

Frightful Power of Great Guns

How Shells Costing Thousands of Dollars Apiece Are Hurlled for Many Miles With Terrible Destructiveness

BY CLIVE MARSHALL.

FOR the space of a few seconds comparative silence reigned in that particular section of the forest some four or five miles back of the front-line trenches. The great gun which stood in the center of the little clearing had been made ready and the gunners were grouped about it alert for the final orders from the commander, who anxiously waited at the telephone a short distance away the report from the observers.

Finally the voice of the commander broke the silence.

"Three degrees left," were the words. The chief gunner gave a quick, short but careful twist to the wheel in his hands, the nose of the big engine of death moved almost imperceptibly to the left, the gunners hurried to positions to the back and each side of the gun and threw themselves flat upon their faces.

"Fire" came the sharp command. The chief gunner, in his place some distance back of the gun, pressed an electric switch. There was a mighty roar from the mortar, the earth shook until the bodies of the gunners fairly bounced and another great shell was sent swirling and droning across the sky on its errand of death.

Day after day, unceasingly, the great guns in the battle zones of Europe are pounding away like giant blacksmiths shaping peace in the forge of war—and the men that man them often do not see a human creature but their own group for weeks at a time.

At the very outset of the war Germany fairly astounded the world with her "Fat Berthas," as the Boches called their Krupp "42s." These big siege guns were cumbersome affairs and their transportation always remained a matter of great difficulty. It required seven railway wagons to transport a single gun, but when it got within range it could throw shells that would smash the most modern fort like an eggshell. And each shell fired from a "Fat Bertha" cost about \$2500.

Together with the difficulties experienced in transporting these great guns and the impossibility of withdrawing them quickly in case of a sudden and unexpected advance by the enemy, the "Fat Berthas" had other drawbacks. They were very costly, very short-lived—150 shots being all that one of them could be made to fire with safety—and the shock of each shot was so great that the gunners had to lie flat on the ground with their mouths open, 200 feet away from the gun when it was fired.

But despite these drawbacks the success of the gun was colossal. The fact is that at the taking of Fort Douaumont, which has been ascribed by the allies to the assembling by the Germans of a number of these heavy guns, only one of these guns, it is claimed, actually took part. This gives some idea of the wonderful destructive power of the "Fat Berthas."

It is said, however, that the German "42s" were inferior to the Austrian 365-centimeter Skoda guns, which were more easily moved about and which, manned by Austrian gun crews, played so pronounced a part in the Antwerp campaign.

France really did not plan her heavy artillery until as late as August, 1914. Her 75-millimeter guns were good, but they could not reach the Germans, who could drop shells in the trenches from a distance of eight miles. So France

got busy and soon succeeded in turning out guns of as great power and mobility as any Germany could boast of.

The first of these new French guns was the 165-millimeter, which could throw a 34-pound shell eight miles. Then came the 120-millimeter howitzer, which could safely discharge a 42-pound shot a distance of five miles and from that distance, once the range was accurately secured, it could drop its great bombs in trenches as though they were being let fall from aeroplanes.

After these two guns came the French short-barreled mortars, which fire at an angle of 70 to 80 degrees, and then still heavier guns, up to the 230-millimeter terrors, firing projectiles weighing from 440 to 550 pounds five and a half miles. These are moved by large tractors or mounted on specially designed railway carriages. The mortar is 11 inches in diameter and French 273.4 millimeter Schneider siege mortar fires a projectile weighing 550 pounds at a velocity of 320 meters a second.

The famous "Long Tom" is England's most effective and precise weapon. It is a gun that is easily moved about, has a range of about four miles and can fire 500 shots in succession with great rapidity.

In Italian ordnance there are three principal types of great guns. The long, 149-millimeter howitzers fire at the rate of 15 shots a minute and throw a projectile of 1300 shrapnel balls and a howitzer-mine loaded with 13 pounds of trinitrotolual. The 21-centimeter howitzers have the advantage of firing from wheels and are easily moved. The 219-millimeter mortars, mounted on platforms were the sensation of the Isonzo front and are given credit to a great degree for the Italian success in that difficult field.

