COGNITIO

Student Research Journal
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St. Andrew's Junior College of
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Editorial

> "A people without knowledge of their past history, origin and culture is like a tree without roots"
>
> - Marcus Garvey.

We as teachers and facilitators encourage our learners to gain knowledge. We try our very best to transfer our knowledge to our learners so that they may gain insights into the world around them, that this insight may enable them to acquire knowledge of their past history and culture, and give them opportunities to shape the future.

This student journal is so named " Cognitio" because in the wider sense of the term it means, the act of knowing or knowledge, and may be interpreted in a social or cultural sense to describe the emergent development of knowledge and concepts within a group that culminate in both thought and action.

This year for the first time the students of St Andrew's Junior college will go beyond the teaching-learning experience and venture into research. The topic for this year is on "World War I". Students from different streams, researched on the impact of the Great War on poetry, society, on human psyche, technology and on life as a whole.

By way of this journal, students can not only acquire knowledge but also share the knowledge they acquire. Sharing knowledge has helped mankind survive and evolve into the intelligent and productive species he is today.

To quote Gautama Buddha "There is no wealth like knowledge and no poverty like ignorance", let "Cognitio" help our students to gain this wealth so as to help them in years to come.

Prof. Tania Donald
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Poetry of World War I

Poems Written in Trenches

- Edrion Ashirvadam (FYJC Sc B)
- Punith Amin (FYJC Sc B)

Roughly 10 million soldiers lost their lives in World War I, along with seven million civilians. The horror of the war and its aftermath altered the world for decades, and poets responded to the brutalities and losses in new ways. First World War poetry described the terror of the trenches and the futility of war. The poems are written by soldier-poets who volunteered and served in the War.

In his introduction to The Oxford Book of War Poetry, John Stallworthy underlines the emotive power of poems about war: "'Poetry', Wordsworth reminds us, 'is the spontaneous overflow of powerful feelings', and there can be no area of human experience that has generated a wider range of powerful feelings than war: hope and fear; exhilaration and humiliation; hatred – not only for the enemy, but also for generals, politicians, and war-profiteers; love – for fellow soldiers, for women and children left behind, for country (often) and cause (occasionally)." The First World War was "one of the seminal moments of the twentieth century in which literate soldiers, plunged into inhuman conditions, reacted to their surroundings in poems," Oxford University English lecturer Dr Stuart Lee says.

The subject of these poems is the War and the Pity of War. Some poets glorified the cause patriotically- trumpeting the older traditional notions of duty and honour. Many younger soldier-poets shirked the platitudes and flowery language of the past and infused their work with the War's gruesome realities to strip modern war of its old-fashioned glory. World War I had made a great impact on literature as well as the whole humanity.

The First World War began with the assassination of Archduke Ferdinard, the Crown Prince of Austria. The poems written in 1914 and 1915 extol the old virtues of honour, duty and heroism.

The poems ‘The Dead’, written by Rupert Brooke, and ‘In Flanders Fields’, written by John McCrae, depicted the poets’ feelings on the death of their fellow soldiers. They do mourn for their comrades, at the same time they are glorifying their martyrdom. ‘In Flanders Fields’ urges the other people to join the war.

1916 onwards as the War progressed the poems depicted in detail the gruesome picture of the War. The trench warfare which was a strategy used for the first time were the places where the soldiers met with the most inhuman conditions. Soldier poet, Isaac Rosenberg, depicted this very well in his poem ‘Break of Day in the Trenches’

The poems of 1917-18 depicted the anger about the War and its futile nature. The poems ‘Anthem for Doomed Youth’ and ‘Futility’ by Wilfred Owen question the sacrifice of the nation’s youth who gave up everything and joined the War only to lose their lives, die unknown in some faraway land. The poems also brought out the effects of lack of proper communication which actually prolonged the War.

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एक सैनिक अकेली मृत्यु

(The Pain of a Soldier)

Tania Fernandes Noella Picardo, Brenell Rosario, Juana Soares,
Janavi Shinde, Elroy Sequeira, Roshan D'souza

रेगिस्तान की रेत के बीच भोर अभी शुरू हुई,
लड़ाई बमबारी उगते सूरज पर्दा, पर रहती.
अभी तक एक आदमी अपने दिल को एक तस्वीर धारण नहीं एक लड़का,
महासागरों उन्हें अलग रखने हालांकि की भूल नहीं लोगों को प्यार करता था.
अपने देश की सेवा करने के लिए कहा जाता है, बहादुर की स्वतंत्रता घर की जमीन,
वह बचा सकते हैं कि जीवन के लिए अपने अस्तित्व को खतरे में डाल.
उसकी निराशा में वह अपने सिर को ऊपर उच्च रखती छुपा
उसकी बाहों उसे धीरे धीरे मर देख एक विश्वासनीय दोस्त को गले लगाओ.
वह अब नहीं है एक लड़का, उस दिन वहां, एक आदमी खड़ा था
क्रोध से भर उसके दिल, उसके मन को समझाने के लिए संघर्ष करता है
भगवान का एक आदमी होना करने केलिए उठाया, तुम हत्या नहीं करोगे सिखाया
अब उसकी ही मर्जी वहाँ आज़ादी जहां युद्ध के मैदान पर रखा .
सूर्यास्त के नीचे आराम कर रहा है, वह घर के सपने घायल
रेगिस्तान के फर्श पर पड़ा एक सैनिक अकेले दम तोड़ दिया.

विश्व युद्ध I, या प्रथम विश्व युद्ध WWI, महान युद्ध और युद्धों को समाप्त करने के लिए एक युद्ध), एक विश्व सैन्य संघर्ष था जिसमें दुनिया की बडी शक्तियों का बहुमत (majority of the world's great powers)शामिल था, दो सैन्य गठबंधन के विरोध में आयेजित: अंतंत पॉवर्स (Entente Powers) और सेंट्रल पॉवर्स (Central Powers) ७० मिलियन से अधिक सैन्य कामिंक इतिहास के सबसे बड़ा युद्ध में जुटाए गए. कुल युद्ध (Total War) की अवस्था में, प्रमुख लड़ाकों ने अपनी वैज्ञानिक और औद्योगिक क्षमता युद्ध के प्रयास की सेवा में सखी. १५ मिलियन (15 million people) से अधिक लोग मारे गए, यह मानव इतिहास में एक भयंकर संघर्ष बना

युद्ध के लिए आसन्न उत्प्रेरक २८ जून १९१४ को एक बोस्नियाई-सर्ब (Bosnian-Serb) राष्ट्रवादी के द्वारा ऑस्ट्रिया के अर्क्डुक फ्रैन्ज़ फ़र्डिनैंड की हत्या (Assassination of Archduke Franz Ferdinand of Australia), जो आस्ट्रिया-हंगरी (Austro-Hungarian) सिंहासन का वारिस था. ऑस्ट्रिया-हंगरी के सर्बिया साम्राज्य (Kingdom of Serbia) के खिलाफ मांगें के परिणामस्वरूप गठबंधनों की श्रृंखला के एक सक्रियण करने को लिए नेतृत्व किया जिसके कारण कुछ हफ्तों मे प्रमुख यूरोपीय शक्तियाँ युद्ध में दिखे, कई यूरोपीय देशों के वैश्विक साम्राज्य की वजह से, युद्ध जल्दी ही दुनिया भर में फैल गया.

