

LCTHF's conservation origins

Dye and Hebard biographies

short rifle and airgun

We Proceeded On

Lewis and Clark Trail Heritage Foundation / www.lewisandclark.org

May 2006 Volume 32, No. 2

WARREN LEE, AIR POWER DIPLOMACY © 2005 ROBERT DAVID BEEMAN



WHACK! CRACK! BOOM! THE GUNS OF LEWIS & CLARK

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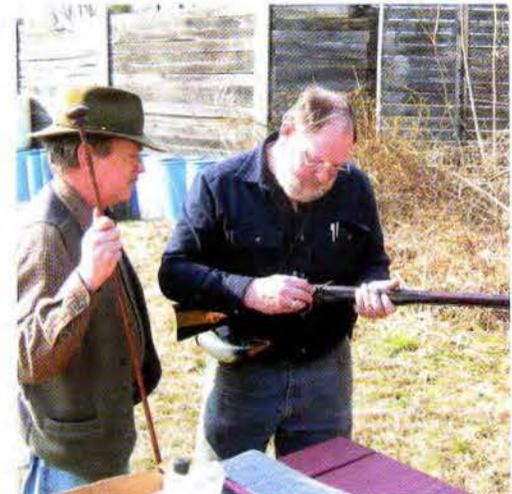
Volunteer support more crucial than ever

On the cover

Warren Lee's painting *Air Power Diplomacy* depicts Meriwether Lewis's demonstration of the expedition's air rifle at a meeting with the Yankton Sioux on August 30, 1804. The air rifle was a repeater, and Lewis's ability to shoot it several times without apparently reloading astonished the assembled Sioux, some of whom rushed to the target tree to examine the bullet holes. Lewis's "wonder weapon" is the subject of Robert Beeman's article beginning on page 29. The two other features in this issue also address the captains' formidable arsenal: Stuart Wier's "The Guns of Lewis and Clark" (pages 10-19) and Richard Keller and Ernest Cowan's "The Short Rifle of Lewis and Clark" (pages 20-28). Prints of Lee's painting (commissioned by Robert David Beeman; © 2005) are available in both full-size (22 by 26 inches) and half-size on www.beemans.net.



The guns of Lewis & Clark, pp. 10-19



The short rifle, pp. 20-28



Conservation roots, pp. 38-40



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Letters

Lewis's longitude readings

Your Biographical Brief profiling Robert Patterson in the February 2006 WPO was most interesting. I am especially grateful for your last paragraph concerning Ferdinand Hassler's failed efforts to use Meriwether Lewis's observations to obtain longitudes. The article's last sentence—"Several years ago, when a physicist entered Lewis's numbers into a computer program based on the Patterson-Ellicott method, 20 of Lewis's 23 observations proved correct to within half a degree."—is especially significant. If true, this certainly explains Hassler's difficulty in carrying out the work Lewis asked him to do.

I have read that Hassler tried to obtain the original data from Nicholas Biddle on the assumption that the "fair copy" furnished to him may have been inaccurate. He received no response from Biddle.

I would appreciate it if you could provide a reference for a paper about the physicist's work.

ROBERT J. BOYLE, JR.
Lewiston, Id.

EDITOR'S NOTE: See Richard S. Preston, "The Accuracy of the Astronomical Observations of Lewis and Clark," *Proceedings of the American Philosophical Society*, June 2000, pp. 168-191. The paper can be accessed on the Web at www.aps-pub.com/proceedings.htm. A discussion of Preston's paper appears on page 11 of the November 2001 WPO.

The last paragraph of your biographical sketch of Robert Patterson touches on a widely accepted explanation of Ferdinand Hassler's difficulty with Lewis and Clark's astronomical observations. It's a neat, satisfying explanation, one that we can't help wishing were true. Unfortunately it can't be.

As you correctly say, Lewis's observations were turned over to Hassler who, 10 years later, "gave up in despair." But then follows the modern explanation for the failure: "It turns out that Hassler was unfamiliar with the valid, if unorthodox, observational method that Patterson and Ellicott had taught Lewis."

That supposedly unorthodox method

was the use of calculated altitudes (in place of measured ones) in clearing a lunar distance. This was, in fact, a perfectly orthodox alternative, and had been known to navigators for some forty years. It was in Maskelyne's *Requisite Tables*, as well as in the four most used and respected navigation manuals of the time. That Hassler could have been unfamiliar with it is outside the realm of reasonable belief.

My guess is, Hassler's problems with Lewis and Clark's observations were aggravated by the copy of the journals he was given. It seems reasonable to suppose it was hastily done and loaded with miscopied numbers. He complained of being unable to get his hands on a second copy for comparison. With nothing to work with but the often erroneous numbers set down for the observations, and for the courses and distances, it's not surprising he eventually despaired of producing a geographically accurate map.

Researchers today have two great advantages in getting past bad numbers and missing information. One is that they have a good idea where observations were taken. The other is that editor Gary Moulton has put different versions of the journals at their fingertips.

Lewis and Clark seemed to take a distinct interest in nautical astronomy, and they did surprisingly well, considering Lewis's brief instruction and the stresses and distractions of the journey. They'd have done a superb job if they'd had the guidance of written advice tailored to the needs of the expedition. The "Astronomical Notebook" Patterson prepared for Lewis didn't fill this bill. Whatever Patterson's virtues as a teacher and mathematician, his "Notebook" is amazingly out of touch with the orders Jefferson gave Lewis and the challenges the captains faced.

BRUCE STARK
Eugene, Ore.

Your article about Robert Patterson and his value to the expedition was so very interesting. It is also encouraging to learn how good a job Lewis did in making his celestial observations, especially in view of all the character assassination to which

he's been subjected. It's so nice at last to read something good about him.

By now you have probably picked up on what I assume is a typographical error in the article, which gives Patterson's year of birth as 1783. Going by the other dates in the article, I believe he must have been born in 1743.

EVEDENE BENNETT
Albany, Ore.

EDITOR'S NOTE: You are correct in stating that Patterson was born in 1743 (the same year of birth as Thomas Jefferson's).

Fort Mandan winter temperature

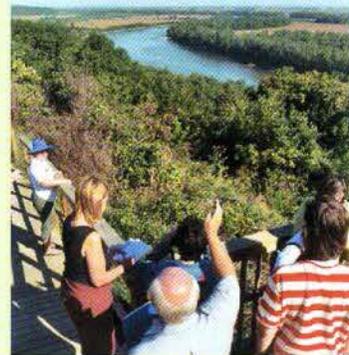
My thanks for two great articles in the November 2005 WPO: "O! How Horrible is the Day," by Terrence R. Nathan, and "Forecast: Variable," by Vernon Preston, which speak to the trying weather conditions faced by the Corps of Discovery. Because both authors are professional meteorologists, I present the following minor points with some trepidation.

I believe that the widely reported low temperature of minus 45 degrees Fahrenheit at Fort Mandan (recorded December 17, 1804) should be noted with a caveat because the fusion point of mercury is minus 38 degrees, and it is unlikely that any of Lewis and Clark's thermometers would be calibrated to this extreme. Today, mercury thermometers are just not used for such very low temperatures.

Mercury does contract slightly when it solidifies, and to a lesser extent the solid continues to contract as temperatures drop below minus 38. Therefore, the captains' thermometer would not have been damaged by the severe cold, so they would have had no reason to question their accuracy. Furthermore, when the temperature was in the neighborhood of minus 45 degrees (and in reality it may very well have been lower), who in their right mind would have dawdled over the measurement?

We should present the captains' temperatures as they reported them, but the potential for error should also be noted. In the same vein, the reference found in Nathan's article to the deviation from the expected boiling point of water states that the barometric pressure wasn't noted simultaneously so that appropriate corrections could be applied. I was impressed,

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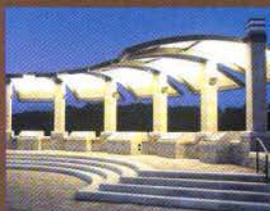
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Letters (cont.)

though, that Lewis thought to check his instrument—an example of good laboratory practice.

This is but nit-picking. I commend WPO and the authors for these pieces.

GRAEME BAKER
Libby, Mont.

Honoring the expedition in Missouri

An article in the November 2005 WPO states that the Missouri State Society of the Daughters of the American Revolution received the LCTHF's Meritorious Achievement Award for marking 14 gravesites of members of the Lewis and Clark Expedition. This is incorrect. We have marked 14 recognized sites of importance to the expedition, including the gravesites of expedition members George Shannon and Robert Frazier.

Since the award was presented we have also honored George Drouillard, the expedition's chief hunter and interpreter. His home was in Cape Girardeau, where he raised horses and lived with his uncle, Louis Lorimier, commandant of the Cape Girardeau District.

This April 2, in New Haven, Missouri, the DAR placed a plaque recognizing John Colter, the expedition member turned mountain man, who is well known for his many adventures in the western wilderness. According to a fourth great-grandson, Timothy Forrest Colter, John Colter built a home on Little Boeuf Creek and died in La Charrette in 1812. Research by another of his descendants, the late Ruth Colter Frick, found he was buried near New Haven on private land.

One of the objects of the DAR is to preserve and protect the history of our great country, and one of the most inspiring events in that history is the Lewis and Clark Expedition. It is an honor to tell this story and to have our efforts recognized by the Lewis and Clark Trail Heritage Foundation.

JANE SHORT MALLINSON
Missouri DAR State Trails Chairman
Sugar Creek, Mo.

WPO welcomes letters. We may edit them for length, accuracy, clarity, and civility. Send them to us c/o Editor, WPO, 51 N. Main St., Pennington, NJ 08534 (e-mail: wpo@lewisandclark.org).

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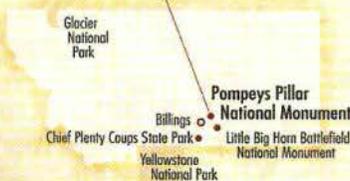
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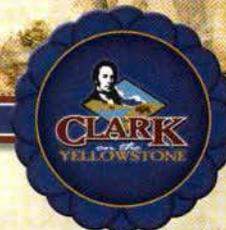
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President's Message

New challenges as L&C Bicentennial winds down

Though she lives only forty miles from me, I had not met Patti Thomsen until the 1998 annual meeting, in Great Falls. We became better acquainted when, later that year, Patti joined the foundation's new Badger State chapter, which my wife and I had helped to found. In time I came to appreciate the depth of Patti's knowledge of the foundation's history and the breadth of her friendships among its members.

So as she effectively took office soon after the annual meeting in Portland last August, I looked forward to a year when I could keep a low profile while supporting Patti and learning from her, just as I had learned the previous three years from Gordon Julich, Ron Laycock, and Larry Epstein. With studious application and good fortune, I might be prepared to do justice to the office by October of 2006.

But as they say, the best-laid schemes of mice and men often go astray. At least mine do. I remember exactly where I was and what I was doing the morning of January 5, when Carol Bronson, the foundation's executive director, called to suggest that I check my e-mail (something I was not very good about in those days). Patti had resigned, she wrote, "effective immediately," due to non-life-threatening health issues "which make this decision absolutely necessary." Anyone who knows Patti and her commitment to the foundation knew instantly that this was quite serious and truly "necessary."

I am pleased to report that Patti is recovering reasonably well, but she was not able to attend our April board meeting. While having no thoughts about resuming her duties, she emphasizes that she misses all of us. The board has asked me to serve as president through the balance of her term, and I have agreed to do that. We all hope to see Patti in St. Louis come September.

You can write her, meanwhile, at P.O. Box 47, Hartland, WI 53029-0047.

You can also take comfort in the knowledge that we have a superb professional staff at our headquarters in Great Falls. It has never been as strong as it is now. Indeed, before her illness Patti and I had talked about our intent to have the board gradually withdraw several degrees to encourage more leadership at the staff level. That still is my resolve.

There remains, nonetheless, ample challenge for the board and its 15 member-based committees. These are daunting times for the foundation as the bicentennial draws to a close and the likelihood of significant public funding wanes. Membership seems to me particularly important—both retaining our veterans and attracting new people, and that in turn requires superior service.

Trail stewardship a priority

During the past year Wendy Raney, Gordon Julich, and Carol Bronson have been especially articulate in making the case for our increased commitment to the Lewis and Clark National Historic Trail. Several chapters and many individual members are leading in this effort as well. If we do not take care of the trail, who will?

Finances are of perhaps greater concern than ever before. The support we have enjoyed from government agencies during the bicentennial has enabled us to grow and implement new programs. We now must make the transition to financial independence.

Membership, trail, and financial security are sharply in focus, but at the same time we must all continue to have fun. Come celebrate with us in St. Louis at our annual meeting September 18 and 19 and stay for the bicentennial commemoration that follows.

—Jim Gramentine
President, LCTHF



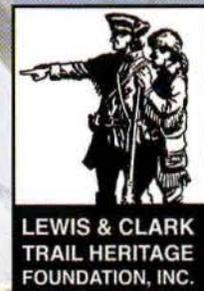
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Past, present, and future connected through the tree of life

In the words of Thomas Fuller, a 17th-century physician, “He that plants trees loves others beside himself.” This horticultural version of the Golden Rule is sorely needed at a time when our natural environment is in peril and whole acres of forests are disappearing at record speeds. I have long been engaged in issues of environmental sustainability, but my involvement with the Lewis and Clark Bicentennial has brought these issues ever closer to home as I have developed relationships with members of Indian tribes encountered by Lewis and Clark.

The two centuries since the Corps of Discovery set out from St. Louis have given us the privileged perspective of hindsight. The west of Lewis and Clark was not empty—it was a settled land with long cultural traditions established by native peoples who had lived there for thousands of years. How have we impacted the land as we settled and exploited it? And how have the plants and animals noted by the corps fared? What would we do differently now?

I would hope that we would plant trees. We did exactly that two years ago during the Three Flags Lewis and Clark National Heritage Signature Event, in St. Louis. Now, as we near the end of the bicentennial and the closing signature event, in September in St. Louis, I find myself reflecting upon such salient moments of the three-year-long commemoration.

The memory of that event is uppermost in my mind as winter’s chill thaws to welcome another spring. In March of 2004, members of the Osage nation came to St. Louis to commemorate the bicentennial in their own way. When Lewis and Clark departed from St. Louis, the Osages controlled much of the trade in the Missouri Valley. This was before their banishment from the St. Louis area by American settlers. By the time of William Clark’s death, in 1838, the Osages had been completely removed from their homeland. Two centuries later, at the grand opening of

Lewis and Clark: The National Bicentennial Exhibition, the mayor of St. Louis proclaimed January 17 as Osage Homecoming Day. The Osages were officially welcomed home, although they can never truly return to the home they once knew.

Yet, despite the grievous injury inflicted upon the Osages, they have hope in a future embodied within the land. It was in that spirit that a tree-planting and branch-tethering ceremony was conducted in St. Louis’s Forest Park. Artists Karen McCoy and Matthew Dehaemers worked with tribal members to re-root, if you will, and ultimately to honor, the ancient Osage presence in this region.

As the artists explained, “When Chief Jim Gray told us about the Indian use of marker trees as guides to special places, paths, or water, it marked a turning point in our process. It seemed that the symbolic use of a living, growing tree, adapted for special guiding purposes, would be the ideal metaphor for our work.”

Preparing the tree

The site centers on a red oak with a large, hollow trunk. The plan was to use as much of the old tree as possible, similar to the way the Osages used every part of the animals they hunted. The large limbs and branches of the old oak were charred, thereby sending some of the tree’s substance skyward. Within the tree’s vast trunk, a young Osage orange tree was planted. One low-growing branch was drawn through a slot cut in the east side of the trunk. This branch was manipulated and tethered in the old way of the Osages so that it forms a marking arm directing our gaze toward the east. The Osages consider that they are always traveling in an easterly direction on their life paths.

That day, we gathered around the massive oak as the branch was bent back and tied down toward the east. An

Osage elder said a prayer, followed by singing and drumming. Eddie Red Eagle spoke in Osage and then translated his words into English. He mentioned the tragedies that have befallen the Osages in the two hundred years since Lewis and Clark, while also emphasizing the need to “move forward.”

“Just for this moment,” he said, “let’s declare this land to be Osage. We promise to take good care of it in this moment and then we will give it back to you. You will take care of it and then we will come back and take care of it and then give it back.” Eddie Red Eagle’s call to pretend that the land that we stood upon was once again Osage was his way of forcing us to acknowledge our relationship to one another. As he ended his brief remarks, I stood beneath the towering oak awestruck by the simple and haunting nature of his words. “You belong to us and we belong to you,” he said.

The more I think of life, the more I think we are headed not to the future but to the past, where our ancestors are. The future comes behind us, not after us. If we behaved as if we belonged to one another in the immediate present, to those in the ancient past, and to those in the distant future, how different would this world be? There is an old Greek saying that comes to mind: “A civilization flourishes when people plant trees under whose shade they will never sit.”

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Upcoming signature events

Mark your calendars for June 14-17, for *Among the Nimipuu (The Nez Perce)*, in Lewiston, Idaho, and July 22-25, *Clark on the Yellowstone*, at Pompeys Pillar and in Billings, Montana. For more information on these two signature events, please visit www.lewisandclark200.org.

