section,⁶ and as one might expect they usually ate dinner together. As their General Staff training emphasized operational expertise, they all had informed opinions on the military questions of the day. In particular, many of these officers criticized the current defensive doctrine
of the German army. Falkenhayn favored the rigid defense of the front lines, holding every position in strength and to the last man. He enforced this policy by ruthlessly sacking officers who lost sections of the front line. Some of the younger officers at Mézières favored a more elastic and flexible defense, in particular Major (later colonel) Max Bauer, Major Bussche, Captain Geyer and Captain Harbou. An elastic defense would hold the front lines with a minimal number of troops, and allow them to retire during a major attack. Reserves kept beyond the range of effective artillery bombardment would then counter-attack and retake the front line positions. Falkenhayn's program of rigid defense had proved satisfactory thus far in the war. The younger officers who criticized it worried about the increased British and French artillery production. Since a rigid defense involved packing troops into the front lines, heavier and longer artillery bombardments were bound to increase German casualties.

For his part, Lossberg remained a believer in the rigid defense of a line, believing it the only practical defensive tactic under combat conditions. An elastic defense requires a higher level of training, discipline, and morale than a static defense. The foremost troops must
make an orderly withdrawal under fire. Reserve troops must then counterattack at the precise moment when the attacking troops are most disordered from their advance. With the exception of Lossberg himself and a captain who had won the Pour le Merite, all the staff officers at Mezières lacked combat experience. Lossberg was sure his junior officers overestimated the capabilities of field troops and underestimated combat difficulties:

... I often came upon over-confident opinions concerning the conduct and capabilities of troops, especially from the younger officers, which my front-line experiences strongly contradicted. From the beginning I openly and very strongly contradicted such ideas and thereby did much good.10

Lossberg considered combat experience an essential component of an officer's development. Since his younger staff officers lacked such experience, he often sent them to the fighting front of the XVI Corps in the Argonne Forest. This action was indeed quite out of the ordinary, as the Operations Section in Mezières did not have any staff duties which required such front-line exposure. As soon as Tappen heard of these expeditions he forbade them, much to Lossberg's disgust.11

In his position at Mezières Lossberg also gained the
confidence of Falkenhayn, which was certainly a factor in his subsequent career. Lossberg already knew Falkenhayn from his peacetime service. When Falkenhayn was in China from 1900 to 1903, Lossberg's family and Falkenhayn's family lived in the same house in Karlsruhe. While Lossberg was an instructor at the Kriegsakademie (1907-08), Falkenhayn refereed a war game for one of Lossberg's classes. During the 1908 maneuvers in Lorraine, both men served on the staff of the XVI Army Corps, Falkenhayn as Chief of Staff and Lossberg as the intelligence officer. Although Lossberg criticized many of Falkenhayn's decisions as Chief of the General Staff, he also described him as a "very industrious, skillful worker with an exceptionally quick intellectual grasp."\textsuperscript{12}

Lossberg also knew Tappen from pre-war days, when Tappen was also an instructor at the Kriegsakademie. When Tappen left the Kriegsakademie to become operations officer of the XVII Army Corps, Lossberg took over Tappen's former subjects of tactics and military history. When Tappen went on to head the 2. Abteilung of the Grosser Generalstab (which in wartime became the Operations Section), Lossberg became Tappen's successor as operations officer of the XVII Army Corps.\textsuperscript{13}
Tappen and Lossberg did not get along. On May 5, 1915, the entire Operations Staff of the OHL Pless headquarters was out of telephone contact on a train to Berlin. On his own authority Lossberg issued some orders directly to Western Front armies, in order to relieve an emergency situation. This step technically overstepped the bounds of Lossberg's authority and infuriated Tappen. In retaliation Tappen ordered Lossberg not to question directly any Western Front army headquarters, which would have made Lossberg's staff work nearly impossible. Falkenhayn overruled Tappen's order as soon as he learned of it. Lossberg was never a great stickler for the procedures and formalities of command, so long as the job was done well. He commented on the situation as follows:

Colonel Tappen and I were of completely different natures. For me purely and simply practical action was important and on this basis I have myself had very good understanding with my superiors and subordinates all my life.¹⁵

Falkenhayn knew of the misunderstanding and suspicion between Lossberg and Tappen. When Lossberg became Chief of Staff of the Third Army Falkenhayn asked: "You are no doubt glad to leave von Tappen?"¹⁶ Indeed, Lossberg
soon received as much independent authority as he could have wished.

Lossberg's position at Mézières made him intimately familiar with the tactical situation of every army on the Western Front. On September 12, 1915, both the Sixth and the Third armies reported increased enemy activity on their fronts. Particularly worrisome was a systematic registration of enemy artillery, which usually heralded a heavy bombardment. On several occasions in September the commander of the Third Army, General von Einem, discussed the anticipated offensive with Lossberg. On September 22, 1915, the French began a prolonged artillery barrage on the Third Army front. The Germans referred to such barrages, so characteristic of most Allied offensives, as Trommelfeur (or "drumfire"). Massed artillery would fire for days without let-up. While these barrages were enormously destructive, they completely sacrificed the element of surprise. The German high command simply shifted its reserves to meet the new attack. For instance, after the Trommelfeur began in Champagne, Lossberg persuaded Falkenhayn to shift the Third Army over to the control of the Army Group of the German Crown Prince, as that army group had more reserves available to it than Third Army's
old controlling headquarters.19

THE CHAMPAGNE BATTLES

The French infantry attack on the Third Army began on September 25, 1915. The Chief of Staff of the Third Army, Lieutenant-General von Höhn, reported serious enemy gains and requested permission for a voluntary withdrawal to positions in the rear. That same day Lossberg and Falkenhayn both rode in the same car to a meeting with Kaiser Wilhelm II. On the way Lossberg objected to the idea of a voluntary withdrawal. At the meeting with the Kaiser, Lossberg explained the serious situation of the Third Army but again protested against the notion of voluntary withdrawal. According to Lossberg, his report "made a visibly strong impression on the Kaiser."20

Falkenhayn then asked Lossberg to leave the room. After a short time Falkenhayn came out and addressed Lossberg: "So, my dear Lossberg, now we will be separated. His Majesty has appointed you Chief of Staff of the Third Army." Lossberg reported that "this completely surprising communication" deeply pleased him. For months it had been his "secret wish" to return to the front: "The office work at the OHL had in no way agreed with my thirst for action."21
Lossberg took his appointment as a "special honor." All the other army chiefs of staff at that time were at least major-generals, while he was a colonel of two months seniority. The prospect of a return to "fresh air and soldiers" also pleased Lossberg.²²

It may be that Lossberg was not lobbying for the job of Third Army Chief of Staff when he denounced all plans for voluntary withdrawal. But he could have hardly done a better job if he tried: Falkenhayn disliked withdrawals of any sort. This was widely known, most certainly to Lossberg. Lossberg's determination to hold the front line was certainly sincere, as the Champagne battles and the Battle of the Somme proved. It must have also been apparent that Lossberg was miscast in his role at Mézières. In any case, Lossberg certainly owed his appointment to Falkenhayn's personal influence. No matter how deeply moved he was, the Kaiser would not make such a major appointment except at Falkenhayn's request.

Lossberg later learned that Falkenhayn lost all confidence in Hohn when the latter proposed a voluntary withdrawal. However, Falkenhayn softened the blow to Hohn by explaining that the Chief of Staff of the Army Group of the Crown Prince was a younger man, with whom
Hohn might find it difficult to work. Falkenhayn then had the Kaiser appoint Hohn (a Bavarian) commander of the Second Guards Division, a Prussian unit with very high social prestige. Lossberg commented that this was "certainly a great honor for a Bavarian general." Thus Falkenhayn used the somewhat archaic Guard units to promote flexibility in General Staff appointments. Hohn's outright dismissal might prove awkward. All that mattered was to reduce his operational influence, which Falkenhayn certainly did. There was no comparison between the influence wielded by an army chief of staff and a division commander, no matter what the social prestige of the unit involved.

Lossberg lost no time reaching his new billet. He learned of his new office about noon. By three o'clock that afternoon he had taken leave of Mezières and driven to Third Army Headquarters, at the French town of Vouziers. On the drive to Vouziers he formulated his plans for the coming campaign:

My determination was unshakeable, to hold firmly to the new positions created by the incursion [the French attack] and to fight for every scrap of ground. A voluntary withdrawal completely contradicted my views and also my battle experience.
As Lossberg entered Third Army headquarters, the telephone rang. The commander of the VIII Reserve Corps wanted to know whether his corps should begin that night the withdrawal planned by Höhn. On his own authority Lossberg canceled the withdrawal, promising to confirm the decision with the Third Army commander as soon as possible. Lossberg was only a colonel, and the corps commander was a lieutenant-general. Yet such was the power of his position as Chief of Staff of the Third Army that the corps commander accepted the last minute change.  

The operations officer of the Third Army, Major von dem Hagen, now greeted Lossberg. As it so happened, Lossberg knew him from his days as a lieutenant in Berlin. Since Lossberg's predecessor had already left Third Army headquarters, Hagen briefed Lossberg on the Third Army's situation. It was not encouraging: eighteen French divisions opposed five German divisions; the French held a three to one superiority in artillery.  

Lossberg then walked into the next room and talked with the commander of the Third Army, General der Kavallerie von Einem. Einem immediately approved Lossberg's cancellation of the order to withdraw the VIII Corps. As Lossberg later learned from Einem, his predecessor Höhn had proposed the
withdrawal of the VIII Corps 3-4 kilometers without even the knowledge of Einem.27 Lossberg then asked for and got full power (Vollmacht) to visit the front immediately and change troop dispositions without Einem's prior approval.28

Several officers on the headquarters staff were senior to Lossberg, including two major-generals and a senior colonel. That evening Lossberg asked these senior officers whether they could work under a chief of staff who was their junior. All said they could and cooperated with Lossberg throughout the course of the battle.29 Of course it was probably clear to them that if a conflict arose, they and not Lossberg would have to leave.

Shortly after 4:00 PM, September 25, Lossberg reached the front lines.30 Between that time and dusk, he toured the battlefield, observing the terrain and talking to divisional and corps commanders on the spot. The French had carried the original German front line, which lay on the forward crest of a ridge. The Germans still had a tenuous hold on their second trench line, which lay some distance below the crest of the ridge. Lossberg decided to base the defense on this reverse slope, as the French artillery could not accurately bombard this line. The crestline hid it from the
view of the French ground observers, and aerial observation was only a poor substitute. By contrast, the German artillery could accurately bombard the French infantry attacks, as its artillery observers had an unimpeded view from their side of the reverse slope. Thus French infantry attacks coming over the crestline would encounter both short range infantry fire and observed artillery fire. If the French managed to take a section of the German front line, the garrison of the next German trench line would immediately counterattack, again with the assistance of their own observed artillery fire. The practical effect of Lossberg's reverse slope defense scheme was that the French infantry alone would have to fight both the German infantry and the German artillery working together. Without ground observers, the French artillery could fire nothing except relatively inaccurate pre-attack bombardments, for fear of hitting their own troops.31 Lossberg had applied the principle of combined arms to the specific situation facing him. In the First World War this meant cooperation of the infantry and artillery, since cavalry was obsolete. Lossberg ensured such cooperation for his own troops, while denying it to the enemy.

Such were the advantages of the position which Höhn
had wanted to abandon at the beginning of the battle. Although Lossberg planned to hold the front line trench at any costs, he did not want to pack it with troops and cause unnecessary losses. Instead he relied on counter-attacks to keep the front line intact. 32 By the evening of the first day, Lossberg was so sure of the course of the coming battle that he ordered huts built in the woods behind the rear positions to house the troops during the coming winter. 33 The course of events justified his optimism. Heavy French attacks continued into the winter, but the combination of reverse slope defense and counter-attacks assisted by observed artillery fire threw back every assault. 34

Lossberg always bore in mind that the commander-in-chief of the Third Army bore the ultimate responsibility for every order. So for all important orders he consulted with Einem, who almost always supported his recommendations. Important orders always carried the signature of the commander-in-chief. 35 A chief of staff could exert a great influence if he succeeded in two areas. First, he had to know what to do in a difficult situation by virtue of expert knowledge and ability. Those who know what to do when no one else does generally exert an influence beyond
their formal rank (provided those in authority will listen to advice). Second, the chief of staff had to retain the confidence of his superiors.

