



GREAT INVENTIONS OF THE GREAT WAR

The First World War, which ended 100 years ago this month, produced many life-saving treatments and amazing inventions.

It was the “war to end all wars”; for four years, from 1914 until 1918, more than 30 countries and 65 million troops fought in the First World War. This tragic period of human history is sometimes called the Great War, not because it was good but because it was the biggest and most devastating war the world had ever seen. On one side were the Allies – Britain, France, Italy, Russia and the US. On the other were the Central Powers – Austria-Hungary, Bulgaria, Germany and the Ottoman Empire.

The battles were so bloody that they brought Europe to a standstill. The worst one – the Battle of the Somme – lasted 141 days. When both sides agreed to stop fighting on Armistice Day, 11 November 1918, 37 million people had been injured or killed. The huge number of casualties was due to new killing technology; machine guns, tanks and poison gas were widely used for the first time. Soldiers could no longer run and attack their enemies; the guns would

kill them before they got there. Instead, they dug trenches to hide in and shoot from. These trenches could be three metres deep, taller than most adults, and were lined with machine guns capable of firing 600 rounds in one minute. That’s 50 bullets in the time it’s taken you to read this sentence.

Despite causing such destruction, the war was also a time of scientific achievement. Without the First World War, life-saving treatments such as blood transfusions and mobile X-rays may not have been developed. The war also helped the development of the technology that is in mobile phones, and the medicine that stops you from falling dangerously ill when you cut yourself or get an infection.

This month, as we remember the sacrifice of the people who fought in the Great War, we can also give thanks for the inventions and discoveries that changed the world. Here are some of the best and most brilliant scientific developments.



TRENCH LIFE

If soldiers weren’t killed by gunfire or poison gas, they faced trench foot, where the skin on their feet rotted after being wet for too long in flooded trenches.

Both sides dug trenches to shelter from gunfire.



Five things we wouldn’t have without the First World War

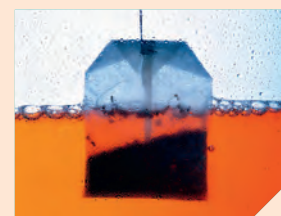
Zips

The first zips were made in 1851 but they didn’t become popular until the US used them in soldiers’ uniforms in the First World War.



Tea bags

During the war, a German company called Teekanne sent the first gauze bags filled with tea leaves to soldiers in the form of “tea bombs”.



Guide dogs

A German doctor called Gerhard Stalling started training dogs to take care of soldiers blinded during the fighting.



Mobile phones

Armies had to talk to pilots in the air and wireless radio kits were developed, without which the mobile phone wouldn’t exist.



Vegetarian sausages

The first soya-based sausages, called “peace sausages” were invented in Germany when meat wasn’t easily available.



THE PRICE OF WAR

It’s estimated that 9.7 million soldiers died and 21.2 million were injured during the First World War.

BATTLEFIELD INNOVATION

Life on the battlefields of the First World War was filthy. Soldiers spent days in the muddy, mucky sludge of the trenches with rats nibbling their feet. Infection was rife and germs spread as soldiers moved across Europe. Today, when you get an infection, your doctor gives you antibiotics, but these weren't available at that time. If you were a soldier and got an infection in a cut on your knee, the disgusting conditions meant your leg may have been amputated (cut off). Leonard Joyce, a surgeon from Reading, saved many arms and legs when he discovered a bacterium (a small, single-celled micro-organism) that "ate" rotting flesh. Surgeons would rub the bacteria, which became known as Reading bacillus, on soldiers' cuts to remove the flesh and get rid of infection.

Blood on the battlefield

If wounded soldiers lost a lot of blood, doctors would carry out a transfusion. This means replacing the blood in one person with the blood of another person. There are four main blood types – A, B, AB or O – and the type is inherited from

The Great War can genuinely claim to have changed the world. Along with many medical treatments and technologies that we use today, it saw the development of some terrible weapons.

your parents. Checking someone's blood type was not common before this war. If a patient was given blood of a different type, they often became sick and might die. Blood does not keep fresh for long outside the body but in 1915, American doctor Oswald Hope Robertson created the first blood bank to stockpile donated blood before a big battle. He discovered that one blood type – O – was safe to use with all patients. Two years later, the first mobile blood-transfusion centre was set up on the Western Front. The Western Front was a strip of land stretching 400

miles from the Swiss border through France and Belgium, on which most of the Great War's battles were fought. Today, thanks to methods developed then, more than 112 million units of blood are collected globally.

X-ray vision

Another common feature in today's hospitals is an X-ray machine. This technology was still new during the war. If you've ever had an X-ray you'll know the machine takes a photo of your insides by sending beams of radiation through your body. To check for injuries and find objects, such as bullets inside soldiers' bodies, scientist Marie Curie built the first mobile X-ray unit. She called it a radiological car and drove it to the front line (the closest point to the enemy), with her daughter, to help surgeons treat injuries. This was the first time women were allowed to play major roles in war. Today there are almost 8,000 women in the British Army.



