

A Historical Overview of American Weapons from the Founding of Jamestown to the 21st Century

The history of all warfare has been the story of overcoming limitations--limitations in transportation, communication and the weapons of war. Never were these limitations more apparent than in the founding of North America's colonies in the 16th century. And over the next four centuries, mastering these limitations would create a vigorous and compelling drama in American history.

The New World's topography and Native American tribes dictated a call for superior and reliable weapons. A colonial farmer defending his family from Indian raids could not depend upon a musket whose reliable range was less than fifty yards. Nor could he and his neighbors readily call for support from the nearest township. Communications took days and sometimes weeks to travel from one city to another. The meager roads and trails through the frontier made it impossible to convey the militia in a timely manner. Overcoming limitations played an integral part in the evolution of warfare in North America.

17th Century

The founding of the New World was precarious. Surrounded by Native Americans, whose greater numbers threatened the early colonists' survival, the men and women of Jamestown, Plymouth Plantation, Rhode Island, Connecticut, New York, and the tidewater regions of Virginia and Carolina had to rely on superior weapons to survive. As the colonies grew in people and size, the weapons improved also. Too late, Native Americans realized that their larger numbers were no longer enough to fend off the encroaching Europeans. Better weapons and fighting tactics had ensured the growth of the colonies.

North America was founded during the transition from sharp edged weapons such as swords and pikes, to gunpowder and the use of cannons and muskets. At Jamestown, colonists still carried swords and each Englishman was required to know how to handle a bow and arrow. However, the musket proved to be the decisive factor in survival. The evolution of firearms at Jamestown was indicative of their use all along the Atlantic coast in the 17th century.

In 1609 Captain John Smith reported that Jamestown had stockpiled 300 muskets--matchlocks (a musket in which powder is ignited by a match) and wheel locks (a musket where powder is ignited by a small wheel that produced sparks by revolving against a piece of flint). By 1625 the number of firearms in the colony had increased to over 1000. As the colonies grew, and conflicts with Native Americans increased, a more reliable gun than the match or wheel lock muskets was needed. By the end of the 17th century the more dependable flintlock (a musket in which a flint embedded in the hammer produces a

spark that ignites the powder) became the firearm of choice. In addition to muskets, pistols were also used, though their short range and inaccuracy made them less desirable.

18th Century

At the beginning of the 18th century, Europe's wars spilled over into the New World and England's colonists found themselves fighting French troops and their Indian allies. The differences in the two worlds' approaches to warfare were striking. In Europe, even with the introduction of artillery and muskets, fighting was still relegated to what was known as the 'pike-push'--rows of soldiers marching toward one another until the front ranks closed. Guns were used, as bows and arrows before them, to soften up the enemy before the charge. (Tactically, this mode of fighting would not change over the next 400 years. Even in modern times, the enemy is softened before troops advance.) But in the New World, European tactics proved impractical. The dense woodlands of the eastern seaboard prevented masses of soldiers facing one another in ranks. In addition, colonists had adopted Native American tactics of hit and run lightning raids, which contrasted sharply with Europe's more formal warfare.

At the same time, the professional European soldiers found themselves ill equipped for such a guerrilla type of warfare. Their heavy, short-range muskets were no match for the long rifles of the colonists. With the change in tactics, the most important weaponry in this period became the long-range rifles and smaller more maneuverable cannons. Cannon, used primarily for siege warfare at the beginning of the century because of their immense weight, began to change by the middle of the century as improvements in casting created lighter and more durable barrels. Beginning in 1759, reductions in the weight of cannon enabled Fredric the Great of Prussia to develop horse artillery and achieve mobility on the field. In the United States, horse drawn artillery made its appearance in the Revolutionary War.

Muskets steadily improved in reliability and speed of reloading by the introduction of paper cartridges containing powder, wad and ball in a single package. At the same time German-American gunsmiths in the colonies produced accurate, long-barreled rifles especially desired by hunters and farmers who lived a precarious life on the American frontier. Improved arms meant a more devastating delivery of firepower and longer range. During the American Revolutionary War, the difference between British and American muskets made a profound difference in the conduct of battles and their outcomes. The British relied upon a basic musket that had little or no accuracy past 50 yards and were forced to use European tactics of massed soldiers advancing across a narrow front. Starting at Lexington and Concord, the colonial militia used their longer range and more accurate rifles for firing from concealment with more deadly effect.