—Robert R. Archibald
President, Bicentennial Council



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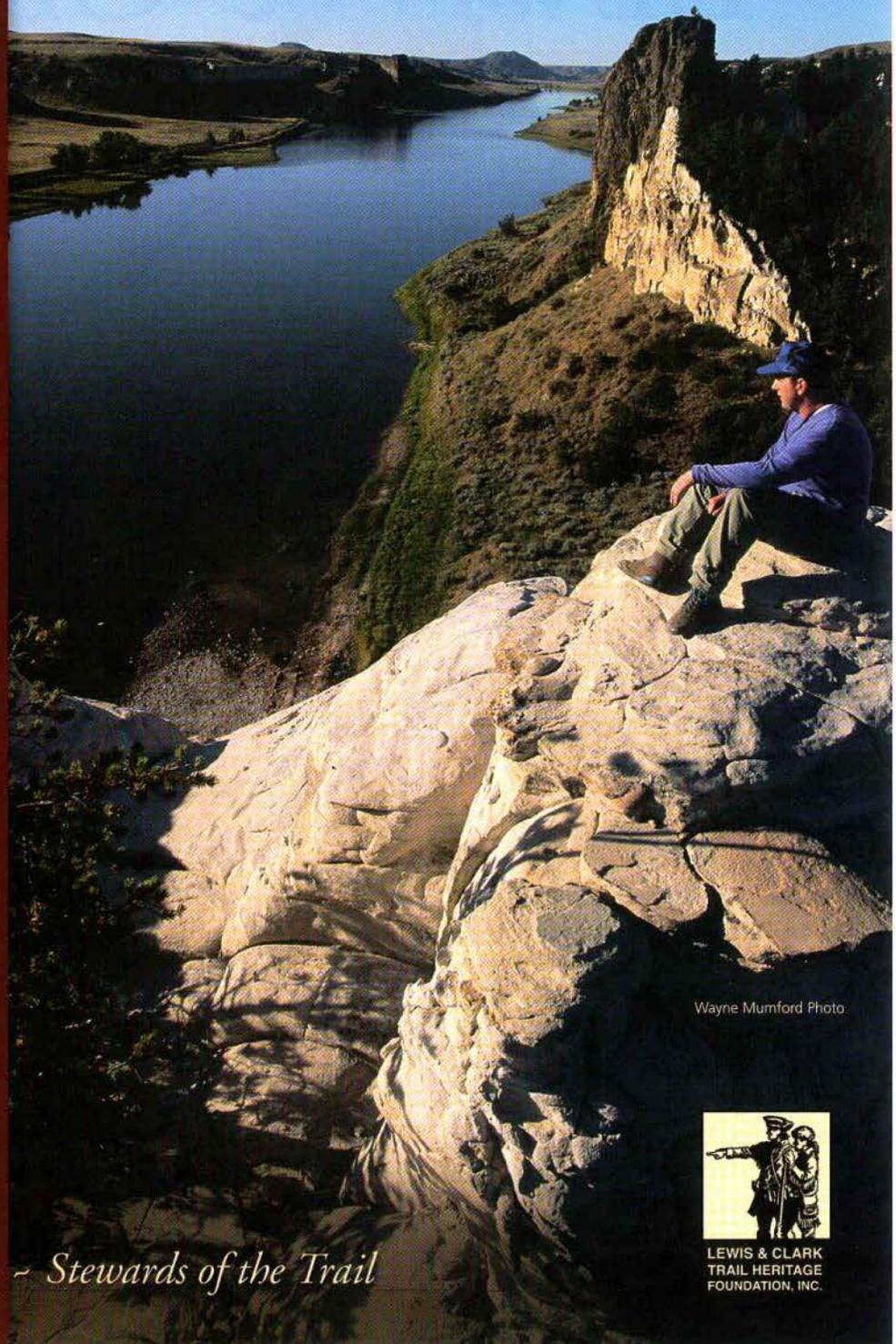
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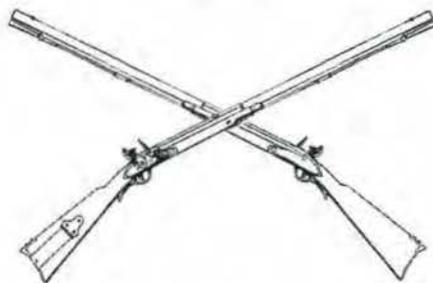


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The GUNS of LEWIS & CLARK



The Corps of Discovery's formidable arsenal was a veritable traveling exhibit of the era's firearms technology

BY STUART WIER

Firearms were essential to the Lewis and Clark Expedition. In the hands of its skilled hunters they provided meat for a party of more than thirty people who spent 28 months in the field, living mostly off the land. They were also critical for defense and for collecting specimens of birds and mammals.

The explorers carried “short rifles” acquired by Meriwether Lewis at the federal armory at Harpers Ferry, Virginia, and army service muskets brought by soldiers recruited from other military units. The Corps of Discovery's arsenal included a pair of blunderbusses, a swivel cannon, and personal weapons such as Lewis's famous airgun and an “elegant fusee” owned by his co-commander, William Clark. With the exception of the airgun, all these weapons were muzzle-loading, single-shot, black-powder guns with flintlock ignitions.

To the frustration of weapons historians, none of the expedition's journalists described their guns in any detail—firearms were everyday possessions on the frontier, scarcely

worthy of mention. The only expedition guns that may have survived to the present are a Harpers Ferry short rifle, an air rifle, and a rifle that once belonged to Clark, but arguments that any of these are actual relics of the expedition rely on inference rather than documented provenance. Our knowledge of Lewis and Clark's weapons is based on the briefest of journal entries and other incomplete and often ambiguous primary sources. Many questions remain. Still, much has been learned in recent years, and today we are able to make more positive statements about the explorers' guns than were possible even a decade ago.

MUSKETS

A musket is a smoothbore weapon: the interior, or bore, of the barrel is smooth. By contrast, a rifle's bore is cut with spiral grooves to make the ball spin, giving it greater accuracy. But a musket loads faster, an advantage in battle, and can fire either a single ball or multiple birdshot or buckshot, like a modern shotgun.

An artilleryman of the Lewis and Clark era stands at the ready with a Model 1795 Charleville pattern musket. The Model 1795 was standard issue in both the artillery and infantry corps. (The Corps of Discovery included one artilleryman, Alexander Willard, in the permanent party and five others—John Dunne or Dame, John Robinson or Robertson, John Thompson, Ebenezer Tuttle, and Isaac White—in the larger group that wintered at Fort Mandan. William Clark was an artillery officer.)





Model 1795 Charleville pattern musket



Reproduction of the Model 1792 Harpers Ferry rifle with truncated barrel and sling, one candidate for the expedition's "short rifle."



The Model 1803 Harpers Ferry rifle, another candidate for the short rifle. The expedition probably carried the very similar Model 1800.



This 36-caliber rifle in the collection of the Missouri Historical Society may have been the "small" rifle carried by William Clark on the expedition.

PHOTO CREDITS: FROM TOP: DIXIE GUN WORKS; HARPERS FERRY NATIONAL HISTORICAL PARK; NATIONAL GEOGRAPHIC SOCIETY; MISSOURI HISTORICAL SOCIETY.

In 1803 the flintlock musket was the army's main firearm. One was issued to every soldier. Lewis's pre-expedition list of needed equipment did not include muskets because the soldiers he expected to recruit at forts on the Ohio River would already have them. Among the articles delivered to Lewis at Harpers Ferry were 125 musket flints and "15 Cartouch Box Belts."¹ A cartouche was a tube of paper, twisted shut at either end, which held ball and powder for a single shot. It facilitated loading because the soldier could simply bite off one end of the cartouche, dump the contents into the muzzle, and ram it home, rather than loading and ramming the powder and ball separately. Each soldier made up a supply of cartouches which he carried in a box on his belt.

Lewis's recruits were equipped with Charleville pattern muskets, so named because they were patterned on a French musket known as the Charleville Model 1763; the American version is also known as the Model 1795. Between 80,000 and 85,000 of these weapons were manufactured at the federal armory in Springfield, Massachusetts, from 1795 to 1814 and at Harpers Ferry beginning in 1801. Its .69-caliber barrel was 44 1/2 inches long.² When Lewis was planning the expedition he intended to provide accouterments for 15 muskets and 15 rifles. Lewis also in-

tended to recruit 15 soldiers, so we can assume that he probably expected each soldier to be equipped with both a musket and a rifle. Because the complement of enlisted men grew, there were probably at least as many Charleville muskets on the expedition as Harpers Ferry rifles.³ Although we tend to think of the explorers hunting with rifles, they often used muskets, which were accurate enough at shorter ranges.

Some of the French *engagés* recruited for the expedition (mainly to man the boats as far as the Mandan villages) surely owned their own trade muskets. Often called the trade gun or North West gun (after the British-Canadian fur company), the trade musket in its basic form was a .60-caliber weapon with an overall length of 50 inches. Distinctive features included a brass butt plate, a side plate in the form of a curling serpent, and an oversized trigger guard that enabled a person wearing mittens to fire it.⁴ The expedition journals often refer to the trade musket as a "fusee," a rough phonetic rendering of *fusil*, the French word for a light musket.

THE MYSTERIOUS "SHORT RIFLE"

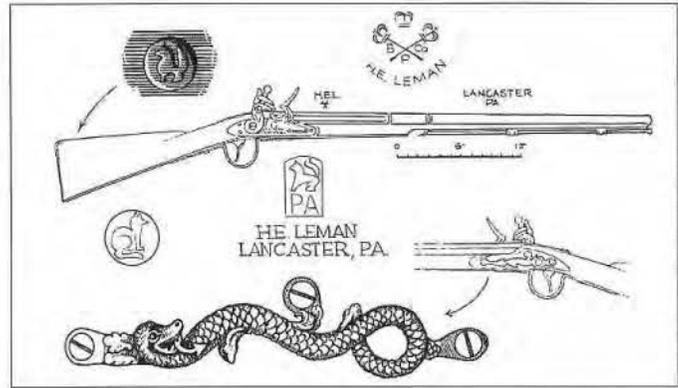
Lewis and Clark scholars have long debated the identity of the expedition's "short rifle," as it was sometimes called

in the journals. Fifteen of these weapons were ordered by Lewis at Harpers Ferry. For many years it was assumed these were the Model 1803, a rifle manufactured at the armory in the early years of the 19th century.⁵ This view changed with the publication, in 1999, of an article by Frank A. Tait in *Men at Arms*, the journal of the National Rifle Association. Pointing out that government records failed to show the manufacture of Model 1803s at Harpers Ferry until 1804, Tait argued that Lewis's rifles were instead modified versions of an earlier rifle, the Model 1792-94 contract rifle, so-called because it was made by Pennsylvania gunsmiths under government contracts issued in 1792 and 1794. (For purposes of this article we will call it simply the Model 1792.) It was a full-stocked flintlock with a 42-inch octagonal barrel firing a .49 caliber ball.

A Harpers Ferry inventory conducted in 1801 showed 382 rifles in storage there, most of them Model 1792s. In Tait's scenario, these rifles were modified to suit the expedition's needs. Alterations would have included new locks and swivels for slings. The bores may also have been drilled out to accommodate a larger ball, the rifling "freshened," or recut, and the 42-inch barrels shortened—although by how much is uncertain.⁶ American rifles of the time typically had barrels 40 to 48 inches long, so any rifle with a barrel much shorter than 40 inches would have been "short."⁷ Given its handiness for anyone hunting in rough terrain or traveling in a small boat, Lewis must have regarded a short rifle as a better match for the conditions he expected to face.

The expedition journals include several references to "short rifles." On April 12, 1806, as the party was proceeding up the Columbia River past numerous Indian villages, Lewis wrote, "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 rob or injure them." Three months later, on August 11, when Pierre Cruzatte accidentally shot Lewis in the buttocks while hunting, the captain coolly noted how "the ball had lodged in my breeches which I knew to be the ball of the short rifles."⁸ Lewis evidently recognized the ball by its atypically large size.

Recently, Tait's conclusion that the short rifle was a cut-down Model 1792 has been challenged by a new theory put forward by firearms historians Richard Keller and Ernest Cowan. They propose that design and prototype work on a short rifle with a 33-inch barrel began at Harpers Ferry as early as 1800 and was more or less completed by Lewis's arrival there in March 1803. This rifle, which they call the Model 1800, would have served as a pattern



FROM CARL F. RUSSELL, FIREARMS, TRAPS AND TOOLS OF THE MOUNTAIN MEN (UNIVERSITY OF NEW MEXICO PRESS, 1981).

The North West trade musket was probably carried by the French-Canadian *engagés* who accompanied the expedition. Distinctive features included a brass sideplate in the form of a serpent.

for the 15 rifles Lewis ordered. Their thesis rests in part on the discovery of a Harpers Ferry short rifle dating from 1803 with a serial number of 15—a possible candidate, they believe, for one of the expedition's 15 Harpers Ferry rifles. [Keller and Cowan make their case in an article on pages 20-28.]

OTHER EXPEDITION RIFLES

Frontiersmen recruited for the expedition, including George Drouillard and the so-called Nine Young Men from Kentucky, may have brought their own firearms. A frontiersman's weapon of choice was the Pennsylvania rifle. This was the common "long" rifle and one of the most famous weapons in American history. It was made by gunsmiths in eastern Pennsylvania and adjacent states. Its caliber ranged from .35 to .50 inches and its overall length from 57 to more than 60 inches.⁹

Clark carried a gun he referred to as the "Small rifle" and at least once as the "Little rifle," as if to distinguish it from the expedition's larger-caliber short rifles and Pennsylvania rifles. He noted that the balls fired by the small rifle were 100 to the pound, which means they were .36 caliber

(not much larger than a pea, and one eighth the weight of a round fired by the Charleville musket).¹⁰ Such a small-caliber rifle was light and easy to carry, which may explain Clark's preference for it over the heftier muskets and expedition rifles.

A .36-caliber rifle that belonged to Clark is now owned by the Missouri Historical Society. This rifle is 53 1/2 inches long, with a barrel length of 37 1/2 inches. It has a silver patch box and is highly ornamented, which is typical of Pennsylvania-style rifles made after 1790. It was made by John Small of Vincennes, Indiana. Both the caliber and the maker's name raise the possibility that this surviving



An officer's fusil, or smoothbore sporting gun, similar to Clark's "ellegant fusee."



An 18th-century fowling piece, a type of long-barrelled shotgun of the sort carried by Lewis.



A Girandoni repeating air rifle like this one was almost certainly the type of airgun used on the expedition. The example shown here has a removable leather sleeve covering its buttstock air reservoir.

PHOTO CREDITS, FROM TOP: JIM CHAMBERS
FLINTLOCKS, LTD.; STUART WIER, STUART WIER

gun was the "small" rifle Clark carried on the expedition, but its comparative lack of wear suggests Clark may have purchased it after the expedition¹¹

CLARK'S "FUSEE" AND LEWIS'S FOWLING PIECE

Clark also took on the journey a weapon he called his "ellegant fusee." By "fusee" he meant fusil, which as noted is a French term for a smoothbore musket. In this context it refers to a gentleman's sporting gun—a light-weight, ornamented smoothbore for hunting birds and small game. Such guns often had brightly polished barrels, were decorated with engraved brass or silver fittings and inlays, and in general showed finer workmanship than military and trade muskets. Fusils were usually English guns of 20 gauge (.625 caliber) and overall lengths between 52 and 55 inches. Fittings might include a butt plate and side plate engraved with hunting or martial scenes, a trigger guard with acorn finial, an engraved thumb piece or escutcheon plate, and checkering on the wrists. They were indeed elegant. Clark appears to have lost his fusil in a flash flood at the Great Falls of the Missouri.¹²

Lewis also had a fowling piece on the expedition. This was a smoothbore long gun, not so elegant as a gentleman's fusil, and with a barrel of unusual length—some fowlers were more than six feet long. They were used primarily with small shot for hunting birds and small game, and we can assume this was Lewis's primary weapon for collecting smaller natural-history specimens. After the expedition's return, Lewis submitted several

requests for reimbursement of personal expenses. One of these listed items traded with Indians: "One Uniform Laced Coat, one silver Epaulet, ... one pistol, one fowling piece, all private property, given in exchange for canoe, horses, &c."¹³

LEWIS'S AMAZING AIRGUN

The most remarkable gun of the expedition was Lewis's personal air rifle.¹⁴ Smokeless, quiet, and probably able to shoot multiple times without reloading, it was frequently used to impress Indians. Clark reported that it "Surprised and astonished the natives."¹⁵ Lewis wrote that he purchased his airgun in 1803, but he did not say where. The journals are silent on what it looked like or how it worked.

Until recently, most writers on the subject believed the airgun was made by Isaiah Lukens of Philadelphia or possibly by his father, Seneca Lukens.¹⁶ Key support for this view is an 1846 auctioneer's pamphlet of items in the sale of Isaiah Lukens's estate. The list includes several airguns, including one "used by Messrs Lewis & Clark in their exploring expeditions. *A great curiosity.*" The pamphlet does not say the gun was made by Lukens, although another item on the list is described as being "of his own construction." The airgun was withdrawn from the sale and lost to view, at least for a time.

Isaiah Lukens was born in 1779 and apprenticed with his father, a craftsman and machinist. In addition to airguns he made clocks, watches, and scientific instruments (an example of his handiwork is the clock in Independence

Hall). He was a founder of the Franklin Institute and a member of the American Philosophical Society.¹⁷

There are six known surviving Lukens airguns. One of these, in the museum of the Virginia Military Institute, was long the leading candidate for the expedition airgun. It shows signs of repairs to its main spring, front sight, hammer, and a lock screw consistent with a journal account of repairs made to Lewis's airgun. The V.M.I. gun has a .31-caliber barrel that is 32 inches long. It loads from the muzzle, like conventional rifles of the period.

Dates are lacking for surviving Lukens airguns, but available evidence suggests they were made after the expedition.¹⁸ This, of course, argues against the possibility that Lewis carried a Lukens gun. Another possibility is that he carried an innovative repeating air rifle made by Bartolemeo Girandoni, an Italian gunsmith based in Vienna. Girandoni designed and manufactured airguns for the Austrian army, which by 1800 had some 1,500 of them in inventory. Other European gunsmiths made airguns based on his novel design, and several hundred Girandoni guns acquired by the Austrian army were lost in battle, so there were probably many Girandoni or Girandoni-type guns circulating in Europe before 1803. It is reasonable to suppose that some of these may have reached the United States.¹⁹

The typical Girandoni-style airgun is 48 inches long, with a caliber of .46-.51 inches and a magazine holding 20-30 balls, depending on the model. The magazine is a tube attached to the barrel. The entire butt is a welded steel tube that serves as a reservoir for pressurized air (it is filled by a pump). Loading a round involves working a spring-loaded horizontal bar that passes through the breech and magazine. Pushing this loading bar moves a ball from the magazine into an opening in the bar and then into the breech. Cocking the hammer and then pulling the trigger releases a burst of air from the reservoir, propelling the ball. All this takes at most a few seconds.

