



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute  
1989 Volume I: American Communities, 1880-1980

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## **Arms Makers in the Community**

Curriculum Unit 89.01.06  
by Fred Kerson

My curriculum unit will examine the role of the armsmaker, 1780-1880 and the service they provided to the people who worked there and to the community. It will explain to students the role they played for the people of the United States and for Europe as well. In the second part, the types of antique firearms will be explored, from the flintlock to percussion ending with the early cartridge arm of 1880. The Connecticut Gun Makers attracted the highest class of workmen. As such they were the highest paid workers and received company benefits unheard of at that time. Skilled craftsmen were brought over from Europe and a German village was built for them by Sam Colt in Hartford, Connecticut. Some of these houses are still in existence behind the old Colt factory.

In Rohan's book "Yankee Arms Maker" Colt wrote to his agent, to get some badly needed German willow workers to Hartford right away. The reply came that this was impossible. [1] "The willow workers of Holland and Germany, he explained were gathered into little communes, and none would leave his particular hamlet without his family, his relatives, and his friends and neighbors. It might be possible to move an entire community bag and baggage but the agent doubted it." The willow workers were set in their ways and would not be happy in a foreign land. Now Mr. Colt demanded full and complete information of their habits and customs along with drawing and plans of their homes. These people knew nothing of new manufacturing methods. They were very communal taking great pride in their craftsmanship. He was astonished to find out by return post to [2] "Gather up the Potsdam willow working hamlet and send it—men, women and children to—Col. Samuel Colt at Hartford, Connecticut." When they arrived a reproduction of the old home by Potsdam was ready for them.

The government armory at Harpers Ferry and Springfield, had harder living conditions for its workers, many refused employment. Armorers resorted to putting up one or two room shacks in which their wives and children lived. While foreigners and outsiders were met with suspicions, local residents received preferential treatment whenever job openings occurred.

John Harris Hall designed and built a gun of revolutionary design. He was named one of the directors at the National Armory at Harpers Ferry, Virginia, around 1817. By 1819 John Hall had moved into the factory building with his bags, of clothing boots, ruler and pen. He turned the factory over to making a new breech loading rifle. Hall's breech loading rifle was revolutionary but more important was his goal [3] "to make every similar part of every gun so much alike that it will suit every gun, so that if a thousand guns were taken apart and their limbs thrown promiscuously together in one heap, they may be taken promiscuously from the heap

and will all come right.” By 1825 two companies of U.S. troops stationed at Fortress Monrow were armed with these Hal rifles. In 1826 a commission composed of James Carington and James Bell inspected Harpers Ferry.

[4] “At Harpers Ferry, at a testing point, these rifle were stripped, the receivers were disassembled, and the parts were scattered promiscuously over a work bench. 100 stocks which had been finished at the Rifle Works were brought to the testing point. The work having been repeatedly mixed and changed by the Commissioner and other workmen were put together and minutely examined were unable to discover any inaccuracy in any of their parts fitting each other.”

Ely Whitney is believed to have done the first interchanging of gun parts, but this is only half true. Only special muskets were worked on that had parts that could truly interchange. Most of the firearms at the Ely Whitney plant needed a small amount of Gunsmithing work to make the part fit. What John Hall did was to make every firearm part interchange with every other. Ely Whitney had a gun factory right here in New Haven Conn. where he made muskets for the government.

Colt even brought the American style of manufacturing to England. In the 1850’s, he started an army band which preformed a great deal in Hartford from military parades to funerals. The general welfare of the employees at colt was never neglected. Most extensive arrangement for their comfort and convenience was taken into consideration. The workers tended to be a thinking community that Sam Colt helped a great deal.

Colt’s ambition was to be first and best in the field of arms building. His means were money and power both of which he had a lot of. Especially to the Connecticut Yankee, who had turned the State of Connecticut into an arsenal for the nation; gun making was not a sin. Colt was one of America’s first tycoons and became a dazzling entrepreneur. Everything about him said, “showmanship” and this shows on many of fine presentation pieces he made for people.

