

## **Explain the importance of the technology of warfare in the Second World War, 1939-45?**

War has been a consistent feature of human existence for millennia, and civilizations have always been developing, new and novel weapons in a desperate attempt to stay ahead of the curve. The unprecedented scale and scope of the Second World War demanded the rapid development and production of devastating weapons. Experiences in WW1, where tanks and machine guns were used, had thought the belligerents how important the role of new weapons was in modern, industrial scale wars. Both the Germans and Italians had refined their use of weapons during the Spanish civil war. During wartime, there is an impetus to develop weapons which can have a huge bearing on the course of world history, during, or even after, the war.

The German Blitzkrieg tactics were designed to take maximum advantage of the mobility and power of modern weaponry. This plan of attack was used successfully against Poland, Norway, Denmark, Belgium and France. First the Luftwaffe took control of the skies and used bombers such as Heinkels and Stukas to destroy railway lines, bridges and communication lines. Then tanks such as panzers and Tiger tanks would smash through enemy defences and finally infantry and mechanised cavalry would mop up any remaining resistance. The fall of France in the summer of 1940 demonstrated the overwhelming supremacy of modern weapons and tactics. The French relied heavily on heavy, immobile weapons and largely obsolete fortifications such as the Maginot line.

Another novel use of technology in WW2 was the first deployment of paratroopers, which settled nicely into Hitler's vision of a fast, mobile army. They were used first in the invasion of Norway in April 1940, to help capture the ports of Oslo and Stavanger. They were also used in the attacks on France and Belgium, including the capture of the famous Belgian fort of Eben Emael. The largest airborne assault of the time was the invasion of Crete, and the Wehrmacht's success prompted the allies to also use paratroopers during the invasion of Normandy in June 1944. This shows how technology could create entirely new ways of fighting wars.

One decisive factor of WW2 was the war at sea, and here too technology played an important role. In the early stage of WW2 of the war, the Kriegsmarine battleships (e.g. the Bismarck) and U-boats caused great damage and disruption to trade routes. These U-boats hunted in 'wolf-packs' and struck from bases in France and Norway. They were armed with torpedoes which had either impact, magnetic or acoustic homing warheads. U-boats commanders received their orders by radio, through an enigma encrypted code. At Bletchley Park in England, a team of mathematicians led by Alan Turing successfully built the 'bomb' the device to break the enigma code. This, along with allied counter-measures such as the development of sonar and long-range aircraft escorts helped diminish the U-boat threat greatly by 1943. But 2700 merchant ships had already been lost.

One of the features of WW2 which set it apart from previous global conflicts was the proliferation of fighter and bomber planes and the resources devoted to the struggle for air supremacy. During the battle of Britain, the Hurricanes and Spitfires of the Royal Air Force went up against the less agile, but better armed Messerschmitts. The successful RAF action managed to prevent Operation Sealion, the planned invasion of Britain. Later in the war, when the tide had well and truly turned, British Stirling and Dornier bombers inflicted heavy damage

on the German cities, often escorted by long range American Mustang fighters. The British also developed the famous 'bouncing bombs' used in Operation Chastise to flood large tracts of the Ruhr region. The US preferred the much more massive B-26 'flying fortress' bomber. The warring countries also developed sophisticated air defence systems. For example, the allies developed RADAR (Radio Direction and Range) to allow them to successfully intercept German bombers. Innovations like these were instrumental in turning the tide of the air war.

British citizens also faced the threat of the Vergeltungswaffen (vengeance weapon) rockets. The V1 flying bombs and its far more deadly successor, the V2 rockets, were launched from Calais at targets in South London. These unstoppable weapons struck terror into the hearts of the British population and claimed the lives of 9000 people. But their use came too late in the war to have a major impact on the War. After the war, leading German rocket scientists such as Werner Von Braun were repatriated to the US where they helped design the Mercury, Gemini and Apollo space programs.

Technology also played a pivotal role in the D-Day (Deliverance Day) operations, where the allies opened up a third front. As part of Operation Overlord, 160,000 soldiers were landed on 5 beaches in Normandy, codenamed Juno, Sword, Omaha, Gold and Utah. Most troops were landed in modified vehicles such as Higgins' boats or Amtraks (amphibious tractors) However a wide range of modified tanks, collectively known as 'Hobart's Funnies', were also designed. These included amphibious tanks, tanks which deployed fascos to fill large ditches and tanks which deployed a canvas and steel cloth to ensure following vehicles would not sink into the soft ground. There were two other large scale technological innovations associated with the D-Day landings; PLUTO (Pipe Line Under The Sea) allowing them to provide vital supplies of

petrol for the armoured divisions, and 'mulberries', artificial harbours allowing them to dock ships.

To end the war in Japan, President Harry Truman decided to unveil to the world the greatest leap forward in military technology since the discovery of fire; the atomic bomb. This device, which would dominate the second half of the twentieth century, was developed by a team of scientists working under Robert Oppenheimer in Los Alamos, New Mexico. The bomb was dropped first on Hiroshima and on the city of Nagasaki a few days later. Tens of thousands were killed by the immediate blast and as a result of the nuclear radiation and fallout. This was the primary factor in ending the Second World War, and was a harrowing reminder of the awful power of technology.

Technology was important in every theatre of war; in the air, at sea and on the ground. It was pivotal to the success of key operations such as the Battle of Britain, the Invasion of Normandy and Victory in Japan (V.J).