A Girandoni is a repeater: balls are stored in a magazine and loaded from the breech. Twenty shots can be fired with one charge of air by simply working the loading bar, cocking the hammer, and pulling the trigger. This is a huge advantage over a Lukens airgun, which, as noted, like other weapons of its day was loaded from the muzzle and had to be reloaded after every firing.

Although no expedition member described the airgun, two other observers left accounts of it. 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, just a week into



MICHAEL HAYNES

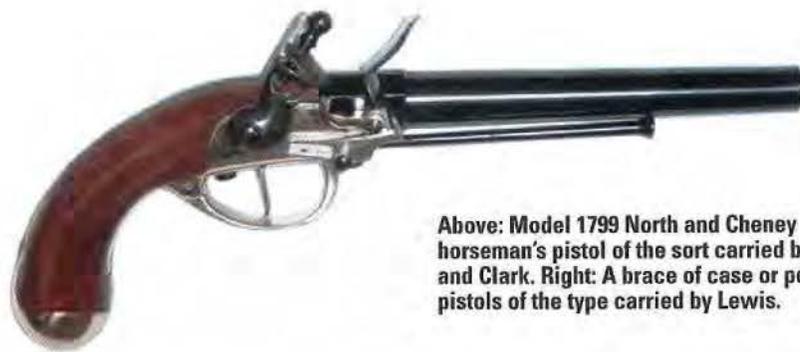
William Clark's "small" rifle is shown in this Michael Haynes portrait of the captain taking a reading from his circumferentor, a type of surveyor's compass used on the expedition.

his trip down the Ohio to rendezvous with Clark, showed the airgun to Rodney and shot it several times in his presence. 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 breech of the gun as serves for one ball. It is a curious piece of workmanship not easily described.²⁰

Rodney appears to be describing a Girandoni. His reference to a "short side barrel" (i.e., magazine) is particularly telling, along with the rapid rate of fire—a single-shot Lukens gun could never have fired 22 rounds a minute.²¹

One other account indicates that the expedition airgun was probably a repeater. Charles McKenzie, a clerk for the North West Company, was visiting the Hidatsa vil-



Above: Model 1799 North and Cheney horseman's pistol of the sort carried by Lewis and Clark. Right: A brace of case or pocket pistols of the type carried by Lewis.



PHOTO CREDITS: FECHALLET, LOYALIST ARMS, STUART WIER.

lages in the winter of 1804-05, when the expedition was wintering nearby. McKenzie witnessed a demonstration of the airgun which he later described. "The Indians," he said, "admired the air gun as it could discharge forty shots out of one load."²² One can interpret this statement two ways—that the gun was a repeater, or that it could shoot 40 times on one charge of air in the reservoir. No existing Girandoni airgun has a magazine capable of holding 40 rounds, but an error may have crept into McKenzie's account, which was probably written at least six years after the fact.²³ If we accept the first interpretation, then the Rodney and McKenzie accounts are both consistent with the attributes of a Girandoni-style gun and inconsistent with those of surviving airguns made by Lukens or his associates.²⁴

[For more on the Girandoni air rifle, see the article on pages 29-35 by Robert Beeman, who believes a Girandoni repeater in his collection was the one Meriwether Lewis carried on the expedition.]

PISTOLS

We know that Lewis took several types of handguns on the expedition. In May 1803 he requisitioned "1 P[air] Horsemans Pistols" from the Schuylkill arsenal, in Philadelphia.²⁵ The arsenal stocked two makes of handguns, the "North and Cheney" pistol and the "McCormick-style" pistol.

The North and Cheney was made by a Berlin, Connecticut, firm owned by gunsmith Simeon North and his brother-in-law, Elisha Cheney. They fulfilled a 1799 government contract to make a pistol now generally known as the Model 1799. North and Cheney produced 500 of them.²⁶ The Model 1799 was based on the French Model 1777 pistol, also called the Charleville or St. Etienne pistol, an unusual design with a brass frame and wood used only for the grips. The American version was 14 1/2 inches long, with a .69-caliber barrel of 8 1/2 inches, one inch longer than the French pistol.

The McCormick pistols were assembled by Robert McCormick from parts supplied by storekeepers at the Schuylkill arsenal. Two have survived to the present day. They are 16 1/2 inches long, with .65- and .67-caliber bores. The arsenal may also have stocked other types of horseman's pistols, including the French Charleville.

Each captain carried one of the horseman's pistols on the expedition. Clark traded his, along with balls, powder, and a knife, for a horse when the explorers were camped with the Shoshones.²⁷ Lewis hung on to his. It served him well on the morning of July 27, 1806, during his exploration of the upper Marias River, when he awoke to a scuffle between his men and some young Blackfeet Indians sharing their campsite. Lewis quickly found that one of the Blackfeet had stolen his rifle, but his pistol was handy. Brandishing the pistol, he chased after the thief and shot him in the belly. (Lewis shot him with the rifle, which he recovered after the Indian dropped it.)²⁸

Lewis also carried among his personal articles a pair of gentlemen's "case pistols," so named because they were often kept in a velvet-lined case. On April 29, 1806, while camped with the Nez Perces, he included one of these pistols among "sundry articles" traded for a horse.²⁹ Lewis asked the government to reimburse him for the pistol in the same letter requesting reimbursement for the fowling piece.³⁰

While in Philadelphia, Lewis purchased a pair of pocket pistols.³¹ These small-caliber concealed weapons were often just four or five inches long and fit easily into a pocket. Also called a screw-barrel pistol or box-lock pistol, a pocket pistol was readied for firing by unscrewing the barrel from the box-shaped lock and loading powder and ball into a chamber in the lock. A small wrench was used to tighten the barrel after it was rescrewed into the lock. Lewis's pocket pistols had "secret" triggers that folded out of sight into the handle and swung into place when the hammer was cocked. Although there is no mention of



A swivel gun like this one (above) was mounted on the expedition's keelboat, while each of the two pirogues was armed with a blunderbuss (below). Both weapons were typically filled with grapeshot for repelling boarders.



PHOTO CREDITS: FROM TOP, STUART WIER, NEUMAN AND KRAVIC, 1976.

pocket pistols in the expedition journals, it seems likely that Lewis would have brought them along.

THE SWIVEL GUN AND BLUNDERBUSSES

Last but by no means least, the expedition's arsenal included a swivel gun and two blunderbusses.

A swivel gun was a small version of the 18th-century naval cannon. Usually cast in iron but occasionally in bronze, it was about 30 inches long and had a caliber of nearly 2 inches. It swiveled on a Y-shaped yoke that dropped into a hole in the rail of a boat or the wall of a fortification. Swivel guns could fire a single solid ball but were usually loaded with a handful of shot or musket balls and employed as a kind of extra-large shotgun to repel attackers.

Blunderbusses were short, heavy, smoothbore shoulder arms used for defense. They were usually mounted on a pivot in the rail of a boat or the top of a wall. The muzzle was flared for rapid loading.

When the expedition was headed up the Missouri in 1804, the swivel gun was mounted in the bow of the keelboat and the blunderbusses were on the two pirogues. They came into play during the explorers' confrontations with the Teton Sioux on September 25 and 28. On the first occasion,

on Lewis's orders the men loaded the swivel gun with 16 musket balls and the blunderbusses with buckshot.³² On the second occasion, warriors seized the keelboat's cable. Clark was ready to blast them with the swivel gun when a chief defused the situation by jerking away the cable.³³ That winter, the swivel gun and blunderbusses were apparently mounted on the walls of Fort Mandan.

Returning to the Hidatsa villages on August 14, 1806, Clark wrote, "we directed the blunderbusses be fired several times"—a peaceful salute to the Indians who had befriended them during the winter of 1804-05.³⁴ 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.³⁵ Again in salute, the blunderbusses sounded for the last time upon the explorers' arrival in St. Charles, Missouri, a month later. As Clark recorded in his journal entry for September 21, "we saluted the Village by three rounds from our blunderbutts and the Small arms of the party, and landed near the lower part of the town. we were met by great numbers of the inhabitants."³⁶

Two days later, according to Clark, when the explorers arrived in St. Louis, "we Suffered the party to fire off their

pieces as a Salute to the Town." The expedition was over. Traveling across an unknown wilderness, remote from familiar sources of aid and supply, the Corps of Discovery depended on guns for survival. The Harpers Ferry rifles, Charleville pattern muskets, trade muskets, the blunderbusses and swivel cannon, Clark's "little rifle" and "ellegant fusee," and Lewis's airgun, fowling piece, and pistols collectively amounted to a traveling exhibition of the firearms technology of their day. Some were more important than others to the expedition's well being, but all contributed in one way or another to its ultimate success.

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NOTES

¹ Donald Jackson, ed., *Letters of the Lewis and Clark Expedition with Related Documents, 1783-1854*, 2 volumes (Urbana: University of Illinois Press, 1978), Vol. 1, p. 98.

² Robert M. Reilly, *United States Martial Flintlocks* (Lincoln, R.I.: Andrew Mowbray, 1987), pp. 51-54.

³ At least 30 enlisted men, including sergeants, made the first leg of the journey, to the Mandan and Hidatsa villages. The Corps of Discovery's 33-person "permanent" party (those who went on to the Pacific) comprised 24 privates, three sergeants, the two captains, and four civilians—the hunter/interpreter George Drouillard; the interpreter Toussaint Charbonneau; Charbonneau's wife, Sacagawea; and their infant, Jean Baptiste. As noted later in the text, not everyone recruited on the Ohio was drawn from other army units; as civilians, the so-called Nine Young Men from Kentucky would not have possessed army muskets. They may have brought long rifles with them.

⁴ Charles E. Hanson, *The Northwest Gun* (Lincoln: Nebraska State Historical Society, 1955).

⁵ Carl P. Russell, *Firearms, Traps, & Tools of the Mountain Men* (Albuquerque: University of New Mexico Press, 1967), p. 37.

⁶ Frank A. Tait, "The U.S. Contract Rifle Pattern of 1792," *Men at Arms*, May-June 1999, pp. 33-45. Frank A. Tait, "Response to the letter of Michael H. Maggelet," *Men at Arms*, November-December 1999, pp. 7-8.

⁷ Lewis and Clark's short rifle had several European antecedents, including the German Jaeger rifle, versions of which had barrels as short as 28 inches. It was widely used in the American Revolution by the Hessian Jaeger Corps and other German units. George D. Moller, *American Military Shoulder Arms*, 2 volumes (Niwot: University Press of Colorado, 1993), Vol. 1, p. 449.

⁸ Gary E. Moulton, ed., *The Journals of the Lewis and Clark Expedition*, 13 volumes (Lincoln: University of Nebraska Press, 1983-2001), Vol. 7, p. 111 and Vol. 8, p. 155. John Ordway refers to the short rifle in his entry for June 18, 1806, found in Vol. 9, p. 324.

⁹ For more on the Pennsylvania rifle, see Henry J. Kauffman, *The Pennsylvania-Kentucky Rifle* (New York: Bonanza Books, 1960); Joe Kindig, Jr., *Thoughts on the Kentucky Rifle in Its*

Golden Age (York, Penn.: George Shumway, 1960); and Merrill Lindsay, *The Kentucky Rifle* (New York: Arma Press, 1972). "Pennsylvania rifle" and "Kentucky rifle" are often used interchangeably, but there is no evidence that the latter term was in use at the time of the expedition. Its source may be a popular song, "The Hunters of Kentucky," written by S. Woodworth and W. Blondell in 1815, after the Battle of New Orleans. (Lindsay, p. 1.)

¹⁰ Moulton, Vol. 6, p. 121. Michael F. Carrick, "William Clark's 'Small' Rifle," *Muzzle Blasts*, November 2003, p. 37. Early in the journey, Clark wrote that he used the "Little rifle for all my hunting." That was before he fired four times at an elk without bringing it down.

¹¹ Carolyn Gilman, *Lewis and Clark Across the Divide* (Washington: Smithsonian Books, 2003), p. 356. Because Clark often capitalized the letter "s" at the beginning of a noun, the idea that he was referring to the gun by its maker is debatable.

¹² On June 29, 1805, Clark, Toussaint 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 flash flood. In his journal that evening, Clark described the incident and his loss of an "ellegant fusee" and other equipment. Lewis, however, wrote that it was Charbonneau, not Clark, who "lost his gun" in the flood, and made no mention of a fusil. Lewis did not learn of the incident until two days later, when Clark and his party reached the Upper Portage Camp. Richard Whitehouse, who was also at the upper camp with Lewis, wrote in his journal, "Capt. Clark lost the large Compass a fusiee pouch & horn." John Ordway was with Clark the evening after the flood. His journal entry, which mainly copies Clark's, states that Clark lost "an elegant fusee." So whose gun was lost actually remains something of a mystery. We should probably accept Clark's version, since his entry offers the only firsthand account. If the lost gun was Charbonneau's it may have been a fancier version of the common trade fusil.

A fusil belonging to Clark surfaces again in his journal entry for August 30, 1805, when the explorers were bartering with the Shoshones for horses: "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." This might have been his "ellegant fusee" (assuming it wasn't lost at the Great Falls) or a simple trade fusil, but exchanging a trade gun for the better-quality Charleville pattern musket (assuming that was what the man had) seems unlikely.

¹³ Jackson, Vol. 2, p. 428.

¹⁴ Journal entries invariably refer to the "air gun," not "air rifle," but in fact it was almost certainly a rifle. For journal references, see 1803: August 30; 1804: August 3, August 20, October 10, October 27, October 29; 1805: January 16, June 9, June 10, August 7, August 17; 1806: January 24, April 3, May 11, and August 11.

¹⁵ Moulton, Vol. 3, p. 209. Entry for October 29, 1804.

¹⁶ Charter Harrison Jr., "The Lewis and Clark Air Gun," *The Gun Report*, May 1956, pp. 6 and 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), No. 89, (1977), pp. 2-7; Roy M. Chatters, "The Not So Enigmatic Lewis and Clark Air Gun," *We Proceeded On*, May 1977, pp. 4-7; Ashley Halsey, Jr., "The Air Gun of Lewis and Clark," *American Rifleman*, August 1984, pp. 36-

37 and 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), pp. 50-77.

¹⁷ 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.

¹⁸ Michael F. Carrick, personal communication, which reads in part, "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."

¹⁹ Michael F. Carrick, "Meriwether Lewis's Air Gun," *We Proceeded On*, 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*, May 2004, pp. 2-3; Joseph Mussulman, "Capt. Lewis's Medicine Gun," <http://www.lewis-clark.org/content/content-channel.asp?ChannelID=249>, 2004.

²⁰ 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.

²¹ Rodney's statement that the gun fired 22 rounds a minute is not in exact accord with a Girandoni's 20-round capacity, but a longer magazine would have accommodated 22 or more rounds.

²² 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.

²³ *Ibid.*, pp. 223 and 227, states that McKenzie's "accounts were apparently written about 1809-1810" and that the surviving manuscript is apparently not in McKenzie's hand but was transcribed from the original by another person.

²⁴ There is at least one scenario in which all the records could agree. Perhaps Lukens obtained the expedition airgun after Lewis's death—he clearly had an interest in airguns—and it was a Girandoni-style air rifle. Forty years later it appeared in his estate. A Girandoni-style airgun could perhaps hold 40 rounds if it were outfitted with a longer magazine.

²⁵ Jackson, Vol. 1, p. 97.

²⁶ Samuel E. Smith and Edwin W. Bitter, *Historic Pistols: The American Martial Flintlock 1760-1845* (New York: Scalamandre, 1985), p. 123; Reilly, p. 168. A later contract for 1,500 pistols of the same model was completed and the guns were received in September 1802 at a government storeroom in New Haven, Connecticut. The pistols made on the second contract were probably not available to Lewis in Philadelphia. 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 stamped on top of the barrel at the breech. Serial numbers are marked internally. Fewer than 10 pistols of this contract are known to survive.

²⁷ Moulton, Vol. 5, p. 178. Clark's entry for August 29, 1805, states in part, "I purchased a horse for which I gave my Pistol 100 Balls Powder & a Knife."

²⁸ Moulton, Vol. 8, p. 134. Lewis's journal entry reads in part, "I jumped up and asked what was the matter which I quickly learned when I saw drewyer [George Drouillard] 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." Case pistols were also the weapon of choice for duels. Early in his army career, Lewis challenged a superior officer to a duel. Fortunately, the duel never took place. One wonders if the pistols Lewis planned to use were the same ones he took on the expedition.

²⁹ Moulton, Vol. 7, p. 183.

³⁰ Jackson, Vol. 2, p. 428.

³¹ *Ibid.*, Vol. 1, p. 91. Lewis purchased "1 Pair Pocket Pistols, Secret Triggers" for \$10 from Robert Barnhill, 63 North Second Street in Philadelphia, on May 21st, 1803.

³² Moulton, Vol. 9, p. 68. John 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."

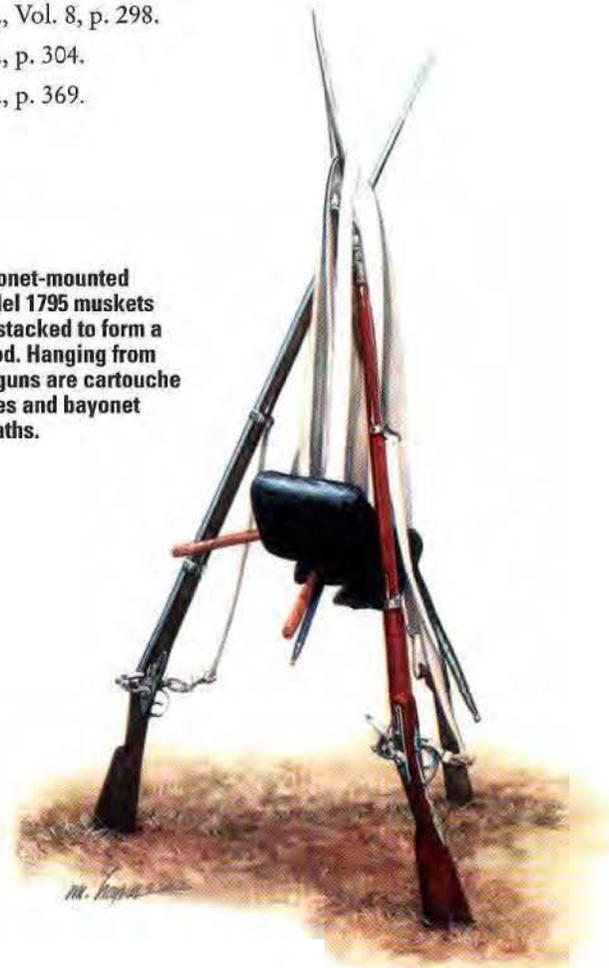
³³ *Ibid.*, Vol. 3, p. 124.