युद्ध के अंत तक, चार प्रमुख साम्राज्यवादी शक्तियाँ जर्मनी (Germany), ऑस्ट्रिया-हंगरी (Austria-Hungary), तुर्ख साम्राज्य, और रूस (Russia) सैन्य और राजनीतिक से पराजित हुए थे, जहाँ दो स्वायत देशें के रूप में अस्तित्व खो चुके थे. सोवियत संघ (Soviet Union) में क्रांतिकारी परिवर्तन रूसी साम्राज्य से उभरा, जबकि मध्य यूरोप का नक्शा कई छोटे राज्यों में पूरी तरह से फिर से बनाया गाया. राष्ट्रों का संघटन (League of Nations) इस तरह के एक और संघर्ष को रोकने की आशा में गठन किया गया था. यूरोपीय राष्ट्रवाद (Nationalism) युद्ध के कारण, जर्मनी की हार के नतीजे और वरसैल्स के समझौते (Treaty of Versailles) ने अंततः १९३९ में विश्व युद्ध - २ की शुरूआत में नेतृत्व किया.

कारण (संपादित करें)

पूर्व- WW I यूरोप मे अंतराष्ट्रीय संबंधो की स्थिति का एक आलेखी चित्रण, अप्रल १९१५ से इटली ट्रिपल अतंत में शामिल हुई.

२८ जून १९१४ के, गर्विलो प्रिंसिप (Gavrilo Princip), एक बोस्नियाई सर्ब (Bosnian Serb) विद्यार्थी ने, अर्क्डुक फ्रैन्ज़ फ़र्डिनैंड (Archduke Franz Ferdinand), ऑस्ट्रिया-हंगरी सिंहासन (Austro-Hungarian throne) के वारीस को साराजेवो (Sarajevo) में गोली मार दी और मार डाला. प्रिंसिप युवा बोस्निया (Young Bosnia) का एक सदस्य था (उस समय काला हाथ), एक समूह जिसके उद्देश्य में शामिल च्या दक्षिण स्लैव्स (South Slavs) का एकीकरण और ऑस्ट्रिया-हंगरी ने सर्बिया (Serbia) से कारवाई की मांग की उन जिम्मेदार लोगों को दंडित करने के लिए और जब ऑस्ट्रया-हंगरी को पता चला की

सर्बिया ने पालन नहीं किया, तो युद्ध की घोषणा की. प्रमुख यूरोपीय शक्तियाँ सप्रताह के अंदर सामूहिक सुरक्षा (Collective Defence) के लिए अतिव्यापी समझौते की वजह से और अंतराष्ट्रीय गठबंधनों के जटिल स्वभाव की वजह से युद्ध में थे.

हम झूठ यहाँ मृत

The love of people for their country

हम झूठ यहाँ मृत
हम झूठ यहाँ मृत
हम चयन नहीं किया है क्योंकि
भूमि रहते हैं और शर्म की बात है
जो हम से उछला.

जीवन, यह सुनिश्चित हो
खोने के लिए बहुत कुछ नहीं है,
लेकिन युवा पुरुषों, यह लगता है कि
और हम युवा थे.

युद्ध शैतानों काम हे

The ill effects of war on living beings

युद्ध शैतानों काम है
युद्ध हमें चोट बनाता है
युद्ध उसके जीवन का अंत काया है
युद्ध मुझे रुलाती है क्या है
युद्ध मे मरने के लिए तेज तरीका है
युद्ध के जीवन का एक रास्ता बन गया है
युद्ध हमें नफरत है क्या करता है
युद्ध में सोचने का लिए :::::: रहै है ले जा रहा है
युद्ध एक जाति के बीच है
युद्ध के एक देश के बीच है
युद्ध हमेशा आ रहा है
युद्ध के शिकार है

युद्ध इंतज़ार कर रही है
युद्ध हमेशा पीछा कर रहे थे क्या है
युद्ध के कई नफरत कर रहै है क्या है
युद्ध हम ले रहै हैं दवा है
युद्ध हर जगह है
युद्ध हमें ——– बनाता है
युद्ध हम बर्तन कपड़े है
युद्ध हमें जागरूक बनाता है
युद्ध हमें डर लागाता है काया करता है
युद्ध हमेशा यहाँ हो जाएगा
युद्ध मैं हमेशा डर क्या है
युद्ध के आँसू क्या कारण है
युद्ध यहाँ है.

Chemicals and Technologies Used in World War I

Ruchitra Patil, Risha D'Souza , Ninoshka Satan, Prathamesh Jadhav, Gweyneth Samson , Shreeya Sonkar, Sarah Monteiro , Roshin Fernando, Arti Lakra, Samantha Cardozo, Vibha Sharma. Hillsley Kinny.
(11A and 11B science)

CHEMICAL WEAPONS: Chemical weapons in World War I were primarily used to demoralize, injure, and kill entrenched defenders, against whom the indiscriminate and generally slow-moving or static nature of gas clouds would be most effective. The types of weapons employed ranged from disabling chemicals, such as tear gas and the severe mustard gas, to lethal agents like phosgene and chlorine

Chemical weapons in World War I

TEAR GAS: The earliest military uses of chemicals were tear-inducing irritants. During the First World War, the French army was the first to employ gas, using 26 mm grenades filled with tear gas (ethyl bromoacetate). The small quantities of gas delivered 19 cm^3 per cartridge. As bromine was scarce among the Entente allies, the active ingredient was changed to chloroacetone.

