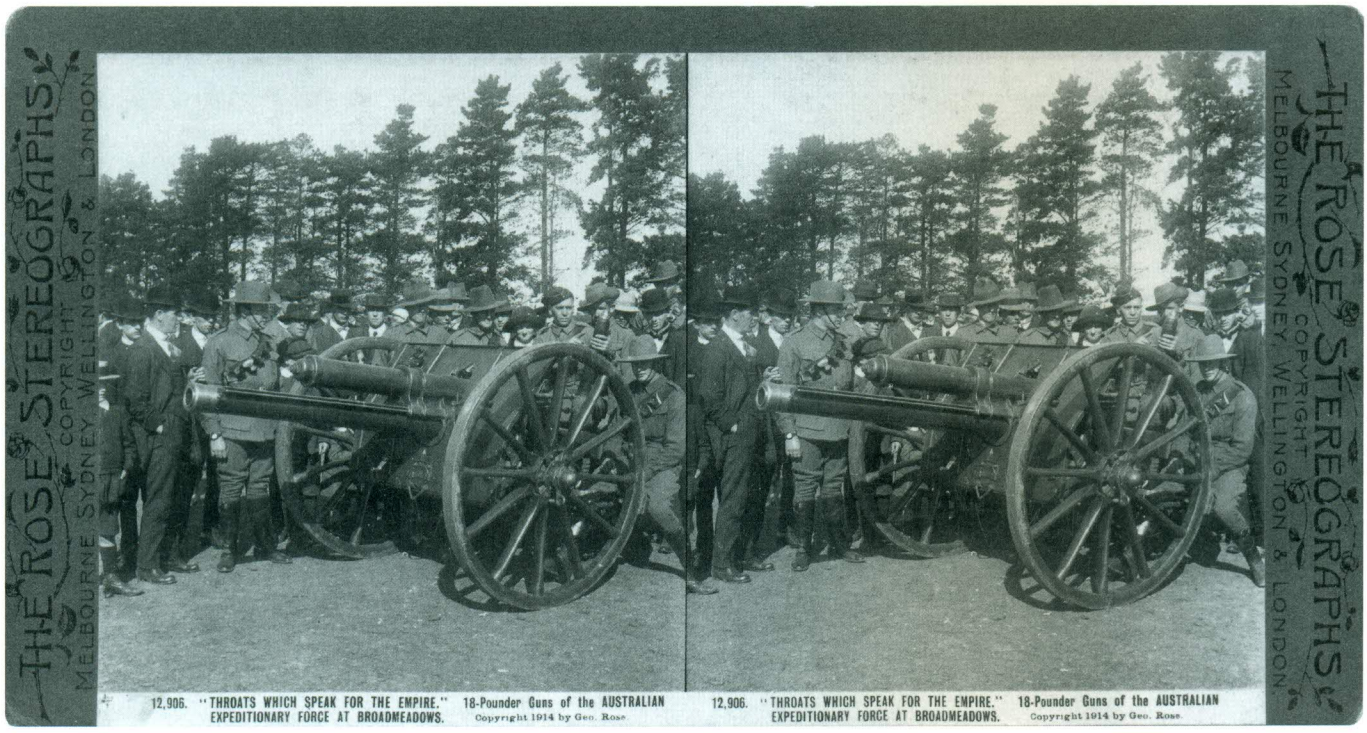
Ultima Ratio Regis;
The Last Resort of Kings
Artillery 1914-1918

by Ralph Reiley

Artillery is defined as any artificial means to propel a projectile to harm or kill. It has been with us since the dawn of history. The bow and the sling were the earliest form of artillery. Siege engines, the artillery of potential energy, hurled stones or javelin bolts for centuries. At the start of the 13th century gun powder had made its way to Europe. By the end of the 14th century, gun powder artillery had replaced traditional siege engines. During the 15th century, guns began to be highly decorated. Some decoration on guns persisted up the start of the 20th century. From the 16th Century to the early 20th Century, it was not uncommon for the kings of France, Spain, Prussia, Bavaria and Württemberg to have the Latin phrase *Ultima Ratio Regis*, The Last Resort of Kings, cast into the barrels of their artillery as an ironic comment on the failure of diplomacy to achieve the desired result.

The First World War is remembered as a long and bloody struggle fought in the trenches. However those who commanded the armies of 1914 envisioned sweeping the enemy from the battlefield with grand maneuvers in the style of Julius Caesar or Napoleon. They were confounded that the war they envisioned eluded them, and became an extended siege. Sweeping the enemy from the field as a sign of victory was replaced by measuring yards of front line gained or sustaining fewer casualties than the enemy.

George Rose No. 12,906, "Throats Which Speak for the Empire, 18-Pounder Guns of the Australian Expeditionary Force in Broadmeadows." The standard British Ordinance Factory Quick Firing 18 Pounder gun, designed in 1904, was based on recent experience during the Boer War. This was the mainstay of the British field artillery in WW1, and the forerunner of the 25 pounder of WW2. Rose sold a small number of WW1 related views, and they are highly sought after today. (Collection of Robert Boyd)



The causes of the stalemate were the modern weapons in use, and the antiquated military doctrine stubbornly adhered to by those in command. The bolt-action rifle, the machine gun, and breach loading artillery brought an end of the era when men could be maneuvered on the open battlefield like pieces on a chess board.

From its introduction in the late 15th Century to 1800, the effective range of the smooth bore musket was 100 to 150 yards, and accuracy was poor. Soldiers had to stand shoulder to shoulder, and fire in volleys for their musket fire to be effective. After 1870, the bolt-action rifle became standard, and by 1914, five to ten round magazines had been added to them. Men were still trained to fight in closely packed ranks but the effective range had been extended to 1000 yards and the rate of fire and accuracy had been greatly increased.

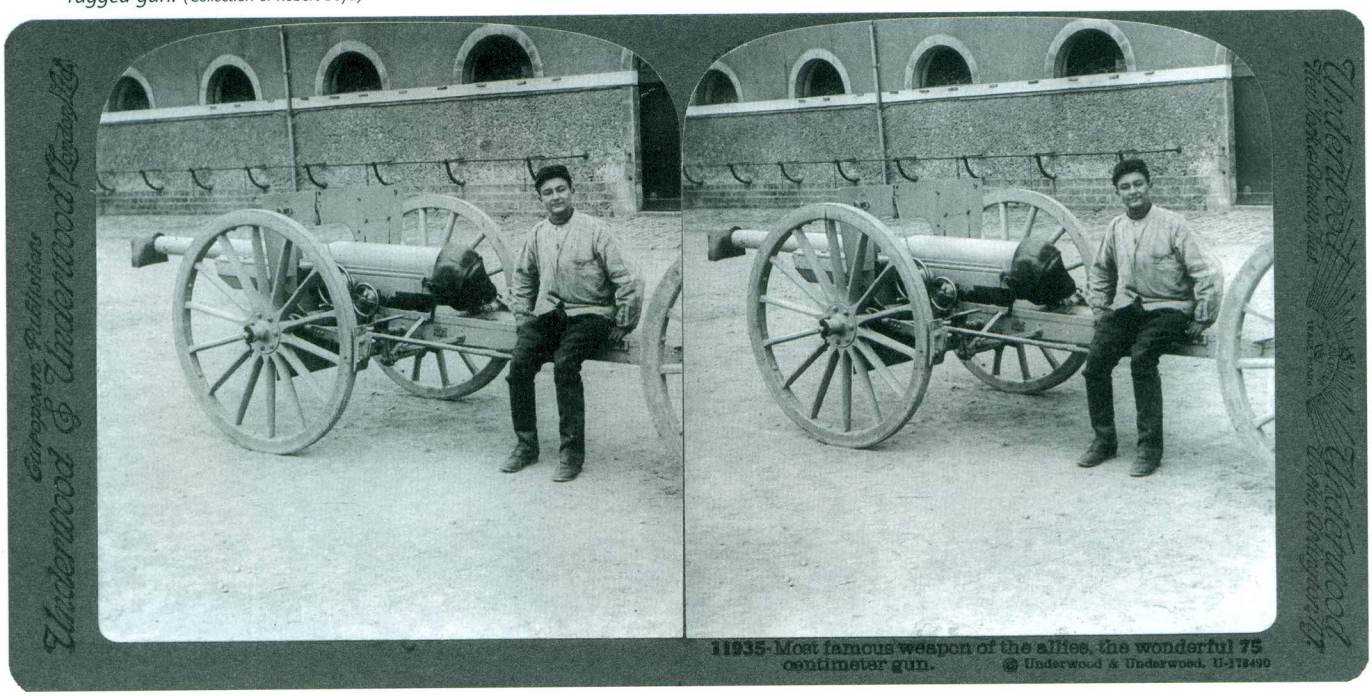
Artillery had also undergone improvements over the years. From the 15th Century up to 1840, the range for artillery had always been greater than the musket, but limited to about 1500 yards. After 1840, developments in artillery increased the range, rate of fire and effectiveness of shells. In the 1880s the machine gun was perfected. Machine guns fired rifle ammunition, but they were considered to be small artillery pieces. From its inception, artillery has been a dominating factor in war, but in World War One, it became the overriding factor in winning or losing a battle.