³⁴ *Ibid.*, Vol. 8, p. 298.

³⁵ *Ibid.*, p. 304.

³⁶ *Ibid.*, p. 369.

Bayonet-mounted Model 1795 muskets are stacked to form a tripod. Hanging from the guns are cartouche boxes and bayonet sheaths.



MICHAEL HAYES

The SHORT RIFLE of LEWIS & CLARK

A recently discovered "Model 1800" may well be one of the weapons made for Meriwether Lewis at Harpers Ferry

BY RICHARD KELLER AND ERNEST COWAN

Perhaps the key firearm in the arsenal of the Corps of Discovery was a military rifle made at the federal armory at Harpers Ferry, Virginia. In their journals Meriwether Lewis, William Clark, and other members of the expedition called it "the short rifle." For many years, it was assumed this term referred to the Model 1803 Harpers Ferry rifle. The problem with this assumption is that, according to existing records, the 15 rifles manufactured for Lewis at Harpers Ferry were completed between March and July of 1803, at least six months before the Model 1803 went into production there. More recently, some historians of the expedition have argued that the "short rifle" was a modified version of an earlier rifle stockpiled at Harpers Ferry, the Model 1792.

In fact, the short rifles carried on the expedition were almost certainly based on a design developed over several years at Harpers Ferry, starting in 1800. The "Model 1800," as we shall call it, may never have gone into large-scale production, although prototypes of it were probably built by the skilled gunsmiths working at the armory under the careful eye of its superintendent, Joseph Perkin. We say "almost certainly" and "probably" because many Harpers Ferry production records—including, presumably, any records concerning a Model 1800—were destroyed when Confederate troops torched the armory in 1861. The existence of a Model 1800 final prototype—a so-called "pattern gun" that served as the model for actual production rifles—must therefore be inferred from other sources.

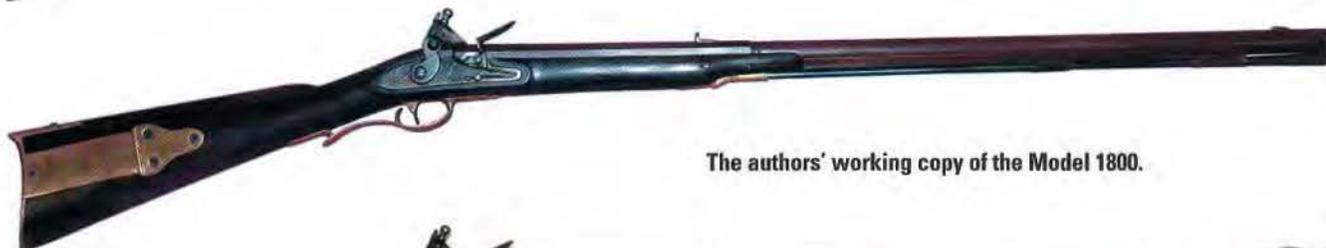
While differing in a number of details, in its overall configuration the Model 1800 would have resembled the Model 1803 so closely that to a casual observer they would appear virtually identical. Both models were on the cutting edge of rifle design and technology for their time.

The Model 1803 was indeed a "short rifle," with a barrel length of 33 inches, versus 42 inches for the Model 1792, which was essentially a military version of the Pennsylvania long rifle. It was a "half-stock" rifle, meaning that its stock extended only halfway to the muzzle, as opposed to the full-stock Model 1792. It also had a larger bore than the Model 1792 (.53 caliber versus .50 caliber) and was far more powerful, firing a .52-caliber ball with about twice the muzzle velocity of the Model 1792. More than four thousand Model 1803s were manufactured at Harpers Ferry between 1803 and 1807. Each gun's lockplate bore the year of manufacture, and the serial number was stamped on the barrel.¹

Evidence to support the theory that the expedition's "short rifles" were based on either a late prototype or pattern-gun Model 1800 surfaced in 2004, when we learned of the existence of a rifle that, while differing in some details, had the same dimensions and general features as the Model 1803. The rifle is owned by Leon Budginas, a collector in Salt Lake City who had purchased it from a man who had acquired it thirty years earlier from a St. Louis antiques shop. Budginas lent us the rifle so we could build a replica based on it. It is an extraordinary find. The rifle's lockplate is marked with the year 1803, and its serial num-



The "Salt Lake City" Model 1800, serial number 15.



The authors' working copy of the Model 1800.



A Model 1803 Harpers Ferry rifle.

ber is 15—the lowest by far of any existing rifle with an 1803 lockplate. Differences in details between this rifle and higher-numbered Harpers Ferry rifles with 1803 lockplates lead us to believe that its manufacture predates production of the Model 1803. In other words, it is a Model 1800 made sometime in the first 11 months of 1803. Although its provenance remains conjectural, it is tempting to believe this rifle may be the last of the 15 made for the Lewis and Clark Expedition.

LEWIS AT HARPERS FERRY

Meriwether Lewis arrived at Harpers Ferry on March 16, 1803, bearing a one-sentence letter from Secretary of War Henry Dearborn instructing Perkin to provide him with whatever arms he needed: "You will be pleased to make such arms & Iron work, as requested by the Bearer Captain Meriwether Lewis and to have them completed with the least possible delay."²

Lewis, who remained at Harpers Ferry until April 14, had come to the right place for his rifles. Established in 1798, the Harpers Ferry armory, like the federal armory in Springfield, Massachusetts, was a major center for firearms research and development. As noted, although official records are silent about the existence of the Model 1800, there is strong circumstantial evidence that such a weapon was developed at Harpers Ferry under Perkin's guidance. In 1799, in response to concerns about a pending war with France, Congress authorized an increase in the regular army that included a regiment and battalion

of riflemen. More than 1,800 rifles were needed to equip this force—far more than the number of Model 1792 rifles in the army's inventory. Moreover, the Model 1792 was obsolete. Supplying the required number of weapons meant designing and manufacturing a new rifle. The War Department expended more than \$11,000 in 1800 on arms manufacture, and we can assume that some of these funds went toward development of the Model 1800.³

France and the U.S. soon patched up their differences, and with war no longer on the immediate horizon, Congress eliminated the rifle regiment and battalion it had authorized. But at least as a back-burner project, the development of a new rifle at Harpers Ferry must have continued for several years, even while it armorers focused on the main business at the time, the manufacture of muskets.⁴ In a letter dated May 25, 1803, Dearborn asked the Harpers Ferry armory to produce "a suitable number of judiciously constructed Rifles ... at least two thousand."⁵ The following year, Dearborn increased his order to 4,000 rifles.⁶

Dearborn's letter bristles with specifics about the kind of firearm he had in mind:

The Barrels of the μ s should not exceed two feet nine inches in length [i.e., 33 inches] and should be calculated for carrying a ball of one thirtieth of a pound weight—the barrels should be round from the muzzle to within ten inches of the Britch [breech], and not of an unnecessary thickness especially in the round part—the stock should not extend further than the tail pipe[;] from thence to within three

inches of the muzzle, an Iron rib should be substituted for that part of the stock—the ramrod should be of Steel and sufficiently strong for forcing down the ball without binding—the but[t] end of the ramrod should be concaved suited to the shape of the Ball—the locks should be light and well executed—the mounting should be brass. ... I have such convincing proof of the advantage the short rifle has over the long ones (commonly used) in actual service as to leave no doubt in my mind of preferring the short rifle, with larger Calibers than the long ones usually have & with stiff Steel ramrods instead of wooden ones—the great facility which such rifles afford in charging, in addition to their being less [liable] to become foul by firing, gives a decided advantage to men of equal skill and dexterity over those armed with the common long rifle.⁷

Dearborn was a bureaucrat, not a rifle designer, so what immediately becomes apparent from the letter's wealth of detail is that he was describing an existing rifle, perhaps one sent to him by Perkin for examination. Although there is no surviving correspondence, it is also possible that Lewis wrote to him about the rifle during his stay at Harpers Ferry or shortly thereafter.⁸ Whatever the source of the "convincing proof" of the short rifle's superior qualities, it is evident that a late prototype or pattern gun had been built and tested by the time Lewis left Harpers Ferry in April and that work had begun on his 15 rifles, which were based on it. As he wrote to Jefferson on April 20 from Lancaster, Pennsylvania, "My Rifles, Tomahawks & knives are preparing at Harper's Ferry, and are already in a state of forwardness that leaves me little doubt of their being in readiness in due time."⁹ Lewis returned to Harpers Ferry on July 6 for a brief visit. On July 8 he wrote to Jefferson, "Yesterday I shot my guns and examined the several articles which have been manufactured for me at this place; they appear to be well executed."¹⁰

Even if we disregard the possibility that Dearborn had a prototype in hand by May of 1803, there is no doubt that he did so later that year. On December 2, he wrote Perkin a letter specifying changes to the Model 1800 rifle that would create what we now know as the Model 1803. The letter states in part,

The ironed ribbed Rifle in my opinion is an excellent patter [pattern gun], with the following very trifling alterations. (Viz) the upper end of the upper thimble should be a little Bell muzzled to receive the introduction of the ramrod more conveniently—the aperture or cut in the sight near the Breech should be a little wider and a Brass ferrule placed on the end of the Stock near the tail pipe, to prevent that part of the Stock from splitting.¹¹



Top two photos: Detail of breech end of Salt Lake City gun showing its serial number, 15; lockplate of Salt Lake City gun showing year of manufacture, 1803. Bottom two photos: Same details on a Model 1803 Harpers Ferry rifle, serial number 318, manufactured in late 1803.

Note that Dearborn is explicitly talking about a final prototype or pattern ("patter") gun.¹²

Published sources on existing Model 1803s do not always mention serial numbers, but our research shows there are many rifles in collectors' hands bearing 1803 lockplates and serial numbers ranging from the 300s through the 700s. In our view, this conclusively demonstrates that the Harpers Ferry armory produced hundreds of short rifles in 1803, far more than the 15 ordered by Lewis. Our guess (and in the absence of further documentation that is all it

can be) is that Lewis's short rifles were completed by May 25, when Dearborn wrote Perkin placing his initial order for 2,000 rifles, and that production on this early version of the short rifle continued until receipt of Dearborn's letter of December 2 calling for modifications. Rifles made before receipt of that letter should be classified Model 1800s, while those made afterward—rifles that would have incorporated Dearborn's requested changes—should be classified Model 1803s. (It should be noted that the designation of early U.S. military weapons as "models" based on the year they were ordered is a 20th-century convention for the benefit of firearms historians and collectors. To Dearborn, the Model 1800 and Model 1803 were simply "the short rifle," as distinguished from "the long rifle," a.k.a. the Model 1792.)



Authors Richard Keller, left, and Ernest Cowan prepare to shoot their Model 1800 copy.

LOCKS AND BURST BARRELS

Among the novel features of the expedition's short rifle was a lightweight lock made with interchangeable parts. (A lock is the rifle's firing mechanism, consisting of the hammer, priming pan, frizzen, and other components.) Lewis also ordered extra locks and lock parts for his 15 rifles. To facilitate repairs in the field, all the expedition's locks and lock components were interchangeable. Dearborn's letter of May 25 makes no mention of the need for interchangeability, so we can be certain it was something Lewis insisted on. This feature—unique for firearms of the period—is another example of Lewis's careful preparation for an extended wilderness journey.

The Corps of Discovery's chief gunsmith, John Shields, used the extra locks and parts of locks many times to keep the rifles in working order. On March 20, 1806, as the expedition was readying to leave Fort Clatsop, Lewis noted,

The guns of Drewyer and Sergt. Pryor were both out of order. the first was repaired with a new lock, the old one having become unfit for use; the second had the cock screw broken which was replaced by a duplicate which had been made prepared for the lock at Harpers ferry where she was manufactured. but for the precaution taken in bringing on those extra locks, and parts of locks, in addition to the ingenuity of John Shields, most of our guns would at this moment be entirely unfit for use; but fortunately for us I have it in my power here to record that they are all in good order.¹³

Shields was also kept busy by a propensity of the short rifle's barrel to burst—an unfortunate trait the Model 1800 seems to have shared with the closely related Model 1803. In early July of 1806, when the explorers were encamped with the Nez Perce Indians on the homeward-bound journey, Shields repaired two short rifles that had burst at the muzzle.¹⁴ It is interesting to note that the barrels of three rifles carried on Zebulon Pike's exploration of the upper Arkansas River in 1806-07 also burst; historians believe the Pike expedition was probably equipped with Model 1803s.¹⁵ The Model 1803 used a finer-grained powder than the Model 1792. Because it burns faster, finer powder is more explosive and generates higher pressures, which propel the ball at greater speed. One weapons historian estimates that the short rifle had a muzzle velocity (the speed of the ball as it leaves the barrel) of 2,000 feet per second,¹⁶ about twice that of a typical long rifle. The high pressures put tremendous strain on the barrel, and even a partial blockage at the muzzle—a bit of dirt, mud, or even snow—could cause it to burst.

The Model 1803's shorter barrel demanded the use of finer powder. Finer (faster-burning) powder assured that the charge would be completely expended by the time the ball exited the muzzle—after that, any powder still burning was effectively wasted. This was a concern because good rifle powder was expensive (all the best stuff was imported).¹⁷ Finer powder also burned cleaner and was therefore less inclined to build up residue in the bore,

which could lead to fouling—an advantage noted by Dearborn in his letter of May 25. Lewis’s pre-expedition inventory lists 50 pounds of “best rifle Powder” acquired at Harpers Ferry and 123 pounds of comparable “English Cannister Powder” purchased in Philadelphia.¹⁸

THE SALT LAKE CITY RIFLE

The rifle owned by Leon Budginas, the collector in Salt Lake City—the one stamped with serial number 15, our candidate for a Model 1800—shows extremely hard use and some major modifications over the years. At some point its firing mechanism was converted from flintlock to percussion, and the barrel was rebored to remove the rifling. (This wasn’t unusual. Repeated firing wore down rifling, reducing accuracy and range. Reboring—in effect, converting the gun to a musket—was one “solution” to this problem. A musket was accurate enough at ranges up to 70 yards or so. It was easier to load, less subject to fouling, and more versatile because it could be loaded with either a single ball or multiple buckshot or birdshot.) The muzzle has been truncated, shortening the barrel length to 32 ¼ inches. The stock shows crude restoration attempts. The patchbox has been removed and its mortise covered with a piece of wood nailed in place. Sun patterns carved in the stock are inlaid with pine resin that has long since hardened into a glasslike substance. This primitive frontier motif suggests the gun might have belonged to a trapper who headed to the Rockies in the years after Lewis and Clark. The Corps of Discovery’s weapons and other equipment were sold at auction in St. Louis following the expedition’s return, and it is easy to imagine some of its rifles winding up in the hands of mountain men.

The rifle shares a number of similarities with early production versions of the Model 1803—features that, with some important exceptions, match the specifications laid out by Dearborn in his letter of May 25, 1803. As noted, it is the same length (less the three-quarters of an inch trimmed from the muzzle), and is half-stocked. The barrel is round for most of its length but octagonally shaped for the last 10 inches near the breech. A longitudinal piece of iron known as a rib is soldered to the underside of the barrel. Brazing joints on the rib indicate the location of three ramrod thimbles, short sections of steel tubing that hold the ramrod. The brass rear thimble, or “tail pipe,” as Dearborn called it, is mortised into the forward end of the stock.

Along with the similarities there are some differences supporting our view that this is not a Model 1803 production rifle but a Model 1800. In his letter of December 2, 1803, Dearborn specified that the upper or front thimble



Top photo: Muzzle end of a Model 1803 with front thimble slightly flared to receive the ramrod. **Middle and bottom photos:** Muzzle end of Salt Lake City gun with straight front thimble. Thimbles are brazed to the rib, which is soldered to the barrel.

should be “a little Bell muzzled” (i.e., should flare slightly) “to receive the introduction of the ramrod more conveniently.” The front thimble on early production Model 1803s are indeed flared, as Dearborn requested, but the one on the Salt Lake City gun is straight, pointing to a pre-December production date.

In other differences, the location of the center thimble is two inches farther forward on the rib. The rib is of three-piece hollow construction, not the solid-forged rib found on the Model 1803. The butt plate is two pieces of brass brazed together rather than a single piece of cast brass. (The multipiece construction of the rib and butt plate is consistent with a prototype weapon, while cast components are in keeping with a production version.) The front sight is of German silver instead of brass. The Salt Lake City gun has a raised, buckhorn-style rear sight rather than a notched flat sight. The name “buckhorn” derives not from the sight’s material—it is made of iron—but from its distinctive U-shaped profile, recalling the antlers of a buck deer. (It was designed for shooting in low light.) The sight is marked with the same batch mark (four closely spaced slashes) as the rifle’s other components, indicating it was fitted at Harpers Ferry and not added later.

THE QUESTION OF RIFLE SLINGS

Conspicuously absent from the Salt Lake City gun are swivels for attaching a rifle sling. Nor is there evidence that swivels were once part of the weapon. Historians have

Shooting the Model 1800 short rifle and Girandoni repeating airgun

There may be no one on earth with a more intimate knowledge of the Lewis and Clark short rifle and airgun than Ernie Cowan. That's because Cowan, a remarkably skilled and largely self-taught gunsmith in Chambersburg, Pennsylvania, builds working copies of these weapons.

His copies are based on a meticulous examination of the originals. His model for the short rifle was a gun made at Harpers Ferry in 1803—the "Salt Lake City rifle" discussed in the main text. His airgun is based on a Girandoni air rifle with repairs that point to a previous ownership by Meriwether Lewis. (See related story, pages 29-34.)

In late March I drove to Chambersburg from my home in New Jersey to meet Cowan and his partner and collaborator, Rick Keller. I wanted to have a firsthand look at the copies and to shoot them if possible. As a bonus, Keller told me on the phone that they also had the original Harpers Ferry rifle on loan from the owner, so I could examine that as well.