Sam Colt built his manor on the top of a gentles lope behind the factory complex. The factory itself was built on property in the South Meadows that fronted on the Connecticut River. He wanted to look at the factory to see his creation. He wanted his workers to look up and see the one they owed so much to. He believed his employees should live near him. He built a four family housing group which were the last word in comfort and convenience. He set up basins with hot soap and water by work stations, unheard of at the time. He also cut the standard work day to ten hours with an hour for lunch. The working day continued to be shorter in the arms industry than in any other. The length of working day was determined by the season work.

At the Springfield Armory the day lasted almost 12 hours and in December just eight. Every mechanic working by the part was permitted to go to his work when he felt like it and to leave at his pleasure. In some instances the machinery at the water-shops has been kept running for the accommodation of a single mechanic. The reading of newspapers during ordinary hours of labor appears to be so common a practice as not to be deemed improper. Rumor had it that Springfield armore’s worked summer only and in the late afternoon. The *Springfield Republican* , a city newspaper, said “Some of the men owned farms outside and would come in early in the morning to do their day’s work, and then go back and put in most of the day in the hayfield.” A man would sometimes do two months work in one, go away for a month and then return to draw his pay. Factory organization and mechanization brought as one result a change in the type of arms worker from one who could make a complete weapon by himself, to one whose job required less skill. When an increase in mechanization brought about the development of a large body of semi-skilled workers it was still evident that the arms maker was one of the most highly rated occupations in American industry. Sam knew from past experience human beings need social activities and entertainment. He built the first social center erected by an employer in the United States—Charter Oak Hall. The design, style and engravings of different firearms will

be explained in drawings and photographs.

In the 19th century in Europe the arms industry took a different turn. The arms worker was opposed to any form of organization that might change the way of life people had for many years. The man working at home was his own boss, he could decide what he wanted to do when he wanted to do it. He would rise at dawn and would sleep when the sun went down. He left work when he wanted to, tended his birds, pigeons and farm animals, than would work double time over his work bench if needed. What he had around him belong to him. The orchard, courtyard and the room he rented. The Gunsmith worked with his wife and children, and was always within ear shot of the talkative neighbor who came by to help run the household.

These people loved their independence. When a man had money from a job he spent lavishly living like a king, but when there was no work he would hide his poverty. The German sociologist said of the gunmaker of Belgium who was without work, [5] "Things are going along fine, thank you."

All European craftsmen kept their trade a secret only passing it down to sons who are close members of the family. They would mistrust anyone that did not belong to their guild or trade union.

The workers who worked at home despised the man who worked in a factory. If a worker could work at home, that is what he did. Even though he was not secure he could see no other way of life even for much more money. By 1850 this worked well. There was cheap labor, other sources of income, and the continuation of a safe way of life. They made a cult out of working hard and of saving money. There were however advantages with the new factory system for America.

Sam in 1851 decided to bring to England his ways of doing things. To this end he took part in an exposition in England to show his firearms to the people. The British arms makers hated him and his methods of manufacturing with a passion. His revolver sales to army personal cost the British gunsmiths dearly in customers. Finely made single shot pistols could not now be given away and the English gunmakers now conspired against Sam. He did not realize the power of his competitors when he set up the Colt Repeating Arms Manufactory in Besborough Place, Thames Bank, Pimlico London. He rented a building and by May 1, 1852 was almost ready to start the manufacturing process of the London Colts, when it happened. The steam engine that ran the plant did not operate as well as it should have. British Engineers were called in and said the engine fit to run. No one in England would fix his engine for any amount of money. English workman began to sabotage the plant. This was unheard of in America and now the war was on. Sam discharged key British employees and brought workmen over from Hartford, Conn. Everything was now done his way. If the English sold a hand made English type revolver for say \$30.00 Sam sold his for \$15.00. In a fire fight, or a gunfight Sam's gun worked better. The English models needed more care and attention as befits a fine English Firearm. Colt wanted no partners or stockholders and would not work with the upper classes. In Hartford Sam Colt helped the community and worked well with the people, in England he worked against the people, and the way they did things. The factory closed down a few years latter because of the lack of English war orders. The constant bickering and fighting in the community played no small part in the final closure of the factory.