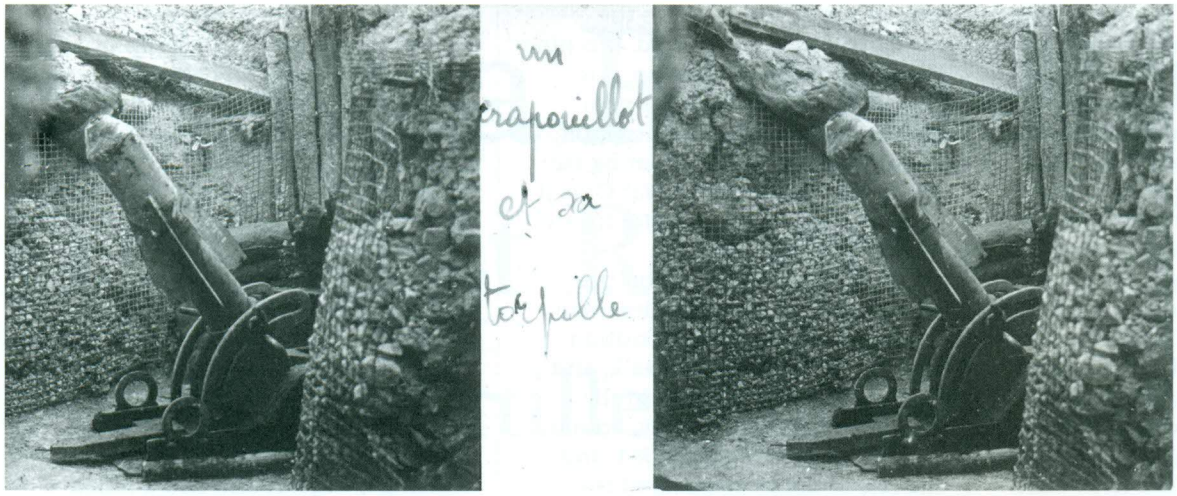
The recoil of large cannon had been a problem for centuries. Manhandling guns back into position after recoil was a difficult task, and kept their rate of fire low. In the middle of the 19th century, breach loading guns were developed, and the rate of fire increased, but the recoil problem remained. At the end of the 19th century, guns were developed that allowed the barrel to recoil while the carriage remained in place. In 1897, the French developed a hydro-pneumatic recoil system. This allowed for smooth and efficient recoil, and a very high rate of fire for a field gun—15 rounds a minute. In the hands of a well trained crew, 30 rounds a minute could be sustained for short periods. In 1914, this would prove to be a devastatingly effective weapon against armies advancing across open fields in closely packed ranks.

Artillery is divided into two types, cannons/guns and howitzers/mortars. A cannon, or gun, fires at a low trajectory of less than 45 degrees and the shell hits the target head-on at a shallow angle. A howitzer, or mortar, fires at a high trajectory of greater than 45 degrees, and the shell lands on top of the target. In 1914 there were two basic artillery shells; high explosive that burst on impact, or with a short delay, and shrapnel, named after its inventor Major General Henry Shrapnel, 1761-1842, a British artillery officer. His shell was filled with lead bullets, with a small bursting charge. It also had a timed fuse so that it burst in the air over the heads of the enemy, showering them with lead bullets. Shrapnel shells are no longer used, but the term shrapnel now refers to all fragments and splinters from a high explosive shell.

Prior to 1914, the last major European war had been the Franco-Prussian war in 1870. There were early examples of quick firing artillery and crude machine guns in use, but they were not crucial to the war's outcome. The European wars of the 19th century were short and decisive. Battles were over in a day, and it was very clear who was the victor and who was the vanquished. The Europeans believed that war in the early 20th century would continue to be short and decisive, despite the long drawn out sieges of the Boer War and at Port Arthur during the Russo-

Underwood & Underwood No. 11935, "Most famous weapon of the Allies, the wonderful 75 centimeter gun." Keystone also sold this view after 1921, but not in standard sets of war views. Underwood's title has the size completely wrong. It's actually a 75mm gun, not 75 centimeter. It had a standard rate of fire of 15 rounds a minute, although a well trained crew could fire 30 rounds a minute for short periods. This was probably the best field artillery piece of the war. Despite its simple and frail looking appearance, it was a very rugged gun. (Collection of Robert Boyd)





"Un crapouillot et sa torpille." (A Toad and a torpedo.) The French called this style of trench mortar a Crapaud, or Toad, for the way they hopped in recoil. A rod was welded to the base of the mortar bomb and fit down into the barrel of the mortar. The fins insured that the bomb landed nose first. Trench mortars were greatly feared and respected by both sides, as they delivered a very large amount of explosive. The nature of trench war created the need for the infantry to have their own artillery close at hand, and trench mortars and infantry guns were developed.
(Collection of Robert Boyd)

