THE DEVELOPMENT OF WEAPONRY DURING THE WAR YEARS
The Development of Weaponry during the War Years – Contents

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In 1914, the technical, technological, and scientific advances of the 19th century were co-opted for military purposes and applied in the pursuit of military strategy. This led to major tactical changes, industrialised the conflict, and profoundly transformed the way war was conducted and combat engaged in. The first major change was in relation to weaponry. The war of position characterised by the trenches froze the front line, with two armies facing each other across no-man’s-land. In this situation, reminiscent of siege warfare, defence was the central focus of the struggle. Artillery came to dominate the battlefields, employed with the aim of punching holes in the enemy lines and saving the lives of one’s own soldiers. Between 1914 and 1916, the number of big guns and machine guns used and the quantity of shells fired rose exponentially. This context led to the invention of a new weapon: the tank. In 1916, aviation was fully incorporated into strategic planning and was deployed in support of land offensives. Chemical weapons were also developed.

1  THE GREAT WAR ARSENAL OF WEAPONS

1.1  Guns and grenades

As a rule, each infantry soldier was equipped with a rifle or carbine. For the most part, these used clips of five cartridges that were moved into the barrel one by one by the use of a bolt. At the end of the war, semi-automatic rifles made their appearance; these were reloaded by means of gas that was released during firing or the recoil of the weapon.

Rifles and pistols were not usually issued to the ordinary soldier, but were reserved for specific troops such as the military police, tank crews, etc. Officers and NCOs usually had one on them. In 1884, an American, Hiram Maxim, invented the first fully automatic machine gun; this made use of the recoil after firing a round to move the next round into position. On the basis of that prototype, both the Germans and the British manufactured their own machine guns. Both had to be cooled with water to avoid overheating. Subsequently, versions emerged that were air-cooled and weighed less. Machine guns were one of the most characteristic weapons of the war in the trenches. During the Battle of Passchendaele, the German machine guns were the key defensive weapon, in a deadly combination with bunkers, barbed wire, and positions located higher than those of the attackers.

A number of different kinds of hand grenades were developed during the Great War. The British used 105 million hand grenades in the course of the war. To increase the throwing range, the British also introduced a whole range of rifle grenades. By 1918, these had a range of 400 metres. Flamethrowers were widely used by the Germans and special flamethrower units were set up. Portable Flamethrowers were little used by the British, who didn’t regard them as very efficient.

1.2  Heavy artillery

Lange Max and Big Bertha, both constructed by the Germans, were the two best-known big guns of the First World War.
The Lange Max, which had a calibre of 38 cm, was a ship’s gun adapted for use on land, moved around by rail, and for the most part fired from a concrete emplacement, although it was also capable of firing from the rails. Weighing 268 tonnes and with a barrel that was almost 17 metres long, it was the largest artillery piece used in the First World War. A gun of this kind was installed in Klerken in 1915: it was active during the Second Battle of Ypres, but was put out of action by Allied artillery.

In Koekelare, in 1917, the renowned Pommern battery included one of these 38-cm guns, which was used to bombard Ypres, 44 kilometres away.

The 42-cm howitzer Big Bertha, named after Bertha Krupp, was much more mobile but had a much shorter range – maximum 12.5 km. The Big Berthas are known above all for the destruction of forts in the first months of the war in 1914; later, they were deployed on the Yser front. In the spring of 1915, they were used to bombard Ypres.

1.3 Mines

The opposing armies frequently undermined each other’s positions and exploded mines under them. On 26 February 1915, for the first time, the Germans set off explosions under the French positions at Broodseinde-Zonnebeke. The British engineering corps reacted by setting up special units known as “tunnelling companies”, made up of men who were used to working underground, such as miners and men who had worked building underground railways, as well as carpenters and others. The Germans, too, set up their own Mineur units. On 27 March 1916, the British succeeded in detonating an large explosive charge for the first time. The most successful explosion of all was on 7 June 1917 (see the information pack on the Battle of Messines).