Lossberg's predecessor Hohn failed on both counts. He failed to recognize the tactical advantages of the reverse slope position, and could offer no more inspired solution to the Third Army's tactical problem than retreat. Second, Hohn lost the confidence of both Einem and Falkenhayn. He disregarded Falkenhayn's dislike of voluntary retreats and failed to consult with Einem. In this instance Falkenhayn's position on retreats proved tactically correct. Retreat would have meant abandoning an advantageous tactical position. But Falkenhayn did not find the tactical solution. He appointed Lossberg as Third Army Chief of Staff, who did.

Lossberg regulated the internal workings of his own staff according to certain principles. All his staff officers had immediate personal access to him, which he felt made "rapid and unerring" actions possible. At the same time he regulated the consistency of orders "with a strong hand." Lossberg believed that "in periods of heavy battle above all systematic action and detailed work are necessary." He himself ordinarily got very little sleep.
THE BATTLE OF THE SOMME

As the battles in Champagne died down in the winter of 1915/1916, increased enemy activity became evident on the Somme front. As early as February 1916, the German Second Army in that sector noticed construction of numerous barracks opposite their front. The number of British divisions facing the Second Army steadily increased. Finally, on June 24, 1916, the Trommelfeuer began on the Somme front, providing definite warning of the great infantry attack finally launched on July 1. The surviving defenders inflicted about 60,000 casualties on the British.

Nevertheless on July 2 the Chief of Staff of the Second Army, Major-General Grünert, recommended a voluntary withdrawal of his army. Falkenhayn visited Second Army headquarters that day. Even though the Second Army was under heavy pressure, he did not agree with the idea of withdrawal. That evening about 11:30 Lossberg received a call from the personnel office of the General Staff. Falkenhayn had appointed him the new Chief of Staff of the Second Army. As Lossberg later learned, Grünert lost his job for proposing a withdrawal.

On his way to the Somme front Lossberg stopped off in
Mézières to see Falkenhayn, arriving at 1:00 AM July 3. Falkenhayn expressed the hope that Lossberg would "master the difficult battle on the Somme." Lossberg pointed out that this was not possible without sufficient reserves. He urged Falkenhayn to break off the attacks on Verdun, thereby freeing the needed reserves. According to Lossberg, Falkenhayn said he would, but did not keep his "promise" (Zusage).\(^{41}\) There is no mention of the incident in Falkenhayn's memoirs.\(^{42}\) The German official history supports Lossberg's version of events, but its source is a letter from Lossberg dated July 21, 1934.\(^ {43}\) If the story is true, it says something about the relationship between superiors and inferiors on the General Staff. Considering that Falkenhayn was the de facto commander in chief of the German army (under the Kaiser), Lossberg's request might be considered near insubordination, or at least impertinence. Yet there is no indication that either Falkenhayn or Lossberg considered it as such. At least at this level of command, Falkenhayn listened to advice from subordinates, even if he did not act on it.

Lossberg arrived at Second Army headquarters by 5:00 AM, July 3, barely six and a half hours after learning of his new appointment. As his predecessor Grünert had already
left, the operations officer briefed Lossberg. By 6:00 AM Lossberg reported to the commander of the Second Army, General Fritz von Below, who Lossberg already "knew and respected." Below gave Lossberg full power (Vollmacht) to regulate unit dispositions, particularly the reinforcements, which arrived slowly thanks to the Verdun battle. 44

Lossberg quickly left to visit the front lines. He immediately grasped the great tactical value of certain hills for artillery observation. 45 In this respect his conduct of the battle resembled that of the previous Champagne battles. Some of the troop commanders he visited already knew Lossberg from when their units served in the Champagne battles. Apparently Lossberg already had a reputation in the German army:

I [Lossberg] had the impression [while touring the battlefield on July 3] that the troop leaders welcomed my appointment as Chief of Staff of the Third Army. They seemed to have firm confidence in my energy, with which I had already mastered the difficult position in the fall Champagne battles. 46

Late in the evening of July 3, Lossberg reviewed his field observations and conclusions with Below. Both agreed that the front line must be held to the last man. If sections were lost anyway, either immediate counterattacks
(Gegenstoss) or (as circumstances warranted) "methodically planned" counterattacks (Gegenangriff) would retake them. Below issued that night orders forbidding voluntary abandonment of ground. Lossberg and Below also discussed plans for a Gegenangriff to recapture ground lost on July first and second. This attack would take place as soon as a sufficient quantity of assault divisions, artillery, and ammunition became available. The prerequisites for the attack did not ever actually materialize during the Battle of the Somme, chiefly due to the continued fighting around Verdun.

Lossberg reorganized his staff during a lull in the fighting on July fourth and fifth. All department chiefs received immediate personal access to Lossberg. All reports from the front were to go directly to Lossberg, so that the appropriate instructions could go out immediately. Lossberg also had a special telephone system installed at headquarters. It was a sort of "party line" which enabled several staff officers to participate in telephone conversations with field commanders. That way both field and staff officers shared a common understanding of orders.

Lossberg found only two other General Staff officers on the staff of Second Army. He regarded this as a serious
deficiency, and immediately petitioned OHL for more. He received three new General Staff officers, including a new quartermaster, Colonel von Redern. Lossberg knew Redern from common service on the OHL staff and regarded him as an especially able officer.

Below and Lossberg worked exceptionally well together. Below was a very senior officer, who in his long years of service had become intimately familiar with every aspect of the General Staff system. Lossberg praised his "great understanding for the work of the General Staff" and described their cooperation as "frictionless" (reibungslos).

Below actually accompanied Lossberg on his journeys to the front line area. After July 5 he and Lossberg visited the front every day except for days of heavy fighting. Then it was best to stay at headquarters and process phone messages. Below and Lossberg usually left about 7:30 AM, by which time Lossberg had already been up for several hours and prepared the morning report to the OHL. The commander and his chief of staff usually drove first to the area of the previous day's heaviest fighting. There they talked to unit commanders. These discussions formed the basis for the day's Second Army orders (usually dealing
with the flow of reserves). Lossberg dictated the required orders on the spot, and relayed them to army headquarters by telephone. According to Lossberg, "The leaders on the battlefield gained through this type of quick action complete trust in the Second Army High Command." 52

In this way Lossberg reversed the usual procedure: he issued orders from the front to the rear, rather than from the rear to the front. No wonder the front line troops came to trust the Second Army command. British and French troops were lucky if they saw a general or high level staff officer anywhere near the front: Below and Lossberg visited it every day.

On July 19 the OHL divided the Second Army into two armies, the First Army and the Second Army. Lossberg and Below commanded that fraction of the old Second Army which became the new First Army. The change was administrative in nature. Second Army had simply grown too large, as additional troops poured in during the battle. The heaviest fighting remained on the First Army front. 53 The chief of staff of the new Second Army was a Colonel von Bronsart, whom Lossberg knew from a time when both had served with the X Army Corps. Each had been a divisional chief of staff for one of the two divisions which constituted
the corps. Once again Lossberg knew one of his colleagues from previous General Staff service.

The staff of the old Second Army split on July 19, some officers going over to the new Second Army staff. This left some gaps in the new First Army's staff. Captain Erich von Manstein filled one such gap. Manstein achieved high rank in the Second World War, and gained fame as a master strategist and tactician. Writing in 1958, Manstein referred to his old chief Lossberg as "the famous 'defensive lion'" (der berühmte "Abwehr Löwe").

On August 28, 1916, Lossberg learned that General Paul von Hindenburg had replaced Falkenhayn as Chief of the General Staff, with General Erich Ludendorff as his chief assistant. On August 31, Lossberg wrote Falkenhayn a long letter. He recalled that Falkenhayn had appointed him Chief of Staff to the Third, Second and First armies, and thanked Falkenhayn for the confidence thereby shown in his ability. Also on August 31, Second Army learned that the new OHL leadership had broken off the attacks at Verdun. This considerably increased the flow of reserves to the Somme Front.

The new OHL leadership (like Falkenhayn before it) soon recognized Lossberg's tactical abilities. At a meeting on
September 8, 1916, Lossberg reported on the situation of the First Army. Ludendorff expressed his complete support for Lossberg's conduct of the battle, and more importantly also provided more tangible support. Besides breaking off the attacks on Verdun and increasing the flow of relief divisions, Ludendorff shifted artillery to the First Army front. The artillery transferred was sufficient to halve the defensive barrage frontage of each battery, thus effectively doubling the intensity of fire.

Lossberg talked to Ludendorff by telephone almost every day. These conversations built up an atmosphere of trust between the two men which increased with time and lasted to the end of the war. The respect was mutual. In his postwar memoirs, Ludendorff praised Lossberg: "This outstanding officer and battle organiser often assisted the Fatherland and the army. His confidence in me [ie., Ludendorff] was a special satisfaction to me." It is noteworthy that Ludendorff considered Lossberg's esteem something of value, despite the relative disparity of their official positions.

Throughout the Somme battle, Below and Lossberg visited the front almost daily. While they were gone
Lossberg left the routine headquarters work in the hands of his operations officer. In addition to these visits, Lossberg insisted that one of his staff officers visit each divisional sector at least twice a week. These visits kept army headquarters constantly aware of each unit's requirements for equipment and supplies.

LOSSBERG AND THE CHAIN OF COMMAND

Lossberg's management of the Battle of the Somme did not consist solely of expert infantry-artillery coordination and handling of reserves. In the midst of the battle he introduced an innovation which eventually became official army policy. He found that it took 8-10 hours for messages to travel between division headquarters and the front line, and just as long to get back again. The "front line" was often just a group of shell holes. There were no regular communication trenches, and the whole area was under constant artillery fire. Consequently Lossberg gave battalion commanders full control over their own sector of the front, so that they hardly needed to consult division headquarters at all. As one author put it:

They [front-line battalion commanders] were given as full a control over their sector of the battle-area as has a captain over his ship, and their decisions were
to be accepted, by superiors and superordinates alike, as final and unquestioned while the battle lasted.

The front-line battalion commander also controlled any reinforcements committed to his sector, regardless of the relieving commander's rank or seniority. This procedure ensured continuity of battlefield control. It also exploited the original battalion commander's intimate knowledge of his sector and the current military situation. The regimental commander now did no more than keep reinforcements close at hand and move supplies.

The role of division commanders resembled that of battalion commanders. They controlled everything that went on in their sectors without interference from corps headquarters. When reinforcing divisions arrived, the commander of the original defending division controlled them, not their own commanders. Like regimental headquarters, the corps headquarters moved up reinforcements and kept supplies moving. The divisional commander had a central role in the command system:

It was, however, on the divisional commander that the fullest responsibility for the conduct of the battle rested. He was given control of all available forces in his sector, including field and heavy artillery, with the exception of heavy batteries engaged on special tasks,
such as long-range objectives, and the aviation units which were under Army or Corps headquarters. His chief means of influencing the battle was by ensuring that both his own reserves and those placed at his disposal by higher authority were allotted and sent forward to subordinate commanders at the right place and time, but it was left to those subordinates to make local arrangements for the employment of those reserves on the battlefield as the situation demanded. It was, however, the divisional commander, acting on the reports from his front battalion commanders, who decided the course of the battle. There was in fact, no chain of command left, as it had only those two links.  

