



# Washington's Great Challenge: Arming the Continental Army in 1777

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I'd like to start by asking, "What comes to mind when you think of Valley Forge and the encampment that occurred here in the winter of 1777-1778?"

*Audience responses:*

Snow.  
Weather conditions.  
Von Steuben rebuilding the army's discipline.  
Starvation.  
No battle.

Thank you! I'm glad we don't have to clear that up. Every day visitors come to the Welcome Center from Brandywine or Gettysburg or other battlefields and ask, "Where was the battle at Valley Forge?"  
What else?

The hardships that they endured.  
Disease.  
Lack of supplies.  
I think about the women and ladies who were here.

Yes. And, of course, the children. This was a winter camp of six months. There were families here. It was a large town for those six months.

Parson Weems' story of Washington praying.

Okay, the myths of Valley Forge, the romanticism.

The name itself.

Yes. In fact, if you're interested, in the stable at Washington's Headquarters we've a small exhibit about the Mount Joy Forge with artifacts that were excavated in 1929 – 1930 from the forge site.

Those are some of things that we think of when we hear the words "Valley Forge." Today I'll talk about the lack of supplies and specifically about the lack of weapons, and not only the lack of weapons but also the lack of training in the use of those weapons. When the army arrived here, about half of the soldiers had bayonets for their muskets. Very few, however, were properly trained in the use of the bayonet. In fact, an occasional use of the bayonet was to roast meat over an open fire.

First, I'd like to read some excerpts from transcripts of three letters from General Washington. The first one is dated February 29, 1778, and it's addressed from Headquarters: "The Armory Department is in as bad a situation as it can well be and requires measures to be immediately taken to put it upon a proper footing. Otherwise the army must be greatly distressed on a score of arms and the public will be at a great expense to little purpose."

A day later from Lebanon (Lebanon was a storage facility for the Continental Army); this is a Return of Arms dated March 1, 1778: "1,564 new French muskets from New England, balance remaining here January 31<sup>st</sup> per last return, 1,500 still there. 2,407 old muskets unfit for service there, at last return still there. 460 of the old muskets in such bad condition the stocks all broke . . . Mr. Dupree thought better to take them to pieces, which was done. The good barrels and mountings will be packed up together and sent to Carlisle." That's Carlisle, Pennsylvania, probably for refitting on new stocks.

Moving along in the Valley Forge encampment, April 30, 1778 - there is no location on this Return: "697 new French muskets sent to camp for the month of April. 4,212 damaged muskets listed total." And then he continues talking about rifles coming in the stores. The point here is that the lack of weapons was a chronic problem faced by the Continental Army up until the end of the Valley Forge encampment. By its end, in April and May of 1778, supplies were coming in from France. We enjoyed the French alliance here at Valley Forge on the 5<sup>th</sup> and 6<sup>th</sup> of May; with that we had more open trade. Overall, the French government supplied anywhere from 100,000 to 150,000 French flintlock muskets during the war period. But before Valley Forge, a chronic problem faced by the Continental Congress and Washington was the shortage of weapons and, if they had weapons, were they serviceable? As one historian put it, in 1776 Washington faced an arms crisis. Without weaponry, the war movement might have fallen apart at that point.

To get a better understanding of the situation faced by Washington (remember, we were allies with the British prior to this war), I would like to take a look at the British system of procuring and developing weapons for their Army. Let's look first at what happened before 1715 and then how everything changed with the adoption of a program called the Ordnance System.

Prior to 1715, the British government's military was one of the strongest in Europe. At that time, the colonels who commanded the British regiments of foot had total control over procurement. The British government would give them an allotted amount of money to purchase weapons for the soldiers in their units. The problem was that the colonels would often procure inferior, cheap, domestic firearms then pocket any leftover monies from the allotment. They worked with commercial gun makers in England, through a group called the London Guild of Gun Makers. The Guild did not necessarily work for the government. They made weapons privately. From what I understand, it was common practice for the colonels to keep some of the money.

In 1715, this changed. The Ordnance System was an attempt by the Crown, under King George I, to gain better control over the quality and the quantity of firearms issued to the British Army. Under the Ordnance System, different gun makers in the midlands of Eng-

land and around London proper were making components for military weapons. One person would specialize in locks, another would specialize in barrels, another in the furniture on the weapons. These specialized craftsmen made the parts and then shipped them to the Tower of London. The Tower itself was the main repository for the British government going back to 1078. So after 1715, individual gun makers were specializing in one component of the manufacturing, then shipping by the crate to the Tower. If England went to war or if a regiment had to be resupplied with weapons, they would be assembled, inspected, and issued by the Tower. This, in a nutshell, was the system of weapons development in England leading up to the establishment of the Ordnance System in 1715.