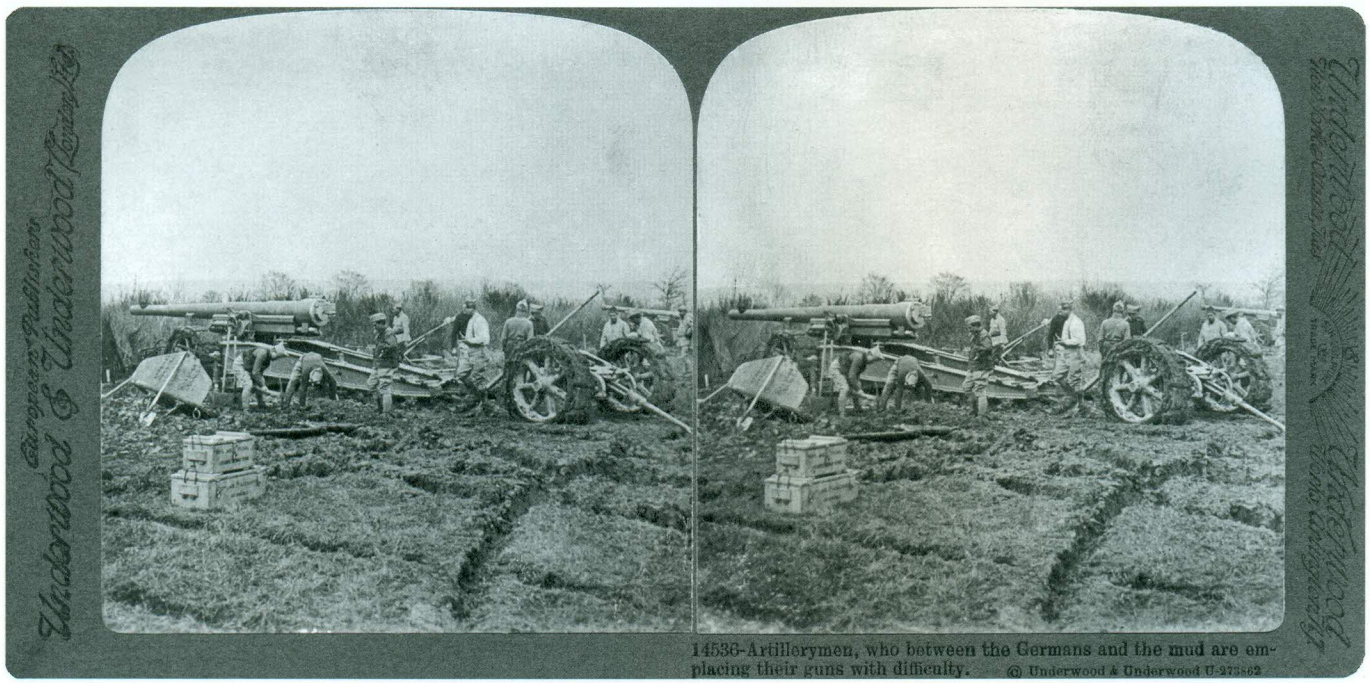
Japanese War in 1905. They were all convinced that their nation was superior to all others, and their army would win the day, as God favored them over all others.

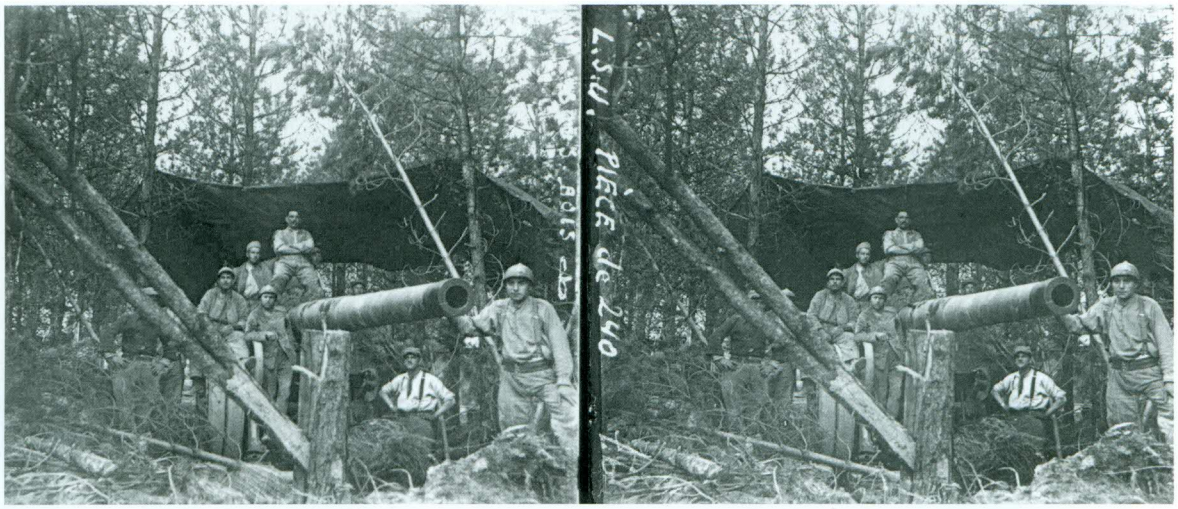
The 75mm, 3", quick firing field gun had become the standard for field artillery. The Germans had their Krupp 77mm FK96, the British the Royal Ordinance Factory Mk I 18 Pounder, and the French had the amazing Canon de 75 model 1897. The "French 75" was such a popular gun it had a cocktail named after it. Quick firing field guns firing shrapnel shells were devastating for armies advancing over open ground. The Germans and the British had learned a few lessons from the Boer War and the Russo-Japanese War, and had integrated some howitzers and heavy guns into their field artillery units, but still relied heavily on the 3" field gun. The French army had no heavy guns or howitzers in their field artillery at the outbreak of war in 1914, although they had a large reserve of obsolete guns in storage.

The new artillery was organized to be highly mobile so it could be quickly moved into place and brought into action. Guns had steel shields on them to protect the gunners from rifle fire, as they expected enemy infantry to be within rifle range. As the war of movement ended, the static nature of the trench war made the mobility of field artillery of less value than the rate of fire or range of the gun.

The war was supposed to be quick and decisive; artillery and the machine gun were intended to make battles more so. In fact they had the opposite effect. Men advancing across a field could not withstand such firepower. At some point the enemy would refuse to advance into withering fire and be annihilated. They would go to ground. Once the enemy had gone to ground and dug in, the machine gun was useless in killing them, but very useful in keeping them pinned down. Artillery was

Underwood & Underwood No. 14536, "Artillerymen, who between the Germans and the mud are emplacing their gun with difficulty." The view is also found in Keystone war views after 1921. This is the French Canon de 155 Grande Puissance Filloux, a 155mm, 6" gun. It began to be used in 1917 by the French and the USA. It had a split tail, a very advanced idea in WW1. The split tail made the gun very steady while it was being fired. It remained in use with the French until WW2 and in the USA until 1942, when it was replaced by a more up to date version, the M1A1, also known as the Long Tom.





"Pièce de 240 sous bois" (240mm Gun in the woods.) A French glass photo by LSU. This is a 240mm, 9.5" gun of naval origin on a stationary mount, under some trees and with a tent for some camouflage. Simple camouflage such as this created the need for aerial 3-D photographs, which were taken by a single camera with timed shots. The speed and altitude of the aircraft determined the time between shots for a proper stereo pair of aerial surveillance photos. This method is still in use by aircraft and satellite surveillance. *(Collection of Robert Boyd)*