The German army eventually made Lossberg's innovation official doctrine. The official manual on defensive warfare, *The Principles of Command in the Defensive Battle in Position Warfare*, clearly stated:

Prior to the battle, the counter-attack divisions will be under the orders of Corps or Army Headquarters. If engaged as a whole or, as will generally be the case, in small bodies, they will be placed under the orders of the commander of the battle sector. . . . The duties of the commander of the counter-attack division will mainly consist in seeing that the division is adequately trained and assembled at the proper time. He will only retain control of his division in action when it has to be led forward, as a complete formation, to the counter-attack, or for some personal reason. But even in these circumstances, control
of the fighting in his sector will generally be retained by the commander of the division in line, regardless of any question of seniority, and both the division in line and the counter-attack division will, consequently, be under his undivided command.69

Lossberg's reliance on immediate counterattacks to hold the front line absolutely required independent action from lower level commanders. A Gegenstoss or "counter-thrust" capitalized on the attacker's confusion and disorganization just after an attack. Delay while higher headquarters approved the counter-thrust only gave the attacker time to consolidate his new position. The official German defensive manual described the situation as follows: "The difficult situation in which the enemy now finds himself after an attack must be utilized without waiting for further orders." [emphasis is original]70

Official German defensive doctrine thus combined Lossberg's breakup of the chain of command and the quick reactions the Gegenstoss required of low level commanders. It produced a defensive system which reacted to emergencies [ie., enemy attacks] in the shortest possible time. By contrast, the British army adhered to a rigid chain of command for its offensives. Information flowed upwards from company to battalion to brigade to division to corps; orders
flowed downward from corps to division to brigade to battalion to company.

On the first day of the Battle of Arras, the British infantry broke through the first line of German defenses on an eleven mile front. Then the British command system took over:

Thanks to the chain system of command from corps headquarters downward, about 90,000 British infantry waited throughout the night for the respective Corps orders to permeate to battalions and companies, and they spent the greater part of the following day attacking and enveloping, according to those orders written the previous evening, positions which the Germans had evacuated overnight except for a few rear guard patrols.71

The British command system functioned at Arras. It had not broken down. Orders went from headquarters to headquarters, and troops eventually obeyed them. But by that time the orders were hopelessly out of date. When they attacked a German defensive position whose command system reacted much more quickly, the British were at a grave disadvantage. At Arras, despite command errors which had kept reserve units too far to the rear, German reinforcements still arrived in time to prevent a breakthrough.72

During the great Allied offensives, the German defenders faced the same communications difficulties as the
British: artillery fire cut phone lines, churned up ground and slowed down messages. Lossberg adjusted to these battlefield conditions by breaking up the chain of command as much as possible. This action reinforced the German army's traditional reliance on the initiative of small unit commanders.

The British command system prepared the Arras offensive with meticulous care.

But when an advance had progressed beyond the concepts of the first detailed plan subsequent contingency moves were made tortuously slow because inadequate communications and slow staff-work impeded the passing of new orders in time for them to be acted on quickly. For instance, [the British Third Army's] orders given at 7:10 PM on the 10th of April,[Arras Battle] for an attack at 6 AM on the 11th did not reach the assault battalions until 5 AM. For this reason fleeting opportunities, rarely perceived in a battle taking place mostly below ground level in the trenches, escaped notice.73

If any single British infantry unit at Arras advanced too far alone, it would expose its flanks and rear. Then the defenders could surround and annihilate the unit. The British sought to alleviate this danger by organizing a coordinated assault all along the line on the night of April 9. Unfortunatley, the cure was worse than the disease. In the time required to extemporize such an assault, the
Germans moved up reinforcements which doomed it to failure.

In their 1918 offensives, the Germans did not let the cumbersome transmission of orders set the pace of their advance. Each unit was to push forward on its own initiative as far as it could, without worrying about flanks and the rear. So long as each unit in the assault did likewise, the defenders would be cut off and surrounded, not the attackers. The German manual *The Attack in Position Warfare* made this clear:

> The first penetration is comparatively easy. The difficulty lies in maintaining the vigor of the attack. The enemy must not be allowed to recover from his surprise. His counter-measures must be rendered useless by the rapid progress of the attack. It is a question of taking rapid action with the consciousness that protection of flanks and rear, as well as support from artillery, will be provided from behind. [emphasis is original]

The danger of slackening in the force of attack is great. The dead center must be overcome by the energy of commanders well forward in the line and by fresh effectives.

With infiltration tactics, each unit went as far forward as possible, using the line of least resistance. A successful attack created a pathway for following units, who protected the flank and rear of the leading units. Thus the attack depended on each unit's tactical skill and initiative, not centralized control.
Ludendorff's rise to a commanding position in the OHL brought a change in defensive doctrine. On December 1, 1916, all German divisions received a new manual issued by the Chief of the General Staff, titled *Conduct of the Defensive Battle*. Ludendorff considered Major (later Colonel) Max Bauer and Captain Hermann Geyer the principle authors of the new manual. These two officers had previously served on Lossberg's staff at Mezières, where Lossberg corrected their "overconfident opinions concerning the capabilities of troops." 

The *Conduct of the Defensive Battle* incorporated the ideas of Geyer and Bauer on "elastic defense." According to their conception, the front line garrisons would retire during a heavy attack, setting the stage for a counter-stroke by the reserves. Lossberg still believed front line garrisons should fight to the last man, although he used counterattacks to recapture lost sections of the front line. The essence of the argument was whether the battle for the front lines should be fought primarily in [Lossberg] the front lines, or behind [Geyer and Bauer] them. 

On September 8, 1916, Ludendorff held a meeting of all Western Front army chiefs of staff and some army commanders. When the subject of elastic defense came up,
Lossberg spoke up strongly against the very idea. The authors of *Conduct of the Defensive Battle* envisaged small independent outposts in the forward defense zone, sometimes as small as a squad or *truppe* of eleven men. These squads were to move freely about the battlefield, they might even withdraw. In Lossberg's view, such small units could not possibly fight in a coordinated fashion. They might not fight at all, if allowed to retire at will. This is what Lossberg meant by "overconfident opinions concerning the conduct of troops." Lossberg preferred to stick with the battalion as the unit of control, besides his distaste for voluntary withdrawal.80

Many officers shared Lossberg's distrust of the new system. Nevertheless, Ludendorff had *The Conduct of the Defensive Battle* published and appeared to be on the side of the elastic defense proponents. Bauer's postwar memoirs stated that Ludendorff "remained on the side of the new tactics," despite opposition from "many older generals."81

However, after the Battle of the Somme died down, Ludendorff ordered Lossberg and his staff to write a summary of the battle's chief lessons.82 They finished the "Experiences of the First Army in the Somme Battle" on January 21, 1917. Ludendorff immediately ordered it widely
disseminated. The work came out eight weeks after Conduct of the Defensive Battle, and it went out of its way to contradict the new manual. Six of the twelve sections devoted to the conduct of the front battalions stressed that they should fight in and not behind the front line. Yet Ludendorff not only circulated Lossberg's Somme memorandum without revision, he included it in a subsequent manual, the Manual of Infantry Training for War.

Ludendorff also accepted Lossberg's recommendation to set up a school at Valenciennes, which would instruct officers up to regimental commander's rank in defensive tactics. Lieutenant-General von Moser became superintendent of the school, with Moser's old 27th Württemberg Division to act as demonstration troops. On Ludendorff's inquiry, Lossberg recommended a Captain Wever as Generalstabsoffizier of the 27th Division. Lossberg considered him an especially able and intelligent officer. This same Wever later became the first Chief of Staff of the Luftwaffe.

Ludendorff did not exactly provide the German army field commanders with definite guidance on the conduct of defensive operations. He distributed two contradictory sets of instructions: The Conduct of the Defensive Battle
and the "Experiences of the First Army in the Somme Battle." The two contradictory manuals would only confuse troop leaders who sought a definite guide to tactical doctrine.

But this difficulty was more apparent than real. When the German army fought its next great defensive battle, Ludendorff trusted not manuals but the German army's authoritative expert on defensive tactics, Fritz von Lossberg. As an authoritative expert, it was Lossberg who finally resolved the tactical debate within the German army, not Bauer or Geyer, not even Ludendorff.

THE BATTLE OF ARRAS

By the end of March British offensive preparations in the Arras region were quite noticeable, and the OHL began to expect an attack there. The British offensive began on April 9. Lossberg did not think the attack would succeed, as he knew there were numerous reserves behind the Sixth Army front, which garrisoned the Arras sector. However, these reserves were not put in motion soon enough and came to the battle piecemeal. As a result the British captured Vimy Ridge and broke into Sixth Army's forward positions on a wide front.
At about 10:00 AM on April 11, Lossberg received a telephone call from Ludendorff. The Kaiser had appointed Lossberg Chief of Staff of the Sixth Army, no doubt at Ludendorff's suggestion. The Sixth Army was in a difficult position, but Ludendorff trusted that Lossberg would "master the situation." Lossberg asked Ludendorff for Vollmacht, full power to make decisions based on his personal assessment of the situation. Ludendorff immediately agreed. Lossberg also asked Ludendorff to communicate this grant of power to the Sixth Army commander, his army group commander, and the army group chief of staff (i.e., all of Lossberg's superiors). Lossberg planned to visit the Arras front immediately. Accordingly he asked Ludendorff to tell the Sixth Army commander, Colonel-General Freiherr von Falkenhausen, that he would not arrive at Sixth Army headquarters until that night. Ludendorff agreed to all of Lossberg's requests.89

Lossberg clearly asked for more power than the traditional role of an army chief of staff ordinarily provided. Lossberg really wanted de facto command of the Sixth Army. That is very nearly what he got, since Ludendorff informed all of Lossberg's nominal superiors that Lossberg had been given Vollmacht. It may be that
the doctrinal confusion in the German army prompted Lossberg's insistence on such a far-reaching grant of power. Lossberg probably wanted to freely ignore Conduct of the Defensive Battle, as he still distrusted the very idea of elastic defense. 90

Ludendorff also asked Lossberg to name his successor as First Army Chief of Staff. Lossberg suggested Major von Klüber, "an especially able, knowledgeable and energetic officer." Lossberg knew Klüber from his service as Chief of Staff of the IX Army Corps in the Champagne and Somme battles. Ludendorff did appoint Klüber First Army Chief of Staff. 91 As an army chief of staff, Major von Klüber would share operational responsibility with the army commander. It is a measure both of Lossberg's prestige and the General Staff's flexibility that Klüber received this important post solely on the strength of Lossberg's recommendation. Certainly it was an important post for a mere major.

Within a few hours Lossberg toured the Arras battlefield, paying as usual close attention to the question of artillery observation. He immediately perceived that on this battlefield the English held a tremendous advantage in artillery observation. 92 Their observers on Vimy Ridge
overlooked the entire German forward defensive zone. This would make a purely defensive posture in the German forward zone tremendously difficult and costly. Lossberg decided instead to garrison the front zone lightly, allow the garrison to retreat during an attack, and then counterattack with strong reserves. The counterattack would go forward with the help of German observed artillery fire. Once the counterattack began, the English artillery would find any intervention in the battle extremely difficult. They could not fire without hitting their own troops, closely engaged with the counterattacking Germans.

Lossberg's plan contradicted all his previous convictions about fighting for every scrap of ground to the last man. He himself was fully conscious of the irony. But he felt that the particular circumstances of this battle had to determine his actions, not pre-conceived ideas. The German army's greatest opponent of the elastic defense was the first to put the idea into practice.

Lossberg's status as the defensive expert of the German army helps account for this practical flexibility. Ludendorff did not send Lossberg to restore the Arras front because he represented the orthodox school of tactical thought--quite the opposite. Lossberg was at odds with
"official" doctrine, as exemplified by The Conduct of the Defensive Battle. Ludendorff needed someone to restore the nearly shattered Arras front. He turned to Lossberg, who had already dealt with such difficult situations in the Champagne and Somme battles. Thus Lossberg's authority rested on his personal ability and expertise, not his tactical orthodoxy.

Very often when innovators in large organizations get the chance to implement their ideas, both they and their innovations rise or fall with the success or failure of their first trial. Lossberg was in a more secure position. He had Vollmacht to do what he thought best, even if it contradicted his own previous convictions. British or French tactical innovators lacked such backing.