A machine-gun placement.

Cameras on planes gave generals the first aerial views of the battleground.



Blood was kept on ice for 28 days.

Marie Curie's X-ray car.

RADIOACTIVE RESEARCH

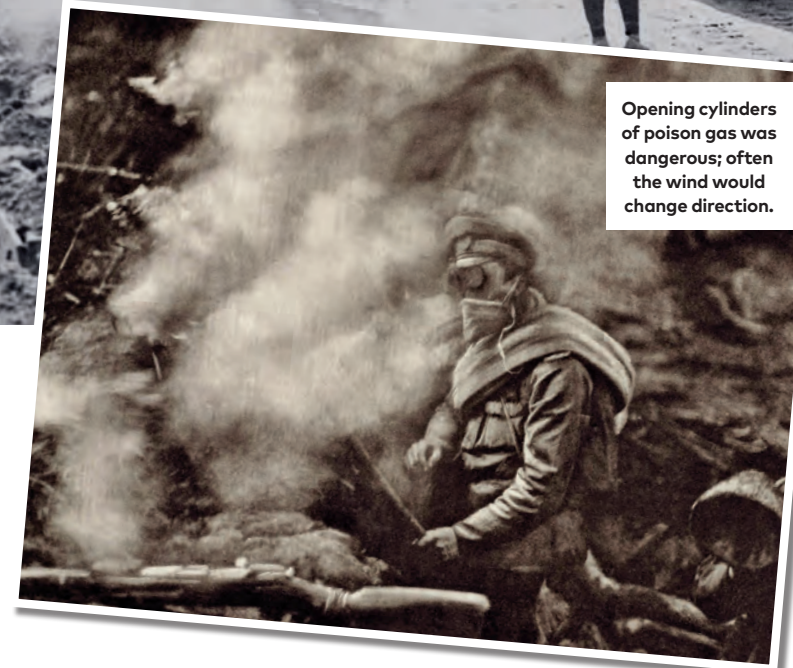
Marie Curie – the only woman to have been awarded two Nobel prizes – worked with deadly radioactive materials. She died from radiation poisoning in 1934.



A British tank after a battle in 1918.

WATER LOAD OF TRICKSTERS

Tanks are called tanks because the British wanted to trick the German army into thinking they were making water tanks rather than armoured vehicles.



Opening cylinders of poison gas was dangerous; often the wind would change direction.

Secret weapon

The X-ray car wasn't the only new type of wartime transport. Tanks were used for the first time to carry supplies and to try to break the standstill caused by both sides being dug into trenches. Led by an armoured tank, soldiers could charge at the enemy without being hit instantly by gunfire.

The British built tanks in strict secrecy. The first tank ever made was called Little Willie, although it was never used on the front line. While it was being trialled, the Mark 1 heavy tank – sometimes called "Big Willie" – was introduced. Tanks first took to the battlefield during the Battle of Flers-Courcelette in September 1916, much to the surprise of the Germans.

Chemical chaos

The Germans had their own secret weapon, too, and it was much more dangerous: chemical attack. In April

1915, the German army, under the guidance of chemist Fritz Haber, released 5,730 canisters of lethal chlorine gas on the front line near the town of Ypres in Belgium. The 150 tonnes of poisonous gas cloud drifted on the wind towards Allied troops. When the gas hit, it reacted with the water in soldiers' eyes and lungs, giving a burning sensation. The chemical attack killed 5,000 Algerian, British, Canadian and French troops, and injured another 10,000.

British soldiers tried to save themselves in later attacks by covering their faces with cotton soaked in urine (wee), but this didn't work. Instead, gas expert John Haldane designed the first gas mask, which was called the box respirator, and was a mask fitted with a filter to stop the poison.

Chemical weapons are so horrible that they were made illegal in battle after the First World War.

Sadly, the Great War was not the end of chemical weapons, nor was it the war to end all wars. Thankfully, however, many lives have been saved or improved due to those early advances in medicine, science and technology.

TITCHY TANK

The first tank to be built was called Little Willie. It was enormous and weighed about the same as 11 male hippos.

HERO OF SCIENCE

Fritz Haber

Described as the father of chemical weapons, German chemist Fritz Haber is a controversial person. He developed lethal gases that helped his country's army kill 5,000 soldiers in the first ever chemical attack. He is also said to have celebrated this horrible victory. However, along with his colleague Carl Bosch, Haber also invented a way to produce

ammonia, a substance that is found in animal poo. Ammonia has many uses: it can be used to make explosives, but it also goes into soil fertiliser, which helps boost food production. Without artificial ammonia, there would be little chance of feeding the growing population of the world.

Fritz Haber was awarded a Nobel prize for his work, although some have called him a war criminal.