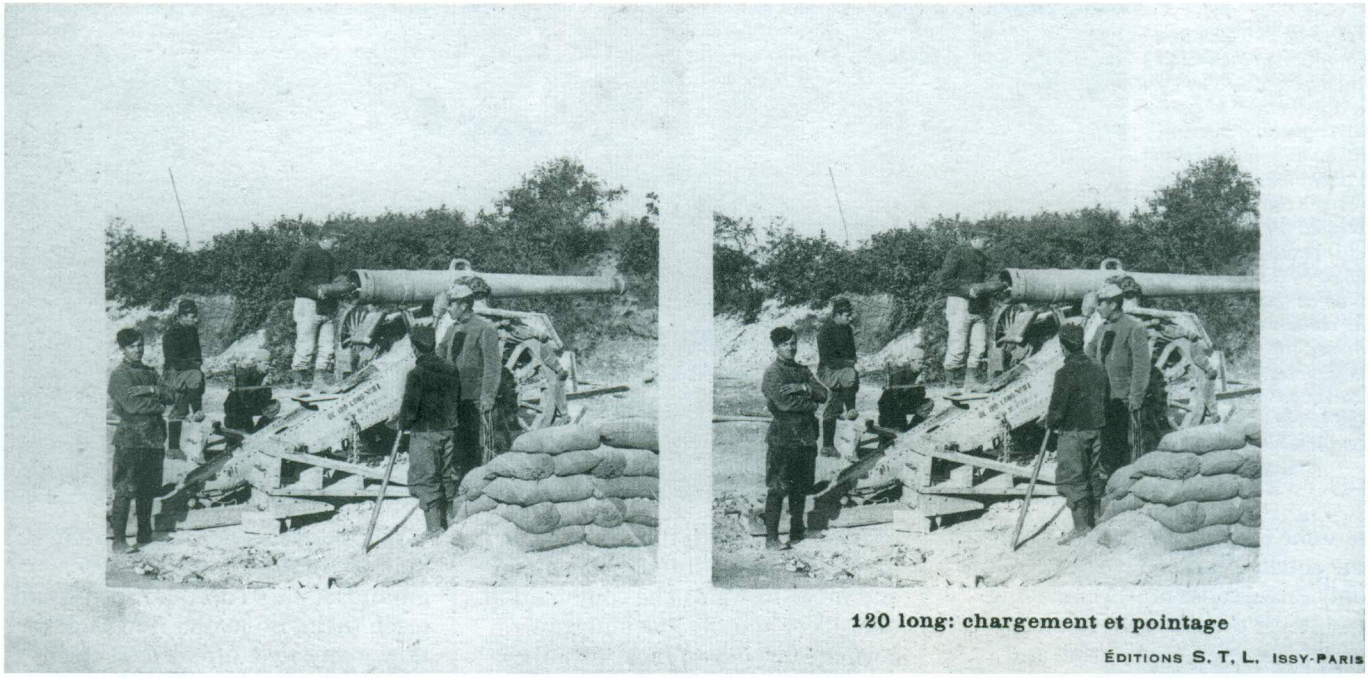
of some use, it could be zeroed in on the enemy position, but artillery fire only drove those on the receiving end to dig deeper to avoid its effects. As the war continued, more and more machine guns and artillery were brought into use, and the trenches got deeper, stretching from the coast of Belgium to the Swiss border. There was no enemy flank exposed, and no way to maneuver into a favorable position.

After the front lines had been established, the European commanders were faced with the dilemma of finding a way to dislodge the enemy and move forward. The combination of artillery and the machine gun gave the defender a huge advantage over the attacker. The firepower the defender could bring into play stopped any forward movement by the attacker, no matter how many men were used in the attempt. As the war continued, guns became more numerous and long drawn out barrages were used in an effort to pulverize the enemy and his earthen works. Bunkers and dugouts were built so troops could go underground, some so deep no shell could reach them, no matter how large or how many were dropped on them.

In 1915, the allies were desperately short of artillery shells. At one point, the British artillery was rationed to three shells per gun a day. During this time, both the British and French carried out repeated assaults on the German lines, gaining very little ground, and sustaining enormous casualties. It was determined that the lack of artillery was the reason for the failures. A tactic based on sheer volume of artillery was developed. After sufficient shells were stockpiled, guns were massed behind the front line. In some places the guns were wheel to wheel, and would fire for days or weeks at the enemy front line. Thousands of guns

NPG No. 14, "Krieg 1914-1915 15cm Schwere Haubitzen in Feuerstellung am nördlichen Kriegsshaupatz." (15cm Heavy howitzers on the northern theater of war.) The 1893, 15cm, 6", Krupp heavy howitzer. This was taken on the Eastern Front, and the guns are being used by the Austrian army. It was an obsolete gun with no recoil system, but remained in use throughout the war by Germans and Austrians on all fronts. Germans tended to name wars by the dates of the beginning and end. Thus, the Krieg 1914-1915 would have been the War of 1914-1915. German propaganda always indicated that the end of the war was just weeks or months away. NPG, the largest German stereoview publisher, always titled their war photos with the start of the war and the year the photo was published, anticipating a quick and victorious end to the fighting. *(Collection of Robert Boyd)*

14 Krieg 1914-15. 15 cm schwere Haubitzen in Feuerstellung am nördlichen Kriegsschauplatz.

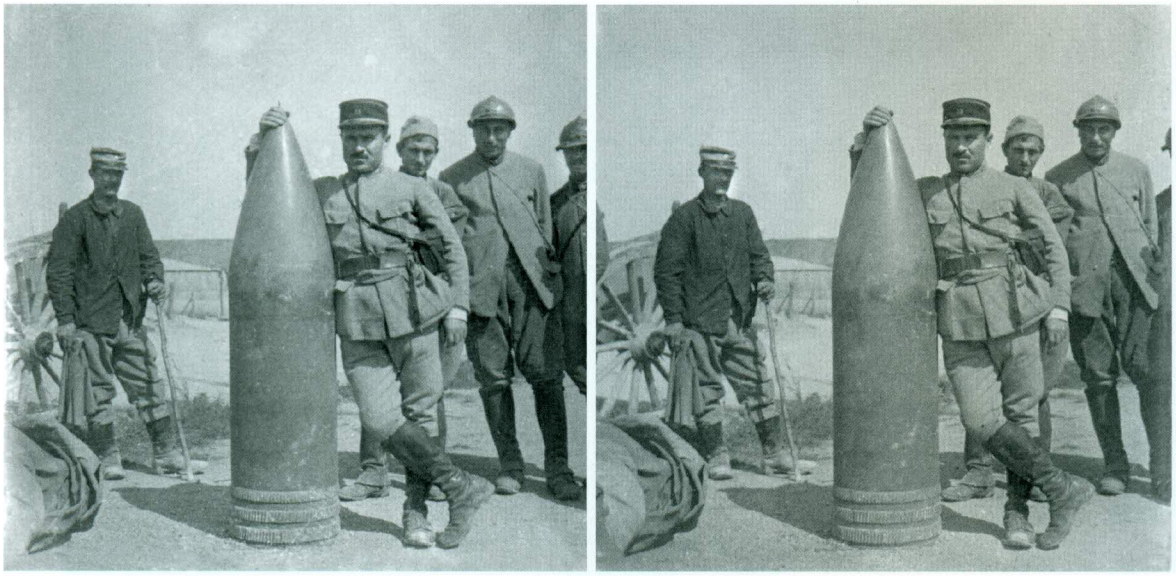


Editions S.T.L. "120 long: chargement et pointage" (120 Long: Loading and Aiming). A French paper view of a Model 1878, 120mm, 5", field gun. The French army of 1914 had no heavy artillery, only the light 75mm field gun. They envisioned a very quick war where their 75mm field gun and the infantryman's invincible bayonet charge would sweep the enemy from the battlefield. When this did not occur, obsolete guns were taken out of storage and used until modern heavy artillery had been manufactured. This obsolete gun, without a recoil system, remained in use through the end of the war. Guns such as this, without a recoil system, often had ramps placed behind the wheels so gravity would return the gun to place. (Collection of Doug Jordan)