1.4 Gas

Both the Hague Convention of 1899 and its 1907 successor forbade the use of poisonous gases in combat. But as early as the autumn of 1914, the French fired grenades containing tear gas: les cartouches suffocantes.

Winston Churchill recalled that in the autumn of 1914 the Allies were considering the use of smoke and chemical materials, more particularly sulphur dioxide. He is also believed to have urged the use of gas during the Gallipoli campaign.

At that time, Germany had at its disposal the world’s greatest chemical industry and outstanding scientists such as Fritz Haber.

At the end of January 1915, the German army experimented with the use of gas on the Eastern Front at Bolimov in Russia (now in Poland). After successful testing, Germany brought its latest weapon into action on 22 April on a large scale on the Western Front: asphyxiating gas.

Asphyxiating gas – in this case, chlorine gas – is an offensive gas, deployed so that the enemy can advance just behind the gas. Its main effect is to cause swelling of the mucous membrane, with suffocating symptoms as a consequence. In those severely affected, fluid can also form in the lungs, causing the victims to die a horrific death by asphyxiation.

On 12 July 1917, on the Ypres front, the Germans introduced mustard gas, a poison gas that burns not only the airways, but the whole body. Mustard gas is more of a defensive gas. It stays in the air over the...
terrain for days, so there will be a lot of victims among the enemy too if they attack. Mustard gas is also known as Yperite.

1.5 Tanks

In 1915, both France and the UK began work on the development of armour-clad vehicles on caterpillar tracks. In order to keep the project secret, the machines were called "(water) tanks", hence the name. The French Schneider CA1 and St. Chamond and the British Mark I were ready in September 1916 and were used for the first time in the battle of the Somme.

During the Battle of Passchendaele, the Allies deployed more than 200 tanks. The terrain, however, was so devastated that most of the tanks got bogged down in the mud. After the battle, it proved possible to salvage half of them. The remainder became major tourist attractions in the early post-war years.

The tank attack at Poelkapelle is described in section 2.3.

1.6 War in the air

In 1903, the Wright brothers made the first flight in a heavier-than-air craft. In the course of the war, engines underwent extremely rapid development, more than doubling the original speed of 80 km an hour.

After the front had become deadlocked, observation from the air became a key source of information on the enemy's movements and positions. Opposing aeroplanes soon came across each other in the air and fired on each other; as a result, observers were armed with machine guns. The Frenchman Roland Garros developed a system that protects propellers against shooting.

On the French coast at Armentières, at the beginning of the Battle of Passchendaele, 858 British aircraft stood ready for action.

During the Battle of Passchendaele in 1917, heavy fighting took place in the air as well as on the ground. Soon after 'Bloody April' (when the British Royal Flying Corps sustained severe losses in France), the war in the air became ever more intense in the Salient just before the summer. This was the heyday of the triplane: first, the Sopwith triplane, followed by the notorious German Fokker Dr.I. A number of aces won fame over Zonnebeke and Passchendaele: Guynemer, Voss, Collishaw, Richthofen, Göring, and McCudden, among others. The war in the air reached its height in late July 1917 over Polygon Wood, with more than 90 aircraft involved in the fighting on 27 July. Above the easily recognisable feature of Polygon Wood, British units set out to draw the Germans into aerial combat. Their heroes in the air inspired the troops on the ground. The intense combat in the air, however, cost the lives of a number of flying aces: G. Guynemer (53 victories), W. Voss (48 victories), K. Wolff (33 victories), J. Allmenröder (30 victories), A. Rhys-Davis (25 victories), and H. von Adam (21 victories) were just some of the fifty aces (aviators with five or more victories) who were shot down over the Salient during the Battle of Passchendaele.
Another new element in the war was aerial bombing. In the second half of 1917, bombing of railway junctions and supply routes became routine and caused many civilian casualties. Aeroplanes were also deployed in support of infantry.

