

The Firearms of the Lewis and Clark Expedition

S. K. Wier



The Expedition's rifle: U.S. Contract Rifle of 1792 (replica; courtesy National Park Service)

Many skills and many tools contributed to the success of the Lewis and Clark Expedition. Firearms were absolutely essential, not for warfare and conquest, but for daily hunting for food, to provide a strong defense if needed, and for natural history collections.

If we want to have a full understanding of the experiences and achievements of the men of the “voyage of discovery,” an appreciation of their guns and the guns' limitations is necessary. Firearms technology improved tremendously in the century after the expedition; their guns were not like modern guns.

The journals and records prepared by the expedition members show that they carried rifles from the arsenal at Harpers Ferry, Virginia, and army service muskets brought by soldiers posted from other units. Personal firearms were brought by Captains Clark and Lewis, and some of the hunters enlisted for the journey may have used their own rifles. The French-speaking boatmen probably carried “trade guns.” Lewis brought an air-powered rifle, a case of matched pistols, and a fowling piece, and Clark brought an “elegant fusil.” A swivel gun, a small cannon, was mounted on the keelboat, and the two pirogues each had a blunderbuss. All the firearms of the Lewis and Clark expedition were single-shot, muzzle loading, black powder guns with flintlock ignition, the notable exception being Lewis's air gun, which on several occasions astonished native Indians, presumably because of its rapid, smokeless, and somewhat quiet firing

The expedition journalists nowhere describe guns in detail. Guns were common properties of life everywhere on the frontier, not worthy of note compared to the daily discoveries of the expedition. The only surviving guns that might possibly be relics of the expedition are a rifle that once belonged to Clark and an air rifle, and it is only a faint possibility. To achieve a complete picture of the guns of the expedition, a kind of detective process is required, piecing together brief journal entries, other expedition records, and documents of the time, as well as recent firearms scholarship and examination of surviving firearms. Sometimes the clues are only a few words, and the meaning is ambiguous. Some conclusions are tentative, linking brief statements written many miles and many years apart. Questions remain, but much has been learned, and firearms research allows more positive statements than were possible even a few years ago.

Expedition Rifles

On March 16, 1803, a year and two months before the expedition headed up the Missouri River, Captain Meriwether Lewis arrived at the federal Armory at Harpers Ferry, then in Virginia, to arrange for military supplies needed by the expedition. President Thomas Jefferson and Lewis originally planned an expedition of fifteen men,¹ and Lewis's list of requirements included “15

1 Donald Jackson, ed., *Letters of the Lewis and Clark Expedition and Related Documents, 1783-1854*, 2

Rifles, 15 Powder Horns & pouches complete, 15 Pairs of Bullet Moulds, 15. do. of Wipers or Gun worms, 15 Ball screws, 24 Pipe Tomahawks, 24 large knives, Extra parts of Locks & tools for repairing arms, 15 Gun Slings, 500 best Flints ... 200 lbs Best rifle powder, 400 lbs Lead.’²

Before 1999, when Frank Tait published his study of the 1792 contract rifles, it was widely believed that the rifle supplied for the Lewis and Clark Expedition was the “U.S. Model 1803” rifle made at Harpers Ferry.³ However, Tait’s careful examination of letters and records of the times makes clear that this rifle was not actually manufactured until 1804 and so could not have been obtained by Lewis during his visit early in 1803.⁴ What kind of rifles did Lewis select at Harpers Ferry, and what was done to prepare them? An inventory at Harpers Ferry Armory taken April 6, 1801, showed 382 rifles in storage there, most of which were the “1792-1794 Contract” rifle.

In 1791, following Major General Arthur St. Clair’s disastrous defeat near the Wabash River, Secretary of War Henry Knox arranged for purchase by contract of nearly 1500 rifles from gunsmiths in Pennsylvania; 2000 more were ordered in 1794. For this contract Knox approved a pattern flintlock rifle with a 42-inch octagonal barrel, 40 balls to the pound or caliber 0.49,⁵ a full-length plain maple stock, and a plain patch box with a release button on top of the butt plate. In early 1801 some of these “1792 contract rifles” were shipped to the Harpers Ferry Armory, which had just opened.⁶ No more than six or seven specimens of the 1792 contract rifle are known to survive, but they show the kind of gun that Lewis had to choose from at Harper’s Ferry.⁷

Lewis directed that fifteen of these existing rifles be prepared to suit the needs of the expedition. The modifications included swivels for slings and new flintlocks. Gunsmiths at Harpers Ferry fitted the new locks, apparently the same flintlock design used later on the Model 1803 rifle. Surviving “1792 contract” rifles indicate the original patch boxes were like those on the Model 1803 rifle. The rifling in the barrels may have been “freshened” or recut, and it appears that the bore was enlarged, as described below. It also appears that the barrels were shortened from the original length of 42 inches, but the reduced length is not known.

On April 18 Lewis departed Harpers Ferry for Lancaster, Pennsylvania, and Philadelphia, for special training and to purchase supplies. Two days later he wrote a long letter to Jefferson reporting his progress and plans, mentioning firearms only in one sentence: “My Rifles, Tomahawks, & knives are preparing at Harpers Ferry, and are already in a state of forwardness that leaves me little doubt of their being in readiness in due time.”⁸

On July 8, 1803, Lewis, back at Harpers Ferry, again wrote to Jefferson. He had just completed arranging wagon transport of all his supplies to Pittsburgh. “Yesterday, I shot my guns and examined the several articles which had been manufactured for me at this place; they appear to be

volumes (Urbana: University of Illinois Press, 1968), Vol. 1, pp. 69-99; 102; 103.

