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NEWSLETTER

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Cannon: A Review Of Artillery Of The American Revolutionary War

Before beginning a discussion on the types of artillery employed during the American Revolutionary War, a few words need to be noted. The word, *Artillery*, was coined in the early Medieval Ages to denote any type of projectile-throwing device. The word, *Cannon*, is of more recent invention, having come into usage only since the Renaissance; it originally referred to only one particular type of artillery. During the American Revolutionary War, the word, *artillery*, was generally used to refer to *cannon* because it was the only form of projectile-throwing device still in use at the time.

Prior to the invention of cannon, there were three types of catapults, which principally made up what armies of the day termed artillery. Known as *engines*, they hurled heavy objects at their targets. The *Ballista* was an engine that shot javelins or arrows by placing the projectile against a flexible piece of timber that would be stretched back and let go. The *Mangonel* hurled large stones and boulders from a spoon-shaped arm lashed to a base in such a way that it sprang forward when released. The third type of engine was the *Trebuchet*, the largest of the three types of catapults. The Trebuchet consisted basically of a long arm, counterweighted to provide sufficient spring, with a leather sling on the opposite end, into which a large stone or another object of substantial size and weight would be placed.

Cannon, per se, did not appear until the Fourteenth Century, the first one having been recorded at Florence, Italy in February of 1326. It would not be until the middle of the next century, though, before cannon was used on a large scale throughout the world. By the start of the 1700s, the cannon was a common weapon in use by European armies, and artillery companies were integral units of the armies, almost on a par with the cavalry.

Cannon was not used extensively in the colonies in North America prior to the French and Indian War period. The difficulty of moving and operating them in the wilderness that made up most of the colonies made cannon impracticable. The first appearance of cannon in use in the Americas was that of cannon carried aboard ships for the purpose of bombarding forts guarding harbors. A naval engagement between the French and Spanish in 1565 off the coast of Florida would probably qualify as the earliest incident recorded in which cannon were used in or near the North American colonies. Field artillery would not be utilized to any extent until 1745 when the British

attacked the French fortification at Louisbourg in Nova Scotia. Assisting the British Royal Army at Louisbourg was the Ancient and Honorable Artillery Company of Boston.

During the various colonial wars, especially during the French and Indian War, the use of cannon and other artillery proliferated. Artillery companies tended to slow the advance of the armies during a campaign, but that was indeed a small problem in comparison to the benefits the artillery provided. Fortifications were generally constructed of stone in the established European countries. The initial fortifications built in the colonies tended to be constructed of wood, which was a readily available material. The forts were generally constructed with the intention of providing safety against the indigenous Indian tribes, who did not possess artillery of any sort. Wood palisade walls sufficed for protection against the arrows and warclubs of the Indians.

As the belligerent European powers quarreled over lands in the new world, those countries sent over artillery along with the artillery companies needed to operate them. It was soon discovered that artillery could penetrate the wood fortifications rather easily. Sieges involving the bombardment of wooden fortifications with artillery became a standard part of campaign strategy for the opposing forces.

By the time of the American Revolutionary War, both France and Great Britain had transported large numbers of cannon to the North American colonies to bombard each other.

There were three types of cannon utilized during the American Revolutionary War: *Guns*, *Mortars* and *Howitzers*. All three types were considered *smoothbore* because the inside of the cannon's barrel was not rifled. Rifling was the cutting of spiral grooves along the length of the barrel's bore, which imparted a spin to the projectile.

Guns shot at a low trajectory and could be used at either short or long range. Guns were very effective at battering fortifications of construction. They were often employed to destroy the enemy's cannon because they could be aimed with some accuracy. Guns could fire balls, bombs, canister shot and grape shot.

Mortars shot at a high trajectory, and because of that was used to reach targets behind the fortification's palisade walls. The mortar's range was about the same as that of the gun. Because of the very high trajectory, bombs were usually fired from mortars. The advantage of the height that a projectile could be shot from a mortar was that a bomb could be timed to burst overtop a group of soldiers and cause widespread injury as it fell to the ground.

Howitzers shot at a trajectory midway between the gun and the mortar. Projectiles shot from a howitzer could, like that of the mortar, reach behind a fortification's walls; but the greater advantage of the howitzer over the mortar and gun was that larger size projectiles could be handled by the howitzer. Because of that advantage, howitzers were often used when it was discovered that a fortification's walls could not so easily be penetrated by the guns.

There were a variety of projectiles that could be shot out of a cannon during the American Revolutionary War period. They comprised three basic types – projectiles that did not explode, projectiles that exploded and projectiles that scattered small fragments without exploding.