MUSTARD GAS: The most effective gas of the First World War was mustard gas.Exposure to mustard gas was extremely painful, and caused blistering, vomiting, and possibly internal bleeding. The most widely reported and, perhaps, the most effective gas of the First World War was mustard gas. It was used for harassing and polluting the battlefield. Mustard gas caused internal and external bleeding which was extremely painful.

POISON GAS: Poison gas was the most feared of all weapons in one. Poison gas was indiscriminate and could be used on the trenches even when no attack was going on. A poison gas attack meant soldiers having

to put on crude gas masks and if these were unsuccessful, an attack could leave a victim in agony for days and weeks before he finally succumbed to his injuries

PHOSGENE: The deficiencies of chlorine were overcome with the introduction of phosgene, which was prepared by a group of French chemists led by Victor Grignard and first used by France in 1915. Colourless and having an odor likened to “moldy hay,” phosgene was difficult to detect, making it a more effective weapon. Phosgene was a potent killing agent, deadlier than chlorine. Phosgene is the chemical compound with the formula $COCl_2$. This colorless gas gained infamy as a chemical weapon during World War I.

CHLORINE: Chlorine is a powerful irritant that can inflict damage to the eyes, nose, throat and lungs. At high concentrations and prolonged exposure it can cause death by asphyxiation.

TABUN: It is an extremely toxic chemical substance. It is a clear, colorless, and tasteless liquid with a faint fruity odor. It is classified as a nerve agent because it fatally interferes with normal functioning of the mammalian nervous system. It was enormously toxic to humans.

SARIN: $[(CH_3)_2CHO]$ CH3P (O) F. It is a colorless, odorless liquid, used as a chemical weapon owing to its extreme potency as a nerve agent. It has been classified as a weapon of mass destruction in Resolution. Production and stockpiling of sarin was outlawed by the Chemical Weapons Convention of 1993, in Germany and it is classified as a Schedule 1 substance.

TECHNOLOGIES

Technology during World War I reflected a trend toward industrialism and application of mass production methods to weapons and to the technology of warfare in general.

TRENCH WAREFARE: Even with all the new technology being introduced, much of World War I was fought in trenches, especially the

Western Front. This meant huge casualties and some of the deadliest battles in history, including Gallipoli, the Marne, Verdun and the Somme. Tanks made their first appearance at the Battle of the Somme. The first tank used was nicknamed ‘Little Willie’ and carried up to three crew members. Little Willie only drove three mph and could not move across the trenches.

GUNS: The machine guns available at the start of World War I needed four to six men to operate them. The guns also had to be positioned on a flat service. This type of machine gun had the firepower of a hundred other guns. Large field guns were also used. They had a longer range, but needed a dozen men to operate them

FLAMETHROWERS AND SUBMARINES. The flamethrower was another weapon used for the first time during the First World War. The Germans introduced it, but it was later used by other forces. The heavy weight of the flamethrower made the weapon’s operators easy targets. However, flamethrowers were effective, causing lots of havoc on the battlefield.

EFFECTS OF WEAPONS USED

LUNG WARFARE AGENT: The oxygen supply of the body is broken, which leads to death. This includes, for example, chlorine, phosgene, diphosgene (Perstoff) and chloropicrin.

BLOOD WEAPON: Again, the oxygen supply of the body is blocked. However, in these warfare agents, the blood is attacked, which transports oxygen to the various organs. This includes, inter alia, hydrogen cyanide, arsenic hydride and cyanogens chloride

SKIN WEAPON: Here, the skin of the body is under attack. This can be fatal if the affected skin area is large enough. Blister agents are used to make the opponent incapacitating him and thereby not necessarily kill. Including but not limited Nitrogen mustard, sulphur Lost (mustard gas), and lewisite Phosgenoxim.

NERVE AGENT: This is an enzyme due to which the nervous system of humans is blocked (acetyl cholinesterase), and some important parts of the body (e.g. B. diaphragm)

HEALH EFFECTS: Soldiers who claimed to have been exposed to chemical warfare have often presented with unusual medical conditions which has led to much controversy. The lack of information has left doctors, patients, and their families in the dark in terms of prognosis and treatment. Nerve agents such as sarin, tabun, and soman are believed to have the most significant long-term health effects.

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Impact of the First World War on Human Health

- Vivian Serrao (XI-B science)
- Vibha Sharma (XI-B science)
- Samantha Cardozo (XI-B science)

It is difficult to measure (or imagine) the effects of having so many young men, both temporarily and permanently, removed from society. Many parents lost the support they normally would have received from their male children in later years. It also meant part of a generation of potential leaders was lost. The human life cycle is marked by milestones. The very beginnings of life and its ultimate end are perhaps those culturally afforded the greatest attention. Soldiers not only suffered on the battlefield. Veterans often needed long-term care owing to the physical and psychological impact of war. The close proximity of people in wartime conditions meant diseases such as tuberculosis could easily spread. The exertion of battle could highlight other health problems including asthma and heart conditions.

In addition to physical problems either exacerbated or caused by war, emotional problems could also be brought on by battle. The First World War is often associated with the syndrome called shell shock. This was originally believed to have a physical origin, caused by the impact of loud shelling. However, it became clear that soldiers who had never been exposed to shells were developing the same symptoms. During the horrendous Battle of the Somme in 1916, there was a severe increase in the number of cases. *TRENCH FOOT*, an infection of the feet caused by cold, wet and unsanitary conditions, were very specific to the water-filled trenches of the First World War.

The influenza pandemic of 1918-1919 killed more people than the Great War, known today as World War I (WWI), at somewhere between 20 and 40 million people. It has been cited as the most devastating epidemic in recorded world history. More people died of influenza in a single year than in four-years. In the fall of 1918 the Great War in Europe was winding

down and peace was on the horizon. The Americans had joined in the fight, bringing the Allies closer to victory against the Germans.

Deep within the trenches these men lived through some of the most brutal conditions of life, which it seemed could not be any worse. In the two years that this scourge ravaged the earth, a fifth of the world's population was infected. The flu was most deadly for people ages 20 to 40. It infected 28% of all Americans (Tice). An estimated 675,000 Americans died of influenza during the pandemic, ten times as many as in the world war. Of the U.S. soldiers who died in Europe, half of them fell to the influenza virus and not to the enemy (Deseret News). An estimated 43,000 servicemen mobilized for WWI died of influenza (Crosby). 1918 would go down as unforgettable year of suffering and death and yet of peace. Diseases flourished in the chaotic wartime conditions. In 1914 alone, louse-borne epidemic typhus killed 200,000 in Serbia. From 1918 to 1922, Russia had about 25 million infections and 3 million deaths from epidemic typhus. In 1923, 13 million Russians contracted malaria, a sharp increase from the pre-war years. In addition, a major influenza epidemic spread around the world. Overall, the 1918 flu pandemic killed at least 50 million people.