2 Ibid., p. 70.

3 Carl P. Russell, *Firearms, Traps, & Tools of the Mountain Men*, (Albuquerque: University of New Mexico Press, 1967), p. 37.

4 Frank A. Tait, “The U.S. Contract Rifle Pattern of 1792,” *Man at Arms* 21, no. 3, (May/June 1999) pp. 33-45. Frank A Tait, “Response to the letter of Michael H. Maggelet,” *Man at Arms* 21, no. 6, (November/December 1999) pp. 7-8.

5 Gun caliber of size of the barrel’s bore is now indicated by diameter in inches. A 0.49 caliber barrel has a bore 0.49 inches across. At the time of the expedition barrel size was given by how many round lead balls could be made to fit a gun from one pound of lead. A 0.49 caliber barrel takes 40 round lead balls to the pound. Modern shotguns preserve the old system: a 12 gage shotgun could fire leads balls of 12 to the pound.

6 Tait 1999a, pp. 34, 36, 37.

7 Ibid., pp. 35-36; George D. Moller, *American Military Shoulder Arms*, (Niwot: University Press of Colorado, 1993), Vol. 2. pp. 19-30.

8 Jackson, Vol. 1, p. 40.

well executed."⁹ At Pittsburgh the rifles and other equipment were loaded on the keelboat for the voyage down the Ohio River.

The Mystery of the “Short Rifles,” Rifle Length, and Caliber

There are several references to "short rifles" in the expedition journals: by Lewis on April 12, 1806 ("we caused all the men who had short rifles to carry them, in order to be prepared for the natives should they make any attempts to robe or injure them."); by Ordway, June 18, 1806; and by Lewis, August 11, 1806, after he was accidentally shot by Cruzatte: "... the ball had lodged in my breeches which I knew to be the ball of the short rifles such as that he had."¹⁰ Lewis must have recognized the round lead bullet simply from its size, even under trying circumstances..

What were these "short rifles?" "Short rifle" appears to be a term for the rifles prepared at Harpers Ferry, with barrel lengths reduced from the original length of the 1792 contract rifle, 42 inches. American rifles of the time typically had barrels 40 to 48 inches long, or more.¹¹ A rifle with a barrel much shorter than 40 inches would have been a short rifle. Hunters know that there is a difference handling guns with short barrels, and a short gun is handy when traveling in small boats or in rough terrain, as on the expedition. Lewis may have desired a handier rifle than one with a 42 inch barrel, and had his selected 1792 contract rifles' barrels shortened at Harpers Ferry.

During the expedition some rifle barrels were shortened again. On July 1, 1806, on the return journey, the party's blacksmith John Shields shortened Windsor's rifle that had "busted ... near the muzzle."¹² Clark reported "two of the rifles have unfortunately bursted near the muscle [muzzle], Shields Cut them off and they Shute tolerable well one which is very Short we exchanged with the Indian whoe we had given a longer gun to induc them to pilot us across the Mountains."¹³ The Indian was the Nez Perce chief Speaking Eagle, and he asked to exchange his gun for the short rifle.¹⁴

So there were two meanings for "short rifles:" the fifteen 1792 contract rifles, apparently shortened at Harpers Ferry, and two or three of those same rifles which were further shortened to remove a split barrel muzzle. All the journalists' references with the words "short rifles" appear to refer to the original unaltered guns. When Lewis directed that short rifles be used on April 12, 1806, in case of "attempts to robe or injure them," before shortening barrels for repairs, he surely was indicating the best guns of the party, the rifles from Harpers Ferry. No commander would choose damaged guns for the weapon of choice.

Lewis's quick recognition of the ball fired by Cruzatte appears to show that the "short rifles," the Harpers Ferry rifles, fired a bullet that was clearly different in size from other guns on the expedition. If others on the expedition had personal rifles (typically with calibers close to 0.49, the same caliber as the unmodified 1792 contract rifles), and personal smoothbores (muskets with caliber of 0.69; fusils with caliber of 0.625 or more), then the "short rifles" must have had a noticeably different caliber, larger than 0.49 and less than 0.625. Lewis's remark is the only evidence I know that the expedition rifles had a caliber larger than 0.49. As a matter of personal experience it is hard to distinguish a .50 caliber ball from a 0.49 ball, but a 0.54 ball, for example, is plainly larger than a .49 ball.

9 Jackson, Vol. 1, p. 107.

10 Moulton, Vol. 7, p. 111; Vol. 9, p. 324; Vol. 8, p. 155.

11 Short barrels were known: German Jaeger rifles had barrels as short as 28 inches and were widely used in the American Revolution by the Hessian Jaeger Corps and other German units. Many Americans in 1803 were familiar with the short Jaeger rifle. Moller, Vol. 1, p. 449.

