The second event which relegated close order tactics to the parade deck occurred in the Austro-Prussian War in 1866. In that brief war, the Prussians first used a breech-loading rifle, the Needle Gun, on a large scale. The breech-loader's significance was that the defender could reload and fire while lying down. This development added to the advantage the rifled musket already gave to the defender. The Needle Gun's rate of fire was also greatly improved. This allowed the Prussians in the defense to spread out in an extended line, since the individual soldier could cover more frontage by fire. Austrian attacks in massed, close-order formations failed miserably.[23]

Weapons

Although invented about 1650, the rifled musket (see figure 2-6) did not become the standard infantry weapon until the mid-nineteenth century. Problems caused by rifling the barrel--difficult loading and excessive fouling when fired[24]--were overcome with the development of the Minie bullet. Unlike previous rifled bullets, the Minie bullet loaded easily because its diameter was smaller than the bore. When fired, the bullet expanded to grip the bore. This gave it a gas tight fit and allowed the rifling to impart a stabilizing spin on it as it left the barrel. The rifled musket now equaled the smooth bore's rate of fire, but was much more accurate.

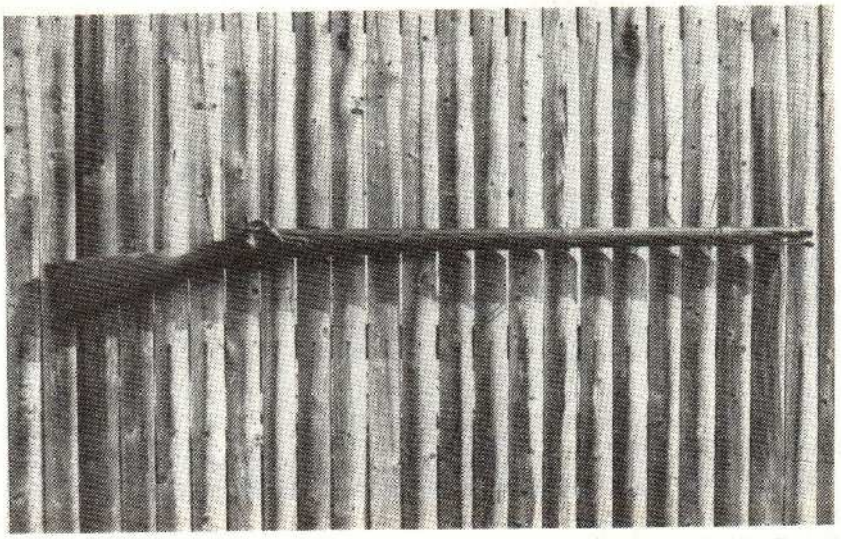

Fig 2-6. U.S. muzzle-loaded rifled musket, 1864, carried in the Civil War by Sergeant A.G. Sturgiss, Ohio Volunteers.

The second major technological breakthrough was the breech-loading rifle (see figure 2-7). In addition to the advantage of firing and reloading while laying down, the breech-loader increased the infantryman's potential rate of fire dramatically. With the advent of the magazine around 1890, a well-trained soldier could fire as many as 16 aimed shots per minute. Some breech-loaders, like the French Chassepot, fired effectively to 2000 meters.[25]

Second Generation Tactics

The transition to second generation tactics was not distinct or immediately accepted in all armies. While most acknowledged the improvement in weapons, many in the mid-nineteenth century were not convinced that they needed to abandon mass-Napoleonic close-order infantry tactics. Accordingly, two schools of thought developed to answer the increasingly difficult question of how to get the infantryman across no-man's land.

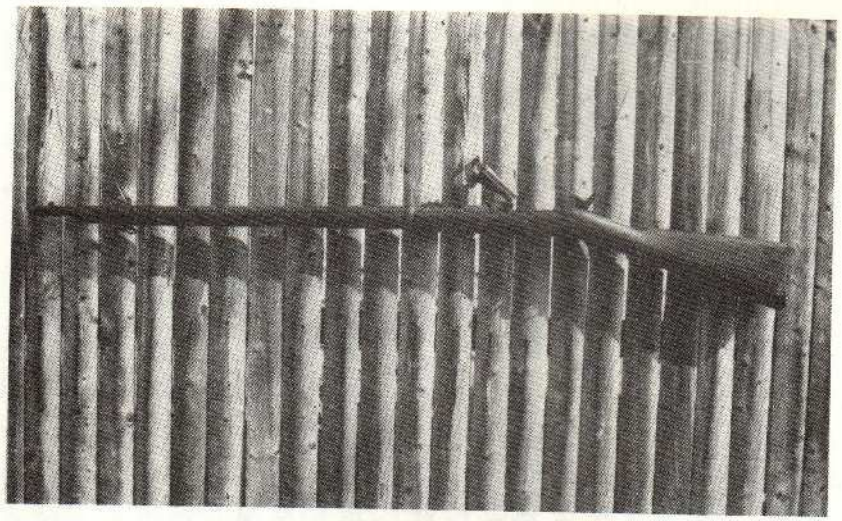

Fig 2-7. Breech-loading rifle. U.S. Model 1884.