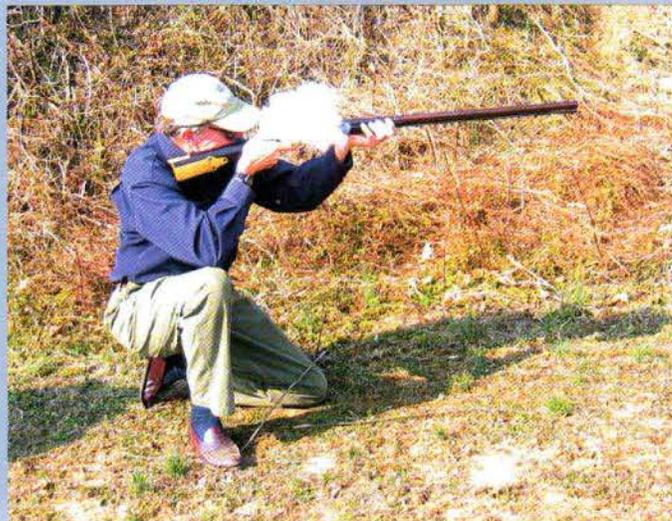
Cowan's rambling shop is in the basement of an old warehouse whose main floors are devoted to Keller's company, Great War Militaria, which sells World War I memorabilia to collectors and reenactors. The shop is filled with tools for forging, cutting, grinding, and machining—Cowan makes virtually all of a gun's components from raw materials, whether iron, bronze, steel, or wood. A pair of Newfoundlands named Shadow and Lance greet visitors with a friendly nuzzle. (Lewis's dog, Seaman, was a Newfoundland, but Cowan's fondness for the breed predates his interest in the L&C Expedition.)

A former deputy sheriff from Chautauqua, New York, Cowan has been working with Keller since the early 1990s. He began by repairing World War I weapons, but the two share a broader interest in antique weapons of all sorts.

When the Lewis and Clark Bicentennial came along, in 2003, they got interested in the debate over the expedition's short rifle. Keller, who does exhaustive research on a weapon before Cowan makes it, initially embraced the then-prevailing view that the short rifle was a modified version of the Model 1792 Harpers Ferry rifle. He changed his mind after examining the Salt Lake City gun, a Model 1800. The rifle is in what Keller calls "almost relic" condition. It isn't a whole rifle but a collection of disassembled rifle parts that have seen a lot of wear. By contrast, the copy made by Cowan is a gleaming facsimile of the gun as it must have looked when it came off the bench at Harpers Ferry 203 years ago.

The craftsmanship that went into Cowan's copy of the Girandoni air rifle was even more exacting because of the weapon's tight tolerances and advanced technology. Building it took him 16 months.

Cowan had set up a makeshift range in his workshop for testing the airgun, and he let me shoot a few rounds. First he showed me one of the lead balls, which at .46 caliber is nearly half an inch in diameter. "We're not talking about a BB gun—this rifle can kill you," he said. Following his instructions, I chambered a ball from the magazine, drew back the hammer, aimed, and fired.



The writer fires Ernie Cowan's copy of the Model 1800 rifle.

I had long been curious about what sort of sound an airgun makes. It's a distinctive WHACK!, followed in this case by the near-instant thud of the ball into the bale of straw behind the target. Cowan noted that the airgun is a lot louder indoors. "Outside, if you're shooting at a distance of 50 yards your target wouldn't know it."

Later, we loaded Shadow and Lance into the back of Cowan's truck and drove to an outdoor range to shoot his copy of the short rifle. He poured a measure of black powder down the barrel and followed it with a .52-caliber ball wrapped in a patch of greased cloth. A pinch more powder went into the priming pan.

Keller had warned me that the rifle kicked, but when I fired at a target propped against a dirt bank 25 yards away its recoil seemed no worse than that of the .22-caliber rifles I remember shooting in summer camp 50 years ago. But no .22 ever produced such a prodigious cloud of smoke. The sound was a CRACK! loud and sharp enough to summon the ghosts of Meriwether Lewis and William Clark.

Cowan and Keller appear at antique gun shows, displaying their copies of the Model 1800 and Girandoni airgun (and when available, the disassembled Salt Lake City gun). They are regulars at the Baltimore Antique Arms Show, held annually in March; this year they won the prize for best educational exhibit.

They pursue their interest as a hobby, not a business, in the belief that the only way you can truly understand an antique firearm is to make a copy of it from scratch. In the case of the Girandoni repeater, said Cowan, "It was a real eye-opener to see that until we built one, the experts had little clue as to how this gun actually worked."

Keller swears the guns produced by his partner are more finely crafted than the originals: "After 15 years of working with Ernie I'm still amazed at what he turns out. He builds them better than they did back then."

—Jim Merritt



Close-up of the Salt Lake City rifle's U-shaped buckhorn rear sight.

Components of the disassembled Salt Lake City rifle, clockwise from top left: butt plate and ramrod thimble; makeshift wooden patchbox cover, which was added later; trigger plate; stock; barrel.

debated whether the expedition's rifles were outfitted with slings. We think they were not, even though Lewis included "15 Gun Slings" on his list of requirements, and Harpers Ferry records show that Lewis drew 15 slings from the armory.¹⁹ The records also show that he drew 15 powder horns, 15 cartouche-box belts, and 15 shot pouches, as well as 500 rifle flints and 125 musket flints.²⁰ Lewis at the time still thought the expedition's permanent party would include 15 soldiers recruited from frontier forts on the Ohio River. These soldiers would have come already equipped with muskets. We think Lewis intended the slings for muskets, not rifles. In 1803, slings were standard equipment on muskets but were not issued to riflemen, who were meant to carry their arms at the ready at all times. Lewis knew that slings and other accouterments might be in short supply or poor condition at the posts where he expected to recruit, and he made sure to bring his own so as not to deplete under-stocked stores.²¹

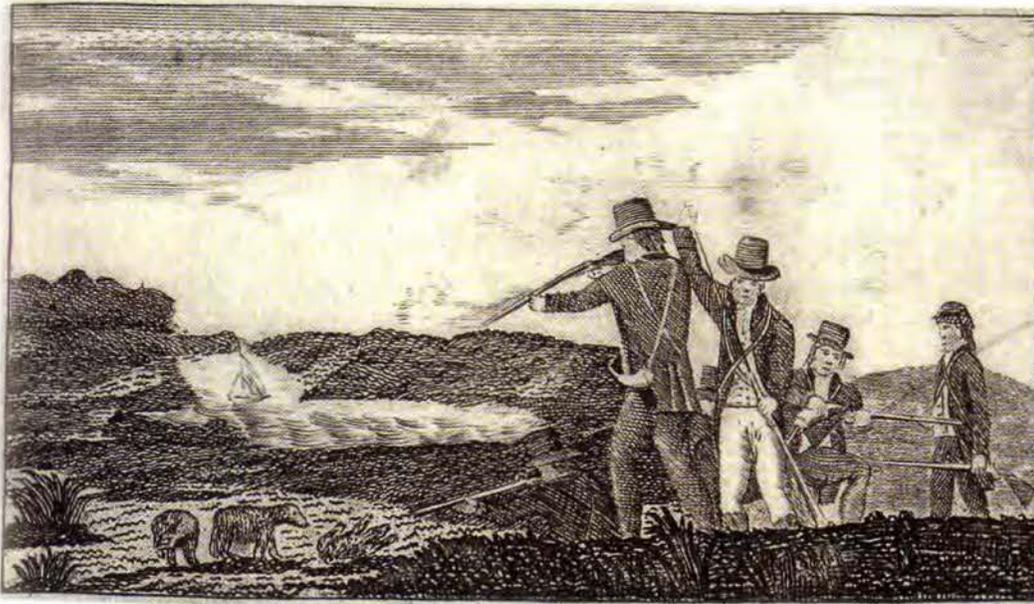
It should be noted, too, that nowhere in the journals are rifle slings (or slings of any sort, for that matter) mentioned. The journals do, however, offer at least one piece of circumstantial evidence that the rifles did not carry slings. On July 29, 1804, while walking on a log spanning a creek in present-day Iowa, Private Alexander Willard dropped his rifle in the water—an incident less likely to have occurred had the gun been shouldered on a sling. (Reuben Field jumped in and retrieved it.)

Although open to interpretation, four of the six woodcuts appearing in the 1811 edition of Sergeant Patrick Gass's expedition journals also offer evidence for slingless rifles. A total of nine shoulder arms (all presumably rifles)

appear in these illustrations, and none of them have slings. It is easy to dismiss these woodcuts as artistic flights of fancy; all are quite amateurish and have an almost child-like quality. Yet many of their details (particularly of clothing and accouterments) appear to be accurate.²² One illustration shows Clark and three other men hunting bears; another depicts Lewis shooting at Indians, with two other men gripping rifles. All of the rifles are noticeably short, as though the artist had taken care to distinguish them from long rifles and muskets.²³

Dearborn, as noted, eventually increased his order for short rifles from 2,000 to 4,000, but the exact number of rifles manufactured at Harpers Ferry between 1803 and 1807 was 4,015.²⁴ This is according to the so-called Bomford Production Records, compiled in 1822 by Colonel George Bomford, the army's chief of ordnance, from storekeepers' records at Harpers Ferry. The Bomford records for Harpers Ferry production rifles begin in 1804.²⁵ This would appear to suggest that no rifles were made in 1803, but as one weapons historian points out, storekeepers' records "usually summarized several earlier deliveries and should not be construed as the actual dates of deliveries."²⁶ The existence of rifles with 1803 lockplates proves that short rifles were manufactured that year, even though those rifles did not go on the books until 1804.

Whatever year their manufacture began, it is clear from the record that Dearborn ordered 4,000 rifles and the armory made 4,015. From this we can reasonably assume that the Harpers Ferry gunsmiths began their production of short rifles with the 15 made for Meriwether Lewis—



This woodcut from the 1811 edition of Patrick Gass's journal depicts the explorers shooting bears. The rifles are noticeably short and do not carry slings.

rifles they numbered 1 through 15—and that the numbering sequence continued as they fulfilled Dearborn's subsequent orders for 4,000 more.

To put it another way, the 15 "extra" rifles over and above the 4,000 ordered by Dearborn were the pre-production rifles ordered by Lewis. The physical evidence found on the Salt Lake City gun suggests it is one of Lewis's rifles and a relic of the expedition.

Richard Keller and Ernest Cowan are leading authorities on the history of early American firearms. They live and work in Chambersburg, Pennsylvania, and make museum-quality copies of antique guns.

NOTES

¹ A Model 1803 rifle manufactured in 1806, for example, would have "1806" on its lockplate. Unlike a smoothbore firearm such as a musket or shotgun, a rifle has spiral grooves—rifling—cut into its bore. The rifling imparts spin to the ball, resulting in greater range and accuracy. In any flintlock rifle, the caliber (diameter) of the bore is slightly larger than the caliber of the ball. The gap allows room for a cotton patch that wraps around the ball and presses against the rifling. This rifling-patch-ball connection gives the ball its spin.

² Donald Jackson, ed., *Letters of the Lewis and Clark Expedition with Related Documents, 1783-1854*, 2 volumes (Urbana: University of Illinois Press, 1978), Vol. 1, pp. 75-76. Dearborn spelled Perkin's name incorrectly as "Perkins."

³ Charles Winthrop Sawyer, *Our Rifles*, Volume 3 of *Firearms in American History*, 3 volumes (Boston: Pilgrim Press, 1920), pp. 127-128; Frances B. Heitman, *Historical Register and Dictionary of the United States Army*, 2 volumes (Washington, D.C.: U.S. Government Printing Office, 1903), Vol. 2, p. 567; Stuart E. Brown, Jr., *The Guns of Harpers Ferry* (Berryville, Va.: Virginia Book Co.), p. 10. Sawyer was the first person to argue for

the existence of a Model 1800 rifle. He does not use the term Model 1803, but instead refers to all contract rifles made at Harpers Ferry through 1814 as Model 1800s.

⁴ Government records show the armory produced 293 muskets in 1801, 1,472 in 1802, and 1,048 in 1803. Merritt Smith, *Harpers Ferry Armory and the New Technology* (Ithaca, N.Y.: Cornell University Press, 1977), Table 1.

⁵ James E. Hicks, *U.S. Military Firearms, 1776-1956* (La Canada, Calif.: J.E. Hicks, 1962), p. 25.

⁶ On November 1, 1804, Dearborn ordered Perkin "to continue making them [short rifles] until 4000 shall be completed." (Ibid.) Government records (Smith, Table 1) indicate that the Harpers Ferry armory produced 4,015 rifles between 1804 and 1807 (772 in 1804, 1,716 in 1805, 1,381 in 1806, and 146 in 1807). As discussed later in the text, this tally includes Model 1800s and Model 1803s manufactured in 1803, even though the records do not list any rifles made that year. Evidence for the start of manufacture in 1803 comes from lockplates marked with that year and from a letter (also discussed later) Dearborn wrote to Perkin on December 2, 1803, suggesting minor alterations to the pattern rifle. (Hicks, p. 25.) An additional 5,703 Model 1803s—most with barrel lengths of 36 inches—were made between 1814 and 1820. Some weapons historians believe these later rifles ought to be called Model 1814s.

⁷ The Model 1792 hypothesis was first presented by Frank A. Tait in "The U.S. Contract Rifle Pattern of 1792," an article in the May-June 1999 issue of *Men at Arms*, the magazine of the National Rifle Association. Proponents of the theory that the expedition's short rifle was a modified Model 1792 dismiss the possibility that instead it might have been, in effect, a pre-production Model 1803 based on Dearborn's specifications. They say that it would have been impossible, as one source puts it, "to design, plan, and manufacture from scratch 15 brand new weapons between May 26 (the earliest probable date of the receipt of Dearborn's letter)" and early July, when Lewis returned to Harpers Ferry to pick up the completed weapons; the quote is from Robert J. Moore, Jr., and Michael Haynes, *Tailor Made, Trail Worn: Army Life, Clothing and Weapons of the Corps of*

Discovery (Helena, Mont.: Farcountry Press, 2003), p. 259. This argument fails to consider, of course, that most or all of the design and prototyping had already been done.

⁸ Lewis left Harpers Ferry on April 14 and proceeded to Lancaster, Pennsylvania, and then to Philadelphia. He returned to Washington on June 6 or 7, two weeks after Dearborn wrote his letter to Perkin.

⁹ Jackson, Vol. 1, p. 40.

¹⁰ *Ibid.*, p. 107. The main purpose of Lewis's return to Harpers Ferry was to arrange for shipment of the manufactured goods (which along with weapons included the iron frame of a collapsible boat) to Pittsburgh, where he went next to supervise construction of the expedition's keelboat. He left Harpers Ferry on July 8, immediately after posting his letter to Jefferson.

¹¹ Hicks, p. 25.

¹² The Model 1800 could easily have been prototyped in the 1800-1803 time frame, as Sawyer suggests, and something close to a pattern gun was probably available by the time of Lewis's arrival in March 1803.

¹³ Gary E. Moulton, ed., *The Journals of the Lewis & Clark Expedition*, 13 volumes (Lincoln: University of Nebraska Press, 1983-2001), Vol. 6, p. 441. Among Lewis's list of expedition requirements, which is undated but which he apparently compiled before his first visit to Harpers Ferry, were "Extra parts of Locks" (Jackson, Vol. 1, p. 70); but as this journal entry explicitly states, the expedition's stores included "extra locks" as well.

¹⁴ Moulton, Vol. 8, p. 80. Clark's entry for July 2, 1806, reads in part, "two of the rifles have unfortunately bursted near the muscle. Shields Cut them off and they Shute tolerable well." One of the rifles was "very Short" as a result of Shield's amputation and was exchanged with a Nez Perce for an unmutilated rifle given to him earlier for guiding them across the Bitterroot Mountains.

¹⁵ Brown, p. 32; Louis A. Garavaglia and Charles G. Worman, *Firearms of the American West, 1803-1865* (Albuquerque: University of New Mexico Press, 1984), p. 9.

¹⁶ Sawyer, p. 131.

¹⁷ English companies made the best powder, and the powder used in the short rifle was almost certainly imported from England. At the time of the Lewis and Clark Expedition, the DuPont company, which had started making gunpowder in 1801 or 1802, manufactured a coarser-grained powder based on a French formula. (Personal correspondence, Hagley Museum Library and Archive, Wilmington, Del.)

¹⁸ Jackson, Vol. 1, pp. 87, 97, and 98. The inventory also lists 176 pounds of coarser "Gun powder" for use in the expedition's muskets and other weapons. In his journal entry for February 1, 1806, Lewis describes inspecting the corps' powder supply at Fort Clatsop, which comprised 27 canisters of "best rifle powder," four canisters of "common rifle" powder, three canisters of "glaized" powder, and one canister of "musqut powder." (Moulton, Vol. 6, p. 265.) The "common" rifle powder was probably reserved for the expedition's long rifles (all personal weapons). "Glaized powder" was an English term for rifle powder, but we are not sure where it fell on the quality scale. Lewis included "200 lbs. Best rifle powder" in his list of expedition requirements. (Jackson, Vol. 1, p. 70.)

¹⁹ Jackson, Vol. 1, pp. 70 and 98.

²⁰ *Ibid.*, p. 98.



Ernest Cowan loads the Model 1800 short rifle he built (based on the Salt Lake City rifle) with a 52-caliber ball.

²¹ An 1803 inspector's report of deficiencies at Fort Kaskaskia included "Gunslings wanting." Moore and Haynes, p. 14.

²² A point made by Moore and Haynes, whose *Tailor Made, Trail Worn* is the definitive work on the Corps of Discovery's clothing.

²³ All six of these frequently printed illustrations can be found in Carol Lynn MacGregor, ed., *The Journals of Patrick Gass* (Missoula, Mont.: Mountain Press, 1997), pp. 62, 77, 90, 136, 205, and 208. Sling proponents point to the well-known full-length portrait of Lewis painted by Charles B.J.F. de Saint-Mémin. Painted in Philadelphia after the expedition, it depicts Lewis posed with a long rifle with sling attachments. The rifle's fancy trigger guard, checkered wrist, and strange patchbox rule this out as any sort of military firearm—it may well have been a prop supplied by the artist. Even if it were a recognizable military short rifle it could not have been one carried on the expedition, since all weapons and other equipment were auctioned in St. Louis following the Corps of Discovery's return.