After Colt's unexpected death in 1862 Mrs. Colt was the driving force behind the company. Her immense fortune helped the cities immigrant poor. At that time the poorest people in Hartford community were the Irish. They came and built the states' canal and railroads with pick and shovel. Many of them worked in Sam's factory in Hartford. They lived in shabby wooden tenements looking for any kind of work. At this time many of the jobs needed to mass produce guns could be handled by non skilled workers. On a Saturday night the Irish laborers would drink themselves under the table, at a local bar. They were put in jail a lot, then released to go to the factory on Monday. The women kept the family together many of them serving as housekeepers for the

fine house holds of the Hartford City. Jews, and blacks, did not make up a lot of the Colt factory work force.

Mrs. Colt worked hard with the Irish woman, forcing the men to clean up their act. Imagine having the boss call a worker to her mansion to be told to shape up at home and after working hours.

Mrs. Colt did much for the community of Hartford. She started the Union for Home work on Market Street, which looked after the needy women and children and improved sanitation. Each leading citizen of Hartford adopted one or two poor families and looked out after them in some small way during the year. She staged the first suffrage convention in Connecticut at the Robert Opera House in October 1869. Suffrage means the right of women to vote. For years every charity event and fair that was held in Hartford had Mrs. Colt's hand and organization in it.

What are the types of firearms that these people make? Let us take a look. To understand what is being manufactured in these companies it is important to understand the origin of the firearm and follow it's development. The match lock hand cannon first appears to have been used [6] "by the Burgundians as early as 1431." A simple tube, made out of a hot iron strip is bent around a bar with the ends welded tight. This is how the early gun barrels were formed. A simple hole in the back end or side of the tube acts as a vent, where fire applied as a match or burning rope ignites the gunpowder in the rear of the barrel. Later matchlocks by the end of the fifteenth century used a serpentine or match holder which has a spring, in a part of the firearm called the lock. This serpentine mechanism allowed for the firearm to be aimed and fired with greater certainty.

In the 16th century, matchlocks were large and cumbersome weapons that needed to be fired from a large fork or a stick, embedded in the ground. Armor that the knights wore lost it's effectiveness and began to become smaller in size and weight. Half-Armor was used, which was nothing more than a breast plate and a backplate worn with an iron helmet.

By the 17th century, muskets had become gradually lighter and could now be fired from the shoulder without the use of a rest. A musket is a heavy barreled military gun fired from the shoulder with or without a fork rest. They continued to be fired by the match.

The main problem with the matchlock was you needed a lighted match with you. This was very dangerous because the gunner had gunpowder on him and the fire might explode the supply given to him.

Improvement of the lock mechanism occurred and with it improvement of the barrel as well. The late fifteenth century saw the introduction of rifling, one of the most important discoveries and one of the most lasting improvements of all times. Rifling are grooves inside the barrel that forms a spiral as it progresses through the barrel. This rifling causes the bullet to spin in flight making it fly much straighter. Not only was it very expensive to make but if you rifled a gun than you can not use bird shot or lead pellets to form a shotgun pattern. All rifles have this spin but not all guns are rifled.

The Wheel lock was invented soon after the matchlock musket. It uses a wheel made out of steel that rotates on a coiled spring. This wheel touches a piece of flint and a small pan of gunpowder. You can see from the following passage from the famous arms historian Harold Peterson and his encyclopedia of firearms how important it was:

[7] "The appearance of the wheel lock brought changes in warfare and in social history as well. Pistols were now practical, and this brought a change in the armament and tactics of many cavalryman, especially the German

Reiters. It was now possible for a gun to be kept fully loaded for instantaneous discharge, and this brought with it problems unknown with the earlier matchlock, in the presence of a smoldering wick always indicated that a weapon was capable of being fired. In this connection, it is interesting that one of the first documents to mention a wheel lock is an account of an accident in which such an arm went off unexpectedly. The gun could now also be carried as a concealed weapon, and crimes of violence involving wheel locks became so prominent that rigid laws controlling their use were promulgated in many cities of Austria, Italy, and England. Finally, the booby trap or infernal machine with clockwork or spring release also became possible, and added one more facet to military and political life.”

Another type we shall deal with is the flintlock. The true flintlock was thought to be made in Normandy about 1615. This has a firelock that has a vise like cock, that holds a piece of flint. This hits a combined pan-cover and striking plate called the frizzen, causing a shower of sparks. These sparks, though a hole in the back of the barrel is called a vent, fires the gun.