The events of August 6 and August 9 can be translated into environmental effects more literally. The blasts caused air pollution from dust particles and radioactive debris flying around, and from the fires burning everywhere. Many plants and animals were killed in the blast, or died moments to months later from radioactive precipitation. Radioactive sand clogged wells used for drinking water winning, thereby causing a drinking water problem that could not easily be solved. Surface water sources were polluted, particularly by radioactive waste. Agricultural production was damaged; dead stalks of rice could be found up to seven miles from ground zero. The impact of the bombing was noticeable within a 10 km radius around the city. The air was filled with toxic pollution emanating from Agricultural production was impaired as soil and water became contaminated with radioactive materials.

The number of instantaneous deaths at the time of the explosion was placed at 100,000, while 200,000 died as an aftermath of nuclear radiations. 70,000 up to 150,000 people died from the aftermath, while an estimated 40,000 were killed instantaneously. Subsequent deaths, and the resulting deformed offspring begotten by women who were within one km. radius, became living evidence of the effects of the radioactive power released by nuclear bombs. The ugly face of war became abhorred by many as innocent lives became pawns and victims of power-hungry leaders.

The war had profound consequences in the health of the troops. Of the 60 million European military personnel who were mobilized from 1914 to 1918, 8 million were killed, 7 million were permanently disabled, and 15 million were seriously injured. Germany lost 15.1% of its active male population, Austria-Hungary lost 17.1%, and France lost 10.5%. In Germany civilian deaths were 474,000 higher than in peacetime, due in large part to food shortages and malnutrition that weakened resistance to disease. By the end of the war, starvation begat by famine had killed approximately 100,000 people in Lebanon. Between 5 and 10 million people died in the Russian famine of. By 1922, there were between 4.5 million and 7 million homeless children in Russia as a result of nearly a decade of devastation from World War I, the Russian Civil War, and the subsequent famine of 1920–1922.

War can also have a drastic impact on the health of civilian populations. The hydrogen bombs dropped on the Japanese cities of Hiroshima and Nagasaki had a horrendous immediate impact, killing thousands. They also had long-term effects on the population. *Radiation sickness* and birth defects of children were problems experienced long after the buildings destroyed by the bomb were rebuilt. The first impact of the atomic bombings was a blinding light, accompanied by a giant wave of heat. Dry flammable materials caught fire, and all men and animals within half a mile from the explosion sites died instantly. Many structures collapsed, even the structures designed to survive earthquakes were blasted away.

Many water lines broke. Fires could not be extinguished because of the water shortage, and six weeks after the blast the city still suffered from a lack of water. A number of small fires combined with wind formed a firestorm, killing those who did not die before but were left immobile for some reason. Within days after the blasts, radiation sickness started rearing its ugly head, and many more people would die from it within the next 5 years. The total estimated death toll: 100,000 were killed instantly, and between 100,000 and 200,000 died eventually. About 40,000 were killed instantly, and between 70,000 and 150,000 died eventually. The First World War therefore had without doubt tremendous effects on human life. These effects can be seen to some extent even today.

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Effect of First World War on Plants, Animals and Human beings

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Warfare is inherently destructive of sustainable development .The application of weapons the destruction of structures and oil fields, fires, military transport movements and chemical spraying, are all examples of the destroying impact of war may have on the environment. Air, water and soil are polluted, man and animals are killed and numerous health affects occur among those still living.

Wars mainly occur in densely populated regions over the division of scarce resources, such as fertile farmland. It is very hard to estimate the exact environmental impact of each of these. Here a summary of some of the most striking environmental effects including biodiversity loss, famine, sanitation problem at refugee camps and over fishing.

One of the most striking effects of the war was oil spills.. For example, the war caused environmental problems as Israelis bombed a power station of south of Beirut. This caused damage to storage tanks. These storage tanks leaked an estimated 20,000 tons of oil into the Mediterranean Sea. The oil spill spread rapidly, covering over 90 km of the coastline killing fish. Part of the spill burned causing widespread air pollution. Smog affected the health of people living in the city of Beirut. So far problems of oil spills have occurred because of ongoing violence in the region. Resources are key sources of conflict between nations after the end of the war. A nation’s survival depends on resources from the environment.

In the Great War tear gas known as CS or Chlorobenzolomalon Nitrile was used. CS was not only regarded as toxic to human beings but also disturbed the total environment in 15 to 45 days. Several hundred deaths were later reported when the gas was used in heavy concentration in confined space.

Pesticide and chemicals are also designed to be toxic to particular groups of organisms. Pesticides are highly specific and can affect terrestrial wildlife, soil, water system and humans. The most striking effect is on birds particularly those in the higher tropical levels of food chain. Pesticides and chemicals used in war may kill grain and plant feeding birds and the elimination of many rare species of ducks and geese have been reported. Population of insect eating birds such as partridges, grouse and pheasants have decreased due to the loss of their insect food in agricultural fields through the use of chemicals .Bees are extremely important in the pollination of crops and wild plants and although chemicals are screened for toxicity to bees.

Environmental pollution may be described as the unfavorable alteration of our surrounding attributed to the anthropogenic activities of man. It results in changes in energy pattern, radiation levels, chemical and physical constitution and abundance of microorganisms. Pollution included release of materials into the atmosphere which makes the air unsuitable for breathing, harm the quality of water and soil, and give out substances which damage the health of human beings.

The most important aspect of First World War is how it affected human beings. There was evidence of increasing anxiety often suspected of being carcinogenic, or of disrupting endocrine activities. The environmental components involved in communicable disease such as malaria, schistosomiasis, filariasis, trypanosomiasis. Chronic toxic effect in human beings is cancer, skin disease, mouth, lung, liver, kidney, breast, vascular systems were affected.

Therefore the impact of the First World War on living beings was deadly. The Nations of the world should therefore respect international law providing protection for the environment.

Psychological Impact of World War 1

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Fighting, Battle, Combat, and War. These words bring to mind thoughts of guns, smoke, planes, bombs, and killing. However, there is another characteristic of this type of combat, one we rarely consider.

