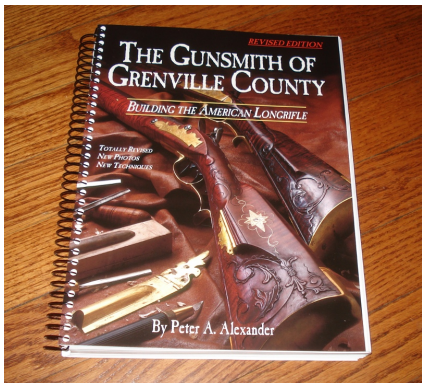

REVISED EDITION
THE GUNSMITH OF GRENVILLE COUNTY
BUILDING THE AMERICAN LONGRIFLE
TOTALLY REVISED
NEW PHOTOS
NEW TECHNIQUES
By Peter A. Alexander

Chapter 1
HISTORICAL BACKGROUND

THE STIMULOUS FOR THIS ESSAY CAME from a *Track of the Wolf* catalog of a few years ago. I was admiring the photograph of "an early transitional longrifle" made by the fine gunsmith Jerry Rice from Track's Edward Marshall kit, and I began to think about the whole subject of "transitional" longrifles. It seems that everyone wants to push back as far as possible the origin of the American longrifle.

I think that with all of the serious research that has been done over the last 30-some years, we can at last take some firm steps to separate mythology from reality. By that I mean the reality of the longrifle's introduction, development and use in 18th and early 19th century America. It should be obvious that not all users of the longrifle were longhunters or even crack shots. But today we are, to some extent or other, buying into the Davy Crockett, Daniel Boone mythology. I much prefer reality. This essay, while long, must still be considered a sketch. To do the topic justice would require a book in itself. I must apologize to my readers in advance. I have had to be selective with the information I have. Undoubtedly there is much more material out there that I don't know about, which readers may have and use to refute some of what follows. Good. The whole point of this is to stimulate thought.

To assist us I have drawn a map (**Figure 1**) to keep us focused on the area under discussion. I can tell you that I have traveled the roads shown and love the country. For each of

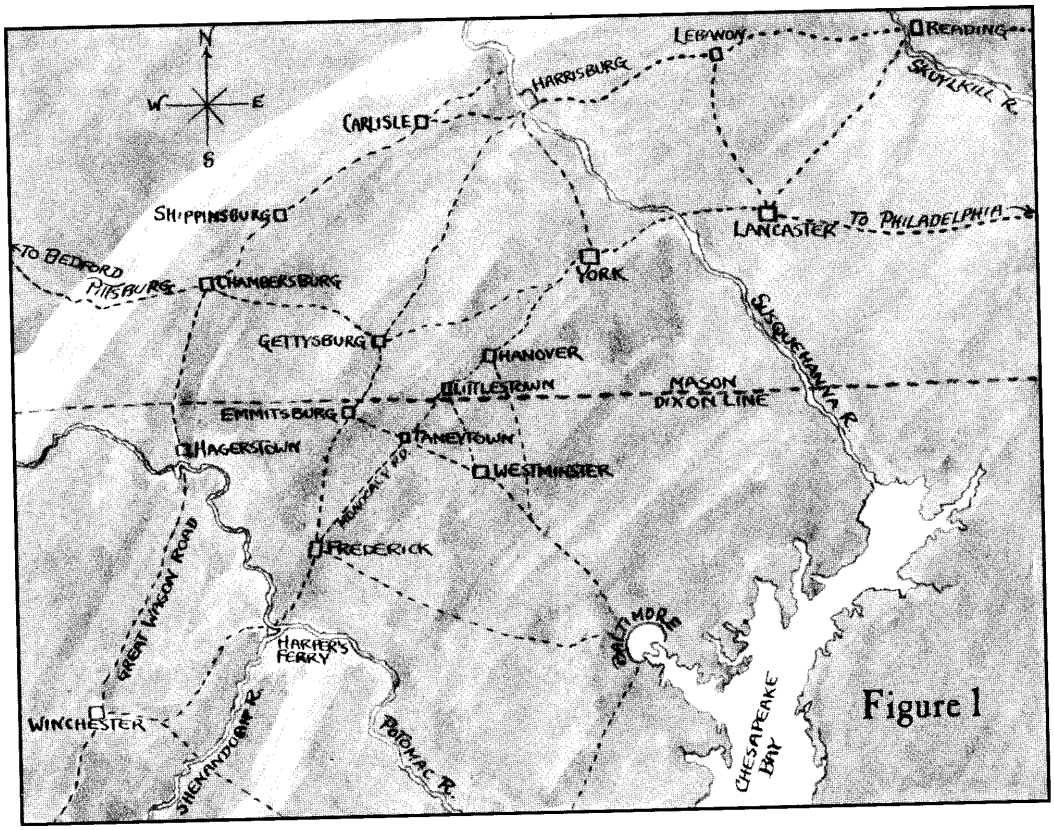


Figure 1

the periods discussed below, I have provided a time chart that enables the reader to relate the gunsmiths' lives to each other and to contemporary events. I learned this technique from George Shumway, and it's a great way to see the reality of history as opposed to vague mythology. An example from a later period may help you to understand this idea. At the same time that Custer was being slaughtered on the Little Big Horn, the folks at the World's Fair were experiencing electric light and the first automobiles.