While field warfare was changed dramatically with better weapons, naval warfare changed through improved communications and navigation. The American navy started as privateers and grew slowly over the next 200 years to become the most formidable navy on the globe. But even in its infancy, the U.S. navy made use of progress in navigational aids, such as the sextant, which made it possible for a squadron of ships to

reach their destination directly. The semaphore, a visual signaling apparatus with flags, lights, or mechanically moving arms, augmented communications and made it easier to coordinate attacks. The newer processes of making cannons, that helped field warfare, also augmented war vessels, providing more accurate gunnery.

19th Century

Perhaps the greatest change in the 19th century in warfare was the integration of technology as well as men, such as the creation of the General Staff, which ran the show while the master tactician plotted the battles, into systems. These technological innovations--introduction of railway and telegraph for example--changed the character of war completely. Tactics used in the 18th century became obsolete. Instead of tight small battle lines facing each other, by mid 19th century battle lines stretched across many miles. Weapons improved too, allowing individual soldiers to lay down a greater, more deadly field of fire. Tactics adopted by colonists in the 18th century--hiding behind cover, creating breastworks and wearing less descriptive uniforms--allowed soldiers to avoid the murderous fire of the enemy. The daring charge of massed soldiers became a thing of the past as Pickett's charge at the Battle of Gettysburg aptly proved. 15,000 southerners charged across a mile of open ground only to be cut down to pieces by artillery and rifle fire from entrenched Union forces. Though Europe would try to revive such misguided heroics in the First World War, never again would American generals misuse their soldiers in such a manner.

In the United States, the introduction of technology systems allowed for the complete mobilization of troops. During the Civil War, steamships and railroads enabled Northern and Southern generals to shipmen and supplies through all kinds of weather close to battlefields. The use of the telegraph greatly improved the speed and accuracy of communications. In addition, industry made for the mass production of military materials from rifles and cannons to uniforms.

While the 19th century would eventually embrace endless improvements in weaponry from mass production to innovations such as repeating rifles, gatling guns and faster loading artillery, the advantages of improving technology were not apparent at first. From the introduction of gunpowder and hand held guns in the 16th century, the improvement of weapons had moved at a glacial pace. And as late as 1820 military theorist Karl von Clausewitz belittled the importance of armament, believing that it was the esprit de corps that won battles. But the Industrial Revolution, which swept the United States, made possible the energy, machine tools and techniques that sped up the advancement of weapons and changed the character of war forever.

Developments included the percussion cap, the cylindrical conical bullet, rifled barrels, breech loading mechanisms, metal cartridges, magazine fed small arms and machine guns. The invention of the recoil system in 1897 revolutionized artillery and made the French 75 millimeter piece into a model everybody else imitated. Improvements in weapons technology increased enormously the volume of fire deliverable by the infantry, making the battlefield a more deadly place than ever. A virtual storm of steel swept

battlefields because of new technology and would culminate in the deadliest and most costly war ever fought with the trench warfare of WWI.

The Civil War saw the introduction of new weapons on a limited scale. Soldiers mostly used muzzle-loading rifles, whose rifled barrels provided accuracy up to 400 yards. At the same time, percussion caps improved the speed with which an individual soldier could reload his weapon. Perhaps the most celebrated weapon of the United States at this time was the Gatling Gun. Invented by Dr. Richard Jordan Gatling, this precursor of the modern day machine gun saw limited use at the end of the Civil War. Its greatest success was in the American Indian wars and in sales to other countries. The Gatling gun was a hand-crank-operated weapon with 6 barrels revolving around a central shaft. It could fire up to 600 rounds a minute. The cartridges were fed to the gun through a magazine mounted on top of the gun. It also took advantage of the new rim fired copper-cased cartridges, replacing the old steel and paper bullets. This enhancement in cartridges would later be used in all small arms.