One school championed a type of attack where long range fire was decisive. This school believed that an attacking swarm of skirmishers, dispersed and firing independently at long range, would overwhelm the defender with firepower. The long range fire fight would be followed by a rapid charge across no man's land and an assault on the positions of the demoralized enemy. The infantryman would use speed and elusiveness to get across no-man's land. These new tactics demanded intelligent soldiers of great skill, initiative, and high morale. Similar to the light infantry skirmishers of Napoleonic times, the new soldier was also an excellent marksman and athlete.

The second school took a more traditional approach. Although acknowledging the increased lethality of weapons, the tradionalist school felt that the loss of control inherent in skirmisher tactics would prove disastrous in combat. Soldiers attacking in open order, they believed, would be overcome by fear and shirk their duty. Initiative and independence were not valuable; on the contrary, both were bad for cohesion and morale. The traditionalists favored the mass, close-order attack, culminating in a quick volley and bayonet charge. They believed that the effects of the new weapons would be overcome by units attacking rapidly in close-ordered company columns. The key to maintaining the momentum of the attack was to keep the morale of the men high. Pausing to fire at long range was both demoralizing and indecisive.[26]

Since Europe remained peaceful from the Franco-Prussian War in 1870 to the Beginning of World War I, the debate between the two schools of thought was inconclusive. The tactics that evolved during this time were based on open-order or extended linear formations, called **skirmisher tactics** or the **tactics of fire and movement.**

In the attack, the unit spread out in an extended linear formation of three lines: the skirmisher, support, and reserve lines (see figure 2-8). The skirmisher line advanced in a series of alternating rushes. Part of the line rushed forward 50-100 meters, went to ground, and took cover. By fire, that unit then supported the rush of an adjacent unit. The skirmisher line continued forward in this manner until it gained fire superiority and reached the point where it could assault the enemy with a bayonet charge. The support line trailed the skirmisher line and fed it with replacements to maintain the attack's momentum. The reserve line trailed both the skirmisher and support lines and provided small columns of reserves to the support line. Success depended upon breaking down the enemy's resistance by the weight and direction of fire.[27]

The defense was based on a strongly-entrenched firing line, support line, and reserves. A battalion typically deployed half of its force equally divided between the firing and support lines, one man per meter, and kept the other half in reserve. In case of attack, the support line joined the firing line while the reserve functioned solely as a counterattack force.[28]

In practice, the attack by fire and movement often failed miserably. At St. Prevat in the Franco-Prussian War of 1870, one Prussian open-order attack against French armed with the Chassepot rifle failed while causing 8,000 Prussian casualties within an hour.[29] At Pleyvna in 1877, a Russian attack on an entrenched Turkish garrison also failed due to withering fire from Turkish soldiers recently armed with breech-loading rifles. Reaction to such engagements was mixed. Citing poor morale or