When Lossberg arrived at Sixth Army headquarters, Falkenhausen approved his plans and gave him full freedom of action. Under the circumstances, he could hardly do anything else. Within 48 hours Lossberg and his staff organized 15 divisions into an elastic defense in depth 18 miles long and 10 miles deep. Thus it was Lossberg who actually implemented (and very quickly) the new elastic defense doctrine—in the middle of a great battle. On the basis of his previous experiences Lossberg reckoned that
the British would take 4-5 days to prepare another major
attack. Actually the next attack came about 12 days after
the first, on April 23—plenty of time for adequate
defensive preparations.

From the German perspective, the remainder of the
Arras battle revolved around certain key artillery
observation points. Sixth Army headquarters expected the
British to make the capture of such points the focus of
their offensive. But they did not:

No notice was taken either by British
G.H.Q. [General Headquarters] or army
commanders of the importance of artillery
observation positions, although they
provided the key not only for making a
great success of the battles of the
Scarpe [Arras] but also for the capture
of the Passchaendaele Ridge a few months
later. Instead they continued to attempt
to overrun the German line on wide
frontages regardless of ground conditions.

There are only two explanations for the tactically
deficient British conduct at the battle. One, their
commanders did not personally reconnoiter the actual
terrain, an inexcusable omission. Two, if any high-level
officers did tour the battlefield, they lacked the military
competence to recognize the importance of artillery
observation. Neither explanation makes the British look
very good.
The German army had its authoritative expert on tactical defense (Lossberg) touring the battlefield every day. He had the power to make any necessary changes, and he certainly knew what to look for. Under such leadership, the Sixth Army successfully beat off all renewed attacks.\textsuperscript{99}

The first day losses of the Arras battle caused Ludendorff and his staff to question the validity of the new elastic defense doctrine. It soon became clear that the initial setbacks were due to improper handling of the reserves, not any defects in the doctrine itself. Ludendorff concluded that "... the principles laid down by General Headquarters were sound. But the whole art of leadership lies in applying them correctly."\textsuperscript{100} In other words, it takes men like Lossberg to make doctrine actually work.

PASSCHAPENDELE

By May 1917 it was clear to Lossberg's staff that the English had shifted their strength northwards to the Fourth Army front. It quickly became apparent that the British were gearing up for a massive offensive in Flanders. On June 12, 1917, Lossberg became Chief of Staff of the Fourth Army. The former Fourth Army Chief of Staff took over
Lossberg's job as First Army Chief of Staff. Obviously Lossberg's predecessor was not in disgrace; Ludendorff just wanted Lossberg on hand when the offensive began.

On June 13 Lossberg reported to Fourth Army headquarters. He already knew the commander of Fourth Army, General Sixt von Arnim, who served as a corps commander during the Somme battles. For the first time Lossberg had time to organize the defense before an enemy assault. From June 13 until the English attack began on July 31, he organized an elastic defense in great depth. A key feature of his defensive system was a line of counterattack divisions 10-15 miles behind the front line divisions. Lossberg intended that the front line division troops should indeed fight in their positions to the last man. He considered orderly withdrawal impossible, considering the amount of artillery the British had available. However, the defenders could really count on a counterattack before the attack submerged them. The counterattack divisions were held in readiness immediately behind the front lines for that sole purpose. Thus Lossberg resolved the old argument over whether it was best to fight in or behind the front lines:

On further analysis it will be found that the Flandern Position [Lossberg's Fourth
Army defensive system) answered that vexed question which had so long perplexed the German General Staff as to whether the defensive battle should be fought in or behind the foremost line. The reply it had given was to fight in both. The front divisions had fought in and for the foremost line, and by doing so they had succeeded in breaking up and delaying the waves of the assault; the Eingreif [counterattack] divisions had fought it behind the foremost line, and their objective had been to recapture the whole position. So the heated discussions between Colonel von Lossberg and the junior members of the Operations Section at OHL in Mézières in the summer of 1915 had ended in July 1917 in a combination of two apparently irreconcilable points of view. 105 [original emphasis]

Naturally the prospect of providing a double row of divisions for the Flanders front did not thrill Ludendorff. Nevertheless he did provide the material support needed for Lossberg's defensive scheme:

I [Ludendorff] need not say that from the first the Fourth Army was as well supplied as possible with artillery, ammunition, aircraft and other weapons; and Colonel Lossberg, who always wanted a lot, was in the end satisfied with his army group and with me. 106

The results justified the effort. The English finally broke off their assaults on November 17, in Lossberg's words "totally exhausted." 107

The German army leadership recognized Lossberg's role
in the development of defensive tactics. A summary of the
Arras fighting published by the General Staff stated that
Lossberg deserved "the credit for having given practical
shape to the organization of the new defensive battle in
all its details."¹⁰⁸ Within the German army, Lossberg's
prominence generated at least some resentment. Colonel
Wilhelm Wetzell, Ludendorff's Chief of the Operations Section,
remarked on June 11, 1917, that Lossberg's appointment as
chief of staff of the threatened Fourth Army would make
it look like there was only one General Staff officer in
the German army who could conduct a defensive battle.¹⁰⁹
Apparently Ludendorff did not worry about the self-esteem
of the rest of the General Staff when he selected Lossberg.
No doubt there were other General Staff officers who could
have handled the job. But there were none with Lossberg's
proven expertise.
Endnotes


2 Ibid., p. 126 and p. 167.


5 Wynne, p. 90.

6 Ibid., p. 84.

7 Ibid., p. 89.

8 Ibid., p. 88.

9 Ibid.

10 Lossberg, p. 131.

11 Ibid., p. 152.

12 Ibid., p. 126.

13 Ibid., p. 127.

14 Ibid., p. 151-152.

15 Ibid., p. 152.

16 Ibid.

17 Ibid., p. 162.

18 Ibid.
Endnotes cont.

19  Ibid., p. 165-166.

20  Ibid., p. 166.

21  Ibid., p. 166-67.

22  Ibid., p. 168.

23  Ibid., p. 167.

24  Ibid., p. 168.

25  Ibid.

26  Ibid., p. 169.

27  Ibid.

28  Ibid., p. 172.

29  Ibid., p. 173.

30  Ibid., p. 172.

31  Wynne, p. 92-94.

32  Ibid., p. 92.

33  Ibid., p. 94.

34  Ibid., p. 97.

35  Lossberg, p. 174.

36  Ibid.

37  Ibid., p. 215.

38  Ibid., p. 213.

39  Ibid., p. 214.
Endnotes cont.

40 German Official History, 10:355. See also Lossberg, p. 220.

41 Lossberg, p. 214.


44 Lossberg, p. 220.


46 Ibid., p. 220.

47 Ibid., p. 222.

48 Ibid., p. 223.

49 The quartermaster of a German headquarters staff supervised the administration of the whole staff. In particular, the Oberquartiermeister (a General Staff officer) supervised the Adjutantur officers working on routine administrative matters. After the operations officer (Ia), the quartermaster was the chief of staff's most important subordinate. See: British General Staff, The German Army Handbook (London: General Staff, 1918; reprint ed., New York: Hippocrene Books, Inc.), p. 41.

50 Lossberg, p. 220.

51 Ibid., p. 223.

52 Ibid., p. 224.

53 Ibid., p. 224-25.

54 Ibid., p. 231.
Endnotes cont.


56 Lossberg, p. 247. This sense of gratitude did not stop Lossberg from criticizing Falkenhayn in his memoirs, often severely.

57 Ibid.

58 Ibid., p. 251

59 Ibid., p. 268.

60 Ibid., p. 257.

61 Erich Ludendorff, Meine Kriegserinnerungen, 1914-1918 (Berlin: E. S. Mittler and Son, 1919), p. 16.

62 Lossberg, p. 269.

63 Ibid.

64 Wynne, p. 125.

65 Ibid.

66 Ibid.

67 Ibid., p. 126.

68 Ibid.

69 Chief of the General Staff of the Field Army (German army), Manual of Position Warfare for all Arms, Part 8: "The Principles of Command in the Defensive Battle in Position Warfare," Translated by the Intelligence Section of the American General Staff (Berlin: Issued originally by the Chief of the General Staff of the Field Army, 1917. English translation issued by the American General Staff, 27 October, 1918), p. 6.

70 Ibid., p. 11.
Endnotes cont.

71 Wynne, p. 196.

72 Ibid., p. 183.


74 Chief of the General Staff of the Field Army (German army), Manual of Position Warfare for all Arms, Part 14: "The Attack in Position Warfare," Translated by the Intelligence Section of the American General Staff (Berlin: Issued originally by the Chief of Staff of the Field Army, 1918), p. 4.

75 Wynne, p. 149.


77 See introduction to this chapter, p. 34.

78 Wynne, p. 302.

79 German Official History, 11:17.

80 Wynne, p. 160.


82 Lossberg, p. 269.

83 Ibid., p. 277.

84 Wynne, p. 159.

85 Ibid., p. 161.
Endnotes cont.

86 Lossberg, p. 277.
87 Ibid., p. 279.
88 Ibid., p. 280.
89 Ibid., p. 280-81.
90 Wynne, p. 200.
91 Lossberg, p. 281.
92 Ibid., p. 283.
93 Ibid.
94 Wynne, p. 206.
95 Lossberg, p. 284.
96 Wynne, p. 213.
97 Lossberg, p. 284.
98 Wynne, p. 242.
99 Ibid., p. 254.
100 Ludendorff, Ludendorff's Own Story, 2:222.
101 Lossberg, p. 293.
102 Ibid., p. 294.
103 Ibid., p. 295.
104 Wynne, p. 291.
105 Ibid., p. 301-302.
106 Ludendorff, Ludendorff's Own Story, 2:104.
107 Lossberg, p. 309.

108 Wynne, p. 213.

CHAPTER 3

THE ARTILLERY EXPERT: GEORG BRUHMÜLLER

BRUHMÜLLER'S RISE

The man who supervised the artillery preparations for each of the major German offensives in 1918 began the war as an obscure lieutenant colonel in the Landwehr, called back from retirement for the war. Only in 1918 did the army see fit to promote him to colonel.¹ Despite his low rank, Georg Bruchmüller was undoubtedly the most important artilleryman of the German army, both in terms of his de facto command authority and in terms of his role as a tactical innovator. For the March 21, 1918 (Michel or "Michael") offensive, he controlled over 1,700 batteries of field and heavy artillery—² about half of the artillery available to Germany on the Western Front.³ Historian Martin Middlebrook commented that "It was as though Haig [commander of the British Expeditionary Force] had allowed an obscure Territorial Army colonel to prepare artillery plans for the lieutenant-general who was his General Officer Commanding, Royal Artillery."⁴
"Bruchmüller owed his position in 1918 to his brilliant performance as an artillery commander on the Eastern Front. As he modestly recorded in his post-war memoirs:

Through a series of circumstances the World War has let me move from the modest position of a Battalion Commander of Landwehr Foot Artillery to the position of Chief of Artillery of the High Command.

These circumstances have so brought it about that first of all in little situations, I could put to the test most of the ideas which were finally put into practice in the big offensives."

What Bruchmüller referred to as "a series of circumstances" was in fact a series of well-organized and effective artillery bombardments which brought him to the attention of his superior officers. He was ". . . one of the half dozen outstanding military technicians of the war, with a unique talent for divining exactly how much ammunition was needed to soften a position before an infantry assault." Perhaps the most fortuitous factor in Bruchmüller's rise to the top was his assignment to the Eastern Front, for that front was a great proving ground for new offensive tactics. In the 1915-1917 period there were few German offensives in the west, while there were many in the east.

In 1912 and 1913 Bruchmüller had served as an instructor at the Foot [heavy] Artillery School. He ran the
departments responsible for the instruction of younger regular officers, as well as reserve, Landwehr (second line army reserve) Reserve officers, and noncommissioned officers.\textsuperscript{8} The groups that Bruchmüller taught received the most basic instruction; the experience nonetheless contributed to Bruchmüller's knowledge of the most important weapon of the coming war.