Before describing the various types of projectiles, it might be worthwhile to note the sizes utilized during the American Revolutionary War. The size of the projectile was signified by the size of the bore diameter of the cannon's barrel. That size was noted as the *caliber* in inches. The caliber size, in some cases, tended to match the weight of the solid iron ball shot. In other words, a cannon with a bore diameter of 3 inches would shoot a slightly smaller iron ball that weighed between 3 and 4 pounds. A cannon with a bore diameter of 9 inches would shoot an iron ball that weighed between 7 and 10 pounds. The size of the cannon came to be referred to in terms of the average weight of the solid ball shot they could fire. A cannon with a bore diameter of 3 inches was called a *3-pounder*, one with a bore diameter of 6 inches was called a *6-pounder*, and so on. Nearly thirteen different calibers were employed in the guns at the time of the War. The most common calibers included 1-1/2-, 3-, 4-, 6-, 9- and 12-pounders. Larger caliber guns,

including 18-, 24- and 32-pounders were also utilized as siege guns.

Projectiles that did not explode were called *solid shot*.

Projectiles that exploded were called *bombs*, from the Greek word *bombos*, which meant 'deep hollow sound'.

Projectiles that scattered small fragments without exploding were called *scatter shot*.

Solid shot included cast iron round balls, bar shot and chain shot. The round balls were simply that - nearly perfectly round balls, solid through. They had developed out of the discovery that round stones hurled from the early types of artillery (such as the trebuchet) sailed through the air more effectively than odd shaped stones. With the introduction of the cannon, the more round the stone was, the more easily it was hurled through the cannon's barrel. The earliest solid ball shot was rounded stones. They were followed by stones covered with a thin layer of iron. Eventually, the stones were dispensed with altogether and solid round balls were cast entirely of iron. Solid ball shot during the American Revolutionary War can be distinguished as of either American or English manufacture by the evidence of, or lack of, a seam mark. The English had been manufacturing solid ball shot (using two part molds) for quite some time before the American Revolutionary War, and therefore had perfected the casting of the balls to the point at which no seam would show. The balls manufactured by the Americans, on the other hand, were, of necessity, being hurriedly produced to meet the demand for ammunition. The raised seam marks did not greatly affect the efficiency of the ball, so there wasn't any urgency to worry about it.

Solid ball shot, though not effective in killing many of the enemy, was very effective in destroying fortification walls and other structures. The solid ball shot was often fired by mortars over a fort's palisade walls with the purpose of striking the fort's defensive artillery. The solid balls would tend to bounce and strike the defenders' cannon, splintering the carriages and rendering them useless. Solid ball shot was also very effective in a siege for battering down the fort's walls. A solid ball shot fired from a 24-pounder gun at a distance of 100 yards would penetrate a wood palisade wall and burrow into an earthen rampart as deep as twelve feet.

Bar shot consisted of two cast iron ball halves connected together by a short length of iron bar. Bar shot was effective in ripping apart wooden structures and were used very effectively in naval battles to destroy an enemy's masts and rigging.

Chain shot consisted of two solid ball shots connected by a short length of chain. The chain shot was utilized in the same way as the bar shot.

Bombs, or *explosive shells*, as they were sometimes called, were basically hollow spheres, cast of iron. The wall of the sphere contained a small hole through which gun powder would be poured, and then into which a fuze would be stuck and lit. The sphere's wall was thicker opposite the hole so that when the bomb landed in the midst of the enemy, it would land with the burning fuze upright. The thicker wall opposite the fuze hole would allow the ball shell to withstand more of the pressure as it was propelled from the cannon. In some cases, the bomb's spherical wall would be cast with a slight lip or collar around the fuze hole so that a pair of tongs could be used to grasp it, for inserting it more easily into the cannon barrel.

Bombs required special handling so as to safeguard the troops shooting them from the cannon, and also so that they would be more effective against the enemy troops into whose ranks they were shot. The powder was not poured into the shell until close to the time that the bomb would be used. Should it take on moisture, the powder would be ineffective because it might cake up. The fuze, likewise, was not inserted until the actual instant of firing. The fuze was constructed of wood; its length often coincided with the diamater of the shell. The length of the fuze, though, was determined by the length of time that was desired before the bomb was to explode. For example, a fuze to be fired from a 12-pounder during the American Revolutionary War might be made seven inches long, calculated to burn forty-nine seconds before exploding. The cannoneer would cover the end of the fuze to be inserted into the shell with a piece of tow. The fuze would be inserted into the shell's fuze hole, cover the

exposed end with a fuze-setter to protect the end, and then it would be pounded into place with a mallet until it stuck out approximately 2/10s of an inch. The fuze would be lit with a matchstick and the bomb would be inserted into the cannon and the cannon, in turn fired.