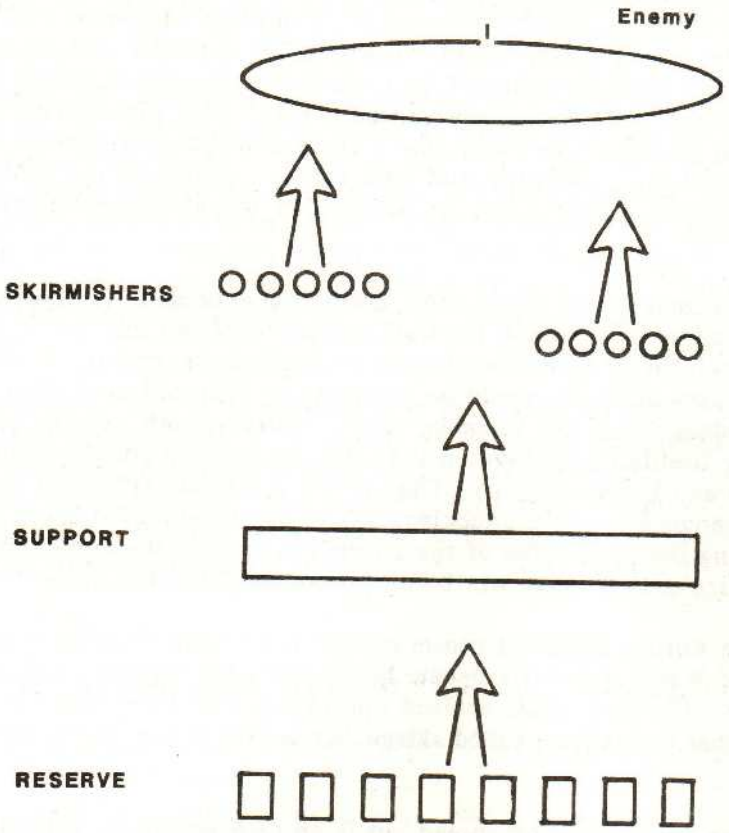

Fig 2-8. Second generation infantry attack.

a lack of supporting arms coordination by the attackers, some dismissed the results. Others, struck by the effective fire of the new weapons, believed that frontal attacks were obsolete, and that the only alternatives were flanking attacks or encirclements.[30]

However, these tactics sometimes worked. At Le Bourget in the Franco-Prussian War, two battalions of a Prussian regiment attacked in open order against a village which the French defended. The attackers advanced, by fire and movement, over 2000 meters of open ground with no apparent casualties.[31] In a later, highly-publicized example, a Japanese brigade successfully charged 600 meters across open ground against a Russian position in the Russo-Japanese War of 1904-05. Although bad Russian marksmanship and poor artillery coordination helped the Japanese, many used examples like this to maintain that the frontal attack was still viable.[32]

The fact is that open-order tactics of fire and movement were sometimes appropriate in mobile warfare, if the defender was caught unprepared and could not coordinate fire effectively. In that case, a bold attack often succeeded. However, in World War I, trench warfare on the Western Front proved that linear frontal attacks against prepared defenses did not work. The prewar emphasis on morale and maintaining order were not the answers to the problem of crossing no-man's land.

You should draw two important lessons from this study of Second Generation tactics:

First, tactics became less centralized during this time. In Napoleonic times, the smallest unit capable of independent maneuver was the battalion. It moved and deployed at the direction of one man: its commander. As units began to spread out, however, the battalion commander could not maintain control over his entire unit. By the late 19th century, the **company** was regarded as the smallest unit capable of independent maneuver. This is why the Austro-Prussian War is sometimes referred to as the "Captain's War."[33] The result of decentralized tactics was **decentralized command**; company and platoon commanders began making tactical decisions that only the battalion commander made previously.

Second, light infantry skills became much more significant during this time. The close-order automation did not succeed against the rifled musket and breech-loading rifle. Important qualities of Napoleonic infantrymen--obedience to orders and drill--were less important 100 years later. Although the tactics were still linear, the new infantryman had to be agile and imbued with Ardent du Picq's *inner leadership*.[34] The new tactics used to cross no-man's land demanded soldiers of high morale who could act independently.

IV. Third Generation: Defense in Depth and Infiltration Tactics

When the European Powers went to war in 1914, few anticipated that second generation tactics would soon be obsolete. Although quick-firing artillery and machineguns (see figures 2-9 and 2-10) proved devastating to open-order tactics in the 1905 Russo-Japanese War, the lesson was largely ignored in Europe. As World War I began, these weapons confirmed what some suspected: skirmisher tactics did not work in frontal attacks against prepared positions. Firepower dominated the battlefield.

In this section, you will study the development of tactics by the German Army during World War I. German infantry tactics in 1914 were no better than those of the Allies; most German infantry units used open-order tactics, while some still attacked in close order formations that resembled Napoleonic drill tactics of a hundred years earlier. Open-order tactics often succeeded while the war on the Western Front was one of movement. However, when the front stabilized in late 1914, skirmisher attacks became inappropriate. The Germans began to look immediately for a tactical solution to combat experience on the Western Front; innovative contributions also came from both the Eastern and Italian fronts, where mobile warfare was more common (the Italian Front was generally static, until the German offensive at Caporetto in 1917 restored mobile warfare). This effort resulted in new doctrines for the defense in 1917 and the offense in 1918.