Bruchmüller's career was interrupted shortly before the outbreak of the war. His separation from active service apparently occurred in October 1913 as a result of a nervous breakdown incurred because of a fall from a horse.\textsuperscript{9} Whatever the nature of his injuries, Bruchmüller was on the retired list in August 1914. Nevertheless, he had received letters of commendation from the Chief of the Foot Artillery School and the Chief of Foot Artillery, letters which were "at that time a great comfort" to him.\textsuperscript{10}

At the beginning of the war, Bruchmüller returned to service and commanded a battalion of Landwehr artillery. He was also a staff officer for the Foot Artillery of Kulm fortress. In November of 1914 he became the artillery commander of the 86th Infantry Division. By 1915 he commanded the 86th Field Artillery Regiment.\textsuperscript{11} Although
he had risen somewhat in the military hierarchy, he by no means held an especially prominent position. His career was quite ordinary until he came to the attention of the Chief of Staff of the Tenth Army, one Colonel Hell. The occasion was the Battle of Lake Narotsch on the Eastern Front in the spring of 1916. Hell recorded that:

The artillery commander (the artillery advisor of the 10th Army . . . ) into whose hands the preparations for the artillery attack (Battle of Lake Narotsch, spring 1916 . . . ) had been placed, had divided the artillery among the divisions and specified that the fire direction should remain under control of the divisions. Bruchmüller, then lieutenant colonel, (artillery commander of the 86th Infantry division . . . ) held on the contrary, that a general concentration of fire was necessary and explained this viewpoint to the artillery commander in writing. The latter sent this proposal to me, as Chief of the General Staff, 10th Army. It contained the concentration of fire, standing barrages and rolling barrages and received the approval of the Army High Command. This plan proved itself so brilliantly when it was carried out that, when I became Chief of Staff . . . [of the Army Group von Linsingen] in the summer of 1916, I requested Lt. Col. Bruchmüller to direct the artillery in several attacks by which it was necessary to win back footholds on the Austrian Front. Here also, the Bruchmüller plan proved its worth in a brilliant way.12

At that time attack divisions ordinarily drew up separate fire plans for the preliminary bombardment. The
idea of drawing up a coordinated fire plan for all the attacking artillery was evidently Bruchmüller's innovation, which will be discussed more thoroughly below. Bruchmüller's rise after the battle of Lake Narotsch was rapid. As mentioned above, Colonel Hell was the first influential officer who made use of Bruchmüller's artillery talents. Bruchmüller soon came to the attention of the Chief of the General Staff on the Eastern Front, General Max Hoffman. The latter thanked Bruchmüller in a letter for his role "... in the attacks prior to the fall of 1917 over the entire zone of operations of Upper East."13 Bruchmüller himself summarized his rise to power:

"Early in 1916, during the battles at... [Lake Narotsch], I became known to the Chief of Staff of the Tenth Army, Colonel Hell, and through him to the commander on the Eastern Front. In the year 1917 I participated in nearly all the attacks in the territory of the upper-east and in the autumn of 1917 and year 1918 in accordance with direct orders of the high command, found employment in the west.14

Bruchmüller made his reputation and refined his techniques with numerous attacks of moderate scale on the Eastern Front. The most famous of these engagements was an assault on Riga in September 1917, which required
a potentially difficult river crossing. Bruchmüller directed the artillery bombardment and one infantry officer remarked that "The artillery did its work so well that the crossing became for us little more than a boat ride followed by a pleasant promenade."\(^{15}\)

Bruchmüller's rise to influential positions involved more than competent direction of artillery attacks. Two further factors explain the efficient use the German army made of Bruchmüller's talents. One, his superiors (or at least his superiors who were on the General Staff) noticed his ability and determined to make further use of it. In Bruchmüller's case, this involved a chain of three General Staff officers. Hell first recognized Bruchmüller's talents. Hoffman used those talents over the entire Eastern Front. Eventually Ludendorff appointed Bruchmüller Chief of Artillery of High Command, with army-wide influence. Second, there had to be some mechanism within the German army for transferring the operational control of artillery units to Bruchmüller, first on widely separated sectors of the Eastern Front, and then on widely separated sectors of the Western Front. Such a mechanism did exist; it was the position of artillery advisor to an army or army
group. Bruchmüller had a good deal to say about the
dynamics of this position, which will be examined below.

There was a clear break in Bruchmüller's career.
The break occurred at the Battle of Lake Narotsch. Before
the battle he was a definitely run-of-the-mill artillery
officer of no particular significance. After the battle
he moved on to progressively larger events, until the
end of the war found him at the top of his profession.
At Lake Narotsch he stated in writing that he could do
a better job than his superior. A General Staff officer
believed him and gave him the chance to prove his assertion.
Bruchmüller's subsequent successes should not obscure
the significance of the risk he was willing to take.
Equally significant, the German army gave him the resources
required to carry out his ideas—both before and after,
they were backed by success.

"BRUCHMÜLLER AS AN EXPERT--TACTICAL PROFICIENCY"

Georg Bruchmüller was an expert at the job of super-
vising the artillery bombardment prior to a major offensive.
He had many opportunities to practice his art after the
battle of Lake Narotsch. By his own tabulation he
organized 10 major bombardments, which included such
battles as the capture of Riga, the counter-attack at Cambrai, the great Michel offensive in March 1918, and the Blücher ("Bluch"er") or Chemin des Dames offensive in May and June of 1918.  

The bombardments organized by Bruchmüller were distinctive and recognized as such by friend and foe alike. The German army nickname for Bruchmüller was a play on the first syllable of his surname: "Durchbruchmüller". In German it meant "Breakthrough Müller". Bruchmüller's bombardments were marked by not one but several tactical innovations. In some cases the innovations were his, in others the credit belongs to another individual. But Bruchmüller was not only an innovator in the field of artillery tactics. He also implemented the new tactics. The device which achieved this union of innovation and implementation was simple: Bruchmüller had de facto command authority over all the artillery participating in a particular attack. He combined in his own person the man with new ideas and the man with the authority to carry them out.

The basis of Bruchmüller's success was a detailed fire plan for every battery involved in a bombardment. Although such concentration of fire may have occurred
prior to Bruchmüller's use of the technique, it was not standard procedure in the German army. Bruchmüller stated that there had been no such coordination of fire at any attack in which he himself participated, prior to Lake Narotsch. At Lake Narotsch it was Bruchmüller himself who proposed the unified fire plan.

Bruchmüller felt that detailed fire plans drawn up for the entire attack frontage were the basis of a successful artillery attack, since such a fire plan in itself helped ensure that the bombardment would proceed in a systematic, uniform way. As he saw it:

Definite instruction are also according to my views the primary requirement, that must be fulfilled particularly in the use of masses of artillery. In contrast with this requirement it is immaterial whether one takes one trench under fire before or after another, whether one employs light field guns or light field howitzer batteries; whether one assigns each battery a zone of 100 or 150 meters etc. Without definite plans promulgated by the most definite orders, there can be no success!

A definite fire plan was Bruchmüller's prerequisite for success. It was this precise fire plan which disrupted the enemy defense. At any given moment in the bombardment every artillery piece had a clearly defined mission: countebattery, disruption of the enemy command
system, destruction of infantry positions, etc. Artillery fires would shift from one portion of the enemy defenses to another at different times during the bombardment, so that when the infantry attacked the defenses were in a state of the greatest possible disruption. 20

The scale of Bruchmüller's fire plans increased as the war went on. At the Battle of Toboly Bridgehead on the Eastern Front in April 1917, Bruchmüller drew up a fire plan for 73 batteries on the basis of aerial photographs. 21 For the huge offensives on the Western Front, Bruchmüller naturally concerned himself with the fire plans of the artillery under his command, not with the individual targets.

The multivolume German official history of the war, Die Weltkrieg 1914-1918, specifically credited Bruchmüller with developing new artillery procedures for the approach march (Aufmarsch) and fire-distribution (Feurverteilung). 22 Indeed, most of Bruchmüller's achievements came under those headings. While one might not ordinarily regard the approach march as a branch of artillery tactics, in the First World War concealing the buildup of artillery prior to an assault was absolutely necessary, if there were to be any surprise. A sudden massing of artillery gave away
an impending attack.

Bruchmüller always made the most strenuous efforts to ensure secrecy. In the east batteries were easy to conceal, as there were usually woods close behind the front lines.\textsuperscript{23} Concealment proved more difficult in the open terrain of the west. Preparations for the artillery bombardments (such matters as laying phone lines, accurate survey of battery positions, ammunition dumps, etc.) could not leave any evidence that would show up on aerial photographs. The actual batteries would move into position the night before an attack, close behind the front in order to support the infantry attack for as long as possible. Bruchmüller described the process as follows:

Any construction, which might in any way come under enemy observation, was avoided. Development of the battery position, O.P.s etc. was undertaken only where such constructions could not be discovered by terrestrial or aerial observation. Usually this had to be dispensed with because of lack of time. As a rule there was little or no such development of positions. This sounds quite simple and yet makes the greatest demands upon the nerves and morale of the troops. The majority of batteries stood, close to the enemy, on the bare ground without any protection for the personnel. The gun squads could protect themselves somewhat from the elements only with their shelter tents. \textit{If such a battery was discovered by the enemy before the general opening of fire it was lost.} Under
such circumstances just a few rounds in the vicinity of the battery were sufficient to put the entire personnel out of action. Every artilleryman was aware of this.\textsuperscript{24} [emphasis is original]

Bruchmüller launched what came to be known as a "hurricane" artillery bombardment. A hurricane bombardment attempted to disrupt and disorganize a defensive position within the space of a few hours. By contrast, the British and the French favored "drumfire" (Trommelfeuer) bombardments. In a drumfire bombardment the artillery fired steadily for a period of several days or weeks at the enemy. Supposedly this obliterated the enemy defenses. In fact it never did (or could) destroy enough to spare the attacking infantry heavy losses. But it did give the enemy high command a clear signal that an attack was on the way—nobody ever fired off that much ammunition without a major offensive in mind. In the meantime the defending command would mass enough reserves behind the threatened sector to make a breakthrough impossible.

The most famous drumfire bombardment of the war was that preceding the Battle of the Somme in 1916. On that occasion 1,437 British guns fired approximately 1,500,000 shells over the course of seven days. By way of contrast, in the hurricane bombardment Bruchmüller directed just
before the start of the Michel offensive (March 31, 1918), 6,473 guns and 3,532 mortars fired about 1,116,000 shells—but in the space of only five hours.25

A hurricane bombardment did not warn the opposing high command that an offensive was coming—provided that preparations were carried out in secrecy and the artillery moved into position shortly before the attack. However such bombardments required that the attacking artillery commence firing without the benefit of registration on their targets. (Registration was a process whereby the artillery fired on its intended target, observed the fall of shell, and adjusted for inaccuracies in the range, weather conditions and individual guns.) If a large number of batteries registered on their targets a few days before a bombardment, it was a sure sign an attack was on the way. In any case, registration was a practical impossibility for a hurricane bombardment. The large number of guns required to deliver a huge number of shells in a few hours could not be given adequate cover. If they fired even once for the purpose of registration, the enemy would probably locate the battery with sound and flash units and destroy it.26
The actual techniques of accurate fire without registration (or "firing from the map") were developed in the German army by an artilleryman, Captain Pulkowski. The basis of the "Pulkowski method" was an accurate survey of battery locations and the exact determination of target locations with the help of aerial photographs. Together these established an exact range to the target. Test firings of each gun produced a correction factor, the "error of the gun." Meteorological data on the day of firing provided a second adjustment, the "error of the day," which compensated for humidity, air temperature and wind speed. While not as accurate as registered fire, the Pulkowski method allowed the delivery of effective fire without registration.  

Bruchmüller gave full credit to Pulkowski for this technical innovation:

Captain Pulkowski instructed about 6000 officers and N.C.O.s at Maubeuge in 1917 in the use of tables for applying corrections of the moment . . . and in 1918 immediately before the attacks, he and Major Marx . . . taught many thousands of officers and N.C.O.s many matters of the technique of fire. It would have been absolutely impossible to carry out the "Pulkowski Method" without these lectures conducted by Major Marx and Captain Pulkowski.

In his memoirs Ludendorff also commended Pulkowski for
his instructional work. 29

Although Bruchmüller did not develop this technique, he did insist on its use in the attacks he directed. Employment of the "Pulkowski Method" began by stages in the eastern battles. For instance at the Battle of Riga Bruchmüller planned some registration of fire, but the large number of batteries limited this to a few rounds per gun. As a result the shelling was relatively inaccurate, 30 but that was the price paid for the advantage of surprise.