Having said that, let's look more closely at the challenge faced by the American government and General Washington in supplying the Continental Army. In 1774, we were a new nation on the brink of war. Like any young nation, we were ill prepared for it. Prior to 1774, of course, we were allies of England; actually, colonies of England. We had fought with them during the French and Indian War and our militia had been supplied by them with British weapons through the Ordnance System. But as the war clouds gathered, the individual Colonies started to recognize that some system was needed to supply weapons to the American militia. When, in September 1774, twelve of the original thirteen colonies met in Philadelphia at Carpenter's Hall to establish the First Continental Congress, one of their actions was to adopt a resolution calling for the American colonists to arm themselves with whatever weapons they could find, either privately or on the commercial market. The problem with this resolution was that it was only a resolution. There was no legal action. We had no legal system established for the procurement and issue of military weapons.

In 1775, when it seemed that war with the Crown was inevitable, the American colonies once again got together to form what were called "committees of safety," or "councils of public safety." They were organized with the sole purpose of procuring weapons for the militia of the thirteen colonies. The first contract was let in the spring of 1775, about a month before Lexington and Concord in Massachusetts. By the way, Massachusetts and Pennsylvania were two of the leading colonies that took active roles in the com-

mittees of safety for arming the colonies. The “Committees of Safety” program was well-intentioned but their ability to procure weapons was very limited, for this reason: the colonists making the weapons were often hesitant to put their names on the guns due to the threat that if their marked weapons were captured by the British during battle, they would be considered traitors. Therefore, a lot of the program’s gun makers were hesitant to manufacture weapons for the colonies.

To supplement the manufacturing activities, committeemen also searched for any weapons they could find. By this time, we were engaged with the British Army in New York. Our committees went to the various Royal Armories that were set up in the colonies - magazines of British weapons that were maybe left over from the French and Indian War or that were issued to the colonists prior to the Revolution - and they’d confiscate the weapons that were still considered Crown property.

The Continental Congress also went to the American people and either confiscated or purchased whatever weapons the public might have. A lot of these were hunting rifles or hunting pieces, fowlers; that is, weapons designed for bird hunting.

Another way that we procured weapons was to contact foreign countries. A major program established by 1776 involved agents such as Silas Deane and Benjamin Franklin, who went to Europe to purchase whatever they could from the Netherlands, Spain, Germany, and particularly France. France was a major supplier of weapons to the American effort. In fact, one of the programs established between the French government and the United States was a corporation for covert arms trading. When we think of the Iran Contra Affair not too long ago, we think of it as covert arms trading. Well, it was going on back in the 18<sup>th</sup> century under King Louis XVI when the French government set up a dummy corporation called Roderigue Hortalez and Company to issue French weapons to the American Congress, primarily through the West Indies. Roderigue Hortalez would carry them to the West Indies and then transport them to Philadelphia, Portsmouth, and other ports of the thirteen states. This went on for about a year. Then in May 1778, France entered the war with the United States and after that we had open trade with the French government. As I mentioned before, about

100,000 French weapons were brought to the American States for the war effort.

When we started the war, we were using British weapons. The Committee of Safety muskets were patterned primarily after British weapons. But by the end of the Valley Forge encampment, we had a flow of French weapons coming in. In 1795, about fifteen years after the war ended, interestingly enough, when we set up two of our national armories, one in Springfield, MA in 1795, and one in Harpers Ferry, VA, in 1799, I believe, we adopted a French style for our weapons. The first standardized U.S. weapon was the U.S. Model 1795. It was based upon a French model widely imported by the United States during the American Revolution, the French model 1763, pattern 1766 French flintlock musket.

In conclusion, by the time of Valley Forge and the alliance with France, it wasn’t as much of a challenge, but the first two years of the war, we had a real challenge to arm the Continental Army under Washington’s command. That concludes my presentation. Are there any questions?

Q: With all the different suppliers of components is there any standardization of calibers and locks? How did they put these things together?