The tail end of the Civil War also saw the introduction of the repeating rifle. Though it was used sparingly in the Civil War, afterwards, the repeating rifle was used during the Plains Indians War. The most famous repeating rifle was the Winchester, touted as the gun that won the west in the fight against Native Americans. Originally known as the Henry rifle for the gunsmith who invented it, the Winchester was famous for its rugged construction and a lever-action that allowed the rifleman to fire repeatedly and rapidly, laying down a murderous barrage.

Another firearm that found wide use in the western U.S. during the Indian Wars was the Colt .45 revolver, also known as the Peacemaker. A single action revolver holding 6 rounds of ammunition, it was designed for the US cavalry and adopted in 1875. As a result it also was known as the Colt Single Action Army. Unlike more modern revolvers, its hammer had to be cocked each time before it was fired. The Colt .45 was popular because of its stopping power. A saying famous during this period illustrated its universality among marshals, cowboys, townspeople and bandits. "God made men big and small; Colonel Colt made them all equal."

By the end of the century the magazine rifle came in response to the U.S. Cavalry's demand for increased firepower during the Plains Indians Wars from 1862 - 1890. The new rifle employed a detachable container that stored several rounds of ammunition, which were automatically transferred to the firing chamber.

Technology affected the American navy too. Steam propulsion and protective armor plating improved speed and changed tactics. No longer reliant on the wind, ships could attack from any bearing. Better technologies for casting large rifled breech-loading cannons and turrets made it possible for ships to shoot at long distances, so that they no longer had to close and fire at point blank range.

By the end of the 19th century, the Industrial Revolution and the integration of technology with systems to deliver increased killing power on the battlefield provided a

more destructive potential for armies facing one another. But the 20th century would see technological developments that would eventually threaten the world with mass destruction.

20th Century

War in the 20th century can be characterized as the invention of invention. Military historian Martin Creveld wrote, "As the endlessly varied kaleidoscopically changing succession of equipment in war indicates, technological inventiveness has always played an important role in military affairs."

By the turn of the century, the technical revolution largely turned war in to management of complex systems. Through the course of the 20th century management of these complex systems allowed greater forces to be mobilized, supplied and hurled at the enemy.

According to Martin Creveld, the paramount importance of management can be seen in World War II, where the victory did not go to the side with the most brilliant commanders or spirited fighters, but to the side whose administrators, scientists and managers developed the means by which gigantic technological systems could be managed the most efficiently. The number of systems to be managed was astounding. A simple list for a tank brigade included, engineering, maintenance, logistical support and communications. In addition, this brigade had to be managed in a singular concerted effort with hundreds of other brigades toward an objective and coordinated with other branches of the army and at times the airforce and navy.

But the need to manage these complex systems was founded on the principle of delivering a greater, more lethal firepower to the battlefield. By the beginning of the 20th century, the industrial revolution had revolutionized the way of making war. America entered the 20th century as one of the largest industrial powers and was able to use her superior technology to create formidable weapons. At mid century, America's nuclear arms were capable of destroying whole cities. And by 1960, between the United States nuclear arsenal and the Soviet Union's nuclear stockpiles of weapons, the two countries could send the planet into a nuclear holocaust that would destroy almost all life on the planet. The need to increase firepower, to have the most devastating weapon on the battlefield had driven the United States and its cold war foes to the brink of nuclear annihilation.

The process of improving weapons was long and involved. Thousands of years passed from the time of the earliest caveman who used flint points as weapons to Roman soldiers organized in Phalanxes with spears and short swords. The next 1500 years saw the creation of siege engines--such as the trebuchet and the catapult, capable hurling a quarter ton of stone at an enemy--and the development of bows and arrows. The introduction of gunpowder in the 15th century once more spurred the development of new weapons. But these improvements were a slow and tedious process. Then in the 19th century, the Industrial Revolution made possible the technology to improve weapons

at vastly swifter speed. But nothing could compare to the 20th century speed and technological breakthroughs of the 20th century in improving existing weapons and creating new ones.

The weapons at the beginning of the 20th century were hardly different than those at the end of the preceding hundred years. However, the build up to World War II saw an incredible increase in firepower poured onto the battlefield. During the trench warfare of WWI, the weapons' storm of steel created a 'no man's land' where no opposing soldier was safe.

