



Artillery

Artillery played a key role during the fighting in WWI. Millions of shells rained down on troops on both sides. The topic is a very big one, and this article is intended to simplify a few bits and pieces for the benefit of my readers. It is not meant to be a primary research source, nor is it intended to delve into the intricacies of the artillery firing tactics or strategies of each side.

One of the first things that confuses civilians like me is the terminology. I will use terms that would apply during WWI, but readers should know that some of the details are different when referring to modern artillery. A “gun” or “field gun” is an artillery piece that has a longer barrel with smaller shells fired with larger charges at higher muzzle velocities and flatter trajectories. Howitzers and guns both have rifled barrels. A “howitzer” is a short-barreled artillery piece with a relatively lower muzzle velocity than a “gun” or “field gun”. It is used to fire shells in a relatively high trajectory, which means that they fall at steep angles of descent. As such, it is a type of piece that is positioned between the gun and the mortar. Mortars are smooth-barreled, in other words, they have no rifling. They fire projectiles at low velocities over short ranges using high arching trajectories.

The artillery pieces used by the Germans in WWI included a variety of calibers. In the Battle of Belleau Wood, the majority were the 77 mm field gun, the 150 mm howitzer, and the 210 mm mortar. The types are shown in the table below:

Some of the Artillery Pieces Used by Germany in WWI

Caliber In millimeters	Type	Weight of high explosive shell (pounds)	Maximum percussion range (yards)
77	Field gun	13-17	11,700
90	Field gun	16.5	7,109
100	Gun	39.5	12,085
105	Light field howitzer	34.5	11,210
120	Gun	36	7,984
130	Light howitzer	89	15,748
150	Heavy field howitzer	92	10,936
210	Mortar	184-262	11,155

All of the above are from Ireland, referenced below.

The German 7.7 cm FeldKanone (FK)96 n/A field gun shot a shell that emitted a whizzing sound before the report of the gun was heard, and thus called a “whizz bang” by American troops. It fired a 77 mm shell at a firing rate of 12 per minute and a range of 7,800-8300 meters. The n/A designated a new design undertaken to improve performance after the French 75 mm proved superior to the original FK 96. The French 75 was still superior with about 500 meters longer range.



Photo taken by John F. Andrews at Belleau Wood, 2015

The relatively short barrel of the FK96 with a range of 9100-10,700 meters depending on the shell and charge. Elevation range was between -10 and +40 degrees.

German trench mortars were used and a number were captured during the battle. They varied in size as shown in the table below.

TABLE 2.—German trench mortars ^a

Caliber, centimeters	Weight of high explosive projectile, pounds	Maximum favorable range, yards
Granatwerfer (stick bomb thrower)	4	208
3.9	1.7	700
7.6	9.9	1,422
17	92.6, 109.1, 123	1,750
24	220.5	1,312
25	207.2	1,094

John Frederick Andrews
Novels of the Great War



Photo taken by John F. Andrews at Belleau Wood, 2015

The 17 cm Minen Werfer fired a 54 kg projectile with a range of 1160 meters and had an elevation range between 45-75 degrees



Photo taken by John F. Andrews at Belleau Wood, 2015.

The 10.5 cm leicht Feld Haubitze 16 was a light field howitzer designed in 1916 that shot at a rate of up to 6 rounds per minute with a range between 8,400 – 9725 meters.

The inventory of American artillery in WWI was much more limited than the Germans. Most of the artillery pieces used by American forces were purchased from the French. There were several reasons for this. First, the French 75 was one of the best field guns available in WWI. The American 3-in gun was a variant of the French 75, but with a slightly larger caliber that would not be compatible with French munitions. The American 155 was a copy of the French Schneider model. Second, shipping and availability. They guns were in France already, and therefore no need to tie up desperately needed shipping with them. Third, politics and economics: the French needed money, and this was a way of supporting them. By using the French model, Americans could use ammunition manufactured in France. The same was true of the 37 mm and 155mm artillery pieces.

Artillery pieces used by the American Expeditionary Forces in
WWI

Caliber In millimeters	Type	Weight of high explosive shell (pounds)	Maximum range (in yards)
37	37mm M1916	1.4	2,600
75	French 75	12-16	6,800
155	Howitzer (French model 1917 Schneider)	100	11,300
81	Stokes Mortar	11	800



An iconic photo of an American 37mm gun crew and their weapon. This was obtained from the photo files of the United States Marine Corps Historical Division. Some authors have used this photo in association with the Battle of Belleau Wood, though I think it was actually taken in a later battle.