A: Before the Ordnance System was adopted in 1715, the London Guild of Gun Makers had two stipulations from the Government; that they be of a certain length, a 46 inch barrel, and of a caliber between 75 and 79. After the adoption of the Ordnance System, they went to a much smaller standardized weapon, what we call the English Long Land Service Musket. The caliber became standardized at 75, that is,  $\frac{3}{4}$  of an inch, and the weight at 9  $\frac{1}{2}$  to 10 pounds. When the Committees of Safety started to manufacture weapons in the spring of 1775, we went to an American Musket, similar to the English Long Land Service; same brass - what we call the ram rod channel on the bottom, similar locks. We copied the British early in the war because it was what we were familiar with.

Q: Is the Brown Bess a copy?

A: Yes, that was essentially the English Land Service Model. “Brown Bess” was a later term. The earliest I’ve seen the term used is about 1785, after the war. It was a term of affection. This weapon was well liked

by the British Army. It was very reliable for the 18<sup>th</sup> century. Accuracy was not an issue but they were well built.

Q: Are they smooth bore? Had rifling been introduced?

A: Yes, they're smooth bore. And, yes, rifling was a European invention going back a couple of centuries before that. There was rifling during the war. There was the famed Ferguson Rifle, developed by Patrick Ferguson in 1776. But 18<sup>th</sup> century warfare still relied on the old European linear tactics where two sides formed up about 150 – 200 yards apart, then slowly closed in, and finished the battle with a bayonet charge. That was still common battle practice in the 18<sup>th</sup> century and was dictated more or less by the smooth bore musket. The smooth bore was still the most reliable firearm in the 18<sup>th</sup> century.

Q: Was there any domestic production at all?

A: Yes, early in the war. But most domestic production was of hunting rifles or fowlers, on the market for private citizens. As I said, the Committees of Safety were involved in trying to procure weapons through domestic gun-making. There was no military firearms system set up prior to the Committees of Safety. But there was some domestic production, of course.

Q: Does the Park have in its collection an authenticated Committee of Safety musket?

A: It's difficult to prove a Committee of Safety musket but we do have two of them. Henry Vogt was a Philadelphia gun maker and a Committee of Safety manufacturer for Pennsylvania. John Nicholson also worked out of Philadelphia. They were and still are around, but again, it's difficult to authenticate.

Q: How would you compare and contrast the Committee weapons to the Brown Bess?

A: They're similar, with the brass ramrod channels on the bottom, walnut stock. The primary difference would be on the markings on the lock itself. A true American Committee of Safety musket will not be stamped "Tower." It would've been marked by that domestic gun maker if he dared put his name on the weapon. The caliber, size, and weight would be very similar to an English one.

Q: Are there gun sights on them?

A: No. Most have a front stud on the top but that's for the mounting of the bayonet. The idea of the smooth bore musket was you'd fire as many rounds as you could get off; in other words, repetitive fire, not accuracy. Linear tactics meant forming two long lines opposite each other on the battlefield, pointing in the direction of the opponent, and hoping to hit something or someone. If lucky, getting off maybe two or three rounds and then within 40 or 50 yards distance, one side or the other gives the order "Fix bayonets" and the engagement ends with a bayonet charge. The bayonet charge was not only physically, but psychologically, to scare the opponent off the field. Then, in a typical battle, horsemen would come in from the side and sweep up, if you will. The idea was rapidity of fire, so no front sights. On rifles, it's the opposite, accuracy versus rapidity. With that said, there's a Ferguson rifle from Morristown in the Visitor's Center with a front sight on it.

Q: How long did it take to reload?

A: When Von Steuben was at Valley Forge, he trained the American forces according to the European method of loading and firing muskets at three times a minute, about 20 seconds per round. Under combat conditions, a soldier's ability to load and fire three rounds a minute could be compromised.

Q: Did the militia use different weapons than the Army did?

A: The State Militia did not. They used the smooth bore musket. Marksmen (called sharpshooters today) had a different weapon. Horsemen or Dragoons typically either had a carbine or would rely on their edge weapons. But most of the militia had the common smooth bore musket.

Q: Did flintlocks work in the rain?

A: No. 18<sup>th</sup> century black powder was hygroscopic, meaning it was susceptible to moisture and dampness. Perhaps you've heard the expression "keep your powder dry." Even high humidity would affect it. If the powder got wet in any way, it would not fire. The other problem was that forty to fifty percent of the granule black powder would turn into a gas and the rest would remain in the breach of the barrel. It was a black sludge. After two or three rounds under combat

conditions, the powder would build up inside the barrel till you literally had to ram it down with a ramrod. That is why you don't find fighting in the winter or in the rainy seasons of the year. Washington's move on Trenton or Princeton was the exception rather than the rule during the American Revolution.