²⁴ Hicks, p. 25; Smith, Table 1. As previously noted, Dearborn placed the order in a letter to Perkin dated November 1, 1804.

²⁵ Smith, Table 1, shows Harpers Ferry production records for all types of weapons between 1801 and 1842. Bomford is Smith's source for the years 1801-1822. An additional 15,703 Model 1803s were manufactured between 1814 and 1820. Some weapons historians have reclassified these later production rifles as Model 1814s due to significant design changes, including a longer barrel length of 36 inches.

²⁶ George Moller, *American Military Shoulder Arms*, 2 volumes (Niweat, Colo.: University Press of Colorado, 1993), Vol. 2, p. 347.

MERIWETHER LEWIS'S WONDER WEAPON

The captain's airgun "astonished" the Indians, not least for its ability to shoot many times without reloading. New evidence suggests that the one he took on the expedition was a 22-shot repeater in the author's collection

BY ROBERT BEEMAN



The Girandoni air rifle that may have belonged to Lewis

Meriwether Lewis's airgun is mentioned 39 times in the journals of the Lewis and Clark Expedition—more than any other weapon in the Corps of Discovery's arsenal—but it is never described. The last contemporary reference to this elusive weapon appears on a list of items shipped east from St. Louis in late 1806.¹ In 1846, it surfaced briefly in a notice advertising an estate sale for Isaiah Lukens, a Philadelphia clock, instrument, and gun maker: "1 large air gun . . . used by Messrs. Lewis & Clark in their exploring expeditions."² It was presumably purchased by an individual and passed down unheralded in his family. The notice makes clear that the airgun still existed 40 years after the expedition's return, and it is reasonable to assume that it survived to the present day.

The first mention of the airgun in the Lewis and Clark journals occurs in the very first entry made by Lewis—on August 31, 1803, the day he began his descent of the Ohio River in the expedition's keelboat, on his way to

meet William Clark at Louisville. Lewis stopped briefly at a place called Brunots Island. As he recorded,

Left Pittsburgh this day at 11 o'clock with a party of 11 hands 7 of which are soldiers, a pilot and three young men on trial they having proposed to go with me throughout the voyage. Arrived at Bruno's Island 3 miles below halted a few minutes. went on shore and being invited on by some of the gentlemen present to try my *airgun* which I had purchased brought it on shore charged it and fired myself seven times fifty five yards with pretty good success; after which a Mr. Blaze Cenas being unacquainted with the management of the gun suffered her to discharge herself accidentally[.] the ball passed through the hat of a woman about 40 yards distant cutting her temple about the fourth of the diameter of the ball; shee fell instantly and the blood gusing from her temple[.] we were all in the greatest consternation supposed she was dead [but] in a minute she revived to our enespressable satisfaction, and by examination we found the wound by no means mortal or even dangerous.³

The only detailed contemporary description of the

airgun in action appears in a travel diary kept by Thomas Rodney, who met Lewis at Wheeling, Virginia, in early September of 1803, a week after the accident at Brunots Island. The passage reads,

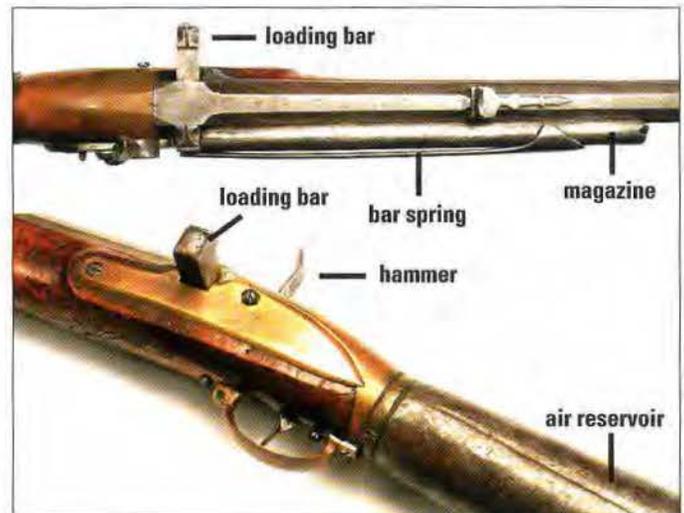
Visited Captain Lewess barge. He shewed us his air gun which fired 22 times at one charge. He shewed us the mode of charging her and then loaded with 12 balls which he intended to fire one at a time; but she by some means lost the whole charge of air at the first fire. He charged her again and then she fired twice. He then found the cause and in some measure prevented the airs escaping, and then she fired seven times; but 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 britch of the gun as serves for one ball. It is a curious peice of workmanship not easily discribed and therefore I omit attempting it.⁴

In an article in the November 2002 *WFO*, firearms historian Michael Carrick drew attention to this passage and its bearing on questions about the kind of airgun Lewis carried on the expedition. Carrick pointed out that Rodney could only be describing a repeating rifle of the sort made by Bartholomäus (also spelled Bartolomeo) Girandoni of Vienna. I was initially skeptical of Rodney's claim that Lewis had a repeating air rifle and continued to believe that the expedition airgun was probably a single-shot weapon made in the Lukens shop and now owned by the Virginia Military Institute.⁵ Evidence supporting the V.M.I. gun was stronger, I believed; casting further doubt on Rodney's account were remarks by the editors of his diary that he was prone to "creative exaggeration and rich embellishment."

Previous articles about the Girandoni military airgun tended to repeat the error that these guns had 20-shot magazines (capacity varied depending on model). Rodney was the only source to mention a 22-shot capacity—an exacting statement made twice in his account. Consideration of this fact is one of the points that finally compelled me to believe Rodney. Physical evidence from a Girandoni repeating air rifle in my collection further led me to accept his report and to conclude that this rifle, in fact, was the one carried on the expedition.

THE GIRANDONI REPEATING AIR RIFLE

Girandoni produced some 1,500 air rifles for the Austrian army. They were delivered between 1780 and 1788. These powerful, rapid-fire rifles—the assault weapons of their day—were years ahead of their time, but they also required high maintenance and staggering logistics to keep them



Top and side views of the breech area of the Beeman airgun. The spring keeps tension on the loading bar. Pushing the bar to the right allows a ball to move from the magazine into a chamber inside the bar. When the shooter releases the bar, the spring pushes the loading bar back to the left, moving the ball into firing position.

charged with air during battles; they also had a high failure rate, due particularly to defective iron in the air reservoirs. Presumably for all these reasons, the Austrian army retired its Girandoni rifles in 1799. They were still in secure storage as of 1806, but some evidently had found their way into civilian circulation, and at least one of these made it across the Atlantic in time for Lewis to acquire it before the start of the expedition.

In 1970s, I was fortunate enough to acquire for the Beeman Airgun Collection a Girandoni air rifle of the same model supplied to the Austrian army. Its provenance was unknown, but over the following three decades I learned that only one or two Girandoni military repeating air rifles exist in the Americas. Thus, we are not searching through a long list of candidates for the Lewis air rifle. Actually, there are very few of these rifles anywhere in the world, and European museums indicate that their specimens have never left Europe. Copies of the Girandoni system are also uncommon, and virtually all of them were either made too late to have been carried on the expedition or are of a design inappropriate for such a wilderness journey. Furthermore, their ball capacities were less than 22.

The Beeman rifle has a butt reservoir and a rifled bore with a caliber of 11.75 mm (.463 inch), a popular caliber of that period. As noted in the Rodney account, its iron reservoir, which holds a supply of compressed air and serves as the rifle's buttstock, has an unusual "bag" shape. The rifle has an external tubular magazine, located along the right side of the barrel, and a transverse loading bar at the breech end of the barrel. A flat spring running the length of the outside of the magazine holds the loading

bar to the left. When the gun is held muzzle up and the left end of the loading bar is pushed by the shooter, the bar moves to the right and a chamber within the bar receives a ball by gravity feed from the magazine. The ball is moved into firing position behind the barrel when the shooter releases pressure on the bar and the spring pushes the loading bar back to the left.

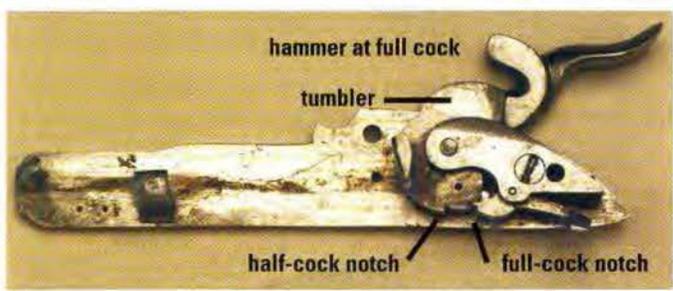
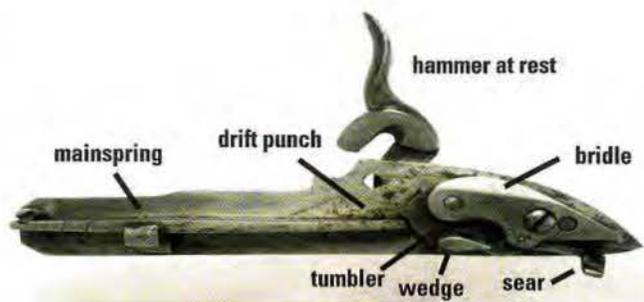
The magazine holds 21 balls; with one ball seated in the firing socket of the loading bar, the rifle's total capacity is 22 balls—a critical point, for as Rodney's account states, Lewis's "air gun . . . fired 22 times at one charge."

Lewis almost certainly acquired his airgun during his monthlong stay in Philadelphia during the spring of 1803, while outfitting the expedition. He probably purchased it from Isaiah Lukens, or possibly Joseph Kunz. Lukens had been making some excellent single-shot airguns, probably for several years before Lewis came to Philadelphia to equip the expedition; Kunz at the very least expanded that line of airguns. A third airgun enthusiast in Philadelphia at the time was a mechanically talented fellow named Coleman Sellers. I think of these three young men—they were all in their twenties—as America's first "airgun nuts." Of all the people in Philadelphia in 1803, they would be the ones most likely to come by a Girandoni air rifle from Europe.⁶

TELLTALE FEATURES OF THE BEEMAN GUN

The turnaround in my views about the expedition's air rifle occurred in late 2004, when I found that the Girandoni air rifle in the Beeman collection could be charged with exactly 22 lead balls and learned that it has certain features matching repairs to Lewis's gun made by the Corps of Discovery's blacksmith and gunsmith, John Shields.

I had loaned the rifle to Ernest Cowan and Richard Keller, a gun-maker and a weapons historian in Chambersburg, Pennsylvania, who specialize in replicating antique firearms for museums and private collectors; they asked to borrow my Girandoni to use it as a model for several replicas they wanted to make. In consultation with two British airgun authorities, Geoffrey Baker and Colin Currie, they confirmed that the weapon was a military version made in the Girandoni shop. None of this came as a particular surprise to me, but one discovery they made did get my attention: the rifle's mainspring (the interior component that puts tension on the hammer) was not the original but a very old replacement; it was apparently made from a farrier's file, a type of coarse rasp used for trimming a horse's hoof. A small area under this improvised mainspring revealed traces of the diamond-shaped groove pattern typical of a double-cut file of this sort. This sur-



Inside views of lock with hammer at rest (top) and at full cock (bottom). In top photo, drift punch (which Lewis didn't know about) restrains the thick, flat mainspring (removed in the bottom photo). Notches in the tumbler engage the sear at the half- and full-cock positions. The sear and tumbler rotate on pins secured by the bridle. See diagrams on page 34 for details of how parts interact during firing sequence.



Farrier's file (top) and underside of the airgun's replacement mainspring. Note the diamond pattern of the file's double-cut rasps and traces of the same pattern on the spring. This field repair was probably made by the expedition's able gunsmith and blacksmith, John Shields.

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prising revelation, combined with the gun's 22-ball capacity, began to ring some mental bells.

We know from Lewis's journals that during the expedition his airgun's mainspring broke and was replaced. Such a repair is the very kind expected of John Shields, who time and again on the expedition showed a knack for improvising, using whatever materials happened to be on hand. A file probably would have been the only piece of suitable metal carried on the expedition of the size needed to replace such a long, thick mainspring. Shields was more than capable of such special work as shaping, annealing, and re-tempering a farrier's file. In his journal entry for June 10, 1805, Lewis wrote,

Shields renewed the main Spring of my air gun[.] we have been much indebted to the ingenuity of this man on many occasions, without having served any regular apprenticeship to any trade, he makes his

own tools principally and works extremely well in either wood or metal.⁷

The mainspring of a military version of the Girandoni air rifle was quite rugged and under normal circumstances would not be expected to break.⁸ When removing the rifle's lock mechanism for repair or cleaning, however, it was important to secure the mainspring by inserting a drift punch into a small hole in the lockplate—otherwise, the sudden release of the mainspring could cause it to snap. Most likely, this is what happened to the mainspring of Lewis's gun. Given their unfamiliarity with the Girandoni design, probably neither Lewis nor Shields was aware of the purpose of the lockplate hole or the necessity of securing the mainspring in this manner.

There are other features peculiar to the Beeman rifle that point to a connection with the expedition. On August 6, 1805, while the explorers were ascending the Jefferson River, three of the canoes swamped while navigating rapids. At least one of them struck rocks, resulting in significant damage to the boat itself and to its cargo, which appears to have included the air rifle. In his journal entry for the next day, Lewis wrote, "my air gun was out of order and her sights had been removed by some accident[.] I put her in order and regulated her. she shot again as well as she ever did."⁹

Close examination of the Beeman rifle reveals a number of repairs consistent with the damage that likely occurred in this accident (damage of a sort almost never found on ordinary working guns):

- The forward barrel lug, which bears a cross pin to retain the brass nose cap on the forward tip of the stock, has been torn open and was later partially repaired.
- The forward end of the stock forearm has been repaired. The stock is made of European walnut, but a replacement piece used in the repair is American walnut.
- The original cast-brass middle thimble was crushed and an inconsistent rolled-brass thimble substituted for it. (The original cast part could not have been bent back into shape without breaking.)
- The existing wooden cleaning rod is clearly a replacement, which one would expect given damage to the center and left-front area of the barrel and stock.
- A close look at the barrel surface and sights reveals repairs by someone less skilled than Shields—possibly Lewis, who specifically noted that the sights had been removed and that he himself had put "her [the gun] in order and regulated her" [i.e., adjusted the sights]. Longitudinal draw-file marks on the original barrel are crossed by rough transverse file marks consistent with the trimming of im-



Underside of octagonal barrel showing torn-open lug, evidence of damage that might have occurred in canoe accident of August 6, 1805. Note angled filemarks on middle flat of barrel—evidence of possible field repair—compared to lengthwise factory marks on bottom flat.



Opened joints on the forearm of the gun's stock, which also may have been damaged in the accident. The left piece is original European walnut, while the replacement piece (right) is American walnut.



Middle thimble on the right is from the Beeman airgun. It is an obvious replacement, made from rolled brass. The gun's other thimbles are cast from solid brass like the example at left (a copy of an original).

pact gouges and replacement of the front sight. The rough nature and irregular angles of the forward filing marks suggest this was not the work of a skilled gunsmith like Shields but of an unskilled person like Lewis.

Another particular of the Beeman air rifle appears to connect it to the accident on the Ohio in 1803. Recall that Lewis, while stopped at Brunots Island, shot the rifle seven times "with pretty good success" and then handed it to a certain Blaze Cenas, who, "being unacquainted with the management of the gun," fired it accidentally. The ball hit a woman standing 40 yards away, cutting her temple and doubtless shaking her up, but leaving her otherwise unhurt.

Lewis and others present that day (including Cenas) were familiar with flintlock firearms, and it would have

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been natural for any of them to put the gun on half cock to safeguard it against accidental firing. A typical flint-lock will not fire on half cock when the trigger is pulled—to fire the gun you must pull the hammer past the half-cock position (normally to full cock). A tumbler attached to the base of the hammer has notches in it at the half- and full-cock positions. A sear, or catch, snaps into one or the other notch, holding the tumbler and hammer in place. Pulling the trigger releases the sear and trips the hammer.

It turns out that the Beeman rifle has a faulty tumbler—the spur on the half-cock notch is broken off. While the gun can still be brought to half cock, the sear rests precariously in the notch; a light touch to the trigger or even a jolt can release it. The broken spur meant that Lewis's airgun at half cock had a hair trigger. (Firing from the half-cock position would release less air from the reservoir than firing from full cock, but as the wounding of the unfortunate woman attests, the shot would still be powerful enough to be dangerous.)

One other contemporary mention of Lewis's airgun is a brief passage in an account by the Canadian fur trader Charles McKenzie relating his visit to the Mandan and Hidatsa villages in the winter of 1804-05, when the expedition was camped nearby at Fort Mandan. According to McKenzie, "The Indians admired the air gun as it could discharge forty shots out of one load, but they dreaded the magic of the owners." While some writers have interpreted this to mean that the magazine held 40 balls, I believe McKenzie meant that the rifle could fire 40 shots with a single load of air in the reservoir. A replica Girandoni airgun of .51 caliber can fire at least 35 balls on a single charge, so Lewis's smaller .46-caliber weapon should easily have been able to fire 40 balls. It is also possible that Lewis carried a Girandoni speed-loader, an accessory holding a 20-ball load for quickly refilling an emptied magazine. A speed-loader would have enabled him to fire two magazine loads—40 rounds in all—in quick succession on a single charge of air.

Given the airgun's capabilities, some have wondered why it apparently was never used for hunting. My assumption is that its defective half-cock made it unsafe for regular use and that Lewis quickly realized it should be reserved for its real value—the psychological impact it had on Indians. This wonder weapon was quiet, produced no flash or smoke, and seemingly could shoot forever. McKenzie's statement that the Indians "dreaded the magic of the owners" of this awesome weapon is echoed by Private Joseph Whitehouse. On August 30, 1804, when the explorers met with the Yankton Sioux,



Left: Original components (spring, spindle, seat) of air intake/exhaust valve. Right: Reproductions of same. The valve's seat or gasket, located at the top of the spindle, was made of three layers of hardened leather.