12 Moulton, Vol. 8, pp. 27; 75.

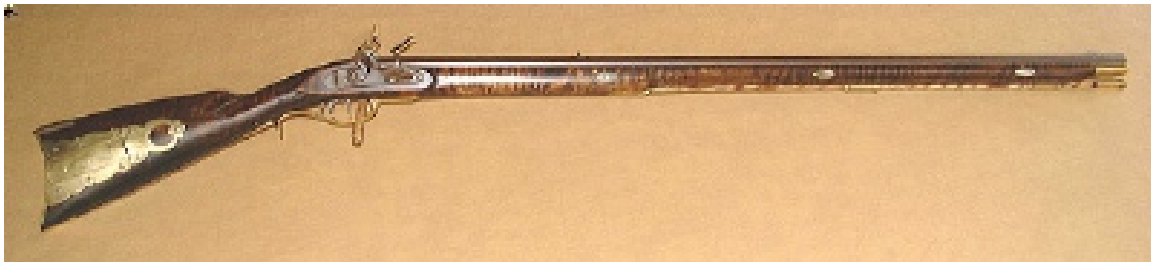
13 Ibid., p. 80.

14 Zoa L. Swayne, *Do Them No Harm! Lewis and Clark among the Nez Perce*, (Caldwell Id.: Caxton Press, 1990), p. 303.

It appears that Lewis selected the fifteen expedition rifles as the best of some three hundred 1792 contract rifles in storage at Harpers Ferry in March 1803. New flintlocks were fitted, the same locks used on the later Model 1803 rifle, and swivels and slings were added. I expect that the barrels were shortened to a length less than 42 inches long, and that they had full stocks. There is some reason to think the barrels were re-bored, increasing the caliber from 0.49 to a noticeably larger bore.

Other Rifles

Civilian hunters enlisted for the expedition, including the "nine young men from Kentucky," may have used their own firearms, and those guns mostly would have been American long rifles or "Pennsylvania rifles," the common rifle of hunters on the frontier. These famous American guns were made by individual gunsmiths in eastern Pennsylvania and adjacent states. They were typically 57 to 60 inches long; sometimes more than 65 inches. Barrels were generally 40 inches long, or more, and the caliber usually was about 0.45 to 0.50. Ornamentation was common, with ornate patch boxes, trigger guards, and side plates, and carving on the wooden stock. Many fine examples of this handsome and famous American rifle survive, and are the subject of intense study.¹⁵ A song "The Hunters of Kentucky," written by S. Woodworth and W. Blondell in 1815 after the Battle of New Orleans, became very popular and may have originated the term "Kentucky rifle," but there is no record of the name "Kentucky rifle" being in use at the time of the expedition.¹⁶



Pennsylvania rifle

Muskets

A musket is a smoothbore: the interior of the barrel is smooth, unlike a rifle barrel which has spiral grooves to impart spin to the ball. Muskets are easier and faster to load than rifles, an advantage in battle, but are less accurate. Muskets can fire single round bullets, or small shot for hunting, like a modern shotgun. Flintlock muskets were the regular firearm for soldiers in the American army of 1803. We know Lewis intended from the beginning that muskets would be used on the journey. The "Invoice of Articles received from the Arsenal for the use of Capt. Lewis May 18th. 1803" includes 125 musket flints and "15 Cartouch Box Belts,"¹⁷ standard infantry equipment for holding musket cartridges – paper tubes containing a bullet and enough powder for one shot.

Lewis did not have to obtain muskets from the arsenal since enlisted men and sergeants coming

¹⁵Henry J. Kauffman, *The Pennsylvania-Kentucky Rifle*, (New York: Bonanza Books, 1960). Joe Kindig, Jr., *Thoughts on the Kentucky Rifle in Its Golden Age*, (York, PA: George Shumway, 1960). Merrill Lindsay, *The Kentucky Rifle*, (New York: Arma Press, 1972).

¹⁶ Lindsay, p. 1.

¹⁷ Jackson, Vol. 1, p. 98.

from other army units brought their service muskets to the expedition. This was the “Charleville pattern musket,” as it was known then, now called the Model 1795 musket. It was manufactured in Springfield, Massachusetts at the Springfield Armory from 1795 to 1814, and at Harpers Ferry beginning in 1801. The total production was 80,000 to 85,000 guns. This gun was the first official model musket made for the U.S. government. It is a very close copy of the French Model 1763 Charleville musket. The overall length is 60 inches and the weight is near 10 pounds. The barrel is 44 $\frac{3}{4}$ inches in length, 0.69 caliber, tapered, and round.¹⁸ In his early planning, Meriwether Lewis provided accoutrement's for fifteen rifles and fifteen muskets for his intended party of fifteen men. On the actual expedition there must have been about as many Charleville pattern muskets as Harpers Ferry rifles. Although we tend to envision the men of the Lewis and Clark Expedition hunting with flintlock rifles, muskets were often used.



Model 1795 Springfield musket

Some of the French *engages*, the boat men, surely brought their own guns, rifles or trade muskets. The trade musket, often called the trade gun or the North West gun, was a basic, plain musket about 0.60 inches caliber and 50 inches overall. Various forms of the North West gun were traded to native Indians in large numbers on the frontier for nearly 200 years. Distinctive trade gun features include a brass butt plate, a side plate in the form of a curling serpent, and an oversized trigger guard that allowed the trigger to be pulled when wearing mittens.¹⁹ The journalists of the expedition encountered trade muskets among the native Indians and called them "fusees."