Weaponry in the 20th century falls into two categories: devices used for killing and devices used for transport and communications.

Transport and Communications:

The 20th century opened with the use of the telephone and communication wires that connected the front lines with headquarters. Communication by wire was pushed forward until Corps, Divisions, and even battalions were hooked together in a vast network of communications. Wireless communications followed, walkie-talkies and field radio packs were used in WWII, Korea and Vietnam and the later wars of the late 20th century. Some inventive commanders in the conflicts of the late 20th and early 21st centuries even resorted to cell phones to contact superiors or call in air power. The use of a satellite system to deliver technological information about the enemy and his troop movements reached its zenith at the end of the century. Satellites provided surveillance, target acquisition, tracking and damage assessment.

Transport also developed rapidly. The century opened with a reliance on trains and horses to ferry men to the battlefield. By WWII mobilization required a network of roads and motor vehicles to transport men and material to frontlines. Vietnam saw the first use of helicopters for airborne strikes. By the end of the century, the United States could deploy a strategic strike force anywhere in the world within 48 hours, using jet transports to carry thousands of troops to a battlefield.

Weapons for Killing:

Weapons for killing improved the ability of the infantry to lay down a field of fire that destroyed everything in its path. However, artillery and the use of air power added immeasurably to overwhelming firepower a military could rain down on an enemy. Bombardments could destroy the enemy's will and ability to fight. Bombardments also led to improved fortifications and entrenchments, including bunkers and pill boxes in WWI and WWII. These fortifications led to such firepower improvements such as bunker busters--laser guided bombs that could destroy an underground bunker.

Advancements in infantry weapons included, automatic, recoilless rifles; hand thrown grenades and later rocket propelled grenades; mortars; machine guns; also the development of anti-personnel mines.

Artillery improved with lighter, mobile recoil cannons. By the end of WWI, artillery batteries fired as many as 450 rounds per day. By the end of WWII, this record was doubled and doubled again.

Mobile artillery in the form of tanks was introduced in limited use at the end of WWI. By WWII, tank divisions made entrenched field positions, such as the famous Maginot Line between Germany and France obsolete. The design for tanks steadily improved from WWII to the present. The M-1 Abrams Tank was used by American forces in the two Persian Gulf Wars (1991 and 2003) against Iraq.

Air Power:

The most significant invention used for war in the 20th century was the airplane. While Frank and Orville Wright envisioned their biplane carrying passengers and mail, the United States Army saw a much deadlier potential. Over the course of the century, air power improved from biplanes strafing troops and troop transports in WWI, to flying fortresses dropping thousands of pounds of bombs on enemy positions in WWII and Vietnam and Iraq. The introduction of the jet engine allowed for jet fighter aircraft and stealth bombers. Ordinance improved too from simple, hand-released bombs in World War One, to laser guided bombs delivered by jet fighters used in the two Gulf wars. WWI set the tone for all the following wars. Strategically: biplanes in WWI engaged each other singularly, were used in reconnaissance, strafed enemy troops and bombed enemy targets. WWII saw the development of aerial bombardment by fleets of planes, used first by Germany against London in the Blitz and later by the allies against Germany and Japan. Aerial bombardment continued throughout the rest of the century with heavy bombing done in Korea, Vietnam and the two Gulf wars.

Naval Power:

Armor plating, steam propulsion, rifled cannons and turrets developed in the 19th century made possible the battleship which dominated the American Navy until mid-century. The trend toward ever larger capital ships culminated in the Iowa Class of battleship introduced in WWII. Displacing 56,000 tons, it was the largest battleship the U.S. ever built. However, after 1960 long-range missiles threatened even the most heavily armored ship and the U.S. began decommissioning its largest ships. During the war in the Pacific against Japan, aircraft carrier groups became predominant and continued the supremacy to the present. Planes were able to launch sorties against Japanese held islands and offer protection to American troops. American carriers were used effectively in Korea, Vietnam, and the two Persian Gulf Wars. The first nuclear carrier, the U.S.S. Enterprise, was launched in 1960. In 1972 the Nimitz class carrier set the standard for all modern day carrier groups. In 1954, the United States launched the world's first nuclear submarine, the U.S.S. Nautilus and changed the face of the U.S. Navy for the rest of the 20th century. Its ability to patrol for long periods of time without surfacing or refueling combined with missiles using multiple warheads (MIRV's or Multiple Independent Re-entry Vehicles) made it a key factor in the deterrence approach to nuclear destruction,

known by the acronym MAD--Mutually Assured Destruction. Currently the American navy employs hundreds of nuclear submarines carrying Trident I and Trident II missiles with multiple warheads.