American artillery included the French 75 mm gun and the 155 mm howitzer, shown below:

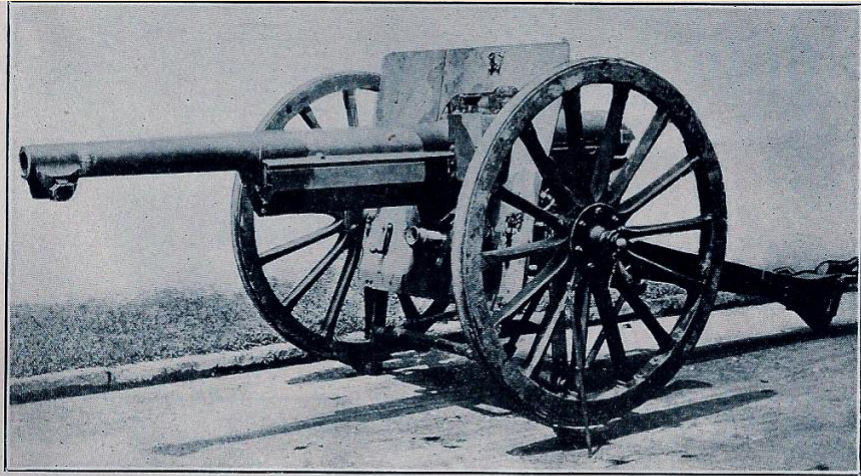
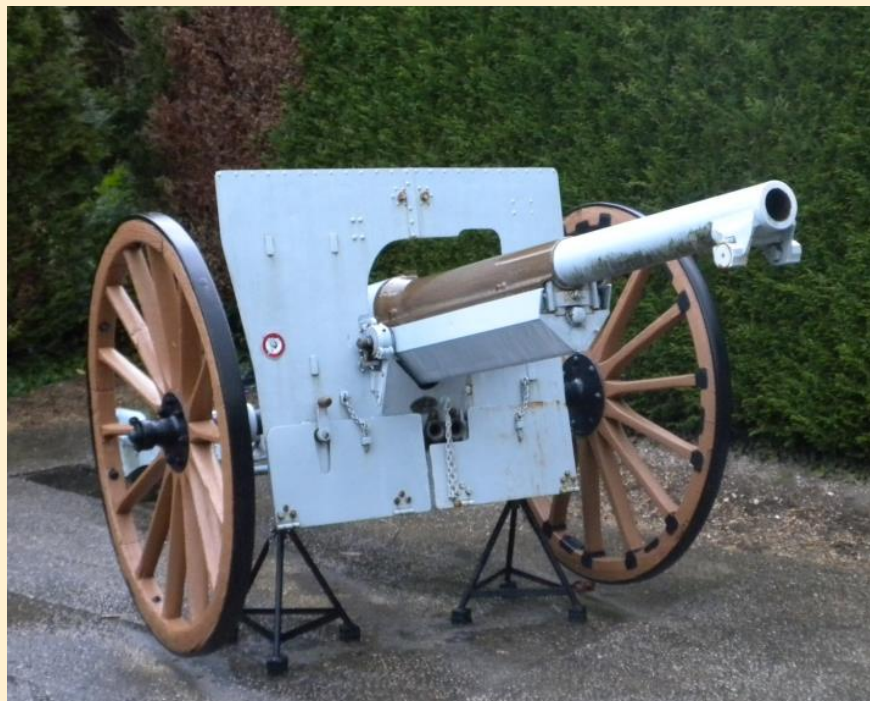


FIG. 14.—French 75-mm. field gun. This type of gun has been used by the French Army since 1897 and was the gun most used by the Allies in the Great War. This gun throws a shell weighing 12.3 pounds a distance of 8,400 meters, with a muzzle velocity of 1,805 foot-seconds, or shrapnel weighing 16 pounds a distance of 9,000 meters, with a muzzle velocity of 1,755 foot-seconds



The 75 Mle 1897 field gun was the first equipped with a hydropneumatic recoil recuperating system. The shells had ranges of 6,000 m, 6,900 m, and 11,200 m with a rate of fire as high as 18 per minute, though a recommended maximum was 12 per minute. Elevation ranged from -11 to +18 degrees.