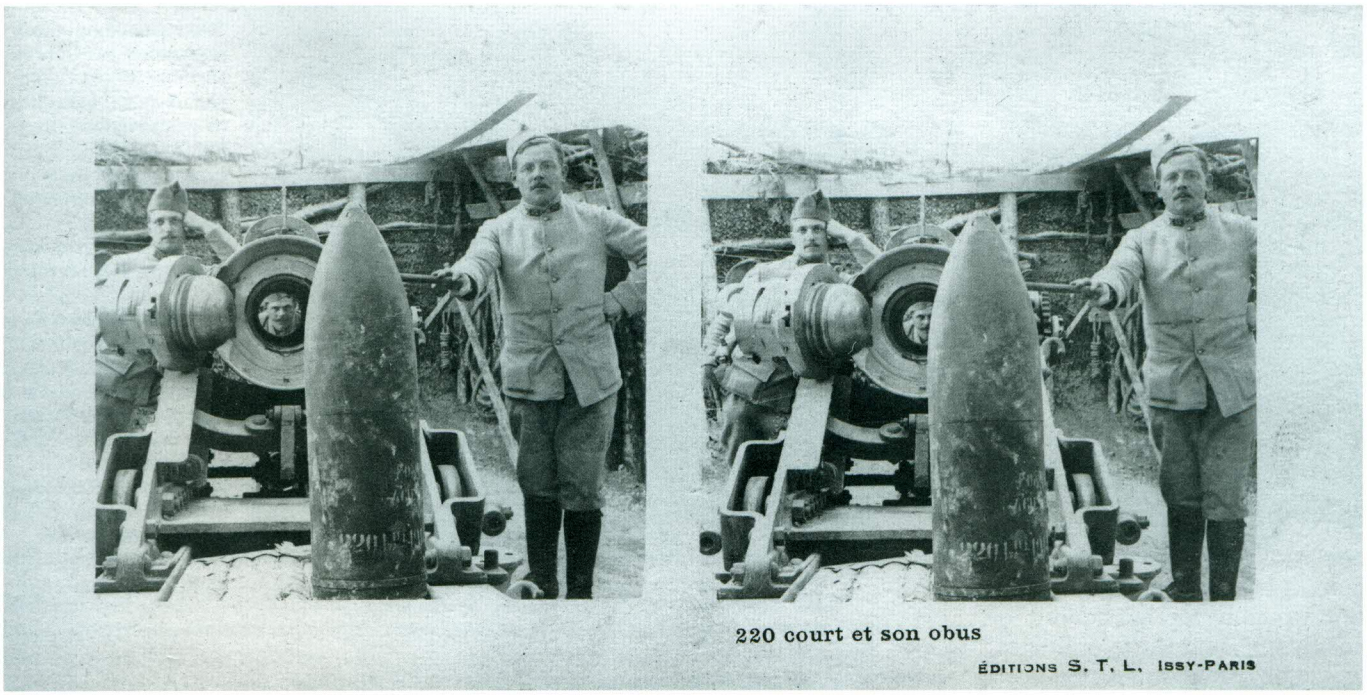
firing millions of shells did make life in the front line miserable for the enemy, but never totally destroyed them or the barbed wire as planned.

The British had also amassed a large stock of shrapnel shells, although shrapnel had little effect in use against a well dug in enemy. Shrapnel, however, was officially declared the best way to cut enemy barbed wire. Despite the official declaration, the German wire refused to be cut. After a week or so of shelling with shrapnel, the German barbed wire was still intact, much to the dismay of attacking British soldiers. A long barrage did alert the enemy exactly where the attack was going to occur and give him time to prepare counter measures. During the six month long Battle of Verdun in 1916, the French and German artillery fired over 40 million shells. A million men were killed and wounded, and no tactical advantage was gained by either side.

This massive use of artillery created landscapes never seen before. Villages and towns were reduced to rubble, forests were transformed into splintered stumps, and fields of wheat and barley were converted into crater filled plains, much like the surface of the moon. Carefully constructed trenches became little more than connected shell holes. The smoke generated by the guns and the exploding shells on a large battlefield affected the weather, causing more rain than normal, and the land was transformed again, into an oozing swamp of mud and corpses. As the rain turned the blasted ground into mud, many shells just



"Obus allemand de 380" (Shell from a German 380.) A French Glass view by LSU, of a dud shell fired by a German 380mm, 15", gun, from a railway gun. Eddie Rickenbacker, the premier American fighter pilot, wrote that while on patrol, they often saw shells of this size as they changed trajectory. They slowly stopped rising, slowly started falling back to earth, and then quickly picked up speed as they fell. Occasionally a shell of this size would collide with an aircraft, with disastrous results. (Collection of Robert Boyd)



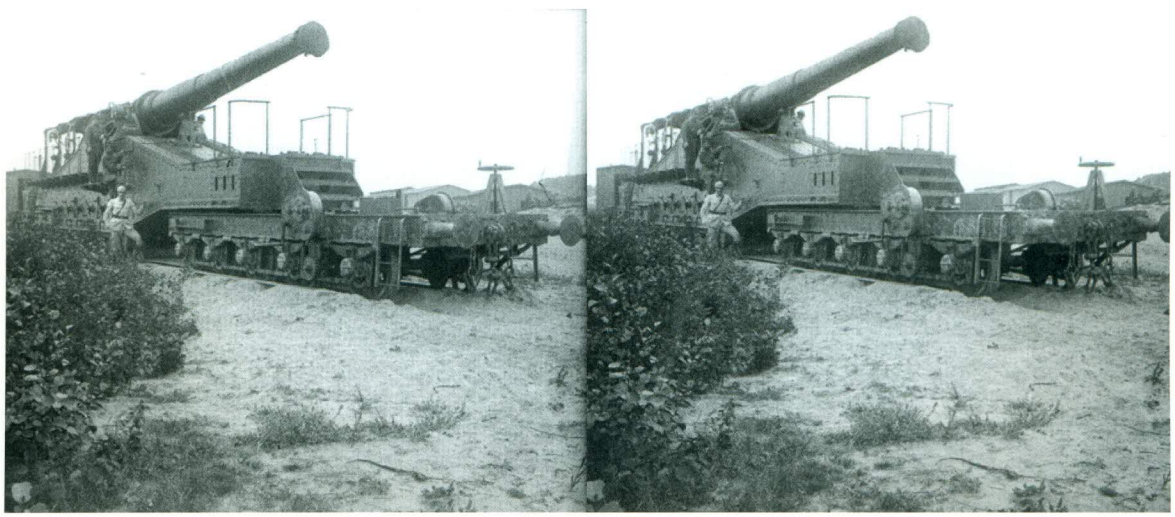
Editions S.T.L., "220 court et son obus" (short 220 and its shell). A paper view of the short barreled Model 1885 220mm, 8.75" mortar, a shell, and crew. This was an old fortress gun used in the field by the French throughout the war. This gun required a very substantial concrete base and had a rudimentary recoil system with an inclined rail to slide on.
(Collection of Robert Boyd)

sank into the wet ground and did not explode.