Scatter shot projectiles consisted of some sort of container, into which was loaded small objects that would scatter in all directions when the container hit something and broke apart.

Canister was a scatter shot projectile consisting of small round shot packed in a can or canister. The shot would scatter from the canister almost immediately after the projectile left the cannon muzzle. It was used primarily against troops at close range.

Grape shot was small round shot packed in a canister that would be exploded by a fuze, so that it did not scatter until some time after the projectile left the muzzle of the cannon. Grape shot got its name from the fact that it was often packed in a cloth bag rather than a metal cannister. The small balls that made up the shot were packed around a wooden core attached to a wood disc base, and then the cloth bag was wrapped tightly around them. The appearance of the balls wrapped in the cloth bag gave the appearance of clusters of grapes, hence the name grapeshot.

Gunpowder that was used in artillery during the American Revolutionary War was a mixture of what is known as *black powder*. Today, black powder consists of a mixture of 75% saltpeter (*i.e.* potassium nitrate), 15% charcoal and 10% sulphur by weight. At the time of the American Revolutionary War, the formulation was six parts saltpeter to one part charcoal and one part sulphur.

The explosive power of black powder comes from the oxygen its own ingredients contain, allowing combustion to occur regardless of the environment in which it is placed. If it could not combust on its own, black powder would perhaps burn, but not be able to ignite with the speed it does in the confines of the cannon barrel. Also, when black powder burns, it releases primarily nitrogen and carbon dioxide gases which take up as much as three hundred times the space that the powder occupied. That is what gave the thrust to the shot, propelling it down the length of the cannon's barrel and out the muzzle.

The firing of a cannon involved a crew of four to five men: a gunner, loader, sponger and a *powder monkey*. In some crews there might be two loaders or two spongers to speed up the process.

The firing of a cannon was performed in five steps: (*1.*) sponge, (*2.*) ram, (*3.*) in battery, (*4.*) point and (*5.*) fire.

At the command of *Sponge*, the sponger would insert the sponge into the muzzle of the cannon. The sponge was a wooden cylinder, covered with lambskin, on the end of a pole. Before inserting the sponge into the cannon, it would be dipped in water. The purpose of dampening the sponge was to quench any sparks still remaining in the barrel in addition to cleaning the barrel. After inserting the sponge, the sponger would press it hard against the back of the barrel and then twist it three turns from right to left, followed by three turns in the opposite direction.

A wormer was inserted into the barrel to grab any remaining bits of the cartridge just previously fired. The wormer consisted of a pole with two intertwined corkscrews on the end. The worm screws were sometimes mounted on the end of the sponge in order to do the two jobs of worming and sponging at the same time.

The sponging and worming of the barrel was followed by inserting the cartridge. The cartridge consisted of a measure of black powder. The cartridge was inserted into the cannon's barrel by means of a ladle. The ladle was a scoop shaped tool which was of a size that provided an exact measure of powder. The measure was often such that the amount of powder would match the weight of the solid shot. A three-pound ball would be matched by a three pound measure of powder. In some cases, such as with scatter shot, the cartridge would contain the projectile itself. If a solid shot was to be fired, it was inserted directly after the cartridge.

Following the insertion of each item into the cannon's barrel, a loader would push a rammer, a wooden cylinder attached to the end of a pole, but uncovered by lambskin, into the barrel to push the cartridge and projectile tight. At the

command of *Ram*, the loader would pull the rammer out of the barrel about an arm's length and then, with a swift, steady push, ram it back into the barrel, packing the cartridge or projectile tightly against the bottom of the barrel. With the cannon ready for firing, as far as loading it was concerned, the gunner would then stick his pick (sometimes called a priming wire) into the vento hole. The pick would clear the vent and/or rip open the cartridge bag so that the primer could ignite the powder charge.

At the command of *In Battery*, the cannon would be positioned properly. The repercussion of the previous firing would have pushed the cannon backwards away from its proper position in the battery. The loading of the cannon for the next firing would be undertaken when the cannon had come to rest, so now it had to be repositioned. All of the crew members would grab handspikes, which were usually six-foot long wooden poles covered in iron, to lever the cannon back in place. The wheels of the carriage were pushed forward to where they were touching a timber, called the hurter, that was laid on the ground.

The command to *Point* resulted in the crew making fine tuning adjustments to the positioning of the cannon. Using a quadrant, the gunner would sight down the length of the barrel and direct the rest of the crew to heave to the right of left as necessary. The crewmen would use the handspikes to lever the cannon.