2 INDIVIDUAL STORIES

2.1 Georges Guynemer

One of the most renowned Allied pilots was Georges Guynemer. Georges Guynemer was born in Compiègne in France to a wealthy and aristocratic family. He was in bad health for much of his childhood. Nevertheless, he succeeded as an aviator through his enormous drive and self-confidence.

He was originally rejected for military service, but was accepted for training as a mechanic in late 1914. With determination, he gained admission to pilot training, joining Escadrille MS.3 on 8 June 1915. He remained in the same unit for his entire service. He experienced both victory and defeat in the first plane allocated to him, a Morane-Saulnier L monoplane previously flown by Charles Bonnard and accordingly named Vieux Charles (“Old Charles”). Guynemer kept the name and continued to use it for most of his later aircraft. On 19 July 1915, he shot down his first plane, a German Aviatik.

On 5 December 1915, the Escadrille MS.3 was renamed the Escadrille N.3, after being re-equipped with new Nieuport 10 fighters. Flying this more effective plane, Guynemer quickly established himself as one of France’s premier fighter pilots. He became an ace by his fifth victory in February 1916 and was promoted to lieutenant in March. At the year’s end, his score had risen to 25. Captain Brocard, commander of Escadrille N.3 (Storks), described Guynemer at that time as “my most brilliant Stork”. Less than a year later, Guynemer was promoted to captain and commander of the Storks squadron.

Guynemer became influential enough to affect French fighter aircraft design; he became the first Allied pilot to shoot down a German heavy bomber (Gotha G.III). His greatest month was May 1917, when he downed seven German aircraft. By July, he began to fly the Spad XII, this plane, his avion magique, was not one for a novice pilot. Guynemer used it to down an Albatros fighter on 27 July and a DFW the next day. The latter triumph made him the first French ace to achieve 50 victories.

Guynemer failed to return from a combat mission on 11 September 1917. At 8.30 am, Guynemer took off in his Spad XIII S.504 No. 2 with a rookie pilot, Jean Bozon-Verduraz. His mission was to patrol the Langemark area. At 9.25, near Poelkapelle, he sighted a lone Rumpler, a German observation plane, and dived towards it. Bozon-Verduraz saw several Fokkers above him, and by the time he had shaken them off, his leader was nowhere to be seen, so he returned alone. Guynemer never came back.

Captain Georges Guynemer was confirmed missing in action by his squadron commander, Major Brocard; this was officially announced in Paris by the French War Department on 25 September 1917.

2.2 Extracts from the letters of Frank Vans Agnew, British soldier
To Mrs P.A.V.A (after the Battle of Messines):

“Our game sounds so comfortable and protected but that is a myth. The Boche is afraid of us and he concentrates salvos of large crumps on us whenever he observes us. It is a mystery how any of us ever get there or get back. You feel very important because you are heralded, followed and encircled by miniature geyser of earth, smoke and biff-bangs, and your own infantry flies from you as if you bore the plague. A good many of our lot got into serious trouble and quite a few faces of chums are missing today. The day for the British army was a veritable howling success and the Boche fought here with no spirit at all. They bolted like rabbits, throwing away rifles and equipment, some back to Berlin and some to us, hands up, and kamerading.

“Our casualties were very light indeed, owing to the absolutely artistic work of our artillery. There is no artillery quite as good as ours today, not even the French, and with our airmen the combination is unbeatable. These wonderful airmen! Like meteors in the sky they swoop and fly, entirely regardless of everything but the job on hand. And the observation miss nothing.”

