TECHNOLOGY OF WORLD WAR 1

Mr. Dodson
Technology of World War One

• In no other war has technology played such a critical role in impacting how the war would be fought.

• The First World War began as a clash of 20th century technology and 19th century tactics, with inevitably large casualties.

• Think of these weapons/technologies as solutions to problems
Technology of World War One

- Machine Guns
- Artillery
- Grenades
- Communications
- Transportation
- Tanks & Armor
- Aircraft
- Chemical Warfare
- U-Boats
- Convoy system
- Barbed Wire

All of these technologies had an impact on the strategy and tactics of the war.

Some were used in a new way, others were used in response to other technologies or new tactics and strategies.
TRENCH WARFARE

• **Description/Use:** Trenches, often reinforced with wood, with larger underground bunkers dug in side for more protection
  - Series of progressively more improved trenches with interconnecting trenches
  - Strategy employed because of stalemate, machine guns & artillery

• **Impact:** Many weapons and tactics were created to overcome the defensive nature of trenches

• **Evolution:** Concrete bunkers, pillboxes and gun emplacements – obsolete by WW2
Aircraft can warn of the build-up of enemy troops before an attack.

Barbed wire: metres deep and an impassable obstacle for any troops able to reach it.

No Man's Land (the stretch of land between the trenches of the opposing sides) has already been churned up by shell fire. In wet weather it becomes a mass of mud, making it even harder for troops to cross.

Concrete block house for a machine-gun

Support trench

Reserve trench

Communication trenches allow reserves to be brought forward without exposing them to enemy fire.

Front-line dug-outs provide protection but not against a direct hit from an artillery shell.

A deep dug-out. German ones could be 15 m below ground and too well constructed to be damaged by shell fire.

Long-range artillery is placed about 10 km behind the front line. These guns fire at advancing enemy troops.

PROBLEMS FACING ATTACKING TROOPS
MACHINE GUN
MACHINE GUN

• **Description:**
  Rapid fire weapon (400-800 rounds/minute)
  typically crewed by several men
  Belt-fed, .30 cal (typical)

• **Use:**
  Anti-personnel, used against massed infantry

• **Impact:**
  Possibly the most influential weapon of the war
  Contributed to stalemate and affected tactics
  No longer would massed infantry be the most effective

• **Evolution:**
  Would be mounted on airplanes and armored vehicles
  Became smaller, less crew (squad-level weapon)
  Submachine guns at end of war
ARTILLERY

- **Description/Use:** Large caliber weapon capable of direct (gun) or indirect (howitzer) fire - 37 mm – 42 cm

- **Impact:** artillery barrage to soften up targets
  - Huge guns to destroy fortresses in Belgium – railway guns
  - Extreme long range attacks (Paris gun) terrified Parisians 126 km (68 mi) range (300 attacks)

- **Evolution:** improved accuracy, range,
  - better shells and fuses, improved explosives
  - Faster reload, more portable
  - Self-propelled artillery
Artillery

Paris Gun

Typical German Artillery piece
**GRENADES**

- **Description/Use:** small, explosive device thrown or projected to cause burst and shrapnel damage to enemy
  - Percussion (contact) or timed fuse
  - Old weapon found new use in trench warfare
    - often referred to as “bombs”
- **Impact:** well-suited for trench warfare (indirect throw) – response to trench warfare
  - Becomes core of new trench assault strategy
  - *sturmtruppen* – trench raiders - bombers
- **Evolution:** better fuses, charges, use of gas improved methods to propel (RPG)
Grenades
AIRCRAFT

- **Description/Use:** 100 mph, monoplane, biplane and triplane configurations. Constructed of canvas stretched over wooden frame
  - Single pilot fighter to several men in a bomber
  - Typically armed with machine guns
  - Initially used for observation, later fighters and bombers

- **Impact:**
  - Anti-Aircraft and aerial pursuit squadrons
  - Most aerial combat techniques used today are derived from WW1 dog fighting.
  - Fixed wing aircraft most influential, though observation balloons and zeppelins played a role as well

- **Evolution:**
  - Unarmed observation craft, Then purpose-built fighters, followed later by bombers - U.S. would pioneer large-scale bombing missions late in war
  - Fighter Aces – five kills
  - New tactics for air support and ground attack - strafing
Fokker Dr1 Triplane
Red Baron’s Plane
Bombers and Zeppelins
SUBMARINES
**SUBMARINES**

- **Description:** At outset Germans had two sub types: coastal sub: (7 kts, 2 torpedoes and a crew of 14) patrol (overseas): 14 kts, 4 torpedoes, crew – 28
- **Use:** attack allied shipping, primarily through use of deck guns NOT torpedoes
- **Impact:** Very effective against shipping, but sinking of ocean liners was negative public opinion. Use of convoy system, depth charges and hydrophones were a response
- **Evolution:** Submarines would get larger and faster with expanded undersea capability
- **Improved torpedoes**
CONVOY SYSTEM

• **Description/Use:**
  – Using armed ships such as destroyers and armed merchant vessels to protect unarmed transport ships from submarines
  – A tactic not a technology

• **Impact:**
  – Fairly effective once employed (late 1917).
  – Declined from 242/mo to 147/mo; 1918 – 103/mo

• **Evolution:**
  – Q-ships – Germany forced to use surface ships
TANKS & ARMOR

• **Description/Use:** tracked, armored vehicle armed with machine guns and/or cannons.
  – Used to assault trenches, destroy barbed wire obstacles, machine gun nests
  – 2 (6.5t) crew to 16 (32t) crews; 3-8 mph

• **Impact:** somewhat effective depending on use; infantry support, combined arms
  – Debate about use breakthrough vs. support
  – Mechanical breakdowns, lack of speed

• **Evolution:** the modern tank with turrets mobility was also emphasized – become important weapon in WW2
German Tank
Armored Car
BARBED WIRE
Barbed Wire

• Description/Use: sharp twisted strands of wire – not designed to kill
  – Often used in conjunction with machine guns and trenches
  – Create barriers while preserving field of fire
  – Control avenues of approach

• Impact: critical to trench defense

• Evolution: improved methods of emplacement
  – Entanglements instead of just fences
  – Coiled barb wire used late 20th century
Communications

• **Description/Use:** New methods include telephones and wireless (radio)

• **Impact:** Would allow for swift communications for better control by command elements
  – Key for Command and Control
  – Used for Artillery Spotting
  – Need for codes and ciphers (Russians sent radio signals “in the clear” – allowed for Germans to know their plans
  – Runners, carrier pigeons still used throughout war

• **Evolution:** more portable equipment, more range
• but telephone was most reliable
• Not until 80s will new methods used (Sincgars, burst satellite)
Transportation

• **Description/Use**: Use of motorized vehicles and railroads to transport supplies and men.

• **Impact**: Railroads were a critical element for mobilization and transport of ultra-heavy artillery

• **Evolution**: As war progressed more trucking. In WW2 this would be standard.
CHEMICAL WARFARE
Chemical Warfare

• **Description/Use:** Chemical gas used to incapacitate or kill enemy. An attempt to find a breakthrough weapon to end stalemate
  – Mustard, chlorine, and “tear gas”
  – Horrible wounds and death
  – Initially just “sprayed”
  – Hard to control

• **Impact:** Troops had to wear masks making fighting difficult
  – Masks often ineffective

• **Evolution:** Better means of dispersal
  – artillery shells and bombs
  – Although outlawed, chemical weapons still made throughout cold war