The Psychological Effects of War, not only on those who are fighting, but also on those who know people who are fighting. This is one aspect of fighting that is often overlooked, but there are great probabilities of being affected and scarred for life. In every major war of the century, there has been a greater probability of becoming a psychiatric casualty than of being killed by enemy fire. This means that individuals who survive combat may very well end up paying a psychological cost for a lifetime.

The emergence of the concept of **Shell Shock** during the First World War focused attention on the issue of traumatic illness. This concept of Shell Shock emerged in the harsh winter of 1914-15 as soldiers sought to describe how they felt when under fire. During training, they had been instructed to conceal their fears because panic was known to spread rapidly through battalions. With no prospect of an early end to the conflict, many soldiers were worn down by the emotional demands of trench warfare.

It was a term coined to describe the reaction of some soldiers during the war to the trauma of battle. It was a reaction to the intensity of the bombardment and fighting that produced a helplessness appearing sometimes as panic and being scared, or flight, an inability to reason, sleep, walk or talk.

Other symptoms included fatigue, tremor, confusion, nightmares and impaired sight and hearing. The person was typically numb at first but later had symptoms including depression, excessive irritability, guilt (for

having survived while others died), recurrent nightmares, flashbacks to the traumatic scene, and overreactions to sudden noises It was often diagnosed when a soldier was unable to function and no obvious cause could be identified. Shell shock became a military priority as a flood of psychiatric casualties eroded the strength of front-line units. Specialist centres were set up within the sound of the guns to provide rapid treatment and to discourage soldiers from believing that they had escaped military duty.

The number of shell shock cases grew during 1915 and 1916 but it remained poorly understood medically and psychologically. Some doctors held the view that it was a result of hidden physical damage to the brain, with the shock waves from bursting shells creating a cerebral lesion that caused the symptoms and could potentially prove fatal. Another explanation was that shell shock resulted from poisoning by the carbon monoxide formed by explosions.

At the same time an alternative view developed describing shell shock as an emotional, rather than a physical, injury. Evidence for this point of view was provided by the fact that an increasing proportion of men suffering shell shock symptoms had not been exposed to artillery fire. Since the symptoms appeared in men who had no proximity to an exploding shell, the physical explanation was clearly unsatisfactory.

Because many of the symptoms were physical, it bore some overt resemblance to the modern diagnosis of **Post-Traumatic Stress Disorder.** Post-traumatic stress disorder (PTSD) was the term used after 1980 to explain the effect of war on soldiers and was later used outside the military to describe the impact of a traumatic event on an individual. However, there is a long history of different diagnoses used to try and get to grips with the psychological impact of war. Civilians, particularly children, can also suffer the effects of trauma.

Child psychoanalysis emerged during the Second World War from the work of Anna Freud, psychoanalyst and daughter of Sigmund Freud. She set up a centre for young war victims. Here the children separated

from their parents were given foster care. After the war this continued at the Bulldogs Bank Home, an orphanage that was run by Freud's colleagues and which took care of children who had survived the concentration camps.

Today, the recognition of post-traumatic stress disorder (PTSD) has established in the minds of the public, media and the health professionals that war can produce long-term and severe psychological effects.

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Role of Women during the First World War.

- Simi Shibu (XI A Arts)
- Antonette D'souza (XII B Arts)

World War I was a time death, destruction and was in general a conflict of monumental proportions. However, as the cliché goes, there was a silver lining to the storm cloud. In case of the Great War, the silver lining refers to the great leaps forward made in women's empowerment and involvement in society because of the advent of the war, which forced them into positions previously never considered by either gender. World War One provide women with the perfect opportunity to demonstrate to a male dominated society that women were for more than simply domestic chores, and this proved to be beneficial for both men and women alike.

Before the war, the most common employment for a woman was as a domestic servant. However, women were also employed in what were seen to be suitable occupations e.g. teaching, nursing, and office work. The British textile and clothing trades, in particular, employed far more women than men and were regarded as 'women's work'. While some women managed to enter the traditionally male career paths, women, for the most part, were expected to be primarily involved in "duties at home" and "women's work".

When the war broke out in 1914, thousands of women were sacked from jobs in dressmaking, millinery and jewelry making. They needed work – and they wanted to help the war effort. With millions of men away fighting and with the inevitable casualties, there was a severe shortage of labour in a range of industries, from rural and farm work to urban office jobs. During the world war women were needed by the national war effort to undertake new roles. For example, Because of naval battles and blockades during the war food supplies from abroad became scarce and food production on the home front had to be massively increased, in Britain 113, 00 women joined the Women's Land Army which was set up in 1917, to provide a workforce to run the farms.

In Great Britain, this was known as a process of “Dilution” and was strongly contested by the trade unions, particularly in the engineering and ship building industries. For the duration of both World Wars, women did take on skilled “men’s work” However, in accordance with the agreement negotiated with the trade unions, women undertaking jobs covered by the Dilution agreement lost their jobs at the end of the First World War.

Not only did women have to keep “the home fires burning” but they took on voluntary and paid employment that was diverse in scope and showed that women were highly capable in diverse fields of endeavour. There is little doubt this expanded the view of the role of women in society and changed the outlook of what women could do and their place in the workforce. Although women were still paid less than men in the workforce, pay inequalities were starting to diminish as women were now getting paid two-thirds of the typical pay for men.

Still today, when women are employed as professional soldiers by a number of state armed forces, we tend to believe that war is man’s exclusive business. This is plainly untrue, and has always been so, since war can’t be reduced to combat, and combat is no longer the sole province of man.

Hence, it can be concluded, though the war, was fatal….traumatic and most destructive of its kind, it had a positive outlook, towards women, which encouraged them to freely interact and associate with the mainstream society, without any inhibitions.

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The First World War
Its Causes and Consequences

- Tabitha Dsouza - XI-A Arts
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Introduction.

World War I also known as the Great War was a global war centred around Europe that began on28th July1914 and lasted until 11 November 1918. More than 9 million combatants and 7 million civilians died as a result of the war. It was one of the deadliest conflicts in history, paving the way for major political changes, including revolutions in many nations involved. The war drew in all the world's economic great powers, which were assembled in two opposing alliances: the Allies (United Kingdom, France and Russia) and the Central powers (Germany and Austria-Hungary) These alliances were reorganised and expanded as more nations entered the war. Italy Japan and the United States joined the allies and the Ottoman Empire and Bulgaria the Central Powers.