Breech area with lockplate and lock removed. A brass medallion, placed for scale purposes, is 22 mm (7/8th inch) in diameter.



The bronze receiver (analogous to the receiver in a firearm) receives air from the reservoir when the gun is fired. Dotted line marks path of air through air-transfer passage from reservoir to ball chamber.

Captain Lewis took his Air Gun and shot her off, and by the Interpreter, told them there was medicine in her, and that she could do very great execution. They all stood amazed at the curiosity; Captain Lewis discharged the Air Gun several times, and the Indians ran hastily to see the holes that the Balls had made which was discharged from it. at finding the Balls had entered the Tree, they shouted a loud at the sight and the Execution that was done surprized them exceedingly.¹⁰

On the return journey, when the expedition was dealing with troublesome tribes on the Columbia, Clark described how "Capt Lewis fired his Air gun which astonished them in Such a manner that they were orderly and

kept at a proper distance during the time they continued with him.”¹¹ Clark is saying that the airgun was the only thing that kept the Indians at a safe distance. The Indian method of attack was to rush an enemy after the defenders fired their single-shot guns. It seems unlikely that a single-shot air rifle would have been so intimidating.¹²

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NOTES

¹ Gary E. Moulton, ed., *The Journals of the Lewis & Clark Expedition*, 13 volumes (Lincoln: University of Nebraska Press, 1983-2001), Vol. 8, p. 419.

² The full quotation states that the airgun was “made for, and used by” Lewis and Clark, but as the ensuing text argues, the gun almost certainly was not made by Lukens. For a facsimile of the estate-sale notice, see Michael Carrick, “Meriwether Lewis’s Air Gun,” *WPO*, November 2002, p. 16.

³ Moulton, Vol. 2, p. 65.

⁴ 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.

⁵ Carrick's article appears on pages 15-21 of the November 2002 *WPO*. Follow-up letters appear in *WPO* issues of August 2003 (Carrick), p. 2; November 2003 (Kerry Lippincott), p. 3; February 2004 (Beeman), pp. 5-6; May 2004 (Carrick), pp. 3-4; and November 2004 (Beeman), pp. 3-4.

⁶ There is no evidence that Coleman Sellers was a gunsmith, but he was involved in his father's boiler trade and apparently imported gun barrels via that business.

⁷ Moulton, Vol. 4, p. 275. Lewis's entry for the previous day (June 9) states in part, “as we had determined to leave our blacksmith's bellows and tools here it was necessary to repare some of our arms, and particularly my Airgun the main spring of which was broken.” (*Ibid.*, p. 271.)

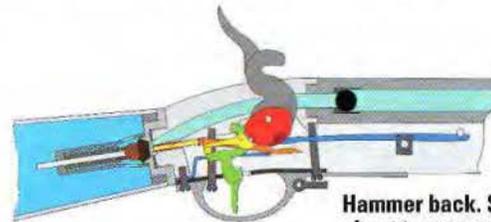
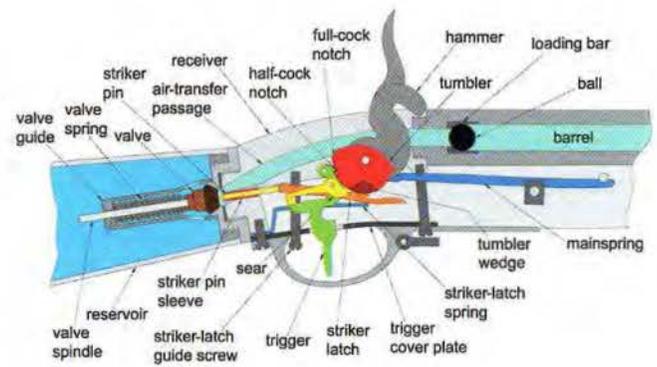
⁸ The Girandoni mainspring was unusual in being an extremely strong flat spring, in contrast to the V-shaped mainsprings typical of flintlocks.

⁹ Moulton, Vol. 5, p. 55.

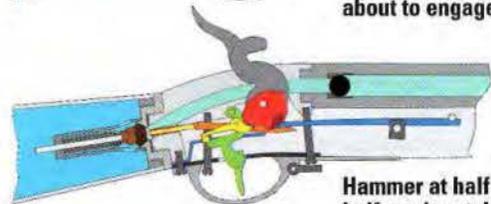
¹⁰ *Ibid.*, Vol. 11, p. 66.

¹¹ *Ibid.*, Vol. 7, p. 66. Journal entry for April 3, 1806.

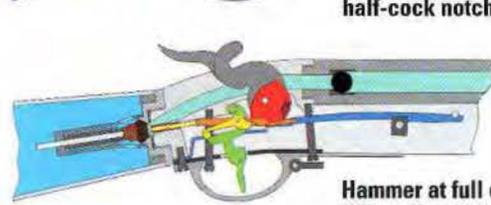
¹² The Beeman Girandoni is now on display at the U.S. Army War College, in Carlisle, Pennsylvania, which has assumed responsibility for its security and keeps it under guard 24 hours a day.



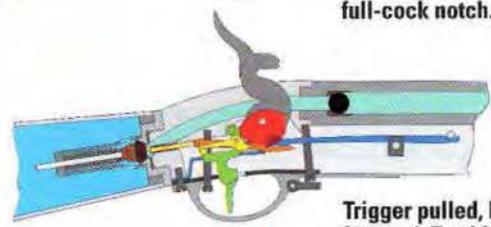
Hammer back. Striker latch about to engage tumbler wedge.



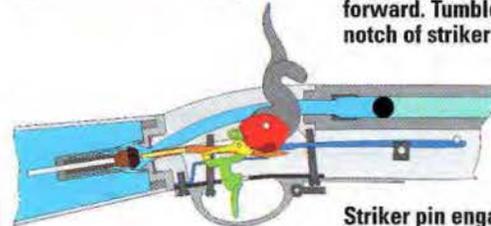
Hammer at half cock. Sear engages half-cock notch on tumbler.



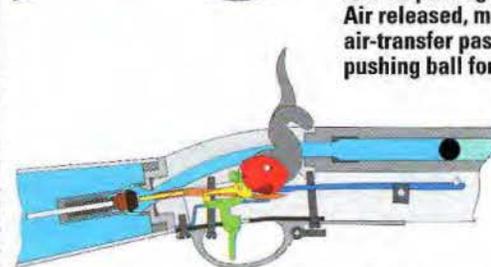
Hammer at full cock. Sear engages full-cock notch. Ready for firing.



Trigger pulled, hammer starts forward. Tumbler wedge engages notch of striker latch.



Striker pin engages air valve. Air released, moving through air-transfer passage and pushing ball forward.



Air valve now fully open. Tumbler wedge disengages striker and hammer returns to rest position. In next sequence (not shown) tumbler wedge disengages striker latch. Striker pin moves forward, closing air valve.

DRAWINGS BY GEOFFREY BAKER. REPRODUCED BY PERMISSION OF GEOFFREY BAKER AND COLIN CURRIE FROM THE CONSTRUCTION AND OPERATION OF THE AIR GUN, VOL. 1, THE AUSTRIAN REPEATING RIFLE (2002).

MEET ASHLEY...

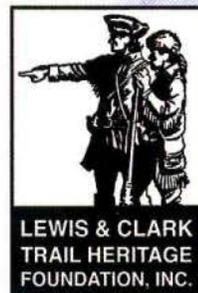


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New biographies of Dye and Hebard, pioneering writers on Lewis & Clark

Eva Emery Dye: Romance with the West

Sheri Bartlett Browne

Oregon State University Press
186 pages / \$24.95 paper

Inventing History in the American West: The Romance and Myths of Grace Raymond Hebard

Mike Mackey

Western History Publications
123 pages / \$14.95 paper

In the waning days of the Lewis and Clark Bicentennial, two new biographies have been published about authors whose books on the expedition have profoundly influenced public impressions of the Corps of Discovery. One is Sheri Bartlett Browne's *Eva Emery Dye: Romance with the West*, from Oregon State University Press. The other is Mike Mackey's *Inventing History in the American West: The Romance and Myths of Grace Raymond Hebard*, from Western History Publications.

Students of the Lewis and Clark story have long admired and criticized Dye's *The Conquest: The True Story of Lewis and Clark* (A.C. McClurg, 1902) and Hebard's *Sacajawea: A Guide and Interpreter of the Lewis and Clark Expedition, with an Account of the Travels of Toussaint Charbonneau and of Jean Baptiste, the Expedition Papoose* (Arthur H. Clark, 1932). Given our collective interest in the Corps of Discovery and the two women's romanticized contributions to that story, it is easy to forget they were both authors of several other best-selling western histories.

Inventing History and *Romance with the West* are thoughtful and thought-provoking biographies. The similarities between the two women portrayed—Dye, who was born in Illinois in 1855, and Hebard, born in Iowa in 1861—are remarkable. For the

time, both were well educated women, who in turn became outspoken, confident historians, authors, educators, and advocates for women's education and suffrage. They were fascinated with the history of the West and particularly of the states they called home, Dye's Oregon and Hebard's Wyoming, and in the roles of pioneering women.

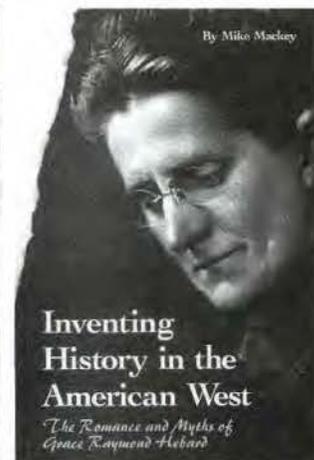
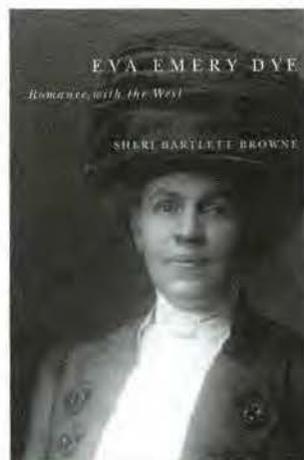
There are also differences between the two. Dye earned a master's degree from Oberlin College. According to Browne, she was a skillful writer, a thorough researcher, and a gentlewoman who felt a civic obligation to bring history and culture to western Oregon. She was a prolific author whose books were a popular "blend of historical detail and decorated facts." (Despite the word "true" in the subtitle of *The Conquest*, the book is a fictional account of the expedition.)

Browne gives us a glowing portrait of an exceptional woman and historian. By contrast, Mackey's view of Hebard is far more mixed. She may have padded her résumé with questionable degrees from the State University of Iowa and Illinois Wesleyan University. Living in Wyoming, Hebard saw herself as a "pioneer" who eagerly tackled nontraditional jobs—as an engineer and surveyor, a trustee of the newly formed University of Wyoming, and a college professor and librarian. Mackey presents her as an argumentative and abrasive self-promoter who brooked no disagreement with her romantic perceptions of western history. He is critical of her methodology, scholarship, and skill as a writer.

However we (and their biographers)

may feel about Dye's and Hebard's histories of the expedition, both authors broke new ground in our knowledge of the Corps of Discovery.

Dye, who wrote four other works of historical fiction besides *The Conquest*, had the advantage of personal contact with descendants of her subjects. Her notes for *The Conquest* show she queried the families of the two captains and of several enlisted men, including Patrick Gass, William Bratton, and Alexander Willard. Unfortunately, Browne does not examine Dye's correspondence with Willard's son, Lewis, which included the startling revelation that his father had kept a journal on the



Both Eva Emery Dye and Grace Raymond Hebard left their marks on public perceptions about the Corps of Discovery, Sacajawea, and Charbonneau

expedition (it is still lost). Nor does Browne tell us if Dye ventured into the homelands of the Shoshones to talk with the descendants of Sacajawea.

Dye portrayed Native Americans according to the prejudices of her day—either as "good Indians" on the road to civilization or as "savages" refusing to abandon their culture for the white man's ways. Hebard, writing thirty years later, had the same stereotypical mindset. Did other contemporary historians share Dye's and Hebard's views

of Indians? Regrettably, neither biographer explores this question.

Hebard was a member of many heritage organizations, including the Daughters of the American Revolution and the Wyoming Pioneer Association, and like Dye she wrote about other historical subjects besides the Corps of Discovery. Her biography of the Shoshone chief Washakie was published in 1930, two years before *Sacajawea*. She used her contacts with Washakie's family and other Shoshones to develop her biography of Sacajawea. She spent considerable time visiting the Wind River Indian Reservation, near Lander, Wyoming. Elders there shared oral histories of a woman they knew as "Porivo," who died on the reservation in 1884. Hebard became convinced that Porivo was Sacajawea—a view largely dismissed by mainstream historians, who believe she died in South Dakota in 1812.

Both books have their strengths. Browne and Mackey have conducted exhaustive research, scouring primary and secondary sources to produce sound biographies of two independent-minded women determined to share their visions with a wide readership.

Both biographies also have their weaknesses. Astute readers of WPO will notice any number of minor errors of historical fact. Browne perpetuates the myth that Toussaint Charbonneau was an abusive husband and a lazy and cowardly member of the expedition. Mackey fails to provide information about Hebard's efforts to track down the fascinating story of Jean Baptiste Charbonneau (who lived until 1866 and whose wide-ranging exploits in Europe and the American West have inspired two biographies) and his mentor, Duke Paul of Württemberg. Nor does he come to grips with Hebard's 16-year professional relationship with her publisher, Arthur H. Clarke and Company. The firm continues to be a family-owned enterprise, turning out new books of Western Americana and reprints of its earlier works. Like Dye's interviewing of descendants of the Corps of Discovery, Mackey presumably could have interviewed descendants of the company's

founder, Arthur H. Clarke.

Three of Dye's books—*The Conquest* and biographies of the British-Canadian fur traders Ranald McDonald and John McLoughlin—were published by A.C. McClurg, of Chicago. Browne, like Mackey, largely overlooks the working relationship between author and publisher. I would like to have learned more, too, about Dye's role in the creation of the famous statue of Sacajawea in Portland's Washington Park. She details Dye's involvement with the Sacajawea Statue Association but leaves out two crucial pieces of the story: how Alice Cooper came to be selected as the sculptor, and how Cooper (probably under Dye's influence) came to portray her subject in such an idealized pose—a young woman gazing to the horizon, with one arm uplifted to the heavens.

Rules for would-be biographers

In conclusion, I offer this unsolicited advice to anyone tempted to write a biography of any other important author associated with the Corps of Discovery. First—know the story. Aficionados will want to read your book because it is about an author whose work they know well and very likely respect. If your book contains errors, as these two do, your work will also be suspect. Second—use the best, most up-to-date, and respected materials, including primary sources, to analyze your subject's work. Don't rely on unscholarly narratives, barely disguised fiction, or out-of-date research, especially if you criticize your subject for the same failings! Third—remember that authors often have close connections with their editors and publishers, and that this is an important part of the story.

Fourth—remember that no author is either perfect or completely inept. As Browne and Mackey for the most part have succeeded in doing, tell your story in a balanced way.

—Barb Kubik

The reviewer is an independent scholar based in Vancouver, Washington, and a former president of the LCTHF.



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Present at the creation: The conservation roots of the LCTHF (Part I)

BY KEITH G. HAY

This is the first part of a two-part article about the origins of the Lewis and Clark Trail Heritage Foundation—Ed.

As the Lewis and Clark Bicentennial successfully draws to a close and we begin to focus on the “Third Century,” we must not forget the colorful history that gave birth to the Lewis and Clark Trail Heritage Foundation some 44 years ago.

This story begins with a legendary conservation leader, cartoonist, and visionary who inspired others to protect and ultimately designate the route of the Lewis and Clark Expedition as a National Historic Trail. His name was Jay Norwood “Ding” Darling and his legacy organization is known as the J.N. “Ding” Darling Foundation. (Ding is a contraction of Darling’s last name.)

Darling began his career in 1900 as a cartoonist for the *Sioux City Journal*. In 1906, he moved to the *Des Moines Register* and created a daily editorial cartoon that appeared on the paper’s front page. His cartoons on protecting our natural resources appeared in nearly 150 newspapers and earned him two Pulitzer Prizes.

In 1934, in the middle of the Great Depression, he became chief of the U.S. Bureau of Biological Survey, which later became the U.S. Fish and Wildlife Service, and obtained federal funding to acquire three million acres for wildlife refuges and initiate the Migratory Bird Hunting Stamp Act. He also designed the first duck stamp, which sold for a dollar. Over the years, this program has contributed more than a billion (inflation-adjusted) dollars for the purchase of wildlife refuges and wetland habitat throughout the nation. After 20 months on the job, he returned to Des Moines and resumed his vigorous editorial efforts for natural-resource conservation.

In 1936, he convinced President



IOWA NATURAL HISTORY FOUNDATION

Cartoonist and conservationist “Ding” Darling (1876-1962) set in motion the forces that led to the Lewis and Clark Trail Heritage Foundation.

Roosevelt to convene the first North American Wildlife Conference, which led to the formation of the National Wildlife Federation. He was promptly elected its first president. Darling also played a key role in initiating the Cooperative Fish and Wildlife Research Unit programs at major universities and in the passage of the Federal Aid in Wildlife Restoration Act of 1937.

Honoring a dying man’s request

Darling retired in 1949. In May of 1961, in failing health, he called an old friend, Sherry Fisher, a fellow member of the Iowa Conservation Commission, and asked him to come to his office. He told Fisher he wanted “to incorporate the Missouri River into a national outdoor recreation and natural resources ribbon along the historic trail of Lewis and Clark.” It would be an “avenue for wildlife.” Fisher recalled that despite his illness, Darling “was bubbling with excitement over the prospect and looked me in the eye and said ‘I can’t live to do these things, but I’d like to know if you’d try to do it for me.’” Fisher promised, “I’ll try.” And indeed he did!

Although there had been numerous, undocumented efforts over the years by individuals and agencies to commemorate the expedition’s route across the nation, none were ever implemented.

(In 1948, for example, the National Park Service had suggested a “Lewis and Clark Touring Route.”)

