6.25 Technological Advances and World War I

Sources: http://mentalfloss.com/article/31882/12-technological-advancements-world-war-I; https://www.historyonthenet.com/how-many-people-died-in-ww1; https://sourcebooks.fordham.edu/mod/1918richthofen.asp

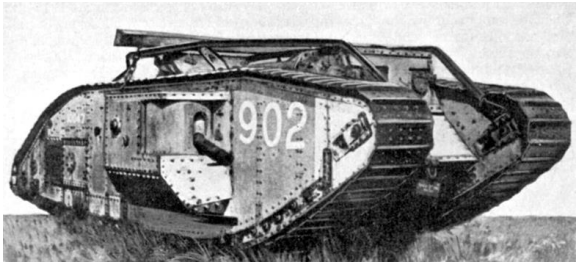
Background: War often leads to technological breakthroughs as militaries seek advantages and try to counter their opponent's strategies. One reason casualties during World War I were so high is that offensive weaponry far outstripped defensive strategies. An estimated 7 million civilians and 10 million military personnel died. The total number of civilian and military casualties, dead and wounded, was about 37 million people. In his memoir, published in 1918, German Captain Manfred Freiherr von Richthofen, who was known as The Red Baron, described air warfare. Von Richthofen was a military "ace" and a German national hero, successful in 80 air combat victories. He was finally shot down and killed in April 1918 during a battle with British pilots. His memoir, *The Red Battle Flyer*, was published in English months after his death. In the memoir, he described an aerial attack on a Russian train yard.

"In Russia our battle squadron did a great deal of bomb throwing. Our occupation consisted of annoying the Russians. We dropped our eggs on their finest railway establishments. One day our whole squadron went out to bomb a very important railway station. The place was called Manjewicze and was situated about twenty miles behind the Front. That was not very far. The Russians had planned an attack and the station was absolutely crammed with colossal trains. Trains stood close to one another. Miles of rails were covered with them. One could easily see that from above. There was an object for bombing that was worthwhile. One can become enthusiastic over anything. For a time I was delighted with bomb throwing. It gave me a tremendous pleasure to bomb those fellows from above."

Questions

1. How did technological advances contribute to high casualty counts during World War I?
2. Based on the account of Von Richthofen, why was the airplane an important new weapon?

Instructions: Below are 12 technological advances developed or improved on during World War I. Select three and explain their short-term and long-term impact on warfare and also on society.



British Tank

German Plane

1**. Tanks:** Machine guns and barbed wire made the territories between enemy trenches a "no-man's-land." Tanks were designed as mobile fortifications to counter machine gun fire. The first tank was the British Mark I. It was used at the Battle of the Somme in September 1916. The French also developed tanks, however Germans was unable to counter with significant tank production that would have offset British and French advances.

2. Flamethrowers: The flamethrower, developed by Germany in 1901, was used by German troops near Verdun in February 1915. It killed British and French troops burrowed in trenches without damaging the structure itself, so it could be used if the German army advanced.

3. Poison Gas: Both sides used poison gas during World War I. Germany first used chemical weapons on the Russian front but had problems when gas froze in cylinders because of frigid weather. The first successful use of chemical weapons was in France when Germany sprayed chlorine gas on French colonial troops. With the introduction of gas masks, poison gas attacks lost their effectiveness.

4. Tracer Bullets: The British invented tracer bullets that emitted small amounts of flammable material that left a "phosphorescent trail" when fired. It added to night accuracy and ignited hydrogen, which made it useful for shooting down German zeppelins.

5. Interrupter Gear: Interrupter gear weaponized airplanes. It allowed a machine gun to fire between the blades of a spinning propeller. Prototypes were developed by Swiss and Dutch engineers. Germany adopted the Dutch Fokker model in 1915. Britain and France almost immediately developed their own models.

6. Air traffic control: The U.S. Army installed the first operational two-way radios in planes. In 1917 a human voice was transmitted by radio from a plane in flight to an operator on the ground.

7. Depth Charges: The German U-boat submarine campaign against Allied shipping sank millions of tons of cargo and killed tens of thousands of sailors and civilians. As a counter-measure, Britain developed the depth charge, an underwater bomb dropped from the deck and set to go off at a specific depth.

8. Hydrophones: The hydrophone was an underwater microphone that located submarines. A thin layer of quartz held between two metal plates responded to tiny changes in water pressure resulting from sound waves. This allowed the user to determine the distance and direction of an underwater object.

9. Aircraft Carriers: The first aircraft carrier was the British ship, the HMS Furious. It had a long platform capable of launching and landing airplanes. Airplanes were stored in hangars under the runway.

10. Pilotless Drones: The first pilotless drones were developed for the U.S. Navy in 1917, however they were not used successfully during World War I.

11. Mobile X-Ray Machines: Nobel Prize winning scientist Marie Curie created truck mounted mobile X-ray stations for the French military. These made it possible to aid wounded soldiers on the battlefield. African-American inventor Frederick Jones developed an even smaller portable X-ray machine in 1919.

12. Sanitary Napkins: The modern sanitary napkin was made possible by the introduction of new cellulose bandage material during World War I. French nurses at the front adapted the bandages for feminine hygiene.