I'd also like to thank Dr. George H. Carroll of the Kentucky Rifle Association and Alan Gutchess for their help and insights. Neither gentleman is content with the accepted view of things.

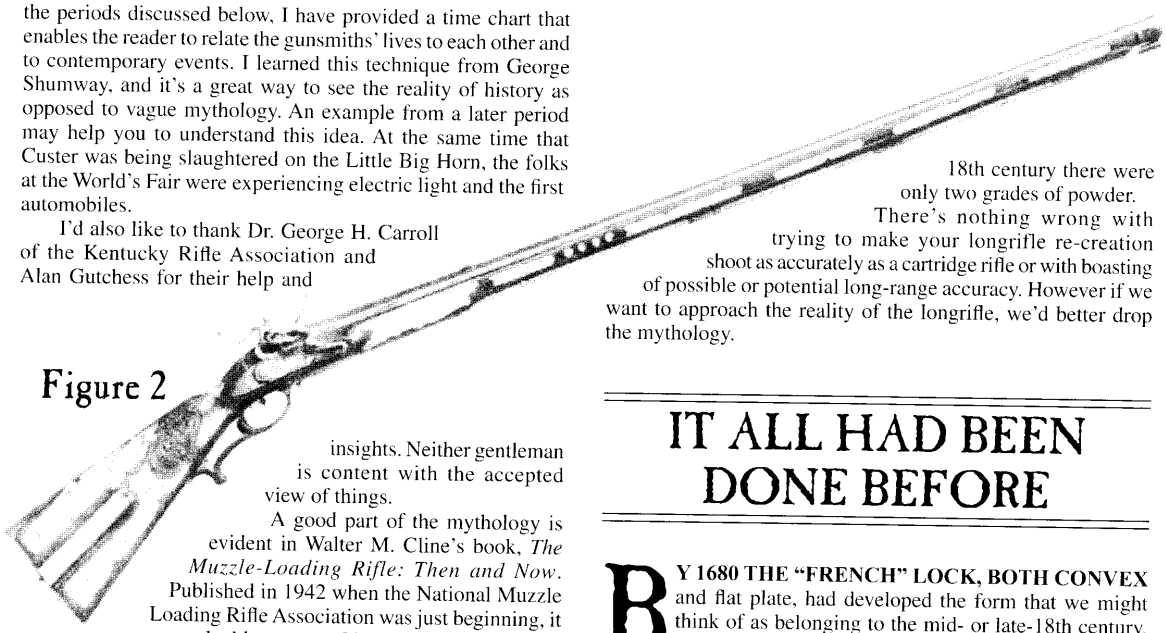


Figure 2

A good part of the mythology is evident in Walter M. Cline's book, *The Muzzle-Loading Rifle: Then and Now*. Published in 1942 when the National Muzzle Loading Rifle Association was just beginning, it was a valuable source of information at the time. However, the author confused the hunting or sporting longrifle with the bench-rest target rifle as made by Horace Warner, Brockway and others.

Yes, Walter Cline did shoot at a target 600 yards away across a lake near Chattanooga. He used an eleven-pound flintlock rifle. The bore of the original rifle was not big enough, so he bored it out and rifled it to carry a bullet of 220 grains (approximately .53 caliber). He loaded it with "a priming charge of 25 grains of FFFG black powder, followed by 50 grains of FG black powder. On top of this a 1/8-inch felt wad was placed. Then the bullet was patched with heavy drilling greased with tallow" (63). Does this sound like an historical load?

Not at all. It is the kind of load used in an 1860-period bench rifle. Then he says, "With the sight raised to the highest elevation, I touched the set trigger" (Cline 63). Adjustable sights? Doesn't sound like a common longrifle to me. Of the ten shots he made at this range, "four would have hit a man" (Cline 63). Later, Cline goes on to say, "However, at ranges up to 200 yards, at least it is highly probable that the most accurate shooting which has ever been done has been accomplished with heavy, muzzle-loading target rifles equipped with telescopic sights, set triggers, false muzzles and bullet starters" (64).