Nuclear War:

The most devastating weapon ever designed by the mind of man came about on July 16, 1945. At 5:00 in the morning at Los Alamos, New Mexico, scientists and American military personnel witnessed the birth of the atomic age with the first successful nuclear bomb test. Less than a month later, on August 6th 1945, Colonel Tibbets commanding the B-29 Super Fortress, Enola Gay, named after his mother, dropped the first atomic bomb on Hiroshima, Japan. The devastation was monstrous. Over 100,000 people were killed instantly and 1000's more died from radiation poisoning and unspeakable burns. Two days later a second bomb was dropped on Nagasaki. From that moment on, the face of war changed forever. Hanging over the heads of every man woman and child on the Earth was the possibility of a nuclear holocaust that could wipe out almost all life on the planet. The means of delivering such a devastating weapon included long-range missiles, first developed by the Soviet Union in the 1950's and later adopted by the United States. Known as ICBM's (Intercontinental Ballistic Missiles) these weapons were in missile silos located in isolated locales in states such as North Dakota and Montana. The U.S. also used long-range bombers, known as Stratofortresses capable of delivering nuclear bombs with multiple warheads.

By the end of the century, technology had given the United States an impressive array of weapons in which to attack and annihilate an enemy by air. Some of these were carried by fighters or launched from carrier groups. Others were unmanned drones guided to their targets by infantrymen on the ground. Unveiled in the two Gulf Wars against Saddam Hussein, these weapons offered the lure of a quick war, reducing the number of casualties. Some of these missiles, guided munitions, and bombs used in Afghanistan and Iraq included:

1. GBU-31 JDAM: The Joint Direct Attack Munition (JDAM) is a guidance tail kit that converts existing unguided free-fall bombs into accurate, adverse weather "smart" munitions.
2. GBU-28 Bunker Busters: The GBU-28 is the famed bunker buster first used in Desert Storm.
3. AGM-86 Missiles: The AGM-86B air-launched cruise missiles and AGM-86C conventional air-launched cruise missiles were developed to increase the effectiveness of B-52H bombers.
4. AGM-154 Joint Standoff Weapon: JSOW is currently flying on the F/A-18 and F-16 aircraft and will soon be flying on the Air Force's B-52 and B-2.

5. Tomahawk Cruise Missile: Tomahawk cruise missiles are designed to fly at extremely low altitudes at high subsonic speeds, and are piloted over an evasive route by several mission tailored guidance systems. The first operational use was in Operation Desert Storm, 1991.

6. Daisy Cutter Bomb -- BLU-82: The world's largest bomb the daisy cutter has to be parachuted from a cargo plane. The designers optimized this bomb to clear vegetation while creating little or no crater. It explodes three feet off the ground and clears almost a 1000-foot radius.

7. Predator Drone UAV: Unmanned Aerial Vehicle guided to its controlled on the ground by an operator and guided to the target by satellite GPS.

Final Word:

Military Historian John Keegan writes, "The written history of the world is largely the history of warfare, because the states within which we live came into existence largely through conquest, civil strife or struggles for independence." So was the United States, borne from war, bound to it for these last 200 years. "War is hell," Robert E. Lee wrote more than 140 years ago after a long, bloody civil war that cost the lives of nearly one million Americans. Even as war is bloody and loathsome, it continues to fascinate us, for at the same time, it offers lessons of peace. As Keegan writes, "Neighborliness flourishes inside firm bounds of restraint. Civilization means that societies live their lives by laws that govern all. At all times, these laws must be upheld, calling at times for the sacrifice of citizens in the ultimate act of courage, going to war to protect the life they have chosen to live under."

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