The transformation of German tactics in 1917 and 1918 was remarkable. The Germans replaced linear attacks over wide frontages with deep penetrations by units infiltrating on narrow fronts. In the defense, the static, linear succession of trench lines was replaced with a mobile defense in depth that allowed the attacker to penetrate before destroying him with a swift counterattack. Major new developments in fire support occurred. The infantry squad developed significantly. Although only an

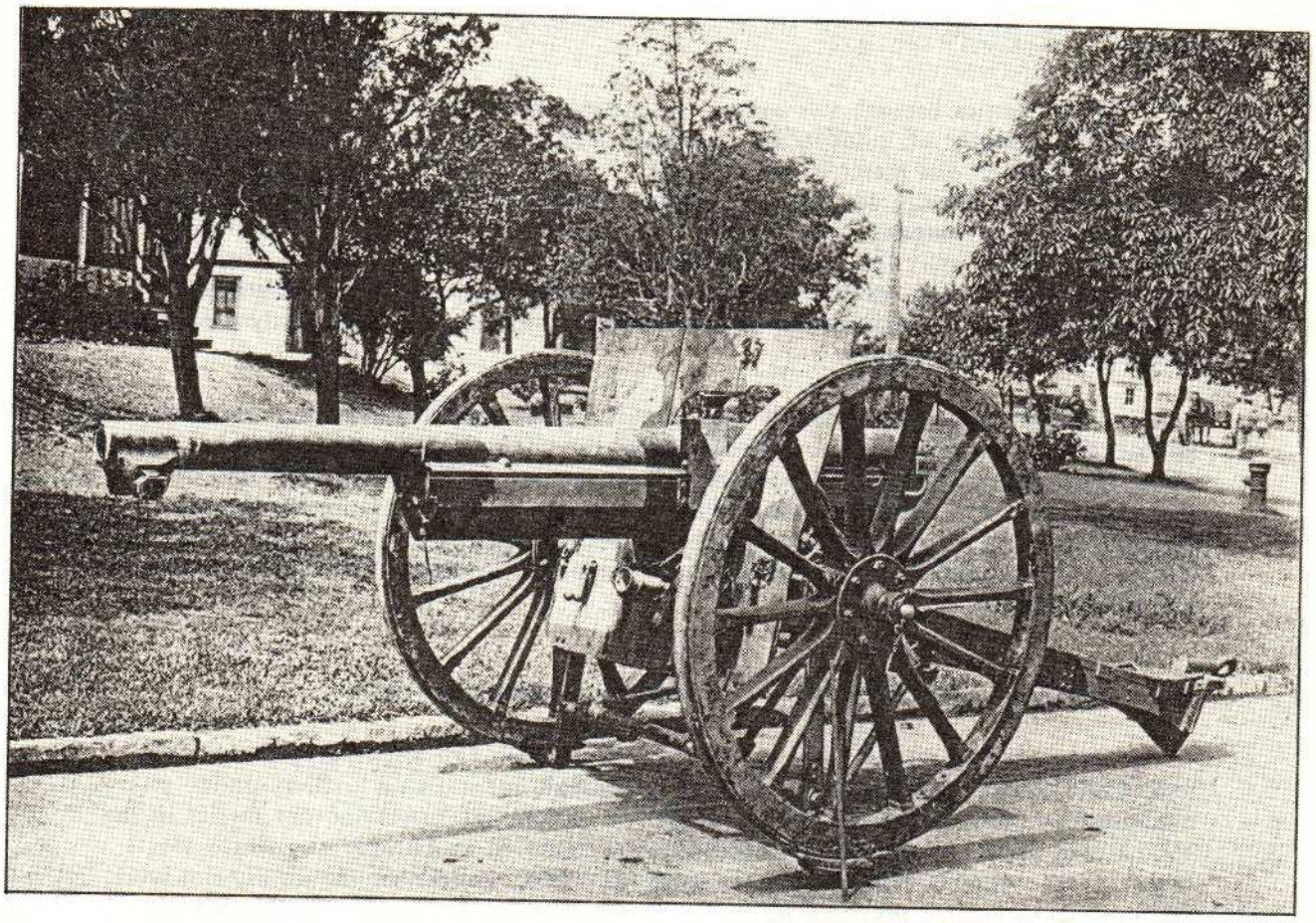

Fig 2-9. Quick firing gun. U.S. 75mm Gun, Model 1897.

administrative subunit of the platoon in 1914, by 1918, it was a tactical entity in its own right. Squad and fire team leaders were making tacical decisions and employing combined arms.

World War I: The Beginning

On the eve of World War I, many debates on appropriate tactics for the new weapons were not settled. Issues included whether firepower or the bayonet charge was decisive; whether close, personal control, or less control and more individual initiative were needed; and whether the more effective way for a unit to fire was by volley or by individuals firing at will. Persuasive arguments favored both sides. Some lessons were learned from both the Anglo-Boer War of 1899-1902 and the Russo-Japanese War of 1905. After seeing the success of Boer skirmisher tactics against British close-order linear tactics, many Germans felt the attack should proceed in widely-dispersed skirmish lines, each rifleman moving forward individually from one covered position to another. This conclusion was reinforced in the Russo-Japanese War when the Japanese, responding to heavy losses while attacking closed-ordered in early battles, tended to spread out more as the war progressed. Others, however, noted the success of some Japanese close-order attacks in Manchuria as a vindication of attacking