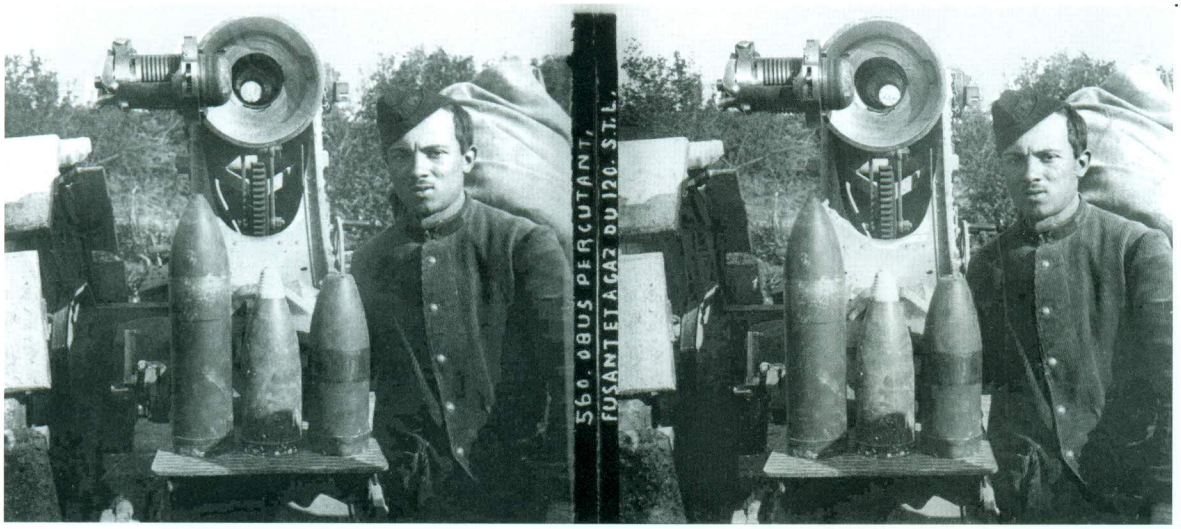
Dud shells are still turning up in the fields of France and Belgium. The explosive in them is still dangerous, and every year there is an "Iron Harvest", where these shells are collected and disposed of. The freeze/thaw weather cycle brings the dud shells back to the surface. Each year the Iron Harvest has collected more shells than the year before, so there is no end in sight. It is estimated that one ton of explosive was dropped on every square meter of the Western Front, and that one out every four shells was a dud. Some sources put that figure at one out of every three. This does not take into account the dud shells and bombs from World War Two, which are also coming back to the surface.

Another artillery tactic in World War One was the rolling barrage. It would be concentrated on the front line, and then it would start creeping forward, while the troops went over the top and advanced across No-Man's-Land, keeping just behind the rolling barrage. In theory it should have worked. In reality, the infantry could never keep pace with the rolling barrage, and it eventually moved on and left them behind to the mercy of the enemy and his machine guns and artillery. Another tactic called for gas shells to be intermixed with high explosive, to keep the enemy off balance. Gas was generally as much a hindrance to one's own troops as the enemy. It made life extremely unpleasant, but had little effect on the final outcome of the war.

The static nature of the war created new challenges for artillery. With targets out of site for the gunners, they had to aim indirectly at coordinates on a map. Front line artillery spotters, balloon observers and artillery spotting aircraft could report on the accuracy of their shelling, and relay adjustments. Any unusual activity reported by balloon or aircraft observers would draw down a barrage on the enemy trenches or



A private glass view of a French railway gun. The immense size of this gun is apparent as it dwarfs the officer standing next to it. These guns were moved by a special train dedicated for the gun. There was a car for carrying the shells and propellant charge, spare parts and maintenance equipment, the crew's traveling quarters, and a locomotive for moving the gun. These guns would roll back on the tracks 100 feet or more in recoil, and the engine would push it back to place for firing the next round.
(Collection of Robert Boyd)



"Obus percutant, fusant et a gaz du 120" (120 Shells for hitting, fusing and gas). A French glass view by Editions S.T.L. of the Model 1878, 120mm, 5", field gun. The three main types of shells for artillery in WW1 are on display, as well as the open breach of the gun. The shell on the left is a high explosive shell, designed to burst on impact or with a short delay, to let the shell burry itself and do more damage. The shell in the center has a timed fuse on the nose, and it is probably a shrapnel shell, which burst in the air over the heads of the enemy, showering them with lead shrapnel balls. The shell on the right is a gas shell. It would have been filled with poison gas in its liquid state and a small bursting charge. The charge was just large enough to break the steel shell and vaporize the gas. The wheels are equipped with "feet", which aided the gun in traveling over unpaved roads.
(Collection of Robert Boyd)

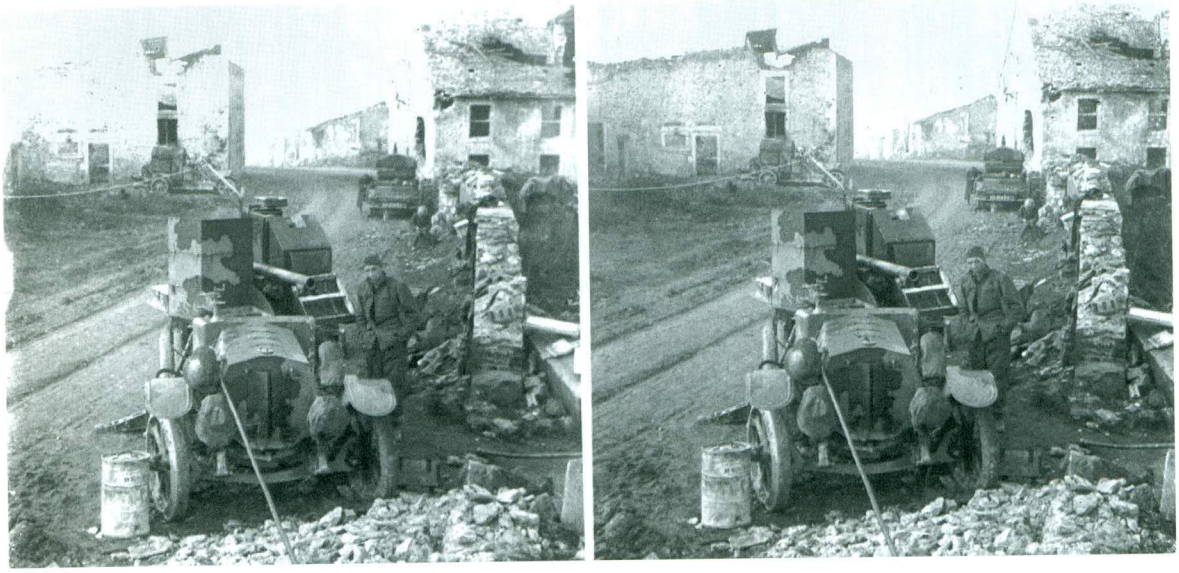
rear areas that were in range of the guns. A crossroad or railroad junction would be located behind the enemy line, and the coordinates would be recorded. It could be shelled randomly at night, just in case the enemy was moving troops or supplies in the dark. Finding the enemy's artillery became a job for one's own artillery units. Aircraft or balloon observers would note the location of enemy artillery batteries and other vital targets. Prior to an assault, these locations would be shelled, often with gas so the enemy artillerymen would have to wear gas masks, reducing their ability to handle their guns. The enemy artillery would engage in counter battery barrages, leading to duels between opposing gun batteries. Hiding from prying eyes in the sky became important for the artillery.

Camouflage was developed to hide artillery emplacements, as well as fortification of gun emplacements. Dummy gun batteries were set up to fool the enemy into wasting shells on false targets and giving away the location of their artillery. A long artillery barrage put the enemy on notice, and their artillery would often remain silent under camouflage canopies to avoid detection. As soon as the barrage lifted, the enemy guns would open up, hoping to catch large numbers of men in crowded front line trenches about to attack.

The use of camouflage nets lead to the invention aerial stereo photography. A single photo could be fooled by a camouflage net, but a stereo shot would reveal the odd interruption of the land contour by the camouflage net. The photos were taken with a single camera using timed shots. The speed and altitude of the aircraft determined the time between shots. This technique is still in use with aerial observation, for espionage and mapping. Satellite imaging also uses the same technique.