Causes of the War

Europe Armed: Political expansion and imperialism compelled European powers to strengthen their armed forces. Large standing armies had become the order of the day since the French Revolution. But the balance of powers kept shifting, during the early years of the 20th century, because of improvements in modern science, means of destruction became readily available. Deadlier war-weapons and aerial warfare were in the air. Germany vying with Great Britain built up a strong navy. Europe was armed to the teeth, and spelled disaster at any moment.

Aggressive Nationalism: The national spirit served to ignite the cauldron of war. The spirit of nationalism urged those of the national groups in Europe which had not yet secured an independent status to secure freedom and to get back the territories which they lost in former wars.

Economic Imperialism: Another potent cause of World War I was economic imperialism. Industrialism had led to an increase in national prosperity and power, and it created the need for markets for the disposal of industrial products and acquisition of ample and cheap raw materials for industry. The race for colonies for economic exploitation led to bitter feelings and conflicts among European nations.

Alliances and Secret Military Pacts: The secret agreements and military alliances of European powers early in the 20th century also hastened wars. The Triple Alliance and the Triple Entente had aligned Europe into two opposing power camps, which made a clash among them inevitable and imminent. An atmosphere of suspicion developed quickly as the great powers entered into secret military pacts.

Europe a live Volcano: Armed to the teeth Europe stood on the bank of a live volcano, which could emit deadly lava at the slightest pretext. Militarism made war an obvious event. With every active preparation for war tensions mounted up, and the war could hardly postponed.

The Immediate Cause

The immediate trigger for war was the 28th June 1914 assassination of Archduke Franz Ferdinand of Austria, heir to the throne of Austria-Hungary, and his wife, by the Yugoslav nationalist Gavrilo Princip in Sarajevo the capital of Bosnia. It was considered a political crime, since the arms for the assassination had been supplied by a Serbian officer. Bosnia was a Slav country, forcibly annexed by Austria in 1908 to sub serve German designs. It was well known that the Bosnians resented Austrian annexation and wanted a union with Serbia.

Austria therefore served a 48 hour ultimatum on Serbia on July 23, to crush the anti-Austrian feeling and propaganda and also to permit Austrian officers to enter Serbia to investigate the Sarajevo crime on Serbian soil.

Consequences of the war

Terrific Bloodbath and Destruction: A very large number of soldiers died in the war and an equal number of people were injured. Of the sixty- five million active participants, nearly nine million paid with their lives and another twenty-five million were disabled permanently. An entire generation of youth was wiped out from Europe.

Degradation of Man: The carnage in which hundreds of thousands of people perished showed how man had degraded himself to the level of a beast. Power politics, imperialist greed, love of power and self and other factors revealed the worst in man.

Fall of Empires : The Empires which challenged British power by military adventures crashed with a big bang .The German, Austro-Hungarian, Russian and Ottoman empires disintegrated ,Turkey, 'The sick Man of Europe ''was almost dead. It was shattered to ruins and new states arose on its ruins. Germany was disarmed and deprived of her colonies. Russia had to surrender large regions in Europe. The war thus changed the map of Europe.

Triumph of Nationalism and Birth of New Nations: Nationalism triumphed. On the ruins of fallen empires, rose new nations which were carved out on the principles of self-determination e.g. Poland, Czechoslovakia, Finland, Latvia, and Lithuania.

Financial crises: The cost of operations and loss of property occasioned by the war were staggering, and virtually beyond computation. What was worse, the financial affairs of the world were in doldrums at the end of the war. National finances of many countries were completely disrupted, creating a dismal atmosphere. The cost of the war was so great that England consumed all of its credits and became indebted to the US, the world's financial centre shifted from England to United States, from London to New York. The war resulted in the economic depression as there was widespread un-employment and failure of the credit system.

Victors Became stronger: The victorious powers emerged stronger. The British Empire became bigger, though Britain faced many problems. France gained at the expense of Germany. France got back the provinces of Alsace and Lorrain. Italy and Japan too secured the spoils of war. But the greatest beneficiary was U.S.A.

The Peace of Paris: The victorious allies signed the Treaty of Versailles, 1919, with defeated Germany, and similar treaties with defeated Austria, Hungary and Turkey. All these treaties formed the Paris Peace Settlement. The Peace of Paris marked the complete humiliation of Germany. By the Treaty of Versailles (1919), she was deprived of all her colonies her military strength was reduced to the minimum, her navy was to be surrendered to the allies, her fortifications on the Rhine and Baltic were destroyed, manufacture of ammunition in Germany was to be banned, compulsory military training was to be abolished, and above all she was subjected to inhuman reparations, which was to be made good in labour or money

Establishment of the League of Nations: Leaders all over the world were convinced that war must be banished and world peace promoted. Chief among these leaders was President Woodrow of United States, who brought hope to the war –torn world by his Peace programme, embodied in his renowned Fourteen Points.

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Military Traces in the History of Mathematics

-Allan Fernandes (XI Com)

In 1939, the British crystallographer and science historian John Desmond Bernal wrote: “Science and warfare have always been most closely linked; in fact, except for a certain portion of the nineteenth century, it may be fairly claimed that the majority of significant technical and scientific advances owe their origin directly to military or naval requirements.”

This is to some extent also true for mathematics, though the mutual relation between military demands and emerging mathematical concepts is intricate.

A Few Examples:

Babylonian clay tablets from about 1800 B.C. deal with siege computation: the number of bricks needed for siege ramps, the volume of earth to be dug and how much workforce was required. But the same calculations were used when building a temple or digging an irrigation canal. Moreover, many “real-world” mathematical problems on the thousands of preserved tablets show (for instance in the choice of unknowns for the quadratic equations) that they were meant to puzzle and train the student rather than to contribute to the solution of problems in real situations.

In spite of its declared praxis-remote motivation, *Euclidean geometry* has for two millennia trained geometric judgment and modeling capacity of immediate military relevance. The greasiest John Onians traces the origin of Greek mathematics to “the importance of absolute order in the military sphere which gave mathematics a dominant role in all Greek culture”. An overlooked aspect of the present decline of Euclidean geometry in school curricula are the diminishing demands for distributed independent geometric calculations in the electronic battlefield.

Archimedes (ca. 287-212 B.C.) demonstrated during the siege of Syracuse his command of the full geometry of three-dimensional translations and rotations and of precise volume and weight estimates for plates, bodies and tools of a most delicate shape. His engineering calculations were admired, the artifacts copied and the proportions disseminated through all the Hellenistic, late Roman, and Arab times, and through the Middle Ages.