Since rate of fire of muzzle-loading guns is a matter of some importance, for example when dealing with grizzly bears, note that properly loading a patched ball in either a flintlock rifle or a musket requires a minute or slightly less. Loading times of half a minute are difficult to achieve. A bear can run more than 600 feet in half a minute. That is one reason the members of the expedition preferred to go out in groups when hunting grizzly bears, that, plus the fact that no gun on the expedition could be certain of killing large game in one shot.

Clark's "Small Rifle"

Eighteenth and early-nineteenth century military officers on campaign often took considerable personal property with them. Clark several times refers to his own "small rifle .. the Size of the ball which was 100 to the pound."²⁰ He even noted early in the journey "Little rifle for all my hunting." That was before he fired four times at an elk without bringing it down. Small indeed: 100 lead bullets to the pound are 0.36 inch diameter balls, not much larger than a pea. These bullets are one eighth the weight of a bullet for a Charleville pattern musket. Such a small-caliber flintlock rifle is light and easy to carry which may explain Clark's preference for it over the heavy muskets and expedition rifles weighing nearly ten pounds. A 0.36 caliber rifle that belonged to Clark is now owned by the Missouri Historical Society (see below). It has a silver patch box and

18 Robert M. Reilly, *United States Martial Flintlocks*, (Lincoln, RI: Andrew Mowbray, 1987), pp. 51-54.

19 Charles E. Hanson, *The Northwest Gun*. (Lincoln: Nebraska State Historical Society, 1955).

20 Moulton, Vol. 6, pp. 121. Michael F. Carrick, "William Clark's 'Small' Rifle," *Muzzle Blasts*, 64, no. 11, (November 2003), p. 37.

is highly ornamented, typical of Pennsylvania-style rifles made after 1790, with a mixture of features from early (Revolutionary War symbols in the ornamentation) and late (percussion lock, after 1810) periods of rifle building. The barrel is 37 $\frac{3}{4}$ inches long and the gun is 53 $\frac{3}{4}$ inches overall.²¹ It was made by John Small of Vincennes, Indiana. Both the caliber and the maker's name raise the possibility that this surviving gun was the "small" rifle Clark carried on the expedition. Stylistically this gun could have been made before 1803 (with an original flintlock replaced later with a percussion lock), or it could have been made after 1806. Clark clearly liked "Small rifles." He may have purchased this one after the expedition. This rifle shows comparatively little wear. There is a chance that this rifle is Clark's "little rifle" of the expedition, but at the moment there is no definitive reason to be sure.



"Clark's small rifle"

Clark's "Elegant Fusil" and Lewis's Fowling Piece

Clark also took an "elegant fusil" on the journey, a gentleman's sporting gun. "Fusil" is simply a French word for a smoothbore, and the expedition journalists call the natives' plain trade muskets "fusees." Fusils of an altogether different sort were comparatively small, high-quality, lightweight, ornamented smoothbores used by gentlemen for hunting birds and small game. Usually these gentleman's guns have a brightly polished barrel, ornamentation in the form of engraved brass or silver fittings and inlays, and finer workmanship than military and trade muskets. They deserve the adjective elegant.

Generally the fine fusils of the time are English guns with round tapering barrels, or octagonal barrels at the breech, becoming round about 10 inches ahead of the breech, with a caliber of 20 gage (20 balls to the pound, or 0.625 inches) to 0.69. Overall lengths fall in the range 48 inches to 58 inches, 52 to 55 inches being most common; the weight is 6 to 8 pounds. Fittings often include a butt plate and side plate engraved with hunting or martial scenes or symbols, a trigger guard with acorn finial, an engraved thumb piece or escutcheon plate, and sometimes checkering on the wrists.

On June 29, 1805, Clark, Charbonneau, Sacagawea, and her baby were in a ravine during a downpour, just upstream of the highest waterfall on the Missouri River, and were nearly swept away in a torrent that grew to 15 feet deep. In his journal that evening Clark described the flash flood and his loss of an "elegant fusee" [elegant fusil] and other equipment. Lewis, however, wrote that *Charbonneau* "lost his gun" and "my wiping rod" in the flood, and makes no mention of any fusil. However, Lewis did not learn of the flash flood adventure until two days later, when Clark and his party reached the upper portage camp. Whitehouse, who was also at the upper camp with Lewis, wrote in his journal "Capt. Clark lost the large Compass a fusiee pouch & horn." Sergeant Ordway was with Clark the evening after the flood. His journal entry is largely a copy of parts of Clark's journal, stating Clark lost "an elegant fusee."²² Whose gun was lost remains a mystery, although Clark was present, and saw what happened. On the other hand

21 Carolyn Gilman, *Lewis and Clark Across the Divide*, (Washington: Smithsonian Books, 2003), p. 356.

22 Moulton, Vol. 4, p. 341; Vol. 9, p. 177; Vol. 11, p. 215.

Charbonneau was prone to poor judgment and mistakes. Clark also wrote, when the flood began, "I took my gun & Shot pouch in my left hand" and does not say he later dropped the gun. Another bit of evidence about a Clark fusil is a later entry in his journal, on August 30, 1805: "finding that we Could purchase no more horse than we had for our goods &c. ... I gave my Fusee to one of the men & sold his musket for a horse" ²³ This might have been a simple trade gun "fusee," but a trade gun is an unlikely exchange for the better quality Charleville pattern musket -- if that is what the man had. So perhaps Charbonneau did lose a gun, or fusil, in the flash flood and Clark gave a personal fusil to one of the men on August 30. Odd to think of one of the men of the expedition using a gentleman's elegant sporting gun. In any case, Clark appears to have had at least one "ellegant fusee" on the expedition. This is another case where scanty evidence leaves us in doubt.