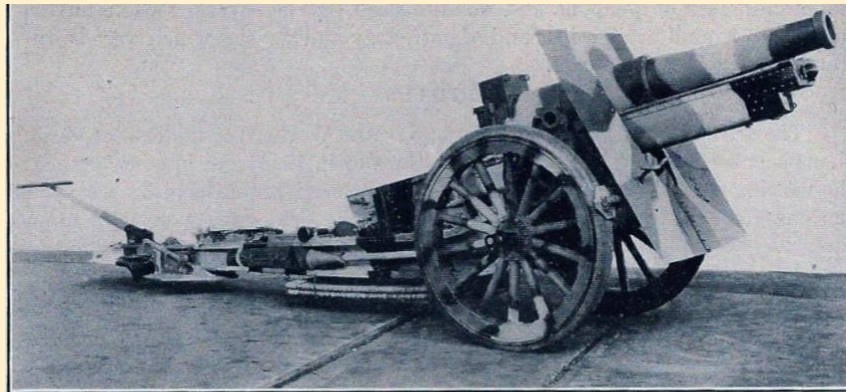


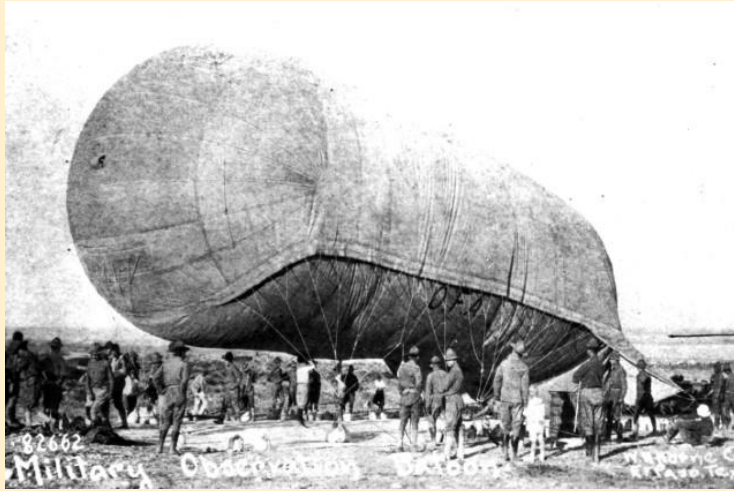
FIG. 10.—United States 155-mm. howitzer, model 1918 (Schneider). This weapon throws shell or shrapnel weighing 95 pounds. Muzzle velocity for shell is 1,420 feet per second

The 155 C Mle 1917 Schneider was designed and built for the French Army and commonly used by the United States. It fired a 155 mm 41 kg projectile with a range between 9,500-11,900 m with an elevation range between 0-42 degrees at a rate of up to 4 shots per minute.

Artillery fire was directed by several means during WWI. Aviation, which is now used, was rudimentary at best. There were no radios in the airplanes of that era, so the best a pilot and his observer could do was to put a written message in a container and drop it as they flew over an artillery position. The most reliable airborne observers used observations balloons. American troops referred to German observation balloons as “sausages”. The balloons were made of fabric and used hydrogen gas for lift. Steel cables tethered them to the ground. The observer stood in a basket underneath, communicating to the ground through a telephone, dropped notes, or flags. The balloons were protected by anti-aircraft emplacements and fighter planes. These hydrogen balloons were flammable. The parachute was invented to allow the observers to escape in case enemy fire hit the balloon.

In the Battle of Belleau Wood, German forces made extensive use of observation balloons. These directed artillery fire, but also provided key intelligence about American troop movements and dispositions. Germany had nearly complete air dominance during

that battle. No American observation balloons were deployed as far as I can tell. The only aerial reconnaissance available was from French Escadrille 252. Their aviators were harassed by the Germans, and often only made one or a few flights over German lines on any given day. Late in the battle, it appears that one or two French observation balloon units deployed, though how effective they were is not clear to me.



American observation balloon. From the photo archives of the United States Marine Corps History Department.

Color photos taken by the author at Belleau Wood and Compiegne, France. Black and white photos and tables are copied from Ireland and USMC History Division.

References:

Ireland, M.W, ed. *The Medical Department of the United States Army in the World War, Volume XI, Surgery, Part One*. 1927, Washington D. C. Government Printing Office.

Firing data were found in the website www.passioncompassion1418.com. This site had photos and very detailed information.

Wikipedia, The Free Encyclopedia:

Accessed on 10/23/16:

https://en.wikipedia.org/wiki/Canon_de_155_C_modèle_1917_Schneider

https://en.wikipedia.org/wiki/Canon_de_75_modèle_1897

https://en.wikipedia.org/wiki/Stokes_mortar

The following were obtained from www.militaryfactory.com on 10/23/16:

http://www.militaryfactory.com/armor/detail.asp?armor_id=936

The following websites have extensive information about the arms and other systems used in World War I. The machine gun section is:

<http://www.militaryfactory.com>

<http://world.guns.ru/index-e.html>

Information on British observation balloons was obtained accessed on 10/23/16 at:

<http://www.westernfrontassociation.com/the-great-war/great-war-on-land/weapons-equipment-uniform/313-ob-bal-west.html>

Other sources accessed on 10/23/16 include:

http://www.ypres-ballooning.com/observer_balloons.php

(this has two very good photos)

<http://www.firstworldwar.com/atoz/balloons.htm>

<https://gottmituns.net/2012/12/21/dragons-over-the-western-front-german-feld-luftschiiffer-units-in-world-war-1/>

(which had photos of the balloons used by Germany).