Greater guns are found in the navy and coast defense than are employed on the inland battlefields.

The British super-dreadnought Queen Elizabeth carries 15-inch guns, which were the largest guns carried by any warship in the world up to the time of the building of the new 18-inch weapon. Some idea of the awful power of these 15-inch terrors can be gathered when one realizes that the regular 12-inch guns of the British navy are 40 feet long, employ a cordite charge of 207 pounds behind a projectile weighing 850 pounds. Their muzzle velocity is 3600 feet a second and yields a striking energy of 38,643 foot tons.

Each shot from one of these big British naval guns costs from \$750 to \$1200, and it is probable that a shot from the new 18-inch wrecker costs between \$1500 and \$2000.

America's largest weapon is her new 16-inch coast defense gun. The gun is 60 feet in length, weighs 235,000 pounds, throws a projectile weighing 2400 pounds propelled by 666 2/3 pounds of powder at a muzzle velocity of 2350 feet per second, with a muzzle striking energy of 100,000 foot tons. The maximum range of this new gun is about 10 1/2 miles and the cost of firing one shot is close to \$1000.

With skepticism and open denial the artillery experts of the allied armies met the first report of the new long-range cannon with which the Germans are bombarding Paris, declaring that it was utterly impossible to construct a gun that would shoot the estimated distance of 72 miles.

Continued bombardment and the in-

spection of shell fragments, with the definite locating of the big cannon, a forced belief, and admission. It is located in a forest near Laon, and its bombardment of Paris is daily.

The gun is said to be of 42-centimeter caliber, and is the invention of

Professor Rausenberger, an artillery manager of the Krupp works. In an interview given in 1916 he predicted the advent of the long-range cannon and declared that it would be possible to construct cannon of such range that England could be bombarded.



Remarkable Photograph of a French Mortar of the Heaviest Type Bombarding the German Lines—Cranes and Hoist Rope Used in Lifting Great Shells Are Seen on the Right of the Gun, Which Has Just Been Discharged.

BEGINNINGS IN ALL WARFARE

THE first standing army was formed by Saul, 1033 B. C.

The catapult was invented by Dionysius, 399 B. C.

The sword came from ancient Egypt and was used throughout Palestine, Syria and Asia Minor, India and throughout the western world. It was in Egypt that the three shapes of the sword blade originated, these being the straight, the curved and the half-curved. As the shape became more settled, great attention was given to the adornment of the sword, especially the hilt, which was made of gold. A sword of the Pharaohs had a pommel surmounted by a hawk's head, symbolical of the sun, while studs of gold ornamented the handle. The Roman sword was larger than that of the Greeks, and in the days of the empire many of the sheaths were so covered with precious stones as to be veritable art treasures. Among the Moslems the highest title given to a warrior of renown is "the sword of Allah," he Chinese made swords of iron as early as 1879 B. C.

Bullets of stone were used in 1514, while bombs came into general use in 1634. Bomb vessels had their origin in France in 1681. Fireships first appeared in the early part of the 16th century.

The use of cannon dates back to the year 1328. Artillery constructed of brass first appeared in 1425. Among the curiosities of artillery odd inventions have a great place. Cannon have been made of the most unlikely materials. Leather was used as early as Henry VIII's day, at the siege of Boulogne. These articles were stored in London tower; Evelyn saw them there inscribed "Non Marti opus est cui non deficit Mercurius."

The Scotch used leather guns in 1640 to batter Lord Conway's fortifications at Newbourne. In a tomb on the Island of Chinal, near Usuacincta, Mexico, was found a cannon four feet 11 inches long, of terra cotta, with terra cotta bullets. It is suggested that when Cortez retired after his great fight at Ceuta, Tabasco, the natives copied the Spanish guns in clay, hoping to produce the same results. Artillery was first used in war by the Moors at Algeciras, Spain, in 1341. Cannon were first used by the English, by direction

of the Governor of Calais, in 1333. Iron bullets were first mentioned in the Poedera in 1550.