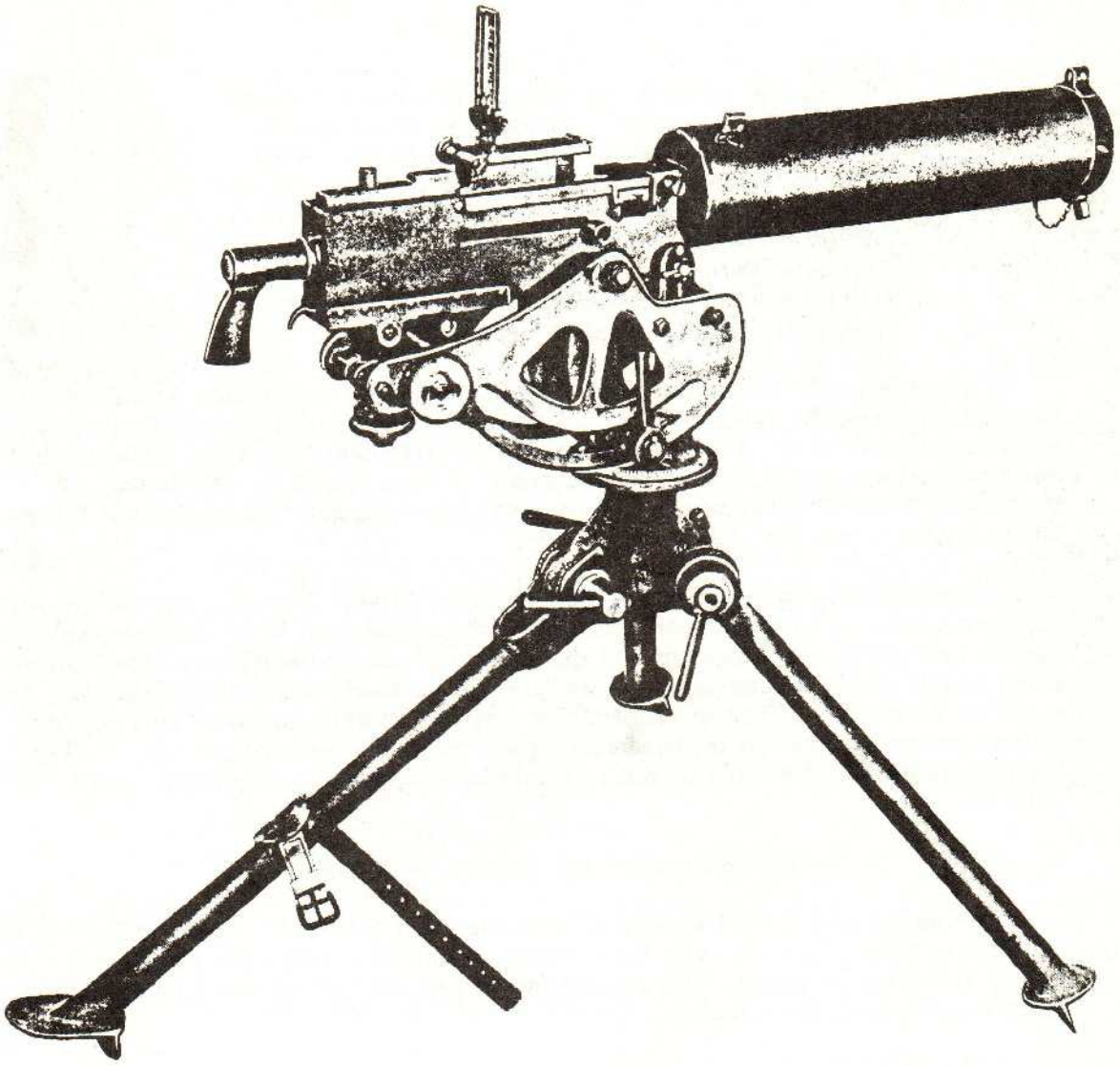

Fig 2-10. World War I machinegun. U.S. .30 Caliber, Browning, M1917 A1.

in close-order columns of platoons. Some disagreement resulted in a lack of consensus in infantry tactics in both the *1906 Drill Regulations* and in practice, when the German Army marched off to war in 1914.[35]

The first two months of the war on the Western Front were a war of movement. German strategy was based on the Schlieffen Plan: a rapid attack through Belgium and northern France to encircle and destroy the French Army. Initially, the plan worked well, and the Germans advanced rapidly through weak, unprepared French positions. In this phase of the war, skirmisher-type attacks often worked well. In his book, *Attacks*, Erwin Rommel describes one such attack:

We rushed forward by groups, each being mutually supported by the other, a maneuver we had practiced frequently during peacetime. ...Thanks to poor enemy marksmanship, we had suffered no casualties up to this time. With fixed bayonets we worked our way up to the rise and to within storming distance of the hostile position. During this movement, the enemy's fire did not trouble us... we assaulted his position but, except for a few dead, found it deserted.[36]

However, not all German infantry units attacked in open order. At the First Battle of Ypres in November of 1914, one division of the German Guards Corps attacked in close-order miserably, and one regiment lost 15 officers and 500 men, while another lost 8 officers and 800 men. Most of the casualties were caused by well-aimed rifle fire, machine gun fire, and artillery. Like many other German attacks, this one failed due to outdated tactics.[37]

By December of 1914, the German offensive halted. The Germans and the Allies faced each other across a series of trench lines which continued unbroken from the English Channel to the Swiss Alps. At this point, the war on the Western Front entered a new phase: one of positional trench warfare. As each side dug deep trenches to avoid the devastating effects of artillery fire, one fact became apparent: Offensive tactics appropriate in a war of movement were obsolete in positional warfare. New tactics were needed if either side was to break the stalemate and regain the initiative.

Development of the Defense in Depth

From the end of 1914 until early 1916, Germany followed a defensive strategy on the Western Front. In early 1916, the Germans attempted to knock the French out of the war by attacking at Verdun. This attempt failed, and the German Army on the Western Front went back on the defensive.

Tactically, the Germans were ill-prepared for trench warfare; their prewar training stressed offensive action in mobile warfare. Prewar German defensive doctrine called for a series of trench lines with the front line, at one man per meter, having the greatest density of soldiers. Holding this trench line became the primary objective: If the enemy managed to seize part of it, the line was retaken by counterattack. Since many German commanders believed that it was bad for morale and propaganda purposes to loose terrain, the principle in the defense was "Hold on to whatever can be held."[38] These tactics usually worked. Most Allied attacks were repulsed with heavy casualties, even if they managed to get through the front series of trench lines.

In the summer of 1916, the British undertook a large scale offensive near the Somme. More than four million artillery rounds were fired in the eight day preliminary bombardment. This bombardment killed or wounded many Germans, but enough survived to extremely high. However, though the British attack failed, the German High Command responded with alarm to their own high casualties. Germany was losing a war of attrition; she lacked the industry, resources, and manpower to respond equally to

massive Allied bombardments. Unless the German Army could break the stalemate or reduce casualties, Germany would lose the war.[39]

In response to the Somme offensive. The German High Command published a document titled. *The Principles of command in the Defensive Battle in Position Warfare* (hereafter called *Principles).* This document provided general guidance for the conduct of the defense and became the German defensive doctrine for the rest of the war. Rather than hold the front line at all cost, the new doctrine had the defender deploy in depth to preserve his strength. The objective of the defense was to destroy the enemy, not hold terrain arbitrarily. To accomplish this, four principles were presented:

- *The defender must not surrender the initiative to the attacker.*
- *The defense must rely on firepower, not large numbers of troops.*
- *The defender must not hold ground at all costs.*
- *The defender must consider depth for all construction and positions.*[40]

Under the new doctrine, the forward positions on which Allied firepower was concentrated were sparsely held. The main German positions were well to the rear, often on reverse slopes where the Allies could not bring accurate artillery fire on them. As the Allied attack progressed, it extended beyond its fire support. As it got into the heart of the German defense, it became increasingly disorganized. When the advance halted, the Germans launched a strong counterattack that either destroyed the attacker or drove him back to where he started. Ideally, the counterattack occurred on terrain that was familiar to the defender but unfamiliar to the attacker and out of view of his artillery observers.[41]

The most controversial principle was the one not requiring the defender to hold ground at all costs. This principle implied an elastic defense that allowed the enemy to penetrate forward positions. Front line forces did not have to hold their positions; they could withdraw as the situation dictated. This sparked opposition from conservative-minded officers, who maintained that no invitation to "walk right in" should ever be offered to the enemy. However, the new defensive tactics proved extremely effective when put into practice. Most officers who criticized the principle later came to support it.[42]

While *Principles* provided basic tactical concepts for defense, *The Principles of Field Construction* (hereafter called *Construction*) provided specific regulations for constructing defensive positions. The new defensive doctrine called for three successive zones: the outpost, battle, and rearward zones (see figure 2-11). The purpose of the **outpost zone** was to provide warning of major attacks and disrupt them. It consisted of a checker board pattern of mutually supporting strongpoints, or "nests of resistance." The rear boundary of the outpost zone was the main line of resistance--a series of three trench lines usually sited on a reverse slope. The **battle zone** extended back about 1500-3000 meters from the main line of resistance to another series of trench lines called the artillery protective line. Behind this trench system was the **rearward zone** where artillery units and higher headquarters were located.