Fusil by William Bennet

After the return of the expedition Lewis submitted several requests for reimbursement of personal expenses. One listed items of personal property he traded for supplies: "One Uniform Laced Coat, one silver Epaulet, ... one pistol, one fowling piece, all private property, given in exchange for canoe, horses, &c." ²⁴ A fowling piece is a civilian smoothbore long gun, not so elegant as a gentleman's fusil, and with an unusually long barrel -- some fowlers were over six feet long -- used primarily with small shot for hunting birds. "Fowlers" in the parlance of the time mean hunters using small shot in a fowling piece or in any suitable smoothbore gun, going out for birds, small game, or even deer.

Lewis's Air Gun

The most remarkable gun of the expedition was Lewis's personal air rifle. Many expedition journal entries mention the "air gun," ²⁵ usually for a demonstration in council with the Indians, a display that usually "astonished the natives." ²⁶ The air gun is a legendary property of the adventure, in no way lessened by being something of a mystery. The air gun proved useful, impressing Indians with apparently magical powers -- it was almost silent, it made no smoke, and it appears to have been a repeater.

Lewis wrote that he purchased the air gun in 1804, but did not say where. There is no known expedition record of what it looked like or how it worked. Our knowledge of the air gun is based on brief expedition journal entries, and on three nineteenth-century documents: a personal journal, a memoir written some years after the event but possibly based on a journal, and a auctioneer's pamphlet, all of which may have errors. Two candidate air guns have been discussed at considerable length. One air gun is a single-shot gun made in America, the other is a repeater designed in Austria and made in Europe.

Until recently the conclusion of researchers was that the air gun was made by Isaiah Lukens of

²³ Moulton, Vol. 5, p. 178.

²⁴ Jackson, Vol. 2, p. 428.

²⁵ Journal entries of Aug. 30, 1803; Aug. 3, 1804, Aug. 20, 1804, Oct. 10, 1804, Oct. 27, 1804, Oct. 29, 1804, Jan. 16, 1805, Jun. 9 1805, Jun. 10, 1805, Aug. 7, 1805, Aug. 17, 1805, Jan. 24, 1806, Apr. 3, 1806, May 11, 1806, and Aug. 11, 1806.

²⁶ Moulton, Vol. 3, p. 209.

Philadelphia or possibly by his father Seneca Lukens.²⁷ Key support for this view is an 1846 auctioneer's pamphlet of items in the sale of Isaiah Lukens' estate, written forty years after the expedition's return. The list includes several air guns and air canes, and "1 large Air Gun made for, and used by Messrs Lewis & Clark in their exploring expeditions. *A great curiosity.*" Note that it does not say the gun was made by Lukens, although another item in the list is described as "of his own construction." One concern is the reliability of the claim, made forty years after the expedition's return, that the air gun in the estate sale was the air gun of the expedition. That air gun was withdrawn from the sale and lost to view, at least for a time.

Isaiah Lukens was born in 1779, lived in Horsham Pennsylvania, apprenticed there with his father Seneca Lukens, and moved to Philadelphia about 1811. He was a notable craftsman and machinist, making clocks, watches, scientific instruments, and air guns. He was a founder of the Franklin Institute and a member of the American Philosophical Society (both in Philadelphia). He made the clock in Independence Hall.²⁸ Dates are lacking for the surviving Lukens air guns, but available evidence suggests that they were made after the expedition.²⁹

Six Lukens air guns survive, four signed and two unmarked. One particular gun, now in the museum of the Virginia Military Institute, is claimed to be the air gun of the expedition. Repairs to its main spring, front sight, hammer, and a lock screw are consistent with brief mention of repairs made to the air gun during the expedition. This air gun is 49 inches long, with a 32 inch brass or bronze barrel, .31 caliber, and rifled. It fires one shot at a time, each bullet being loaded from the muzzle with a ramrod, like a conventional rifle of the period. Among the surviving air guns made by Lukens, this one is the smallest.

But the historical consensus now is that Lewis took a Girandoni air rifle on the expedition.³⁰ Bartolomeo Girandoni of Vienna designed and manufactured an innovative and powerful air rifle which was adopted by the Austrian Army in 1780 as a silent – and secret – weapon. By 1800

27 Charter Harrison Jr., "The Lewis and Clark Air Gun," *The Gun Report*, (May 1956), pp. 6, 34-35; Charter Harrison Jr., "More on the Lewis and Clark Air Gun," *The Gun Report*, (June 1956), p. 28; Henry Stewart Jr., "The American Air Gun School of 1800-1830," *Monthly Bugle* (Pennsylvania Antique Gun Collectors Association), 89, (1977), pp. 2-7; Roy M. Chatters, "The Not So Enigmatic Lewis and Clark Air Gun," *We Proceeded On*, 3, no. 2, (May 1977), p. 4-7; Ashley Halsey Jr., "The Air Gun of Lewis and Clark," *American Rifleman*, (August 1984), pp. 36-37, 81-82; Robert D. Beeman, "Proceeding On to the Lewis & Clark Airgun," in Robert D. Beeman and John B. Allen, *Blue Book of Airguns*, (Minneapolis: Blue Book Publication, 2002) 2nd ed., pp. 50-77; Website Robert D. Beeman, "Proceeding On" To The Lewis and Clark Airgun II," <http://www.beemans.net/Lewis%20&%20Clark%20Airgun.htm>, 2004, Website Robert D. Beeman, "Did Meriwether Lewis Carry and Assault Rifle?" <http://www.beemans.net/Lewis%20Assault%20Rifle.htm>, 2004;