Q: Was the powder like the 2X or 3X black powder of today?

A: Yes, it was triple X granular powder and that continued right up to the American Civil War. When the '61 Springfield was issued in the American Civil War that was still triple X gunpowder.

Q: Using the same powder to prime?

A: Yes. The soldier would take a cartridge out of his cartridge box; pour a small amount in what is called the flash pan on the lock and then pour the rest of the powder down the barrel; the same powder.

Q: Is the lock or the barrel the critical part in manufacturing?

A: The two most critical parts of the musket are the lock and barrel.

Q: In manufacturing, too?

A: Probably the lock. It's the lock that activates the frisson that activates the explosion of the powder. From my research, there were more lock makers than barrel makers. There were quite a few lock makers in the midsection of England. That was the main component of the musket. From an archeological standpoint, in our collection at Valley Forge, for example we have maybe only four or five lock plates that have been dug up, that were probably lost or discarded by a soldier. They were reusing those parts over and over again until they were completely non-serviceable. By the time they discarded a part, it was probably either cracked or unserviceable. This was before the age of interchangeable parts, too, so if you had to refit a lock on a different musket, you probably had to carve out a cavity to make the lock fit on a different stock.

Q: Did the Pennsylvania Rifle have a presence during this time?

A: Yes. The forerunner of the so-called American-Pennsylvania Rifle was called the Jaeger rifle, a "hunting" rifle brought over from European principalities of Germany. Marksmen would carry a rifle such as the Pennsylvania. They were used effectively at Saratoga. The main problem with a rifle is it will not accept a bayonet. The smooth bore was more effective under the linear tactics. Rifles were used effectively but they never became standard issue because they wouldn't accept a bayonet and rifles were generally slower to load than the smoothbore musket.

Q: Did we have snipers?

A: Yes, absolutely.

Q: The British Ferguson Rifle was not fitted for a bayonet?

A: Interestingly enough, they were fitted for a bayonet but they weren't used that much.

Q: It seems there isn't technically a big step to go from the smooth bore's rapidity to the longer range - the accuracy of the rifle bore, still with the ability to close with the enemy using the bayonet.

A: Schools of thought die hard. The idea in the 18<sup>th</sup> century was still to fight with linear tactics and that existed throughout the war. Particularly here in the eastern theater; now out in the western frontier and that area, frontiersmen and forces under George Rogers Clark resorted to more frontier warfare against the British-supported Native-Americans, employing the rifle, but again, that was the exception rather than the norm. A standard weapon was still a smooth bore musket.

Q: I thought that prior to Von Steuben, Washington didn't fight linearly, but mostly via attacks with knives and hiding?

A: He certainly used some of that. He was not against other types of warfare and we were still using that type. But some of the battles before that were still the linear tactics. It worked. Trenton and Princeton, of course, were not. Germantown was, Brandywine Creek - they were still based upon linear tactics.

Q: In Mel Gibson's "The Patriot," there were a lot of scenes of guerilla-like attacks, coming in on angles, etc.

A: What we call the partisan war. That was more common in the South, particularly after 1778. After Monmouth Courthouse, the theater of war shifted to the southern colonies and you'd find more of that in the south; for example, in the mountains of the Carolinas.

Q: Before the French Alliance and the introduction of French arms, and prior to the Committees of Safety, were people bringing their own private arms?

A: It was a little bit of everything. The initial Minutemen in Massachusetts, for example, local farmers, townspeople, they brought their own weapons from home. The formal Colonial Militia had their own private muskets, which was another issue faced by Washington - the whole conglomeration of different sized calibers and weapons. It was phenomenal. Some of the German muskets and Dutch muskets had an 80 caliber, while your standard British carbine, for instance your light infantry carbine, had a caliber of 64 or 65, and everything in between. There was such a difference, a mixture, of weapons. Archeologically speaking, among the ammunition that we've found here, we have literally hundreds, if not a thousand, musket balls in the collections, their size varying from little buckshot, buck and ball type ammunition, up to a 75 - 80 caliber ball. Minutemen and farmers came out with what they had. Committees of Safety, when they first started in the spring of 1775, patterned their guns off of the British weapons. Standardization really didn't come along until after the American Revolution.

Q: How did the Committees of Safety pay for the weapons?

A: I'm not sure I can answer that. The Committees were organized by the colonies so I'm assuming they had some kind of monetary backing behind them.

Q: How much of a problem was flint?