Letter to Ida (just outside Ypres South, on way to Passchendaele Ridge):

“One shell, especially, landed about twenty yards from me and almost in the gun-pit of a Britannic Titan, with a most appalling rush and roar from the sky (you have no idea of the volume of sound). I saw men throwing themselves flat in all directions, then a dense wall of smoke, flame and mud spreading out like a fan towards and over me and, from the wall, smaller and harder particles going high into the air, tins, mud in chunks, all sailing up in a circle. I bowed my tin hat to the storm and half a paraffin tin came hustling out of the sky crumpled up like a concertina, just over me by about four feet. For twenty seconds or so, other things came from the sky and splashed and thumped into water and mud and shell-holes around. When the cloud dispersed there was one man in the battery lying very still and one man being dragged away by friends. Later on this man walked off supported by two friends. Other aerial cyclones fell near us at work and spoiled our appearances but only this man was hit, on the very top of his tin hat by a piece which came from on high and a long way. He was only stunned and went to work again in less than ten minutes. But we were very, very fortunate.”

For more letters: http://www.pen-and-sword.co.uk/Veteran-Volunteer-Hardback/p/6107

2.3 First-hand accounts of tank warfare

“4 October 1917 was the date of one of the most successful tank actions of the whole 1917 Flanders campaign. The object of the attack was the capture and subjection of the village and surrounding of Poelcapelle, which had been strongly fortified by the enemy in view of tank attacks. No. 10 Company, under Capt. Maris, was detailed for the show and they had the unenviable knowledge that the ground to be covered had been shelled without cessation for two months. Their only hope lay in keeping to the St Julien-Poelcapelle road, but they were fully aware of the fact that the Germans would keep an almost impassable barrage on this particular route. Luck, however, was on the side of the Tank Corps for once, and eleven out of twelve successfully manoeuvred through the barrage to the village streets. Here they
found the going better and, deploying in Poelcapelle, were the decisive factor in its capture. They then pushed on to the outskirts and completed the destruction of all adjacent strongpoints.

"On 9 October two sections of Maj. Watson's No. II Company, under captains Talbot and Skinner, participated in a small, local attack. In this instance luck deserted them, the two leading tanks receiving direct hits on the road up and, being unable to move further, they completely blocked the road for the remainder. The last tank then ditched, so the rest were caught up in a trap in which they were subjected to a heavy barrage which finally accounted for the lot, and the attack served to swell the huge numbers of derelict tanks in the salient.

"One branch of the Corps deserves special mention for very gallant work done in a very quiet way. The Tank Salvage Companies had the thankless job of recovering every possible salvageable portion of every derelict tank as promptly as possible. Those who served in the salient know that the task was tremendous, with all the kicks and no ha'pence. After every action the position of each ditched or otherwise immovable tank was reported to the Tank Salvage Company, who had to set to work immediately, whatever the position of the tank, which often meant salvaging on the actual front line. The results achieved are sufficient proof of the gallantry and efficiency of this branch of the Corps, and the rewards they received were fully deserved, as tank salvage was by no means the cushy job that many imagined."

Read more at: https://books.google.be/books/about/Tanks_and_Trenches.html?id=_gNuPwAACAAJ&redir_esc=y

3  THINGS TO SEE

3.1  Memorial Museum Passchendaele

This museum tells the story of the war in the Ypres Salient, with a special emphasis on the Battle of Passchendaele in 1917. Zonnebeke and its five villages have the biggest concentration of underground constructions. Because these dugouts are generally not accessible to the public, a life-like reconstruction has been built in the Museum. It also has 150 yards of recreated German and British trenches. The MMP also has an impressive collection of weapons, both Allied and German. This includes the rifles most widely used on the Western Front, such as the British Lee-Enfield and the German Mauser. Some revolvers that were in very widespread use can also be seen, including the British favourite, the Webley, and the German favourite, the Luger. But there are also less common guns, as well as tank guns and machine guns.