The military writer Aeneas Tacticus (around 360 B.C.) published a whole chapter with ideas about cryptology (for instance sending a book with one letter thinly marked in each line - an early instant of steganography). Subsequently Polybios, Caesar, and Augustus introduced true bilateral substitutions, i.e. permutations (of vowels and consonants) for military communication. The Islamic Middle Ages took over this complex of applied mathematics and (occasionally military inspired) techniques, expanded and moulded it into arithmetic and algorithmic form – like moving squadrons and armies - and handed it over to the early Modern period.

The Renaissance had a high appreciation of the possibilities of mathematics in every practice. Specific military needs (cartography, artillery and ballistics) partly preceded, partly met specific civilian needs (the theory of the central perspective, bookkeeping, merchants' calculation and algebra). Keeping it a strict military secret, the fifteenth-century Portuguese court took up a systematic development of navigational mathematics which led them to distinguish between great circle arcs (= geodetic curves) and loxodromes (curves of constant angles like the parallels).

When Niccolò Tartaglia (1500-1557) tried to 'give rules for the art of the bombardier' (Nova scientia, 1537), he abandoned Aristotle's concept of a piecewise linear trajectory and created the modern concept of a function with a smoothly curved graph (though not yet the correct parabola orbit, later derived by Galileo). The Flemish mathematician Simon Stevin (1548-1620), later quartermaster general of the army under Maurice of Nassau, engineered a system of sluices to flood certain areas

in defense of besieged cities and thus founded the modern statics and hydrostatics (De Beghinselen der Weeghconst, 1586).

History of Maths In 19th Century

Throughout the century mathematics became increasingly abstract. In 19th century lived Carl Friedrich Gauss he did revolutionary work on function of complex variables in geometry and on the convergence of series. He gave the first satisfactory proof of the fundamental theorem of algebra and of the quadratic reciprocity law.

Technologies used during World War I

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Technology during World War I reflected a trend toward industrialism and the application of mass production methods to weapons and to the technology of warfare in general. This trend began fifty years prior to World War I during the U.S. Civil War and continued through many smaller conflicts in which new weapons were tested. The earlier years of the First World War can be characterized as a clash of 20th-century technology with 19th-century warfare in the form of ineffective battles with huge numbers of casualties. Tactical reorganizations went hand-in-hand with armored cars, the first submachine guns, and automatic rifles that could be carried and used by a one man.

ARTILLERY: At the beginning of the war, artillery was often cited in the front line to fire over open sights at enemy infantry. During the war, the following improvements were made.

The first “box barrage” in history was fired at Neuve Chapelle in 1915; this was the use of a three- or four-sided curtain of shell-fire to prevent the movement of enemy infantry indirect counter-battery fire was developed for the first time in history.

The first anti-aircraft guns were designed out of necessity. Metallurgical and bioindustries, innovative mechanical inventions, had created new firepower that made defense almost invincible Infantry rifles, rifled artillery and hydraulic recoil mechanisms, trenches and machine guns , made it nearly impossible to cross defended ground. The hand grenade, already in existence, developed rapidly as an aid to attacking trenches. High explosive shells, dramatically increased the lethality of artillery over the 19th-century.

Air warfare: As with most other technologies, the aircraft underwent many improvements during World War I. A key innovation was the interrupter gear, a German invention that allowed a machine gun to be mounted behind the propeller so the pilot could fire directly ahead, along the plane's flight path. Large planes with a pilot and an observer were used to reconnoiter enemy positions and bomb their ply bases. Because they were large and slow, these planes made easy targets for enemy fighter planes. As a result, both sides used fighter aircraft to both attack the enemy's observer planes and protect their own by inhibiting the enemy's ability to move in secrecy, aerial reconnaissance over can be blamed to some degree for the stalemate of trench warfare.

Tanks: Although the concept of the tank had been suggested as early as the 1890s, few authorities showed interest in them until the trench stalemate of World War I caused serious contemplation of unending war and ever escalating casualties. Based on the caterpillar track

(first invented in 1770 and perfected in the early 1900s) and the four-stroke gasoline powered internal combustion engine (refined in the 1870s). Early World war one tanks were fitted with Maxim type guns or Lewis guns, armor plating, and their caterpillar tracks were configured to allow crossing of an 8-foot-wide (2.4 m). In the Battle of Amiens, major Entente counteroffensive near the end of the war, British forces went to field with 534 tanks. Regardless of their effects on World War I, tank technology and mechanized warfare had been launched and grew increasingly sophisticated in the years following the war.

Naval Warfare: The launching of HMS Dreadnough in 1906 revoluionised battleship construction. The advantage was in long-range gunnery, and naval battles took place at far greater distances than before. The Battle of Jutland (1916) was the only full-scale battle between fleets in the war.

Submarines: World War I was the first conflict in which submarines were a serious weapon of war this struggle between German submarines and

British counter measures became known as the First Battle of the Atlantic. German submarines became more numerous and effective.

Small arms: In 1903, French military researched the possibility of a light machine gun which could be carried by troops. The French Army was equipped with it, and the first American units to arrive in France used it in 1917 and 1918. Seeing the potential of such a gun, the British Army settled upon the American-designed Lewis gun fitted for a .303-inch (7.7 mm) round; infantry platoons provided with the guns were instructed in fire and movement tactics.

The Imperial German Army deployed flame throwers (*Flammenwerfer*) on the Western Front attempting to flush out French or British soldiers from their trenches. The German Army had two main types of flame throwers during the Great War: a small single person version called the Kleinflammenwerfer and a larger multiple person configurations called the Grossflammenwerfer. In the latter, one soldier carried the fuel tank while another aimed the nozzle.

Early tanks were unreliable, breaking down often. Though they first terrified the Germans, their use in 1917 engagements provided more opportunities for development than actual battle successes. It was also realized that new tactics had to be developed to make best use of this weapon.

World War I introduced machine guns, modern artillery and airplanes to the battlefield. Railroads made the supply of vast, stationary armies possible, and even the taxi cabs of Paris were employed to bring men to the front in 1914. Horses were removed from the battlefield except as beasts of burden, and tanks entered service in 1916. But the most destructive weapon of World War I was invented in DeKalb, Illinois in 1874 to help cattle farmers keep control of their flocks, kept as beasts of burden, and tanks entered service in 1916.

World War I was so deadly primarily because it saw the use of nineteenth-century military tactics with twentieth-century technology. At the beginning of the conflict, the cavalry was still the premier branch of

military service, and the commanders believed that this war would be like the last big European fight, the Franco-Prussian War Fought in the same way as the Napoleonic Wars of the early nineteenth century, the Franco-Prussian War taught commanders that offense could still beat defence; in other words, an attacking army could still out-manoeuvre an enemy on the defensive.