Bruchmüller did not direct the artillery bombardment at the Battle of Caporetto. 31 He did comment adversely on the direction of that battle:

The offensive in Italy of the fall, 1917 followed Riga too quickly to be able to utilize its lessons. Consequently the artillery executed exact adjustments spread over some four days. A fifty meter bracket was sought on targets to be bombarded with gas. [Bruchmüller evidently regards this as excessive accuracy for gas.]

Measures designed to deceive the enemy are hopeless when fires for adjustment are made over a period of days; this is an experience repeated repeatedly verified. The success in Italy is attributable to the quality of the adversary and could not have been obtained against the French nor probably against the Russians. 32

Bruchmüller's comments are especially interesting in
view of frequent claims that Caporetto was an early example of the new German offensive tactics in action. Evidently this is not true for the artillery, at least.

As time went on, Bruchmüller relied less and less on artillery registration. The artillery bombardment preceding the Chemin des Dames offensive in May of 1918 was the first to do entirely without such registration of fire. About 1100 German batteries fired the artillery preparation. Even for a really large number of batteries, registration was no longer necessary.

Due to the static nature of the front lines throughout most of World War I, most attacks were not made by the divisions which ordinarily held a particular section of the lines. Full strength, rested divisions would move up to the line and take over the sector from the defensive divisions just before the attack. The defensive divisions had generally occupied their sector of the front for some time, and Bruchmüller sought to utilize the greater familiarity of their artillery commanders with the area. Specifically, he placed the units of the attack divisions assigned to counter-battery work under corps command, which in turn largely kept them under control of the former defensive commanders. Meanwhile, the attack
division artillery units assigned to batter the infantry positions would remain under command of the attack divisions. 35

Such a split in the artillery units of the attack divisions violated a time-honored military principle: unity of command. Many artillery commanders of the attack divisions felt it encroached on their prerogatives. 36 Nevertheless, there were good reasons for splitting the command in this manner. Chief among these was the greater familiarity of the former defensive division artillery commander with his sector. Also, usually three or four attack divisions occupied a sector formerly held by just one defensive division. This was necessary in order to achieve numerical preponderance over the defender. Each attack division would simply occupy a narrow front. 37 By its nature, counter-battery fire involved sweeping wide stretches of the enemy front. Therefore the task was best coordinated at corps level, and directed by the old defensive artillery commanders. 38 Sometimes the nature of the enemy's artillery dispositions made it advisable to put counter-battery artillery units under army command. If the situation dictated, army headquarters did assume direction of counter-battery
fire. Bruchmüller commented that "This matter was always handled according to circumstances rather than by slavish following of rules."\textsuperscript{39}

Here was a clear conflict between adherence to established procedures and the chain of command on the one hand, and letting the individual in the best position to do the job take precedence on the other. According to Bruchmüller, "Naturally, an innovation of this type could not be adopted without friction."\textsuperscript{40} All attacks in the East in 1917 (most of them directed by Bruchmüller) allowed the defensive artillery commander to command the artillery. On February 8, 1918 the \textit{Oberste Heeresleitung} (OHL) ordered the procedure adopted by the whole German army.\textsuperscript{41}

Clearly there were objections to this policy, but Bruchmüller was never one for letting personal objections get in the way of doing the job right:

\begin{quote}
Particular circumstances demand following certain lines, and the Groups of Armies, and armies, of which I [Bruchmüller] was artillery advisor, did not allow the above objections by certain individuals to interfere with doing so.\textsuperscript{42}
\end{quote}

Bruchmüller mentioned that the British and the French, who according to him "had rich experience to
draw from", also adopted the same system for coordinating their artillery attacks.\textsuperscript{43} No doubt they found the system attractive for the same reasons as the Germans.

However, on the German side Bruchmüller played an important personal role in the adoption of this policy. He clearly stated that removing counter-battery fire from the command of the attacking divisions "at first brought on much opposition on the Western Front."\textsuperscript{44} Of course the German army had not launched any major offensives on the Western Front between Verdun and the spring offensives of 1918. Bruchmüller's combat experience on the Eastern Front led him to different conclusions.

One final example helps to show what set Bruchmüller apart as an exceptional artilleryman. When he directed the smaller attacks in the East, he personally briefed all the officers of the attacking regiments on the artillery fire plan. They in turn briefed their men. Although this took a great deal of time, particularly when he had to lecture the officers of several divisions, Bruchmüller felt that it was a "prerequisite of success."\textsuperscript{45} It increased the confidence of the infantry in their artillery support, and hence their vigor in the attack. The infantry was more likely to follow the rolling barrage
closely (a factor of vital importance in infantry attacks of this period) if they were familiar with its course and timing. Then again, the artillery could not bombard every enemy position continuously. For maximum effect it had to shift its fire from one enemy position to another before the assault. If the attacking troops were ignorant of the artillery fire plan, they became anxious and jammed phone lines with reports of known enemy positions still unshelled. This was not a small matter to men about to actually assault those positions. The problem did not occur in bombardments directed by Bruchmüller.

Bruchmüller also made sure to lecture the officers of the artillery units on their role in the coming attacks. In the east where he dealt mostly with relatively small units, Bruchmüller performed this duty in person. In the west he delegated it to the indefatigable Captain Pulkowski and Major Marx. Conceivably Bruchmüller could have relied on orders to regulate the artillery units, but he found that in practice his artillery lectures ironed out a number of problems and questions for the artillerymen.

There were at least two cases where artillery officers organized similar infantry lectures for attacks
Bruchmüller had nothing to do with. However Bruchmüller first implemented the idea in a systematic way:

Lectures to the infantry on the subject of the artillery plans were given as a matter of principle to all attack troops in 1918, but also in the preceding years they were conducted here and there outside the area of my activity... So far as I know, no thorough carrying out of this scheme occurred prior to my coming to the Western Front in the fall of 1917. The lectures to the infantry had not been conceded by all concerned to have importance that they should have had. It was impossible to value them too highly. The conduct of the infantry was certainly in all penetrations the final deciding factor.

The principle of cooperation between different arms is a military ideal. Bruchmüller achieved the ideal, though only at the expense of greater effort from himself and other artillery commanders. His pre-assault briefings involved a great deal of extra work. However they did increase infantry confidence in the artillery preparation and provide tactically useful information. It was indicative of his attitude when Bruchmüller said: "The thanks of the infantry, in my opinion, must be treasured more by every artilleryman than all orders and citations, which of course only an individual could
receive in place of the group."51

BRUCHMÜLLER AND THE ROLE OF THE EXPERT

Thus far we have presented some of Bruchmüller's ideas on the proper employment of artillery. Exactly how he influenced German artillery tactics is another story. Certainly it was not due to his high rank and status. He commented on that as follows:

To give my orders weight was, in my military service; not always easy for me. At the beginning of the war I was just the usual retired lieutenant colonel, and, in spite of the repeated efforts of my superior to have me restored to the active list, I was only placed "on duty" in 1918 with, however, the promotion to colonel. The restoration was to take place after the conclusion of the war. The revolution, however, interfered.52

What really explains Bruchmüller's impact is the simple concept of delegation of authority. "Delegation of authority" is often a pseudonym for handing the dirty work to subordinates. In Bruchmüller's case a real delegation of authority took place: men in high positions lent him their authority, enabling him to carry out his ideas. Specifically, various officers wanted an effective artillery bombardment to precede
particular offensives, believed Bruchmüller could organize such a bombardment, and gave him the effective power needed to carry out his ideas.

The position of artillery adviser to a major command made this transfer of power possible. Each higher-level German formation (those commanded by an officer of general's rank or above) had an artillery adviser attached to it. While such artillery advisers did not possess any formal command powers, they could still exert a tremendous influence on the course of operations.\(^{53}\) Bruchmüller commented on the position of artillery advisor in these words:

\[\ldots\] The peculiar position of an artillery adviser, however, required a special personality. One could make much of this position--could exert a great influence, an influence vital to the outcome of a battle action.

Anxiety as to holding the position, was quite too readily brought about due to \[\ldots\] [conflicting opinions held by] the artillery adviser and the Chief of Staff concerned. Worries as to rank, timidity when it came to standing out alone and similar reasons, however, were contributing causes to the failure of artillery advisers to exercise generally this influence which should have been accorded them and exercised by them. Happily these cases were only the exceptions. With most of the artillery advisers the artillery found itself in good hands.\(^{54}\)
The artillery adviser to a large unit, the General der Artillerie (a generic title, many who held the position were colonels or majors), held a position analogous to that of a chief of staff. Both men held advisory positions, lacking formal powers of command. Yet by virtue of force of personality, ability and expertise, each could decisively influence affairs. Since the General der Artillerie had a staff and not a command function, he probably worked mostly with the unit's chief of staff. Of course the unit commander retained overall control, as indeed he retained control over the chief of staff himself. It is surely significant, however, that in the quote above Bruchmüller referred only to difficulties with the chief of staff, not the commander. No doubt much depended on the personalities of the individuals involved. In an analogous way, the effectiveness of a chief of staff depended on his relationship with the unit commander.

It is clear that when the artillery expert did win the confidence of the commander and chief of staff of the unit he advised, he could be in a strong position indeed. In such cases his recommendations were often as good as orders to subordinate units, by the express authority of
the unit commander. Bruchmüller cited this instance from the Battle of the Chemin des Dames in May 1918:

The Seventh Army (General von Boehn) was to make the attack. General Ludendorff assigned an artillery specialist to the group of armées of the Crown Prince, the group of which the Seventh Army was a part. This specialist had the rank of general of artillery and was assigned by the Crown Prince to the Seventh Army. The army chief of staff, Colonel Reinhardt gave him every assistance [], also the army published a directive giving the force of orders to the recommendation of the specialist. 55

In a similar fashion Bruchmüller himself enjoyed the confidence of his superiors for the German offensive on the Marne in July of 1918:

Let it be understood that I consider myself entirely responsible for all artillery plans in this attack, even though as artillery adviser to the Army Group of the German Crown Prince I had no power to command. Since his Royal Highness the Commander placed the highest trust in me and since the Armies had been repeatedly informed by the Chief of the General Staff of the Army Group that all instructions and suggestions from me were to be regarded as emanating from the Army Group. 56

The special importance of the artillery specialist was apparently widely recognized in the German army. The mere arrival of such a man could signal an impending offensive to friend and foe alike. Just before the battle of Riga
in September 1917, the German Eighth Army imported an artillery specialist from the East Galician front. This man came to Riga by way of Berlin, rather than directly from Galicia. Once he arrived on the Eighth Army front he was "lodged more or less secretly" in order not to give away the impending attack, since "The arrival of a specialist was always a cause for comment and rumor."57

Although Bruchmüller was certainly the exemplar of the type, he was by no means the only artillery specialist of expert quality available to the German army. He noted that "several" artillery experts participated in the "Michael" offensive in March 1918.58 Apparently there were even such things as minenwerfer specialists, for a Major Witte drew up all the plans for minenwerfer employment at the Battle of the Chemin des Dames.59

As with most innovations, there was much opposition to the new artillery tactics. The lack of artillery registration encountered particular opposition, as it violated the prewar training and doctrine that had considered accurate adjustment essential to effective fire. Bruchmüller noted that "This viewpoint was taught solemnly to every artilleryman of prewar times and of the first years of the war."60
Those opposing Bruchmüller's innovations had some valid objections. Fire without registration simply could not be as accurate as registered fire. It was simply a case of the advantages (chiefly surprise) outweighing the disadvantages (inaccuracy and greater complexity). Bruchmüller overcame the opposition only with the support of higher authorities:

In attacks, a method, new in essential points, was employed which like everything new had its disadvantages. Every commander knows now, however, how hard it usually is in such a case to "make his orders felt."