A: Flints were good for about twenty-five rounds. The French flints were typically a brown or honey color and the English were more of a black stone, because of the quarries that were available in the midlands of England.

Q: Were flints a commodity supplied along with powder?

A: Yes. Flints were issued by the French government literally in barrels, 25,000 per barrel. Most soldiers would carry two or three extra flints in a pouch called a cartridge box. They have a very sharp edge on them called knapping and that edge would strike the frisson or the battery to create a shower of sparks. As that edge wore down and became more rounded, it became less effective, resulting in sporadic ignition.

Q: Were they all imported or did we have some here?

A: 90 - 95% of our flints were imported, primarily from France. It was a big market for the French government.

Q: Is it true that the French flint was preferred over all others because of their durability?

A: Yes, the American forces preferred the French flint to the English. Apparently, they knapped better and they lasted longer.

Q: Why were the British rigid about the length of the barrel? Does a couple of inches either way make a difference?

A: I don't know if I can answer that question. Early on they were standardized at 46 inches. Maybe it was a weight factor, for carrying.

Q: And yet, the light infantry weapon has a shorter barrel.

A: Light infantry were oftentimes individually selected. Their weapons were lighter and they traveled lighter, all designed for greater mobility and faster movement. They could be used as skirmishers or to travel more quickly than your standard infantryman. A weapon developed for them was the light infantry carbine. It's basically the same design as your standard musket but on a smaller scale, about a 65 caliber musket versus 75; it's lighter - there's less iron going into the making of it, and less wood stock; about 6 1/2 to 7 pounds in weight.

Q: When you shoot a ball, the length of the barrel gives you some degree of accuracy. It works better than a rifle. Another consideration is that you have the advantage in bayonet fighting with a longer barrel.

A: The standard flintlock was accurate to 80 – 90 yards. Mind you, the barrels gum up. As the ball leaves the barrel, the trajectory is affected. The difference between the barrel and the size of the ball is called windage. When the ball travels down the barrel, it bounces inside the barrel. If the ball hits the top of the barrel before it leaves, that is going to determine the trajectory, the ball is going to travel downward. It was just the inaccuracy and the unpredictability of these things. You can actually see the balls losing their trajectory the farther they went.

Q: Didn't they have a patch to solve that problem?

A: Yes, but the patch was more for the rifle. It was a linen or leather patch that you'd grip at the ball. In the barrel is a series of lands and grooves. They would stuff the paper from the cartridge down the barrel with the musket ball but it really wasn't effective to grip the ball, which would literally bounce down the barrel.

Q: Is it safe to say then that there wasn't much target practice?

A: It's funny you mentioned that. About two years ago, we did an archeological study outside the Welcome Center over along Route 23 and they found a grouping of 100 musket balls. The only thing we can surmise is that in fact maybe they did have a practice range.

Q: Who made the musket balls in the encampments?

A: There is a wonderful scene in the Mel Gibson movie "The Patriot". He's sitting in the swamps with his two sons and he's melting down their lead toy soldiers. That wasn't common, but it did happen. There were armories. Springfield, before it became Springfield Armory, was a depot for the Continental Congress. And they were manufacturing ammunition, musket balls. But a lot of them were still being hand-made by the soldiers. I say that because a lot of them here in the Park still have what's called the sprue or a little attachment where they poured the lead. Those would have been completely filed off if they were government made. There were store houses set up at Lebanon, PA, and Carlisle, PA, (before it was Carlisle Barracks) that were making ammunition for the government.

Q: And the powder?

A: Powder was being issued by the Continental Congress and being imported from France. The dummy company, Roderigue Hortalez, imported not only weapons, but powder, and also cannon. We were making powder in the States as early as 1776. In fact, the Continental Powder Works at French Creek was the first federally funded powder works here in the country, even before du Pont set up his establishment outside of Wilmington in 1802.

Q: There is a diary or collection of receipts from Samuel Nutt, the ironmaster, telling how to make gunpowder and how to retrieve it when it's gone bad, very helpful.

A: Saltpeter, charcoal, and sulfur, the three main ingredients of powder.

Thank you for your attention.

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### About the Author

Scott P. Houting serves as a Museum Specialist at Valley Forge National Historical Park. He is responsible for the management of the park's renowned military collection of 18<sup>th</sup> century firearms and memorabilia documenting America's War for Independence from 1775-1783. A native of Michigan, he began his career in 1982 at the Smithsonian Institution in Washington, D.C., and worked in the office of former President Gerald R. Ford before accepting his current position at Valley Forge in 1994.