Soldiers came up with slang names for the various shells dropped on them. The British called the shells from the Krupp 77mm gun Whiz Bangs. When your heard the whizzing sound, you had a second

"Piece de 305 marine" (305mm Naval Gun). A French glass view by an unknown maker of a 305mm, 12", naval gun with a naval crew. The gun is set on a rotating mount as if on a ship, and is anchored to a concrete base. There is a light gage railway line next to the gun to bring up shells and the propellant charge for the gun. It was not uncommon for navy personnel in the French and German fleets to be transferred to duties in the field after 1916, when the casualty rates were higher than the number of replacements available. The navy was the senior service in England, and very few navy personnel were transferred to duties with the army.



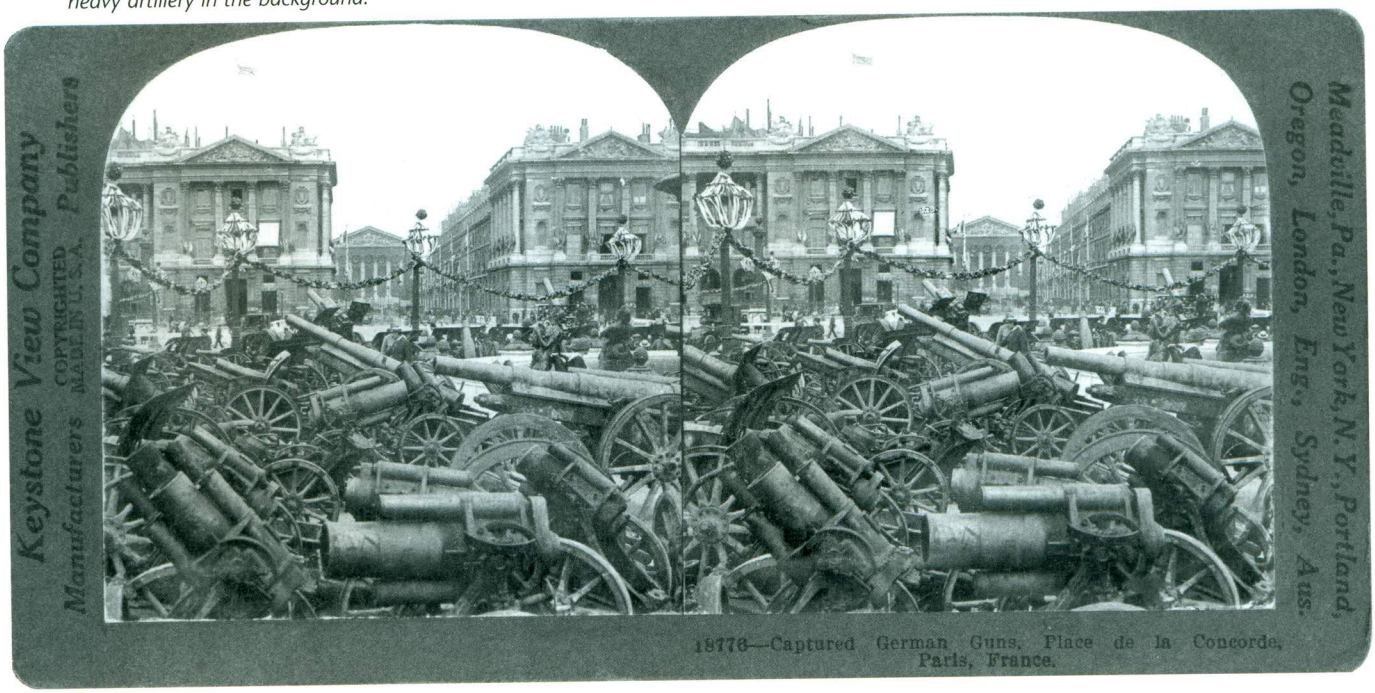
"Auto canon americain" (American auto cannon). A French glass view by Brentano's from their Over There series of war views sold in Brentano's book stores shortly after the war. This is a French built mobile anti-aircraft gun in use by the American army. It is lightly armored, but is essentially the standard French 75mm gun on a special mount set onto an automobile chassis. No American built artillery, tanks or aircraft were used in France. The USA purchased all artillery and aircraft from the French and British, although American made aircraft and tank engines were in wide use by 1918.

or less to hit the ground before the bang. They called the shells fired by the German 155mm howitzer Coal Boxes, as the shells exploded with a dense black cloud. A Daisy Cutter was a shell that exploded instantly upon striking the ground. The Russians referred to large German shells as Suitcases. Some of the shells were so large, you could see them coming, giving the soldiers time to vacate the area. When England was desperately short of artillery shells in 1915, American industry stepped in and manufactured hundreds of thousands of them. Quality control was lacking, and a large percentage of these shells were duds. They were referred to as "Wilsons", as they were too proud to fight. This was the soldier's comment on the reluctance of the USA to actually enter the war, but not to profiting from it. The shells from the German 42cm mortar, called Big Bertha, had whistles on the fuse, so one could hear them coming. The British called the 42 cm shells Jack Johnsons, after the black American Boxer, due to the immense black cloud of smoke they produced, and enormous explosive power.

The vast length of the front lines required more guns than were available in 1914. All the armies scrounged their arsenals and museums, searching for any gun to make do, while new ones were being built. Guns from the 1870s and 1880s were put back into use. Some 18th century Coehorn mortars were taken from museums and used in the trenches until new trench mortars were available. Some guns were also removed from fortresses and coastal artillery and placed in the field. They were stationary guns, and a heavy timber or concrete pad had to be placed in the field for them. The old guns were difficult to move, and had a slow rate of fire, but the static nature of the war made them useful again.

Naval guns meant for battleships and coastal defense were used as field guns. They were capable of sending a very large shell a very long

Keystone No. 18776, "Captured German guns. Place de Concord Paris, France." Heavy and medium trench mortars are the foreground, with a wide variety of German field and heavy artillery in the background.



"Somme-transport l'obus" (Transport of shells on the Somme). This is a French glass view from the Brentano's Over There set sold in the USA after the war in Brentano's book stores. Shells for a heavy gun are transported from the supply depot to the gun by a light gauge rail line on hand carts that hold two shells. Light gauge railways such as this were used to move men, ammunition, and supplies from the supply depot to the front lines.

distance. At first they were put on makeshift gun mounts, but the recoil was enormous, making them hard to handle in the field. Stationary rotating mounts were developed, like a gun turret on a battleship. When naval guns were placed on special railroad mounts, the railway gun was born. A heavy and mobile gun was of immense value. A spur track was put in behind the lines near the target area, with a curved section for aiming the gun. The entire gun and rail carriage rolled backwards in recoil, as much as 100 feet. These guns got larger and larger, 30 cm (12") and 40cm (15") rail guns were common, able to send a huge shell 15 miles or more. At the end of the war the French were building a 52 cm, 20.4", rail gun, but the war ended before it was finished.

The Germans built the ultimate special purpose gun, the "Paris Gun". The Germans called it the Kaiser Wilhelm Geschütz, Kaiser Wilhelm's Gun. Only one was made, although numerous gun barrels were made for it. It was a 210mm, 8", gun, but it was massive in size, and sent a shell over 75 miles. The barrel was so long it had a cable suspension support to keep it straight. The Paris Gun was in use from April to August of 1918, and only used to shell Paris. It created more terror than real damage, although civilians were killed. No target of any military importance was ever hit by the Paris Gun. Because it sent its shell 25 miles high, and it took nearly three minutes to reach its target, the rotation of the earth had to be calculated when aiming the gun. This was the first time objects from the stratosphere fell from the sky onto civilians in a time of war. At the end of the war, the gun was dismantled, and most its blueprints were destroyed to keep the gun out of the hands of the Allies.