The occurrences at the introduction of the Pulkowski method, ... for example, are an illustration hereof. Hence, it became necessary for the high command to prevent any arbitrary, intentional deviations by the subordinate commanders, from the adopted method recognized as correct and required for success, and this could also be done only by the publication of the most detailed orders. 61

Ludendorff took note of these objections in his postwar memoirs: "The new procedure [the "Pulkowski Method"] was strongly objected to, especially by some of the senior gunners. But it had to be adopted, nevertheless, and fulfilled all expectations." 62 The senior gunners in question were doubtless of higher rank than Bruchmüller. Yet Bruchmüller had his way and not the senior gunners.

As Chief of Artillery of the High Command, Bruchmüller
had support from Ludendorff himself.

Although this account has stressed the role of individual initiative in promoting tactical change in the German army, this did not occur through a disorderly process. It was not simply a case of allowing all lower level commanders greater tactical freedom. In fact as we see above, Bruchmüller suppressed individual initiative through "publication of the most detailed orders." The command system promoted the tactical ideas of one man [Bruchmüller] and suppressed those of many others, those not in accordance with "the adopted method recognized as correct and required for success." The interesting question in such a situation is who decided which tactical viewpoint to favor, as expressed through the selection of key personnel. In Bruchmüller's case, the answer was clearly the General Staff, not as a collective body but in the persons of Helm, Hoffmann, and Ludendorff.

Bruchmüller's views on the proper role of subordinate commanders were significant. On the one hand the detailed instructions required for a hurricane artillery bombardment necessarily curtailed the independence of subordinate commanders. By and large artillery commanders on the Western Front welcomed close supervision, as they
had mostly dealt only with defensive artillery tactics. But Bruchmüller also recognized the military value of allowing subordinates as much initiative as the situation allowed:

In personal contact with the artillery advisers and the artillery commanders it was always pointed out, that suggestions for improvement of the orders of the high command were always desired and that assent would always be given to proper deviations from orders.65

However subordinates could change orders only for sound military reasons, and "not for the purpose of merely satisfying the whims of individuals."66

Naturally differences of opinion regarding sound reasons for exceptions could arise. Bruchmüller gave some examples:

For example, when an artillery commander requested permission on good ground to make changes in assignment or targets, a general of artillery [the title given an officer assigned as artillery adviser to an army command] was not authorized to answer: "The army directs that everything remains as is." The chief of staff of the group of armies of the German Crown Prince, Count von der Schulenburg was called upon to apply the proper remedy. Obviously, published orders could not always be recalled.67

Note that in case of a dispute at the army level, the chief of staff at the next higher level (army group)
acted as referee. Here again the General Staff played a critical role. Von der Schulenburg adjudicated artillery disputes by virtue of his position as a General Staff officer. It is also significant that it took someone a level higher on the chain of command to overrule the artillery adviser.

It was clear that Bruchmüller's position depended on Ludendorff's support. But it was also clear that Ludendorff listened to and heeded Bruchmüller's advice. For instance, it was Bruchmüller's practice to calculate the exact number of artillery batteries needed to disrupt an enemy position. Even when the artillery fire shifted from target to target, there was an irreducible minimum of guns required for success. Bruchmüller made his needs known to Ludendorff, who took appropriate action:

Let it be clearly stated, however, that General Ludendorff in the major attacks always placed special emphasis upon the fact that the required number [of guns] be really made available even when great difficulties were connected therewith. It was repeatedly necessary to bring batteries from the western to the eastern front (and vice versa) to supply the required mass of artillery.68

At the Battle of the Chemin des Dames Bruchmüller prevailed upon Ludendorff to make a major operational change
in the plans for the offensive. Although the artillery bombarded 37 miles of the enemy front lines, on Bruchmüller's advice Ludendorff limited the initial attacks to the middle 25 miles of the shelled sector. 69 Bruchmüller implied in his memoirs that there was insufficient artillery available to support a wider attack. 70

Thus, an artillery adviser in the German army could do a great deal to make his influence felt. The term "adviser" did not mean someone whose advice could be safely ignored. Bruchmüller's status as an expert did not depend on any particular innovation or practice. Rather it depended on a thorough-going competence in the conception, planning and direction of an artillery bombardment. Bruchmüller conducted every phase of the bombardment in the most effective possible manner, regardless of who originated the techniques used. It is this universal quality which set Bruchmüller apart from someone like Pulkowski whose work was clearly of critical importance—but limited to one aspect of the problem.

Clearly Bruchmüller was an "authoritative expert." He understood every aspect of artillery tactics. This enabled him to select the techniques most appropriate to a given situation, including techniques borrowed from
narrow experts like Pulkowski. The essence of Bruchmüller's contribution was to combine narrow solutions of particular problems into a single comprehensive solution. Bruchmüller's direction of a large artillery bombardment then put the comprehensive solution into actual practice.

As an authoritative expert, Bruchmüller identified other experts and put them to good use. Certainly this was the case with Pulkowski. After his appointment as OHL Chief of Artillery, Bruchmüller logically would have nominated many of the Western Front artillery advisers. By virtue of his own comprehensive knowledge of artillery tactics, Bruchmüller could identify artillerymen of true talent. Through his powerful advisory position, he could put such experts in positions of influence.

No doubt Bruchmüller's status as an authority on artillery tactics helped him conceive and execute innovations. Significant innovation in any field ordinarily requires thorough mastery of existing knowledge. The innovator must know precisely what the problems are before he can solve them.

The problem which Bruchmüller faced and solved vexed artillerymen of all nations in World War I: How could the artillery best support an infantry assault? Technological
advances had increased the destructive power of artillery, but improved infantry weapons threatened to permanently deadlock the battlefronts. The drumfire bombardment attempted one solution to this dilemma: simply obliterate all defensive positions. The British drumfire barrage at the Battle of the Somme lasted a week and expended 1,500,000 shells. Yet to completely eliminate the opposition, this bombardment had to destroy concealed and dug in German machine guns, scattered over a 30,000 square yard area. The bombardment delivered about one pound of high explosive for each area ten yards square. This was hardly sufficient. When the infantry attacked on July 1, few British soldiers walked into shattered defenses with sloped arms, as their commanders had promised them. Instead, intact machine guns mowed down thousands. A drumfire bombardment simply could not destroy all defenses. The technical means were inadequate. Bruchmüller's bombardments had a different goal in mind. They sought primarily to disrupt and disorganize enemy defenses. A short but intense bombardment cut phone lines, destroyed headquarters, neutralized enemy artillery positions, stunned the defenders. Its purpose was to help the infantry fight its way through the enemy defenses.
There was no nonsense about walking over enemy positions with sloped arms. In conjunction with infiltration tactics, hurricane bombardments worked. In the great Michel offensive of March 1918, German infantry fought its way through the British trenches to open country. No previous British or French offensive had ever gotten through the German trench system. Eventually the Germans gained 40 miles of territory, dwarfing all previous Western Front gains (post-1914).  

Artillery bombardments were subject to a law of diminishing returns. Long bombardments could not destroy the defender. But the longer they went on, the more time the defender had to move up reserves. By World War II, commanders realized that "guns, in no matter what quantity, could only achieve so much, and that within the first few hours." Bruchmüller simply perceived and adapted to this state of affairs in World War I.

Bruchmüller showed a good deal of self-consciousness about what this paper has termed his status as an "expert". It is sometimes surprising how often the term "expert" appears in German military literature.

Let us only point out briefly that each separate field, be it ammunition or any other technical field, requires
its expert. To have such a one available at the proper time will always be one of the most important problems. The solution of a problem brought up by conditions is then most quickly and accurately insured. 75

Bruchmüller even mused upon the interrelationship between experts and history:

Experiences, which were had in great numbers in war, will soon be forgotten in the perspective of peace-time, or will be side-tracked because of their insufficient practical value, and apparently insufficient bearing on the future. Succeeding generations do not find their way by searching dust of innumerable experiences of war, and again lacking experts will follow out the paths of experiment already opened by us but unknown to them. 76
Endnotes


4 Ibid., p. 51-52.

5 Bruchmüller, German Artillery in the Breakthrough Battles, p. 6-7.


7 Bruchmüller, German Artillery in the Breakthrough Battles, p. 1-2.

8 Ibid., p. 8.

9 Ibid., p. 41.

10 Ibid.

11 Ibid., p. 6.

12 Ibid., p. 67-68. The quotation is printed exactly as it appears in the source. Evidently this was not a professional quality translation. The text contains many examples of Germanic phrasing which is awkward in English, indicating a sometimes word for word translation. Nevertheless the meaning is clear.

13 Ibid., p. 68.
Endnotes cont.

14 Ibid., p. 6.


16 Bruchmüller, German Artillery in the Breakthrough Battles, p. 1-2.

17 Middlebrook, p. 339.

18 Bruchmüller, German Artillery in the Breakthrough Battles, p. 67.

19 Ibid., p. 42-43.

20 Bruchmüller, Artillery in the Attack. See for instance p. 72-82.


22 Ibid., 14:44.

23 Bruchmüller, German Artillery In the Breakthrough Battles, p. 65.

24 Ibid., p. 24.

25 Middlebrook, p. 52.

26 Bruchmüller, German Artillery in the Breakthrough Battles, p. 77.

27 Ibid., p. 6.

28 Ibid., p. 48.
Endnotes cont.


30Bruchmüller, Artillery in the Attack, p. 88.

31Bruchmüller, German Artillery in the Breakthrough Battles, p. 1-2.

32Bruchmüller, Artillery in the Attack, p. 88.

33Ibid., p. 69.

34Ibid., p. 57.

35Bruchmüller, German Artillery in the Breakthrough Battles, p. 44.

36Ibid.

37Ibid., p. 56.

38Ibid., p. 57.

39Ibid., p. 58.

40Ibid., p. 55.

41Ibid.

42Ibid., p. 58.

43Ibid.

44Ibid., p. 55.

45Ibid., p. 43.

46Ibid., p. 46.

47Ibid., p. 44.
Endnotes cont.


49 Ibid., p. 46-47.

50 Ibid.

51 Ibid., p. 74.

52 Ibid., p. 41.

53 Ibid., p. 12.

54 Ibid.

55 Bruchmüller, Artillery in the Attack, p. 57.

56 Bruchmüller, German Artillery in the Breakthrough Battles, p. 35.

57 Bruchmüller, Artillery in the Attack, p. 57. The artillery specialist referred to was probably Bruchmüller, who certainly directed the bombardment at Riga and was previously employed in Galicia. If not Bruchmüller, it was one of his immediate subordinates.

58 Ibid., p. 75.

59 Ibid., p. 57.

60 Bruchmüller, German Artillery in the Breakthrough Battles, p. 77.

61 Ibid., p. 41-42.

62 Ludendorff, p. 206.

63 Bruchmüller, German Artillery in the Breakthrough Battles, p. 40.

64 Ibid., p. 42.

65 Ibid., p. 40.
Endnotes cont.

66 Ibid., p. 60.
67 Ibid., p. 41.
68 Ibid.


70 Bruchmüller, Artillery in the Attack, p. 57.


72 Ibid., p. 244.
73 Middlebrook, p. 309.


75 Bruchmüller, German Artillery in the Breakthrough Battles, p. 21.

76 Ibid., p. 21.
CHAPTER 4

CONCLUSIONS

The powers of command given to Lossberg and Bruchmüller did indeed accelerate tactical change. These two innovators did not merely advocate tactical changes, they ordered them. In and of themselves, these tactical changes were important and affected the course of the war. The interesting question is whether the German command system merely allowed or positively encouraged this type of tactical innovation. Conceivably Bruchmüller and Lossberg achieved their powerful positions for reasons unrelated to their tactical skills, and then implemented tactical change.

However, the evidence indicates that Bruchmüller and Lossberg rose to their positions through superior tactical skills, as recognized by General Staff officers. General Staff officers selected both for their first major assignment. Once they performed well, the General Staff utilized their talents in a systematic way. After the Battle
of Lake Narotsch, Bruchmüller did not fade back into obscurity. He went on to run artillery bombardments for other General Staff officers, all the way up to Ludendorff. Likewise both Falkenhayn and Ludendorff put Lossberg in positions where he could do the most good. The rise of Bruchmüller and Lossberg was no accident.