28 Brooks Palmer, *The Book of American Clocks*, (New York: MacMillan, 1950), p. 235; George H. Eckhardt, *Pennsylvania Clocks and Clockmakers*, (New York: Devin-Adair, 1955), pp. 183-184; James B. Whisker, *Pennsylvania Clockmakers and Watchmakers* (Lampeter, Wales: Edwin Mellen Press, 1996), p. 164.

29 "Lukens moved to Philadelphia (from working in his father's shop in Horsham, PA) in 1811. The first listing I could find in the Philadelphia business directories was in 1813 as a 'turner' (of lathes). ... Lukens is in the business directories until 1830... I have looked at all I could find in Philadelphia libraries. A companion of Lukens wrote in 1822 that 'Lukens was chiefly engaged in making town clocks, but found time, with never more than the assistance of one or two men, to finish two or three small lathes and an air gun or two in the course of a year, for which there were always ready purchasers.' Lukens was primarily a clockmaker, a maker of small lathes (of a style he invented), and a machinist." Michael F. Carrick, personal communication.

30 Michael F. Carrick, "Meriwether Lewis's Air Gun," *We Proceeded On*, 29, no. 4, (November 2002), pp. 13-19; Michael F. Carrick, "Meriwether Lewis' Repeating Air Gun," *The Gun Report*, (January 2003), pp. 28-36; Michael F. Carrick, "More on Lewis's Air Gun," *We Proceeded On*, 30, no. 2, (May 2004), pp. 2-3.; Website Joseph Mussulman, *Capt. Lewis' s Medicine Gun*, <http://www.lewis-clark.org/content/content-channel.asp?ChannelID=249>, 2004.

about 1500 Girandoni air rifles were in use by the Austrian Army.³¹ Other gunsmiths in Europe made single copies of this design for private individuals, before and after 1800. An Austrian government report of January 20, 1801 states that 399 Girandoni air guns had been lost in battle,³² so there were many more potential expedition air guns circulating in Europe before 1803 than Lukens guns, if any, available in America. The Girandoni-style air gun is a large caliber rifle, near 0.50 caliber, 48 inches overall, with a magazine holding about 20 round lead bullets. The magazine is a short tube lying next to the barrel on the right side, looking something like a second and shorter barrel. The entire butt is a welded steel tube that serves as the air reservoir. Loading a shot involves working a short horizontal bar or breech block that passes through the breech and magazine from left to right against a long external spring on the right side. A bullet moves from the magazine into an opening in the bar, and then into the breech when the bar is released and moves back to the left. Cocking the hammer prepares the air release. This takes a few seconds at most. Nothing is loaded from the muzzle. The gun is not an automatic, but it is a true repeater: twenty shots can be fired with one charge of air by simply working the breech block and hammer.



Girandoni air rifle

Although no expedition member described the air gun, there are accounts from two other observers. Colonel Thomas Rodney, a judge traveling to Mississippi Territory, visited with Lewis on September 7, 1803, in Wheeling, Virginia, and recorded the day in his journal. Lewis showed the air gun to Rodney and others with Rodney, and fired the gun several times. Rodney wrote "... when in perfect order she fires 22 times in a minute. All the balls are put at once into a short side barrel and are then dropped into the chamber of the gun one at a time by moving a spring; and when the trigger is pulled just so much air escapes out of the air bag which forms the brith of the gun as serves for one ball. It is a curious piece of workmanship not easily described..."³³ This description closely matches the Girandoni gun. The "side barrel" magazine is particularly distinctive, and a Lukens gun never could fire 22 shots in a minute. Some fanciful material is present elsewhere in Rodney's journals,³⁴ but Rodney's editors state he was "closely observant and unquenchably curious."³⁵ Rodney's visit is corroborated by Lewis's journal entry for September 8, 1803.³⁶ To question Rodney's account is to ask why did Rodney correctly describe the unusual Girandoni air gun, with a mechanism found on no other gun, if Lewis showed him something else?

One other account indicates that the expedition air gun was a repeater. Charles McKenzie was a young clerk for the North West Company, on a trading expedition to the Hidatsa villages in the winter of 1804-1805, at the same time the Lewis and Clark Expedition wintered over there. He later wrote "The Indians admired the air gun as it could discharge forty shots out of one load – but they dreaded the magic of the owners."³⁷ This might mean it could fire many times on one

31 Carrick 2003, p. 32.

32 Ibid., p. 35.

33 Dwight L. Smith, and Ray Swick, eds., *A Journey through the West Thomas Rodney's 1803 Journal from Delaware to the Mississippi Territory*, (Athens: Ohio University Press, 1997), p. 50.