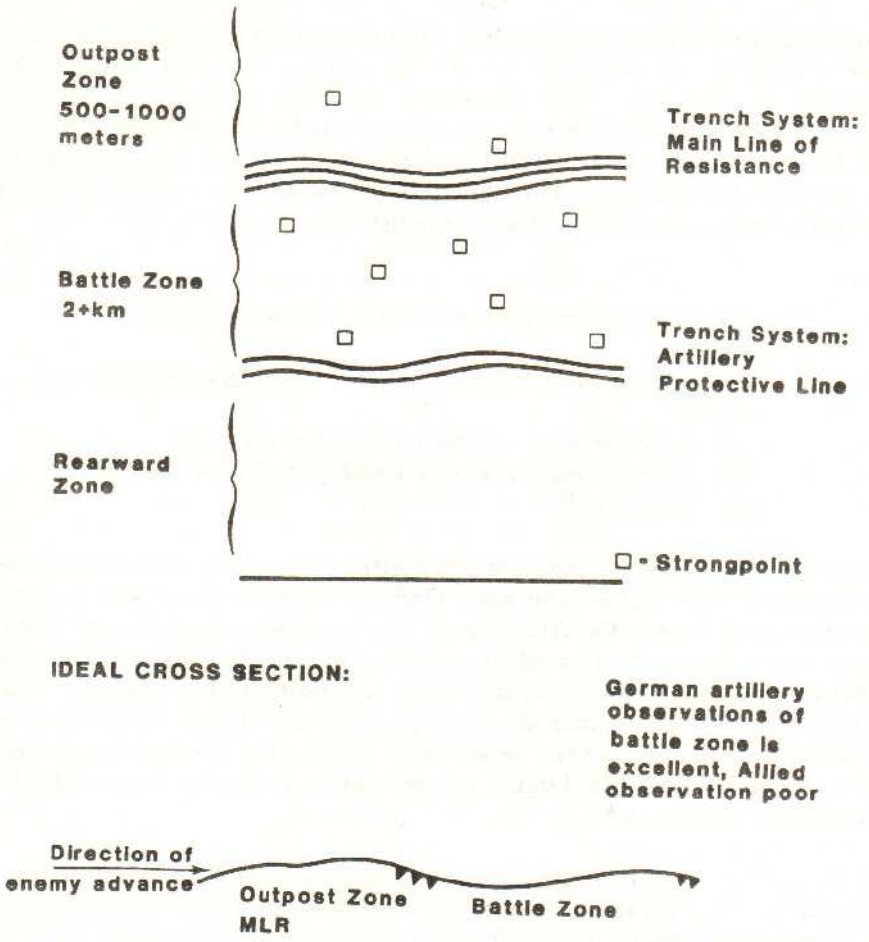

Fig 2-11. German 1917 defense in depth.

Normally, a division defended its sector with three regiments abreast. Each regiment positioned its battalions in depth: the first occupying the outpost zone and main line of resistance, the second deployed in the battle zone, and the third in reserve. Commanders in each zone designated counterattack forces: In the outpost zone, local commanders designated counterattack squads; in the battle zone, companies were designated to counterattack; and the rear battalion was designated part of the division's counterattack force in the rear zone. Additionally, a front line division might have an entire division deployed behind it as an army level counterattack force.

The key to success in this defense was a **timely counterattack.** The counterattack had to occur before the attacker consolidated his position and reorganized his forces. This required speed and independent action on the part of the defenders on the scene. To speed the counterattack and streamline command and control, forces counterattacking in a particular zone came under control of the senior commander occupying that zone. For example, if a reserve regiment were committed to a counterattack, it came under

direct control of the commander of the battalion occupying that zone. This ensured that orders were passed and executed quickly, and that a unity of effort resulted from unity of command. Commanders did not need to wait for permission from higher headquarters to counterattack; they were required to use initiative and act aggressively.