Once a form of fulminates of salts was invented, the percussion form of ignition was invented. This replaced the cock with a hammer that struck a piece of explosive cap. This spark fired the gun, through the vent.

These early guns all had to be loaded through the muzzle but with the invention of the self contained cartridge guns could now be loaded from the back end or the breach. This made loading and firing much faster.

Engraving is the most important form of decoration that can be done on a firearm. Deep relief forms look best but there are times when the fine line engraving is even better. For best effect a combination of the two are used. In Europe, an example being Germany, engraving on firearms were just a small part of the craftmans every day life. In America firearm engraving in the 19th century became an art form of the highest order. They are hired by many of the gun companies. A skilled engraver of gold and metal finds it a challenge to cut into harden steel, he must learn the technique of chasing rather than graving. [8] “Graving means using hand pressure on the tool, while chasing means using the tool with a hammer on the metal.” The engraver must be something of an artist before he starts his work because he must be able to draw his design freehand on the metal surface.

Step one. A thin coat of Chinese white [from a jeweler supply house] is brushed on and allowed to dry. A sharp lead pencil is used to draw out the lines of the scrolls. Engravers use both graving tools and matting punches to work on backgrounds, sometimes using acid. A graving tool is a sharp chisel like tool. Matting punches are nail like tools that make a tiny dent into the surface.

Engravers use blocks which are really small universal vises, with a pad around the jaws. This vise holds the work to be done and moves around in any position. Remember only a small part of a gun is engraved at one time. Rarely is the entire firearm placed into a vise.

Graving and chasing tools come in different sizes even if they are the same shape. A line graver cuts grooves that give a line effect and is used to shade in a design. Chasing hammers look like a shoemakers hammer with hickory handles.

Famous Colt engravers are Gustave Young [worked 1852-1869] L.D. Nimschke [worked 1871-1900] and Cuno Helfricht [worked 1871-1921.] Today Alvin White is the world renowned engraver working at the Colt shop. Turning out works of art for the Winchester shop New Haven Conn. are CF Ulrich and John Ulrich around 1895. They made Winchesters of great beauty.

Connecticut is rich with the lore of the arms manufactures. Many people owe their employment to those people. No man made object combines the grace and beauty of both wood and metal like a firearm does. It can help us enjoy our American freedom, and it can be a tool of great personal tragedy, all at the same time. Let me close, by retelling a Hartford fable that people say was true. Sam Colt's only and beloved son was named Caldwell Colt. He had power and position in the factory after his fathers death in 1862. One of the richest of young men in America, he liked to sail large sailing yachts, and he won many races. One day he was caught in a cabin of another mans wife. The next morning her husband found out about it and broke into the cabin. Caldwell was shot dead while trying to escape. Shot dead with a Colt revolver manufactured by the factory of Samuel Colt.

*Things to do:*

Why was there a danger in carrying a lighted match?

What are matchlocks?

Why was the flintlock used instead of the wheellock?

What purpose did rifling have?

Describe the shape of the lock. How was the barrel made?

What skills were needed by the master gun maker?

What is the system of the apprentice?

Why was the father and son in the gun trade?

Did the factory system of the 19th century destroy the apprentice system?

Where is the Colt factory located and who founded it?

Why did Colt fail in setting up a plant in England?

Where is the Winchester factory located and who founded it?

In what city is the Whitney firearms factory located?

Were the firearms factories good to it's employees, give examples.

Write a page paper on the progression of the different types of firearms.

Using a piece of cardboard or wood and a scissor or saw, cut out the shape of the early flintlock, matchlock, wheellock, and percussion locks. Cement each part into place. Make a complete lock.

On a sheet of paper draw different types of engraved firearm lock plates. Use the different types of scroll engraving that are shown in this article.

## READING LIST

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ELLSWORTH GRANT  
MOWBRAY CO  
222 WEST EXCHANGE ST.  
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Harrisburg Pennsylvania 1963.  
[3] Guns of Harpers Ferry [3] page 69.  
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1525 Old Louisquisset Pike, Lincoln, RI, 02865.h



*(figure available in print form)*

*(figure available in print form)*

Colt Factory, Hartford, Conn.

*(figure available in print form)*

House at Potts Dam, Hartford, Conn., Still standing

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