The final preparations for the firing of the cannon would be made prior to the command to fire. One of the crewmen would pour the priming powder into the vent hole. The lanyard, a length of rope would be attached to the priming hammer, and held at the ready by one of the loaders. The gunner, who would now have taken his position to the windward side of the cannon, in order to be able to watch the effect of the shot. When the time was right, the gunner would give the command to *Fire*, and the lanyard would be pulled, releasing the priming hammer. The spark produced would ignite the priming powder, travel down the vent hole and ignite the cartridge of black powder. The resulting explosion of the black powder would send the projectile hurtling through the cannon's barrel.

A Note On The Publication Of This Newsletter

I, Compatriot Larry D. Smith, write and publish this newsletter as a totally volunteer effort. I am not compensated for my efforts ~ nor would I accept any monetary compensation if offered to me. I produce the newsletter because I enjoy doing it. I have a very insatiable appetite for historical knowledge; the researching and writing of articles for this newsletter (such as the article on cannon in this issue) satisfies that appetite in a way that no amount of money could. Therefore, I plan to continue publishing the newsletter until such time that someone else steps forward and requests to take on the task.

The parameters of the project of publishing the Chapter's newsletter have been set (and changed) over the ten years that I have been involved with it. I have attempted to produce articles of varied interests in addition to an ongoing Chronology of the War so that the compatriot members of the Blair County Chapter will be able to more closely identify with the lives of their Patriot ancestors.

Recently, the publication schedule was called into question. The schedule I followed in the past was not totally arbitrary. Acting upon the wishes of various members about six years ago, I began to publish the newsletter and distribute it just a week or two prior to the quarterly and annual meetings. The entire upcoming year's schedule of meetings would be published in the first newsletter of the year, which would be distributed just prior to the first quarterly meeting and the annual George Washington's Birthday celebration (which tend to fall close together in February). The entire year's schedule of meetings (barring any required last minute changes), therefore would always been available for compatriot members to refer to throughout the year (assuming the newsletters were

not immediately discarded upon receipt.) The timing of the receipt of the newsletters just a week or two prior to the quarterly meetings and the annual meeting was established because various members indicated that they could not remember the dates of the meetings if the newsletter arrived a month prior to the meeting. The claim was made that the yearly schedule might be mislaid, and then the newsletter that arrives a month or more prior to the meeting might be also mislaid, resulting in the missing of a meeting. The publication of meeting notices in the various quarterly newsletters, therefore, were intended to serve simply as reminders of what the compatriot members would already have been informed in the yearly schedule included in the first newsletter of the year.

It was indicated at the recent (*i.e.* fourth quarterly) meeting, that the arrival of the newsletter just prior to the meetings is inconvenient for a number of the members (possibly as inconvenient as the previous schedule had been for a number of the members). I have endeavored to be as accommodating as possible, but it is not possible to please everyone. Therefore, I have decided to set an alternative publication schedule that should be a neutral compromise. The newsletter will be published during the last month of the quarter, irregardless of when the various meetings fall in the calendar year. The first newsletter will be published during March, the second during June, the third during September, and the fourth during December. A fifth issue, which has heretofore been published to accommodate the fifth meeting, the Annual Meeting, will be dispensed with.

The yearly meeting schedule, which would normally appear in the first issue of the year, will, in the future, be included in the fourth quarter's issue. *Note:* A schedule for the year 2001 would have been included in this issue, but it was not received from the Chapter president in time to be included. The yearly schedule will be included in the first quarter's issue, to be distributed in March. President Faulds distributed postcard notices prior to each meeting during the past year of 2000; he will possibly continue to do the same during this upcoming year of 2001.

For the benefit of those compatriot members having internet access, the year's schedule of meetings will also continue to be published on the Chapter News page of the Blair County Chapter's website at the url:

http://www.motherbedford.com/ChapterNews.htm

Upcoming Event – George Washington Birthday Dinner 2001

Deka Anne Smith, of the Colonel John Proctor Chapter, DAR has sent us preliminary information that the joint DAR/SAR George Washington Birthday Dinner (to be hosted this year by the DAR) will be held on February 17, 2001 at the Ramada Inn – Altoona. The dinner meeting will begin at 12:00noon. Altoona Mayor, Thomas Martin will be the featured speaker for this event.

The main course for the meal will be stuffed chicken breast.

The cost per person will be $17. Please send your payment to Helen Louise Sellers at 901 Penn St., Hollidaysburg, PA 16648. As in the past, you may pay at the dinner, but in order to plan for the proper number of attendees, please make sure you notify Mrs. Sellers by Monday, February 12 with the number of guests in your party.