The location of the main line of resistance was also important. Ideally, it was sited on a reverse slope, terrain permitting. If so, the reverse slope defense conveyed several advantages to the defender. It offered protection from the enemy's artillery, which could devastate forward slope positions. It also concealed defending troops from observation, which denied the attacker knowledge of the defender's exact location. Finally, it allowed his machineguns to suddenly open fire at short range, which was more successful at stopping attacks than protracted, long-range fire.[43]

The idea scenario was this: An attacking enemy force encounters flanking machine-gun fire from a number of squad-size strongpoints in the outpost zone. Additionally, small, mobile units, shifting from shell hole to shell hole to avoid artillery fire, counterattack to further disrupt and delay the attackers. As the attackers approach the main line of resistance, they suddenly come under surprise machinegun fire that separates them from their creeping barrage. Although the attackers might seize the main line of resistance, they come under increasing fire from strongpoints located in the battle zone, and from artillery. As the attack runs out of momentum, it is hit by a well-organized counterattack in the battle zone, the heart of the German defense. The counterattack either cuts off and encircles or expels the Allied attackers before they consolidate their gains.[44]

Throughout 1917, the French and British launched several major offensives. In each, casualties were high while they failed to achieve a breakthrough. The new German defensive doctrine worked well. It allowed the Germans to remain on the defensive in the West while conserving forces for a spring offensive in 1918.

The new German defensive doctrine was soundly based on the idea that as the attack proceeded, it became weaker while the defense got stronger. Rather than engage the attackers decisively in the front trench line where the Allies concentrated artillery fire, the Germans allowed the Allies to penetrate so they could decisively engage them farther back where Allied artillery had less of an effect. The objective in the defense was to **restore its cohesion** not simply hold or recover terrain.[45]

Development of the Infiltration Attack

Trench warfare's unique nature gave the defender a clear advantage. Front line troops dug deep, reinforced trenches and dugouts to protect themselves from heavy artillery bombardments. Machineguns were positioned to provide flanking fire across the front. Barbed wire was laid, and artillery observers sited on commanding terrain to adjust fire on the enemy. No man's land became more dangerous than ever before: If the attacker made it across open terrain swept by machinegun and registered artillery fire, he faced an assault against enemy soldiers in fortified positions and protected by rows or barbed wire. Under these conditions, frontal attacks were costly and seldom successful.

To test new ideas and develop new tactics to overcome the advantages of the defender, the Germans created an experimental assault detachment. This detachment was provided with machineguns, mortars, flamethrowers, and light weight artillery and garrisoned in a rear training area. In August of 1915, Captain Willie Rohr assumed command of the unit.

The Rohr Detachment, building on lessons learned by front line units, developed a new method for assault. Small, independently-acting assault squads, support by suppressive fire from machineguns, flamethrowers, mortars, and artillery, used terrain to work their way forward and into the enemy trench line. Upon entering the trench line, the assault squads cleared them using hand grenades. Then, follow-on infantrymen entered the trenches and consolidated the gains. On 12 October 1915, the 2d Pioneer Company of Rohr's Detachment used this method in a limited attack on a French position. As six large flamethrowers opened fire on the forward trench line, assault squads followed the burning oil into the trench and began clearing designated sections with hand grenades. German mortars and artillery suppressed French artillery and machineguns firing on the squads. After clearing the trench, the assault troops, aided by follow-on infantry, sealed off the breech from the rest of the French position. The attack was successful.

Rohr solved the problem of getting across no-man's land. Through experience, he discovered that small columns of specially-trained assault troops, using speed and terrain for cover, could cross no man's land and penetrate the enemy trench line at several points. Then, trench lines were rolled up using hand grenades. The chief purpose of supporting arms became **suppression** not **destruction**. Also, supporting arms coordination was done at a much lower level--company and battalion--than before. Most importantly, Rohr's new tactics changed the NCO's role in battle. Previously, the NCO enforced discipline and kept the firing line in order and moving forward. In the new tactics, the NCO became a leader and tactical decision maker.[46]

Rohr's methods were immediately recognized as a superior means for attacking fortified positions. On 1 April 1916, the assault detachment expanded and was officially designated Assault Battalion Rohr. Several light infantry battalions converted to assault battalions on the model of Captain Rohr's unit. Officers and NCOs from units on both the Eastern and Western Fronts received training from Rohr's storm troopers and went back to train their own soldiers in storm trooper tactics. Later that year, General Erich Ludendorff ordered the formation of an assault battalion in each army on the Western Front. Ludendorff saw the value of storm trooper tactics and planned to have every infantryman on the Western Front trained as a storm trooper. He felt that better tactics were the key to breaking the stalemate ad restoring movement on the Western Front.[47]

By late 1917, conditions appeared favorable for a German offensive the following spring. On the Eastern Front, German success and the Russian Revolution allowed the High Command to transfer divisions to the West. Throughout 1917, major offensives by the Allies on the Western Front failed miserably. Most significantly, the United States declared war on Germany in 1917 and began assembling an expeditionary force for combat in Europe. German's leaders believed it would take a year for the United States to exert decisive influence on operations in the West. Therefore, a decisive attack by Germany in early 1918 was deemed imperative.[48]