34 Beeman, 2004a.

35 Carrick, 2004, p. 3.

36 Moulton, Vol. 2, p. .

37 W. Raymond Wood and Thomas D. Thiessen, *Early Fur Trade on the Northern Plains: Canadian Traders Among the Mandan and Hidatsa Indians, 1738-1818* (Norman: University of Oklahoma Press, 1985), p. 232.

charge of air, each bullet being separately loaded, but it sounds like it was a repeater. The discrepancy between McKenzie's statement of forty shots in one load and the Girandoni-style twenty shot magazine is puzzling, but an error may have crept into the only surviving copy of his journal, while the description preserves the essential attribute of many "shots out of one load."³⁸ The Rodney and McKenzie accounts are both consistent with a Girandoni-style gun, and not consistent with the surviving air guns made by Lukens or his associates.

There is a way to make all the records agree. Perhaps Lukens obtained the expedition air gun after Lewis's death -- he clearly had an interest in air guns -- and it was a Girandoni-style air rifle. Forty years later it appeared in his estate. Incidentally, a Girandoni-style air gun could have a forty shot magazine, simply by a longer magazine tube.

Pistols

Captain Lewis requisitioned "1 P[air] Horsemans Pistols" from the Schuylkill Arsenal in Philadelphia in May 1803.³⁹ Although details of these pistols are not recorded, two kinds of horseman's pistol were on hand in large numbers in the Schuylkill Arsenal at that time: the "North and Cheney 1799" pistol and the "McCormick style" pistol.

Simeon North of Berlin, Connecticut, a noted gunmaker with a 53 year career supplying pistols and rifles for the U.S. military, and an early innovative New England industrialist, accepted his first contract with the government on March 9, 1799, for five hundred pistols of what is now called the U.S. Model 1799 pistol, or the "North and Cheney 1799" pistol. North's partner was his brother in law, Elisha Cheney. All five hundred pistols were received by January 24, 1801 at the Schuylkill Arsenal in Philadelphia. A later contract for fifteen hundred pistols of the same model was completed and the guns received in September 1802, at the New Haven, Connecticut storeroom.⁴⁰ The pistols made for the second contract probably were not available to Lewis in Philadelphia in 1803.

The North and Cheney 1799 pistol closely follows the French Model 1777 pistol, also called the Charleville or St. Etienne pistol, an unusual design with a brass frame, using wood only for grips. The American version is 14 ½ inches overall, with an 8 ½ inch barrel, one inch longer than the French pistol. The caliber is 0.69, using the same bullet as the Charleville pattern musket, and the gun weighs about 3 pounds. The first 500 contract pistols were stamped S. NORTH & E. CHENEY BERLIN in a curve on the underside of the brass frame near the trigger, and US was



French 1777 Charleville pistol (replica)

38 McKenzie's "accounts were apparently written about 1809-1810...." The surviving manuscript is "Narrative C, which is an unknown hand, and probably does not represent Charles McKenzie's original composition on these subjects, which are lost." Wood and Thiessen, pp. 223; 227.

39 Jackson, Vol. 1, p. 97.

40 Samuel E. Smith and Edwin W. Bitter, *Historic Pistols The American Martial Flintlock 1760-1845*, (New York: Scalamandre, 1985), p. 123; Reilly, p. 168.

stamped on top of the barrel at the breech. Serial numbers are marked internally.⁴¹ Fewer than ten pistols of this contract are known to survive.

In 1797 or 1798 the storekeepers at the Schuylkill “military storeroom” in Philadelphia issued gun parts to several local gunsmiths for assembly into pistols.⁴² Delivery of horseman's pistols were noted from gunsmith John Miles in October and December 1798 (200 pistols total) and from Robert McCormick in August 1799 (98 pistols). Of fewer than 10 guns remaining of this lot, two are marked McCormick and the others are unmarked. The few surviving guns of these “1799 Contract” or “McCormick style” horseman's pistols are near 16 ¼ inches overall, with round barrels 9 ¾ to 10 ¼ inches long in calibers 0.65 to 0.67, and weigh near 2 ½ pounds. Brass mountings include a butt cap with short side extensions, a single ramrod thimble, the trigger guard, and a brass band at the muzzle; the full stock is walnut. The locks were purchased from Ketland & Company of London and Birmingham by the federal government.⁴³ The Schuylkill Arsenal also may have had on hand other kinds of horseman's pistols; for example, the original French Charleville pistol was used by U.S. officers at that time.

On the expedition each of the captains carried one of the horseman's pistols. Among the Shoshones, Clark wrote on August 29, 1805 "I purchased a horse for which I gave my Pistol 100 Balls Powder & a Knife."⁴⁴ For Lewis the critical moment with a pistol was the fight with the Piegan Blackfeet early on July 27, 1806: “I jumped up and asked what was the matter which I quickly learned when I saw drewyer in a scuffle with the indian for his gun. I reached to seize my gun but found her gone, I then drew a pistol from my holster...”⁴⁵ After a pursuit on foot of some 300 yards, he fired at a Blackfeet warrior who was driving off the horses. The warrior was hit but was able to return fire and nearly hit Lewis. Blackfeet accounts say the injured man died.⁴⁶ These are the only shots fired at other humans during the expedition.