After Darling’s death, in February 1962, Fisher brought together family and friends to discuss the best way to honor him by perpetuating his interest in conservation and implementing his proposal for a Lewis and Clark trail. They formed the Darling Foundation, whose charter trustees included former Presidents Eisenhower and Truman as well as educators, publishers, artists, businessmen, and conservationists.

Udall becomes involved

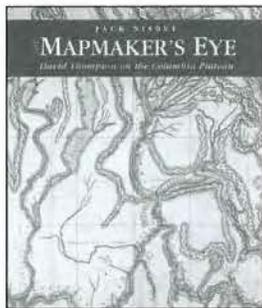
The foundation’s first priority was to arrange a meeting with the Secretary of the Interior, Stewart Udall, and his staff to discuss the concept of a “wildlife and recreational ribbon” following the Lewis and Clark trail from St. Louis to the Pacific Coast. Udall was receptive and suggested that the Darling Foundation obtain endorsements for the concept from the 10 states along the trail.

In October of 1962, at the invitation of the Darling Foundation and the Department of the Interior, representatives from the states met in Portland, Oregon, to discuss the proposal. The following month, a second meeting was held in Omaha, with 67 participants, including representatives from state and federal agencies and conservation and historical organizations. Resolutions were passed to endorse the trail proposal and to ask Congress to approve a plan and establish a formal commission to oversee its implementation.

In the fall of 1963, Congress passed a joint resolution (No. 61) approving a Lewis and Clark trail. In August of 1964, Representatives John Kyle and Ben Jensen of Iowa introduced a bill in the House to establish the Lewis and Clark Trail Commission; Senator Jack Miller, also of Iowa, introduced a similar bill in the Senate. These bills were passed, and by authorization of Public Law 88-630 of the 88th Congress, the Lewis and Clark Trail Commission was

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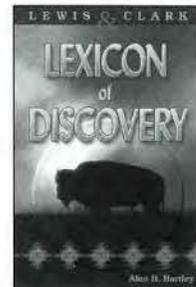
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Michael Haynes painting at the Falls of the Ohio "On the Threshold of Discovery" October 26, 1803



Jim Keith, Chairman
Lewis and Clark Indiana Bicentennial Commission
Phyllis Yeager
Sunnyside Tourism Bureau
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Looking Back (cont.)

established for a five-year period. The commission comprised 27 persons, including personnel from the federal agencies involved, four Congressmen, the governors of all trail states, and four members of the Darling Foundation.

The commission held its first meeting in Washington, D.C., on January 4, 1965. Sherry Fisher was elected chairman, a position he held throughout the commission's tenure.

Secretary Udall, meanwhile, had already assigned the new Bureau of Outdoor Recreation (B.O.R.) to initiate the trail study. The B.O.R.'s regional offices in Seattle and Denver conducted a comprehensive investigation in cooperation with the state, federal, and tribal agencies involved. Victor Eklund of the Seattle office was appointed to study the four western states of the trail, and I was appointed to handle the six eastern states out of the B.O.R.'s Denver office. Our mandate called for:

- Inventorying and mapping existing and potential historic, archeological, geologic, fish and wildlife, conservation, and recreation resources, including all travel and access routes within 25 miles of the trail.
- Analyzing present and future demands for such resources.
- Determining the need for new recreational developments, improved management practices, and additional access routes.
- Identifying special problems.
- Recommending a plan for development of the trail.

This was a daunting challenge, and we knew that the study's recommendations would provide a road map for the trail's development for years to come. By November of 1963 the study was underway. We "hit the trail" and began interviewing state officials responsible for parks, geology, archaeology, fish and wildlife, highways, and tourism. Ten federal agencies and 12 tribal nations were also involved in the study.

We located existing L&C historic sites, proposed new ones, and recommended designating Lewis and Clark highways on either side of the trail. All



FROM PETER MATTHIESSEN, WILDLIFE IN AMERICA (1987)

Ding Darling's cartoon "The Happy Farmer and His Sportsman Friends" was one of many he drew in the cause of wildlife conservaton. (He was himself an ardent sportsman.)

this (and much more) was contained in a report of 121 pages. It listed 896 sites encompassing nearly 2 million acres suitable for outdoor recreation and proposed the creation of a "conservation and recreation ribbon" along the entire expedition route.

The report took two years of study and review to complete. On September 30, 1965, Secretary Udall forwarded the final version, titled *The Lewis and Clark Trail: A Proposal for Development*, to the Lewis and Clark Trail Commission as it was beginning its second meeting, in St. Louis. In his cover letter, Udall observed, "The Lewis and Clark Expedition did not occur in 1804-06 and then become history, instead, it fired a national spirit of adventure which yet persists."

Foundation member Keith G. Hay is the author of The Lewis and Clark Columbia River Water Trail Guide and a founding member and former president of the Oregon Chapter. He lives in Newberg, Oregon, and served as vice president of his state's L&C bicentennial committee. Quotations in this article are drawn from documents of the Department of the Interior and the "Ding" Darling Foundation. Part II of the article will appear in the August WPO.

*“the grass begins to Spring.
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**From Capt. Clark’s remarks for
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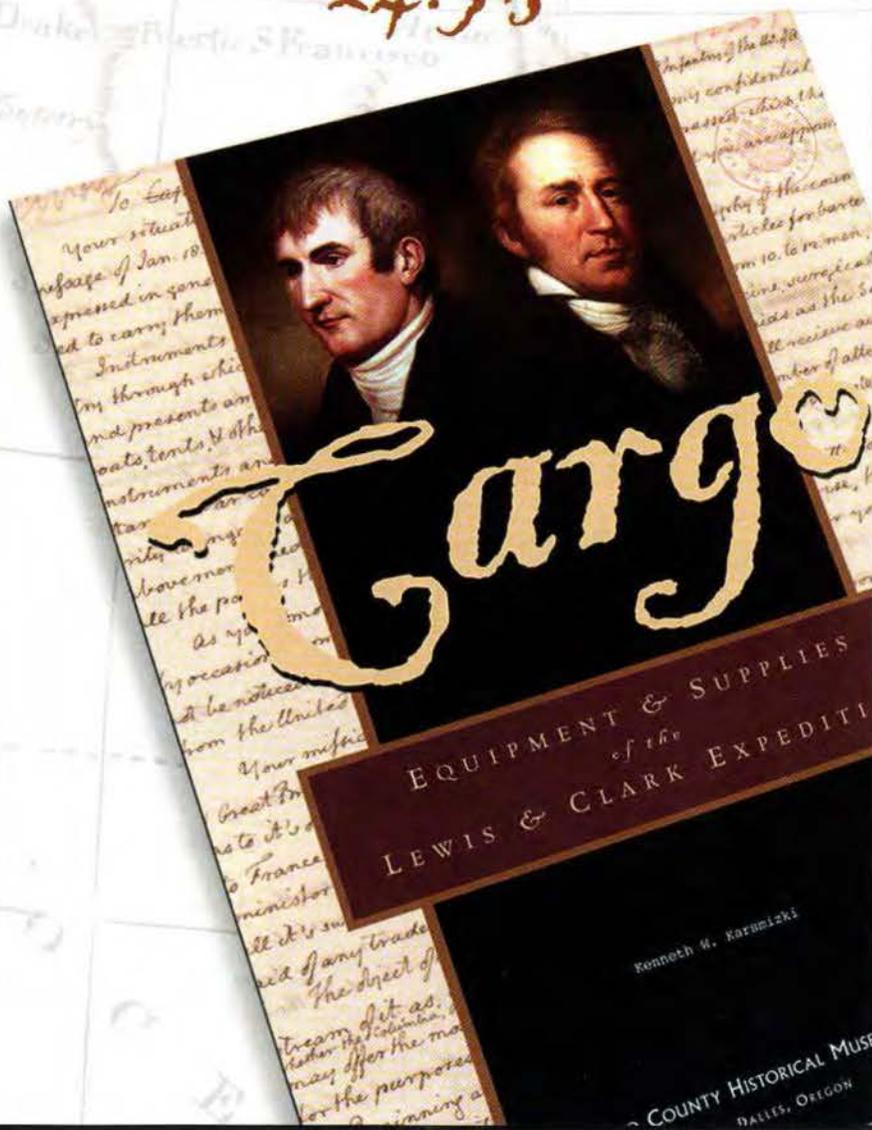
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L&C Roundup

Gramentine elected; Williams retires; Bird Woman symposium

Jim Gramentine, founder of the Badger State Chapter of the LCTHF and a resident of Mequon, Wisconsin, has been elected president of the foundation. He will serve the remaining eight months of the office vacated by Patti Thomson of Oconomowoc, Wisconsin, who resigned for health reasons.



Jim Gramentine

Gramentine will oversee the development of an updated strategic plan and the foundation's Third Century Fund. He has been a member of the foundation since 1997 and is a retired secondary-school administrator, teacher, and coach.

Williams bids adieu

Dick Williams, chief of resource management of the Lewis and Clark National Historic Trail, retired last month after 29 years with the National Park Service. In 1991 he was named the first full-time employee of the Lewis and Clark National Historic Trail and played a major role in planning for the L&C Bicentennial. He is largely responsible for developing the Corps II traveling exhibit and the Challenge Cost Share program for the bicentennial, which has dispensed millions of dollars for events and facilities.

Sacagawea confab

Finding Sacagawea: A National Symposium on an American Phenomenon, will take place June 1-4 in Bismarck, North Dakota. Sponsored by the Bismarck-Mandan Lewis & Clark Bicentennial Committee, it will feature Clay S. Jenkinson, Amy Mossett, and other scholars and educators. For details, contact Camie Lies (camie@bismarckmandancyb.com; 1-800-767-3555). ■

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Volunteer efforts more crucial than ever as federal support declines

The Lewis and Clark National Historic Trail has enjoyed unprecedented attention throughout the national bicentennial commemoration of the Lewis and Clark Expedition. As the end of the official commemoration nears, it is becoming ever more apparent that the increased support the trail has received from Congress and federal agencies is on the decline.

Funds are needed elsewhere. The war in Iraq persists. Cleanup continues on the devastation caused by Hurricane Katrina. Homeland security remains a fiscal priority. The budgets of the National Park Service and other federal land-management agencies are under attack, and the Lewis and Clark National Historic Trail is no longer a priority in the president's proposed budget for fiscal year 2007.

In some ways, the trail, and the Lewis and Clark Trail Heritage Foundation, will go back to operating in a pre-bicentennial environment. There will be no more bicentennial signature events. Other commemorations will attract the spotlight. We will draw from the same small Challenge Cost Share pools as constituents of the other 23 national scenic and historic trails. (Over the past six years, Congress has appropriated \$2.5 million to \$5 million annually to a National Park Service Lewis and Clark Challenge Cost Share program.)

In reality, however, we can never go back to the way things were before the bicentennial. That's because the Lewis and Clark Trail had this nation's attention for more than four years. New visitors will continue to make their way along the trail. Conservationists will support protection of treasures along the trail. Every year, more students will discover this part of America's heritage. And enthusiasts will continue to study the expedition and the westward expansion that followed.

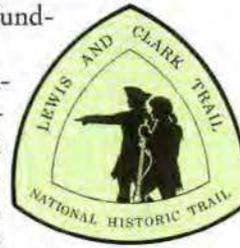
Federal agencies will continue to administer and manage the trail with reduced staff and fewer dollars. Communities and organizations will con-

tinue to support interpretive signs and site maintenance without Challenge Cost Share grants. The foundation will continue its leadership role along the trail as Keepers of the Story and Stewards of the Trail, but it will have to find new ways to fund its operations when federal support and Challenge Cost Share funding subside.

Foundation volunteers are stepping forward in impressive numbers to assist with trail preservation efforts. In greater numbers than previous years they are monitoring, cleaning up, and maintaining signs, sites, and trail infrastructure through programs sponsored by the foundation. Those efforts will need additional funding to keep operating.

Future funding for the trail and for the foundation's trail stewardship efforts is a critical concern. This public resource, the trail, is our treasure to enjoy. It's also ours to support or abandon, and I know that no one in this organization wants to see it disappear through development or neglect. It's our responsibility to maintain and preserve the trail for future generations so they can interpret, understand, and experience the legacies of the Lewis and Clark Expedition.

There are many ways to get involved in assuring that necessary resources are available for trail preservation and protection. You can urge Congressional support for a federal budget that provides adequate funding for management of the trail. Members can meet with their Congressional delegations or write letters requesting support. Foundation staff can provide information to members on the proposed 2007 budget, what we are requesting in the budget, and how to contact and work with your Congressional delegations. The same type of lobbying can be done at the state level to encourage legislative



bodies to support agencies with management responsibilities along the trail.

In recent months, the foundation has been working with a variety of interested parties to request that Congress fund the Lewis and Clark Challenge Cost Share program at \$2.5 million in fiscal year 2007. Many of our chapters and members have called or written members of Congress to urge support for this valuable program.

Since 2001, Lewis and Clark Challenge Cost Share recipients have matched \$25 million in grants with more than \$100 million, including the value of volunteer labor. L&C enthusiasts have demonstrated their commitment to the trail and the stories of the expedition, but their work is not done.

The foundation recently announced its Third Century Campaign to grow the endowment essential for the continuation of our trail stewardship programs. Your contribution to the endowment supports foundation programs that preserve and protect our most valued resources along the trail.

We must count a commitment to the long-term preservation of the trail among the many great legacies of the bicentennial. Otherwise, there will be no special places for future generations to commemorate the tercentennial.

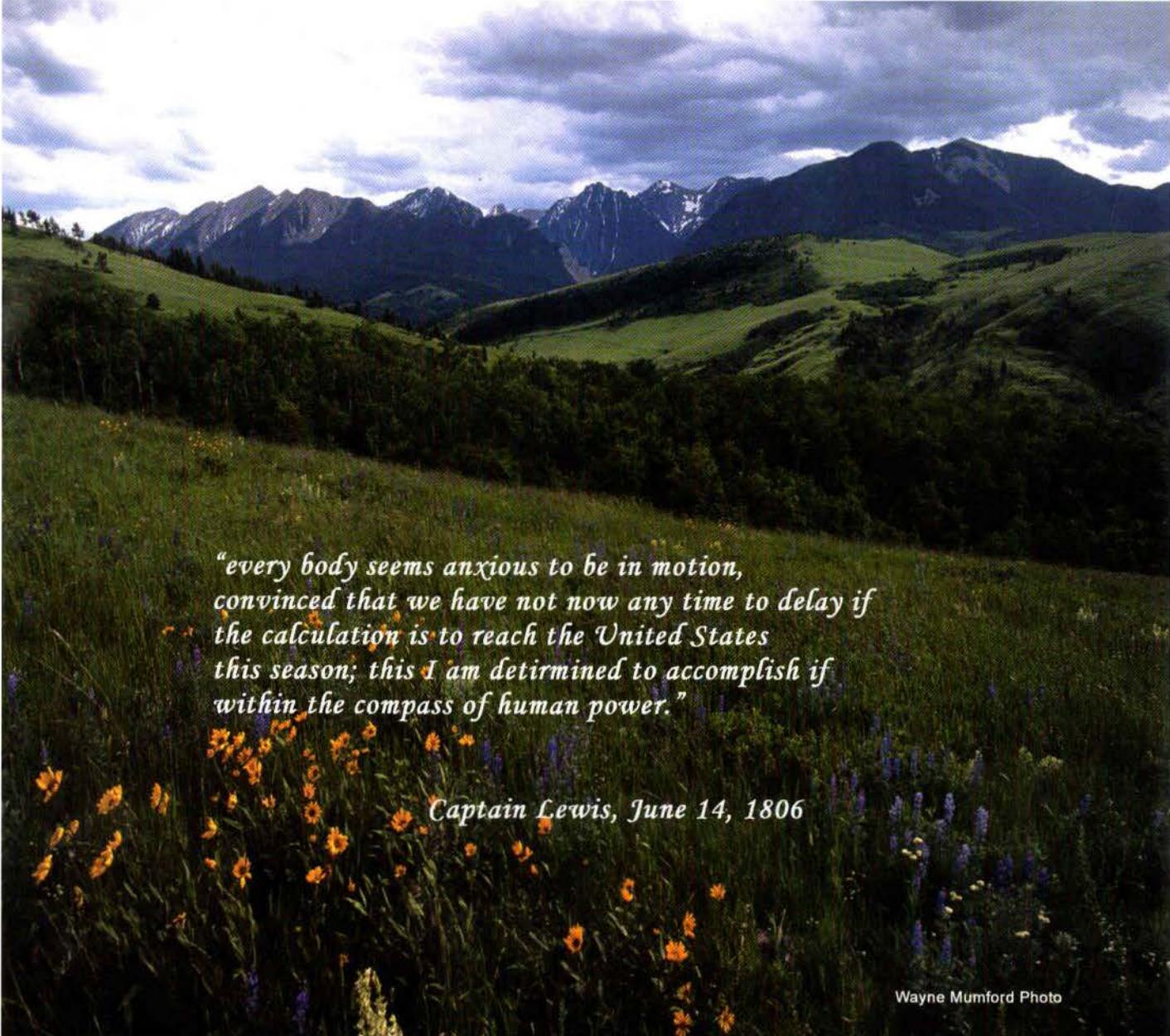
Another important legacy

A U.S. Representative from Pennsylvania has breathed new life into efforts to extend the L&C National Historic Trail east to Philadelphia and Monticello. Congresswoman Melissa Hart is sponsoring H.R. 5053, which would amend the National Trails System Act to extend the trail to include additional sites associated with the preparation and return phases of the expedition.

For information on this federal legislation or on how to contact your Congressional delegation to support it, you can reach me at wraney@lewisandclark.org or 1-888-701-3434.

—Wendy Raney

Director of Field Operations



*"every body seems anxious to be in motion,
convinced that we have not now any time to delay if
the calculation is to reach the United States
this season; this I am detirmined to accomplish if
within the compass of human power."*

Captain Lewis, June 14, 1806

Wayne Mumford Photo

Help the
Lewis and Clark Trail Heritage Foundation
preserve the trail - become a member
or give a gift membership *today*

Visit our Website,
www.lewisandclark.org

OR

Call the Foundation Office
(888) 701-3434