Letters of marque and reprisal were first granted in 1295. Muskets were first used in 1414, during the siege of Arras, while chain shot was a device of a Dutch admiral, De Witt, in 1656.

The bayonet was invented in Bayonne, France, about 1670.

Pistols were first employed by the British cavalry in 1544. The revolving-chambered breech of the pistol was patented by Colt in 1835.

Muskets supplanted the bow and arrow among the British soldiery in 1521. Spain was the first nation to equip foot soldiers with muskets.

Lead bullets came into use shortly before the end of the 16th century. The Minie rifle was invented about 1823 by M. Minie, of Vincennes.

The battering ram had its beginning with Artemones, 441 B. C., while the first army arranged in a regular line of battle was that of Palamedes of Argos.

Palamedes is credited with devising the idea of placing sentinels and pickets around a camp. The watchword as used by sentinels is supposed to have been his conception, also.

The most famous cavalrymen of antiquity were the Parthians. Their invasion of Judea, 40 B. C., resulted in such terrible devastation of the country that 100 years later the terrors of the Parthian invasion gave the Apostle John the idea for one of his most vivid pictures.

The earliest sea fight took place between the Corinthians and the Corcyreans, in which the former conquered, 664 B. C.

The Venetians made the earliest use of artillery in sea fighting against the Genoese in 1377.

The first use made of fireships by the English was during the engagement with the Spanish Armada, in July, 1588. Wildfire, sometimes called Greek fire, was an invention ascribed to Callinicus of Heliopolis. Gunpowder was known in China at a very early period. This mixture of saltpeter, charcoal and sulfur is well known all over the world. It was used in the 12th century both by Christians and Moors in Spain. Roger Bacon first introduced it into England early in the 13th century, but

its preparation was so imperfect that it was of very little use until a German monk, Berthold Schwartz, introduced a new method of manufacture in 1320. With the progress of science demands for new varieties in gunpowder have resulted in smokeless powder. It is a compound of gun cotton and cellulose nitrate, the latter consisting of sawdust which has been soaked in sulphuric and nitric acids. Gun cotton is attributed to the device of Professor Schoenhein, of Basil, who made it known in 1815.

Dynamite, which takes its name from a Greek word meaning strength, is produced by mixing nitroglycerin with a kind of earth known under its foreign name of kieselguhr. It was first discovered by Ascarne Sobrero, in 1846. Twenty-one years later it was patented by Alfred Nobel.

The French navy, consisting of galleys, is first mentioned in history, 728 A. D.

The United States Navy virtually had its beginning March 30, 1794; the first United States war vessel was built at Portsmouth, N. H., in 1781.

The man-of-war of the ancient Romans had a crew of 225 men, of which 174 were oarsmen, working on three decks. The speed of this vessel was about six knots an hour in fair weather.

The original regiment of dragoons was organized in England in 1581. British historians assert that guns were used by their soldiers at Cressy in 1346.

Military uniforms were originally worn in France by order of Louis XIV, 1668. The French claimed that scarlet color was best fitted for uniforms, in that it is the most difficult color to hit.

Explosive bullets were first used in India for hunting tigers and lions. They were brought into Russia in 1862. In 1868 an international convention declared their employment in war to be inhuman and unnecessary.

The first breechloading firearm used in this country was the Sharpe rifle.

The study of submarine boats, which has been carried on with great secrecy by the different nations, at present is attracting the attention of the world.

The first war, according to scriptural authority, was begun by a son of Cain, 2563 B. C.

Roumania was formed in 1859 by the union of Moldavia and Wallachia, two principalities tributary to the Sultan of Turkey.



Series of Big Guns on the Italian Sea Front, Planted in Defense Against Attack From the Adriatic.