Location: Memorial Museum Passchendaele, 5A Berten Pilstraat, Zonnebeke

www.passchendaele.be
3.2 Guynemer Pavilion

The Guynemer Pavilion provides a unique and fascinating opportunity to discover the war in the air during the First World War. There is a special focus on the extraordinary life of the outstanding French pilot Georges Guynemer, who was involved in more than 600 aerial combats, survived being shot down seven times, and achieved 53 victories. On Monday 11 September 1917, sadly, he crashed between the British and German lines, near the Poelcapelle cemetery. The exhibition also looks more generally at aviation during the First World War and its considerable significance. Text and images will expertly tell the story, from the use of aviation for reconnaissance to its use for bombing enemy positions. The Pavilion's showpiece will be a replica of the Morane-Saulnier Type L (Parasol).

www.guynemerpaviljoen.be (from January 2017)

3.3 Lange Max Museum

The Lange Max Museum, situated on the German side of the Western Front, has a farmyard at its heart. A long lane takes you from the farmyard to the remains of the artillery platform of the German big gun known as "Lange Max". In the brand new museum, you can learn all about the largest cannon of its time, which was designed to bombard Dunkirk. The museum focuses on the German occupation of Koekelare, with a unique exhibition on the organisation behind the front line and the production of army goods. It also features a little bakehouse, which still shows signs of the German presence and has now been converted into a multimedia room.

www.langemaxmuseum.be

3.4 Langemark-Poelkapelle tank memorial

The memorial commemorates 243 WW1 tank corps soldiers, commemorated by the Commonwealth War Graves Commission in Belgium. Poelkapelle was the scene of fierce tank warfare in 1917. Many British tanks became bogged down in the mud or were shattered by enemy fire. After the war, there remained a trail of wrecked tanks between Sint-Juliaan and Poelkapelle. One of those bogged-down tanks, the Damon II, stayed in position in front of a cafe called De Zwaan ("The Swan") until long after the war. In 1923, it was moved to the market square, where it continued to attract sightseers, especially British tourists. In 1941, it was dismantled by the Germans.

http://tankmemorial.vpweb.co.uk/

4 MORE INFORMATION
4.1 **Websites**

Interesting websites for a visit to Flanders Fields include:

www.flandersfields1418.com  
www.flandersfields.be

4.2 **Pictures**

On our Flickr page, you will find pictures of Flanders Fields. All images may be freely used, provided copyright is acknowledged.

www.flickr.com/photos/visitflanders/sets/72157625168448934

If you have any problems, please contact Kanittha Paksee: kanittha.paksee@toerismevlaanderen.be, +32 2 504 03 06.

4.3 **Interviews**

You are welcome to contact the following person to arrange an interview:

- Franky Bostyn  
  Coordinator, Historical Section, Ministry of Defence, and former curator of Memorial Museum Passchendaele 1917  
  franky.bostyn@telenet.be

- Steven Vandenbussche  
  Current curator of the Memorial Museum Passchendaele  
  Steven.vandenbussche@passchendaele.be

4.4 **Accessibility**

VISITFLANDERS strives to ensure access for all visitors and provides information on all aspects of an accessible stay.

The following symbols are used in this info pack:

The 🚶 symbol is used to indicate wheelchair-accessible options. Whereas certain locations provide easy access, others may require a little more effort or third-party assistance. For more detailed information on wheelchair-accessible locations, please consult our “Great War centenary - Accessible for all” brochure.
indicates the museums and/or sites that offer additional facilities for visually impaired visitors. For more detailed information regarding these facilities, please consult our "Great War Centenary - Tips for visually impaired visitors" brochure.


For more specific details on all disability-related facilities, please contact pieter.remmerie@intro-events.be. Also useful in terms of wheelchair accessible locations is the AccesSEAble app. which can be downloaded via Google Play, the App Store or the Windows Phone Store.

Website and contact at VISITFLANDERS: www.visitflanders.com/en accessible@visitflanders.com

4.5 Visit Flanders contacts

If you want more information about visiting Flanders, you can find it on our website: www.visitflanders.com.

You can also contact the press manager of Visit Flanders in your country.

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4.6 Sources