Lewis also purchased "1 Pair Pocket Pistols, Secret Triggers" for ten dollars from Robert Barnhill at 63 North Second Street in Philadelphia on May 21st, 1803.⁴⁷ Pocket pistols, also called screw-barrel pistols and box lock pistols, were small in caliber and small in size, small enough to fit in a pocket, often only four to five inches long. The gun was loaded by unscrewing the barrel from the lock, loading powder and ball into a chamber in the box-shaped lock, and screwing the barrel back on. There was no ramrod, but there was a small wrench to tighten the barrel. Some pocket pistols had a “secret” trigger which folded out of sight, into the handle. The trigger swung into place when the hammer was cocked. There is no further mention of the pocket pistols in other records of the expedition.



Pocket pistol with “secret trigger, by Constable

41 Smith and Bitter, pp. 126-128.

42 Reilly, pp. 164-166.

43 Smith and Bitter, pp. 126-128; Reilly, pp. 164-168.

44 Moulton, Vol. 5, p. 178.

45 Moulton, Vol. 8, p. 134.

46 James P. Ronda, *Lewis and Clark Among the Indians*, (Lincoln: University of Nebraska, 1984), p. 242.

47 Jackson, Vol 1. p. 91.

The same request by Lewis mentioned previously for reimbursement of a fowling piece given in trade also indicates that he traded a personal pistol for supplies. On the return journey, and very short of trade items, on April 29, 1806, Lewis wrote "we gave small medals to two inferior chiefs of this nation and they each presented us a fine horse in return we gave them sundry articles and among others one of my case pistols and several hundred rounds of ammunition."⁴⁸ Case pistols are a matched pair of high-quality pistols, kept in a lined case or box, such as gentlemen used for dueling.

Early in his Army career, Lewis, then an Ensign, challenged a superior officer to a duel, contrary to regulations. The duel did not occur.⁴⁹ The outcome was that Lewis was transferred from the post where the incident occurred, to another fort, where he met Willima Clark, lived in Clark's quarters. Perhaps the case pistols of the expedition were the same pistols which led to a key event in Lewis's life.

Swivel Gun and Blunderbuss

The expedition had one swivel gun and two blunderbusses. A swivel gun is a small version of the 18th century naval cannon, about 30 inches long and with a bore near 2 inches, usually cast in iron but occasionally cast in bronze. It swivels on a U-shaped yoke, standing on a vertical pin in the rail of a ship or in the wall of a fortification, and is easily and quickly pointed in any direction. Swivel guns could also be mounted on a miniature naval gun carriage. Swivel guns can fire a single solid ball but usually were loaded with a handful of shot – or even musket balls - and used as a kind of extra-large shotgun to repel attackers. Blunderbusses are short, heavy, smooth-bore flintlock shoulder arms used for defense, usually mounted on a pivot in the rail of ship or boat, or on the top of a wall. The muzzle is flared to assist rapid loading. Going upriver in 1804 the swivel gun was mounted in the bow of the keelboat and the blunderbusses were on the pirogues. During the winter of 1804-1805, the swivel gun and blunderbusses apparently were mounted on the walls of Fort Mandan. The time they were most important for defense was during confrontations with the Teton Sioux, September 25 and 28, 1804. On the first occasion Sergeant Ordway wrote "Capt. Lewis who was on board ordered every man to his arms. the large swivel loaded immediately with 16 Musquet balls in it the two other Swivels loaded well with Buck Shot, Each of them manned."⁵⁰ On the 28th a group of braves seized the keelboat's cable to prevent departure and demanded more gifts. Clark wrote that he spoke firmly, gave a carrot of tobacco to a chief, and prepared to fire the swivel gun.⁵¹ The chief jerked the cable from the braves and the expedition departed.

Returning to the Hidatsa villages on the Missouri River on 14 August 1806, Clark wrote "we directed the blunderbusses be fired several times...." as a peaceful salute.⁵² The swivel gun was presented to the Hidatsa chief One Eye, with an admonition by Clark to heed the words of the captains and to remember those words whenever the gun was fired.⁵³ The blunderbusses sounded for the last time at the return to St. Charles, Missouri, September 21, 1806. Clark wrote: "at 4 P M we arrived in Sight of St. Charles, the party rejoiced at the sight of this Hospital [hospitable] village plied their oars with great dexterity and we soon arrived opposite the Town, ... we saluted the Village by three rounds from our blunderbusses and the Small arms of the party, and landed near

48 Moulton, Vol. 7, p. 183.

49 E. G. Chuinard, "The Court-Martial of Ensign Meriwether Lewis," *We Proceeded On*, 8, no. 4, (November 1982), pp. 12-15.

50 Moulton, Vol. 9, p. 68.

51 Moulton, Vol. 3, p. 124.

52 Moulton, Vol. 8, p. 298.

53 *Ibid.*, p. 304.

the lower part of the town. we were met by great numbers of the inhabitants."⁵⁴ The expedition was over.

Traveling across an unmapped and unknown wilderness, remote from familiar sources of aid and supply, guns were indispensable to the explorers. The Harpers Ferry rifles, the Charleville pattern muskets, the air gun, Clark's "little rifle," the plain trade muskets and Clark's elegant fusil, Lewis's fowling piece and his case pistols, the pocket pistols with secret triggers, the horseman's pistols, the small cannon, and the blunderbusses made a kind of traveling exhibition of firearms technology of the day. Many of these guns were little used on the expedition, and others, especially the rifles and muskets, were essential to survival in the wilderness and for the successful return of the expedition.

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Boulder, Colorado

⁵⁴ Ibid., p. 369.