One could hardly overestimate the General Staff's emphasis on tactical and operational skill. Skill in the conduct of operations had brought the General Staff to prominence and continued to be its sole raison d'être. The War Ministry handled all other matters. Constitutionally, the War Minister might either follow or disregard the Chief of the General Staff's suggestions on army organization, armament, and equipment. The emphasis on operational effectiveness, however, ran through all phases of the General Staff officer's career.

As a natural consequence of this focus on operational excellence, the General Staff became a body of operational experts. Such was the goal of training and experience at the Kriegsakademie, the Grosser Generalstab, and on the Truppengeneralstab. The General Staff selected only officers of outstanding talent, and trained them rigorously
in all aspects of troop command.

As a body of operational experts, the General Staff could evaluate tactical innovations from an informed perspective. The selection of Bruchmüller from the mass of Eastern Front artillery officers becomes more understandable in this light. The elevation of such a *Landwehr* officer spoke well for the General Staff's flexibility. But operational results mattered most to the General Staff, and Bruchmüller produced them. Of course Lossberg was himself a General Staff officer.

It is easy to get carried away with the mystique and omniscience of the General Staff. It was not "a smoothly functioning system which automatically selected and promoted competence."² Far from being automatic, professional judgement played a critical role. But the General Staff did achieve its primary goal of operational competence. Some examples from the last half of World War I illustrate the point.

Throughout autumn 1917, massive British artillery bombardments followed by infantry assaults battered the Germans in the Battle of Passchaendaele. Both sides lost heavily, but Lossberg's defensive system prevented
any operational breakthrough. When the Germans attacked a few months later in March 1918, the combination of secret preparations, infiltration tactics, and Bruchmüller's hurricane bombardment produced the first operational breakthrough on the Western Front since 1914. The German General Staff's solution to the problem of creating an operational breakthrough combined two independently developed tactical innovations. The improper British application of elastic defense principles helped the Germans somewhat. The result was a tremendous embarrassment for the British army:

The German successes on 21 March mocked the results of earlier Allied efforts, when the capture of a few trenches, a few acres of ground and a couple of ruined villages had been trumpeted as major victories. The battle that started on this day would later become known, unofficially, as the Second Battle of the Somme, and it is a comparison with the results of the first battle that highlights the German success on 21 March 1918. On the Somme in 1916, the British and French had captured ninety-eight square miles of ground and forty-six villages in 140 days of hard fighting and at a cost of over a half a million casualties. This was almost exactly the same as the ground and villages just taken by the Germans in one day! Furthermore, on the night of 21 March, the British were voluntarily withdrawing from a further forty square miles of ground, containing eleven more villages, in an effort to save certain units from being encircled and overwhelmed. The new lines that would appear on maps, showing reverses which were massive by all preceding standards in that
war, were a source of great embarrassment to the British military and political war leaders and would place a great strain on relations between the two groups and also between Britain and her allies, particularly with less-enlightened Frenchmen who were disgusted at the extent to which the British had given ground.  

While the General Staff emphasized operational competence, it ignored the larger strategic and political issues of war. This attitude originated with Helmuth von Moltke, the man whose battlefield success established the power and prestige of the General Staff. Moltke did not believe political considerations should influence military decisions:

But what one does not find in Moltke, or indeed in any of his disciples or successors, is any reflection of Clausewitz's insistence on the need for military means to be subordinate to political ends. He showed no signs, either in his writings of his work as Chief of Staff, of understanding Clausewitz's requirement for war to be versatile if it were to serve the political object. For Moltke war was not so much an instrument of policy as the inevitable fate of mankind, to be stoically endured and efficiently conducted. Certainly, he accepted the supremacy of the political authority so long as it was the King himself, the War Lord whose uniform he wore and to whom he had sworn allegiance. But it did not extend to the King's political advisers, who had no business whatsoever, in Moltke's view, to meddle in matters which the King had delegated to him.

Schlieffen continued Moltke's conception of war as a strictly military matter. His famous Schlieffen Plan
calmly accepted grave political repercussions for the sake of military expediency. The invasion of Belgium branded Germany as an aggressor in the eyes of the world: "This [the Schlieffen Plan and the invasion of Belgium] was the cause which put the consciences of the Anglo-Saxon world into uniform." The Schlieffen Plan ensured that Great Britain, a great power by any standard, would enter the war against Germany. Schlieffen believed that the war would be over before Britain's seapower or army mobilization could have any effect. Besides the fact that he was wrong, the most elementary caution and strategic sense should have told him that Germany could not risk adding another great power to the list of her enemies.

Waldemar Erfuhr, a German General Staff officer who began his career before World War I, stated that "Until World War I was under way all General Staff officers regarded themselves as disciples of Moltke and Schlieffen." Erfuhrt meant this in terms of Moltke and Schlieffen's theories of battlefield command. But the General Staff as a whole also copied Moltke and Schlieffen's basic approach to war as a purely operational problem, without political or grand strategic implications. The education
of General Staff officers at the time of these two Great Chiefs "purposely left political knowledge and interest in politics out of consideration."\textsuperscript{10} When Ludendorff accepted America's entry into the war in return for the dubious prospects of victory through unrestricted submarine warfare,\textsuperscript{11} he duplicated Schlieffen's failure to perceive the basics of strategic sense. In that uncomplimentary sense he was a true disciple of Schlieffen.

An earlier General Staff officer, Carl von Clausewitz, pointed out that war and politics are inextricably linked.\textsuperscript{12} War arises from political motives, and every act of war has political consequences, like it or not. In his capacity as wartime commander of the German army, the decisions of a Chief of the General Staff inevitably had political consequences. The decisions behind the Schlieffen Plan and unrestricted submarine warfare constitute only the most obvious examples.

But the operational success of the General Staff propelled some of its members to a more overtly political role. The victory at Tannenberg was more a victory of the General Staff's operational excellence than anything else.\textsuperscript{13} But Hindenburg and Ludendorff got all the credit
in the popular imagination. Even though the Kaiser dis-
liked and distrusted Ludendorff, he had little choice
but to replace Falkenhayn with the Hindenburg-Ludendorff
team. Their personal popularity made them a major factor
in German politics. As German historian Gerhard Ritter
pointed out:

A political turn of great importance was taking
place. The authority of the Crown, and with it
the old monarchial order, were about to pale once
and for all before the gloriole that encircled
the two popular heroes of Tannenberg. The Kaiser's
freedom of action, and the Chancellor's as well,
were being circumscribed by the need to take un-
controllable popular opinion into account.15

The Kaiser hoped the aura surrounding the heroes
of the East would help his own political position. As
Center party leader Matthias Erzberger commented in 1916:

    Even the Kaiser can afford to lose the war, with
Hindenburg at the head--it would simply show that
he had done everything possible. To lose the war
without Hindenburg would mean the downfall of the
dynasty.16

Chancellor Bethmann-Hollweg thought along similar lines.17

In other words, the Kaiser's own political position
probably depended on the tacit support of Hindenburg and
Ludendorff. Ludendorff exploited this situation shameless-
ly. He and Hindenburg would threaten to resign (in this as
in most other matters Hindenburg followed Ludendorff's
lead) whenever Ludendorff wanted something done on the
domestic political front. Although such tactics ran count-
er to every tradition on the Prussian military,\textsuperscript{18} they
worked quite well:

The resignation of Tirpitz had already provoked
right-wing criticism; for William to have dismis-
sed his new commanders would have meant an out-
cry which might have cost his throne.\textsuperscript{19}

Ludendorff exploited this situation to involve him-
self and the General Staff in German domestic politics.
He justified all his interventions as necessary to the war
effort, but his own appetite for power was also evident.
This is a well known story ably covered by historians.\textsuperscript{20}

It is enough to note here that Ludendorff's policies had
important effects. He wanted nothing less than complete
mobilization of the German nation for total war:

One of his Ludendorff's most important--and
unpopular--measures was a compulsory labor law by
which every German male between the ages of 15 and
60 would be pressed into the service of the state
and an adequate number of female workers would be
compulsorily employed in munitions plants. \textsuperscript{21}

Gerhard Ritter believed such policies and Ludendorff's
insistence on victory at any price destroyed the "nation-
al unity front," which had united Germans of all classes
in support of the war. \textsuperscript{22}
Although Hindenburg was the popular hero, he was but a figurehead—even if an imposing one. Ludendorff was the military brain behind the Hindenburg-Ludendorff team. Ludendorff's political power depended on the operational expertise which made him absolutely indispensible to Hindenburg. His position was secure so long as he seemed to hold the key to victory.

Ludendorff's fall from power after the defeats of 1918 illustrated this point. Operational success had brought Ludendorff political power, but he kept it only so long as his battlefield success continued. This was not a matter of mere luck on his part. Ludendorff's performance as a commander justified his reputation. He sought out the best tacticians and put them to good use. Ludendorff's political role might have ended in the autumn of 1917, if Lossberg's defensive system had not held the powerful British Passchaendaele offensive to insignificant gains. If the March 1918 German offensive had cost as much and gained as little as the British Passchaendaele offensive, Ludendorff's threat of resignation would have ceased to shake the foundations of the Prussian monarchy. By an indirect route, changes in tactical doctrine
affected the larger history of the German nation, at least insofar as they kept Ludendorff in power a few months longer.

One cannot help but compare Ludendorff's methods in the military and political spheres. Ludendorff's General Staff training made him an expert in the fields of operations and tactics. He was able to participate in informed debate, listen to conflicting opinions, and make sound decisions. These qualities were singularly lacking when he dealt with political or even strategic questions. Ludendorff's mistakes in the political arena have been widely documented. But historians have often overlooked his supervision of highly successful innovations in German army doctrine. Yet these formed an important part of Germany's military-political situation in 1917, both for their military value and because Ludendorff's political power rested on his reputation for operational excellence. That reputation was not unfounded.
Endnotes


3 The development of infiltration tactics was the work of many men. Among the most important were Captain Andre Laffarque of the French army, Captain Geyer, Captain Rohr, and Major Max Bauer of the German army. Graem gave the definitive account of this complicated development, which took place under General Staff supervision. Geyer and Bauer were both themselves General Staff officers. See Graeme C. Wynne, If Germany Attacks (London: Faber and Faber, 1940; reprint ed., Westport: Greenwood Press, 1976), passim.


5 Ibid., p. 309.


Endnotes cont.

9 Waldemar Eruhrt, "Training and Development of German General Staff Officers," German General Staff Project, vol. 5. (Headquarters, United States Army, Europe: Historical Division, 1954), (Typewritten), p. 10.


15 Ibid.

16 Ibid., p. 133.

17 Ibid.

18 Ibid.

19 Balfour, p. 368
Endnotes cont.


22 Ritter, vol. 4, p. 121-123.

23 Ibid., p. 317-369 passim.
APPENDIX

AN OUTLINE OF BRUCHMÜLLER'S FIRE PLAN
FOR THE MARCH 21, 1918 OFFENSIVE

4:40 AM -- 5:30 AM.  Reinforced counterbattery.  Fire on
the command system.

5:30 AM -- 5:40 AM.  Surprise fire by all artillery on in-
fantry positions.

5:40 AM -- 6:40 AM  Reinforced counterbattery.  Fire on
command system.

6:40 AM -- 9:40 AM  Systematic neutralization of infantry
positions preceded by a checking of
adjustments.  Frequent raking of zones
between positions.  Corps artillery
on counterbattery.

9:40 AM  Assault preceded by a rolling barrage
on a time schedule with visual signals
to speed it up.  Rate 200 meters in
4 min.  Batteries designated to fall
out for concentrations on unexpected
resistance.  Half corps artillery on
counterbattery, half on second pos-
ition.

Source: Georg Bruchmüller, Artillery in the Attack in Pos-
tition Warfare, translated from the French version L'Artil-
lerie dan L'Offensive en Guerre de Position of Major Brunet
and Captain N. Azier by Lieutenant Maxwell D. Taylor for
the U.S. Army.  Date of Publication not supplied.  Page 72.
Some technical terms have been rendered into simpler lan-
guage.
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