The war was over, but a new mobility-driven form of warfare was beginning to emerge; one that would be mastered by the defeated Germans and deployed in 1939 as their blitzkrieg, or lightning warfare, embodying all they had learned in 1918.

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Technological Advancements during World War I Communication Techniques

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New technological advancements during the First World War included several communication technologies used by the military. For the first time during the war communication took place by light signals, Morse code, radio and hydrophones.

Air Traffic Control for Military: In the first days of flight, once a plane left the ground the pilot was pretty much isolated from the terrestrial world, unable to receive any information aside from obvious signals using flags or lamps. This changed thanks to the efforts of the U.S. Army, which installed the first operational two-way radios in planes during the Great War (but prior to U.S. involvement).

Development began in 1915 at San Diego, and by 1916 technicians could send a radio telegraph over a distance of 140 miles; radio telegraph messages were also exchanged between planes in flight. Finally, in 1917, for the first time a human voice was transmitted by radio from a plane in flight to an operator on the ground.

Communication by Light Signals: Historically, warfare was a daytime endeavour, but that began to change in 1879, when Thomas Edison filed a patent for a long-lasting electric light bulb. By the time World War I began, electricity was in use worldwide (though it was still not as common as it is today).

For the first time ever, military leaders were able to conduct mass troop movements and launch large-scale invasions using artificial light. Virtually every mechanized contraption — battleships, tanks, airplanes,

cars and trucks, radio devices — could be powered or enhanced by electricity.

Radio: Radio made its debut years before World War I — it was often used by ships transmitting messages via Morse code, and in 1912, operators on the Titanic depended on radio to communicate with other ships and with onshore radio stations.

Morse code: The biggest improvements radio offered over message systems like Morse code were the speed and accuracy afforded by the use of voice communication. Advances in radio technology such as oscillators, amplifiers and the electron tube made reliable voice communication possible.

Hydrophones: Of course it was a big help if you could actually locate the U-boat using sound waves, which required a microphone that could work underwater, or hydrophone. The first hydrophone was invented by 1914 by Reginald Fessenden, a Canadian inventor who actually started working on the idea as a way to locate icebergs following the Titanic disaster; however, The hydrophone was further improved by the Frenchman Paul Langevin and Russian Constantin Chilowsky, who invented an ultrasound transducer relying on piezoelectricity, or the electric charge held in certain minerals The hydrophone claimed its first U-boat victim in April 1916. A later version perfected by the Americans could detect U-boats up to 25 miles away.

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Technological Advancements during World War I
A Revolution in Science & Technology

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The First World War brought about a revolution in the fields of science and technology. The war was fought with new technological discoveries and inventions. Some of these technological advancements are listed below.

Codes and Ciphers: Codes and ciphers were extensively used in World War I. The Codes on the right were decoded by British Naval intelligence of the Zimmermann telegram helped bring the United States into the war. Trench codes were used by field armies of most of the combatants (Americans, British, French, German) in World War I. Code and ciphers had a greater importance in the second world war than in the first because science and technology was much more developed by then.

Trench Code: In cryptography, **trench codes** were codes used for secrecy by field armies in World War I. A reasonably-designed code is generally more difficult to crack than a classical cipher, but of course suffers from the difficulty of preparing, distributing, and protecting codebooks.

Communications Discipline: American code makers were often frustrated by the inability or refusal of combat units to use the codes or worse, to use them properly. A soldier engaged in combat doesn't always feel the need to do things "by the book" even when there are very good reasons to do so, and generals on the front line felt that they had other things to worry about. One code maker suggested that the best way to address the problem was to publicly hang a few offenders, but he lacked the authority to do so.

The British and French were already familiar with such problems in "communications discipline". They hadn't completely solved the problems either, but they had at least managed to get it through the heads of most of their signalmen that if they didn't have time to properly encrypt a message, they shouldn't bother trying; send the message unencrypted, or "in the clear". A partially or badly encrypted message could undermine a cipher or code system, sometimes completely, which made an unencrypted message far preferable

Command and Control: In the early days of the war, generals tried to direct tactics from headquarters many miles from the front, with messages being carried back and forth by couriers on motorcycles. It was soon realized that more immediate methods of communication were needed. Radio sets of the period were too heavy to carry into battle, and phone lines laid were quickly broken. Runners, flashing lights, and mirrors were often used instead; dogs were also used, though they were only used occasionally as troops tended to adopt them as pets and men would volunteer to go as runners in the dog's place. There were also aircraft (called "contact patrols") that could carry messages between headquarters and forward positions, sometimes dropping their messages without landing.

Trench Warfare: The new metallurgical and bio industries, with many innovative mechanical inventions, had created new firepower that made defense almost invincible and attack almost impossible. Infantry rifles, rifled artillery and hydraulic recoil mechanisms, zigzag trenches and machine guns, and their application had the effect of making it difficult or nearly impossible to cross defended ground. The hand grenade, already in existence, though crude, developed rapidly as an aid to attacking trenches. Probably the most important was the introduction of high explosive shells, which dramatically increased the lethality of artillery over the 19th-century equivalents.

Trench warfare led to the development of the concrete pill box, a hardened blockhouse that could be used to deliver machine gun fire. They could be placed across a battlefield with interlocking fields of fire. Because

attacking an entrenched enemy was so difficult, tunneling underneath enemy lines became one of the major efforts during the war. Once enemy positions were undermined, huge amounts of explosives would be planted and detonated as part preparation for an overland charge. Sensitive listening devices that could detect the sounds of digging were a crucial method of defense against these underground incursions. The British proved especially adept at these tactics, thanks to the skill of their tunnel-digging "sappers" and the sophistication of their listening devices.

Submarines: World War I was the first conflict in which submarines were a serious weapon of war. In the years shortly before the war, the relatively sophisticated propulsion system of diesel power while surfaced and battery power while submerged was introduced.

The United Kingdom relied heavily on imports to feed its population and supply its war industry, and the German navy hoped to blockade and starves Britain using U-boats to attack merchant ships in unrestricted submarine warfare. This struggle between German submarines and British counter measures became known as the First Battle of the Atlantic. As German submarines became more numerous and effective, the British sought ways to protect their merchant ships.

"Q-ships," attack vessels disguised as civilian ships, were one early strategy.

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