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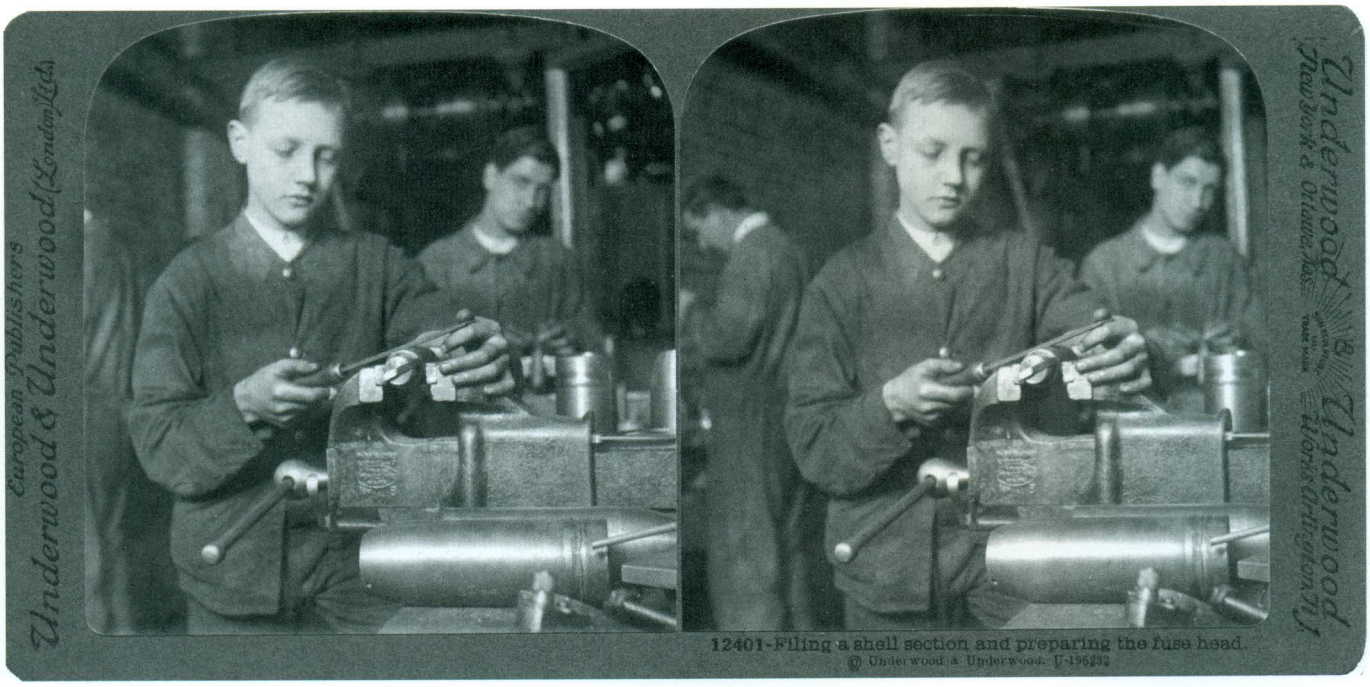
Underwood & Underwood No. 12401, "Filing a shell section and preparing the fuse head." A boy filing the part of the shell that held the detonator. The shell fuse would have been screwed on top of this, then place into the shell. The fuse could be adjusted to vary the amount of time it took the fuse to activate the detonator. This photo was taken before child labor laws had gone into effect.



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By 1917 new field guns were in use, all improvements over the pre-war designs. The pre-war 3" field guns had been modified so they could fire at a higher trajectory, increasing their range. New field guns grew larger and larger, up to 16", with longer ranges. Howitzers were also more numerous, and larger, with greater ranges. There were even early experiments in putting field guns and heavy mortars on a tank chassis to make self-propelled artillery, that could follow the infantry over broken ground. Guns also got smaller, so the infantry could carry them on an assault. The French 37mm, 1", infantry gun was developed. The Germans used a short barreled 75mm, 3", mountain gun that could be manhandled in the field, as well as providing a wheeled carriage for the 77mm, 3.25", light trench mortar, which converted it from a stationary mortar into a mobile infantry field gun. The machine gun was also transformed from a stationary small field piece to a mobile gun to be taken on an assault. The Italians and Germans developed sub-machine guns firing pistol ammunition. The French and Americans developed light machine guns, now called assault rifles. The British stuck with the Lewis Gun as a light machine gun, a pre-war invention that was very effective.

A successful tactic developed by the Germans late in the war was the box barrage. With no long preliminary barrage to give the location of the attack away, artillery would be massed behind the attack area. On the morning of the assault, every gun would begin an intense, but short, barrage of the enemy line, including gas shells. Storm troopers would have moved out into No-Man's-Land just before dawn, up close to the enemy line, but just short of the barrage area. The barrage would then lift to the sides and rear

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of the area under attack. The box barrage kept the front line troops from retreating as well as keeping reinforcements from coming to their aid. When the barrage lifted, the storm troopers would immediately attack with hand grenades, flame throwers, and light machine guns. They were quickly followed by the first wave from the trenches, and ground attack aircraft. Areas that held out were bypassed and left for the second wave to finish off, but the first wave kept moving forward. The territory gained by the troops would be consolidated, the artillery would be brought forward, and the next morning it would begin again, and again, until the enemy line was broken.

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This tactic was developed on the Eastern Front against the Russians, and then used against the Italians. The tactic was used against the French and British during the German spring offensive of 1918. The tactic nearly broke the allied line. They pushed the allies back, in some places for 40 miles. The previous years had taken their toll on all the armies, especially the Germans, who had taken massive casualties in this spring offensive, and did not have the reserves to replace the men lost. The intense barrages also took a toll on the artillery, also irreplaceable in 1918. The guns could only fire a finite number of shells before the barrels wore out and needed to be re-lined. Shells fired from worn out guns were not accurate, and fell short, often on their own men. At the moment when the Germans had found a solution to end the stalemate of trench warfare, they had run out of men and guns to continue, and the Spring Offensive ended, just short of breaking the Allied line.

In the summer of 1918, the allies, reinforced with the ever increasing numbers of American troops, began their own offensive, using similar artillery tactics as the box barrage and ground attack aircraft. They also spearheaded their attacks with hundreds of tanks. The allied summer offensive of 1918 steadily pushed the Germans back until November 11, 1918, when the armistice was signed.

The artillery of World War One put an end to 19th century romantic ideas of glory in war. No matter how strong, brave or bold a soldier was, there was no safety from an anonymous machine gun bullet, shrapnel ball, or shell fragment. Only an armored vehicle could cross No-Man's-Land amid the bursting shells and drive a path through the enemy barbed wire and eliminate his front line defenses before the infantry could reach the enemy's rear area. Artillery was credited with causing 67% of all the casualties of the First World War. Their impersonal and devastatingly destructive power ended old ideas of waging war, and any notion of war as a glorious adventure.

Censorship was very tight during World War One, but there are a large number of stereo photos of artillery in the commercial sets of war views, very often of obsolete artillery put back into use, or captured guns of the enemy. It could be that the photographs of the guns were taken so far behind the front lines that

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security was relaxed or could not be enforced. Captured enemy guns on display were good propaganda. It was a traditional sign of a significant victory when large numbers of prisoners were captured and the enemy abandoned his artillery in a hasty retreat. It could also be that the guns, being large objects, lent themselves as very good subjects for a stereo view.

As usual, I am highly indebted to Robert Boyd and Doug Jordan for providing me copies of the images in their amazing stereoview collections. I am also indebted to Neal Sobania for his editorial services, repairing my haphazard punctuation, and treating me to my favorite kind of beer, a cold one.

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