The point is that Mr. Cline was trying to prove that the muzzleloader was just as accurate as a cartridge rifle in the 1930s when the antiques were considered useless. It is this goal that resulted in the confusion of the match rifle with the hunting rifle and the consequent use of the short starter. We still use the short starter to load our longrifles, despite the fact that no 18th or early 19th century starter has ever been found. The small priming horn, filled with FFFFg powder probably saw its first use during the 1930s, because it isn't historical either, primarily because in the 18th century there were only two grades of powder. There's nothing wrong with trying to make your longrifle re-creation shoot as accurately as a cartridge rifle or with boasting of possible or potential long-range accuracy. However if we want to approach the reality of the longrifle, we'd better drop the mythology.

IT ALL HAD BEEN DONE BEFORE

BY 1680 THE "FRENCH" LOCK, BOTH CONVEX and flat plate, had developed the form that we might think of as belonging to the mid- or late-18th century. We tend to think of rifled barrels, particularly long ones, as being miraculous products of frontier Colonial gunsmiths. And if we consider the conditions under which they were made, perhaps they were. But the rifled barrel was known in Europe as early as 1468, so it's really no big deal. It seems to have developed in the Germanic lands for target shooting.

By the third quarter of the 17th century, the stock, following the French, had arrived at the shape we associate with 18th century longrifles. It's also in the 17th century that you find breechloading guns, revolvers, turn-barrel guns, wenders and superimposed loads, all of which must have worked well under European conditions or they wouldn't have been in continuous production. On the other hand, such marvels of the gunsmithing trade would not have worked well in the Colonial environment because of the cost of manufacture and the cost of repair.

When you look at 18th century European firearms, you see an end to invention and a refinement of the simple. So, for example, after mid-century the conservative English take over the technical improvement of the lock.

It all had been done beforehand. Before the Americans had started to develop the longrifle, the Europeans, and more particularly the Germans, had already invented the main features

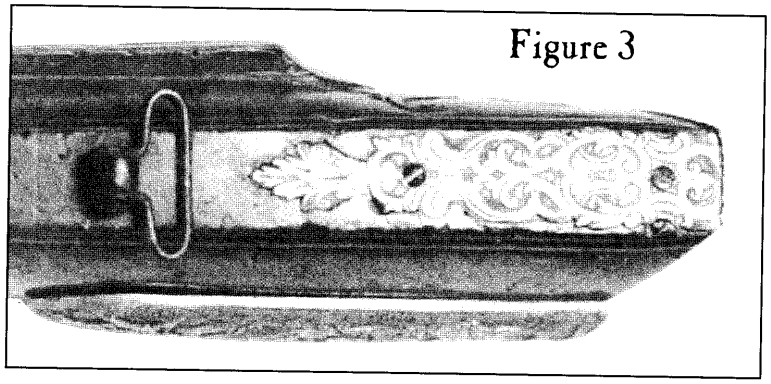


Figure 3

of the American longrifle.

The mythology is that all Germanic guns had short barrels. Anyone who has read George Shumway's excellent series, "Our Germanic Heritage," published in the magazine *Muzzle Blasts*, should realize that Germanic gunsmiths did produce long-barreled guns. Admittedly, most of them seem to have been octagon-to-round smoothbores or fowlers following the French style. That the Germans produced long-barreled fowlers should cast some doubt on the mythology that one ancestor of the American longrifle was the *English* fowler.

But the Germans did occasionally produce long-barreled rifles, as you can see in **Figure 2**, which shows a highly decorated Germanic rifle circa 1730. The barrel is 42 inches. Another example is one that I've recently held in my hands. It was a 42-inch swamped barrel with multi-groove rifling of about .50 caliber, evidently from a wheel-lock. The date on the top flat is 1608.

Admittedly, Germanic rifles commonly had short barrels, but short barrels were common on American-made rifles as late as 1771, according to a notice seen in *The Pennsylvania Gazette*.

Another myth is that American gunsmiths invented the metal toe plate to protect that area of the stock. **Figure 3** shows you a baroque toe plate from a rifle made by Johann Paul Breitenfelter of Carlsbad prior to 1735. This piece, and indeed all of the furniture of the gun, was made of gilt bronze. The rifle itself was featured in "Our Germanic Heritage" by George Shumway. I am assigning a pre-1735 date to it because the decoration is classical baroque and after that date rococo rapidly took over.

Perhaps the greatest myth that has been repeated over and over by writers is that the metal patchbox was an American invention. See **Figure 4**. Here we have a side view of a gorgeous rifle made in Suhl, circa 1730. As you can see, there is a side-opening metal patchbox, relief-carved against a gold background. Generally speaking, the earliest metal patchbox I can date in America is on a rifle made in 1768 in Philadelphia.

All of this is *not* to claim that the features described above were common on 18th century Germanic rifles. What I do want to emphasize, though, is that the early German gunsmiths who emigrated to the Colonies were following a tradition already well-established back home.

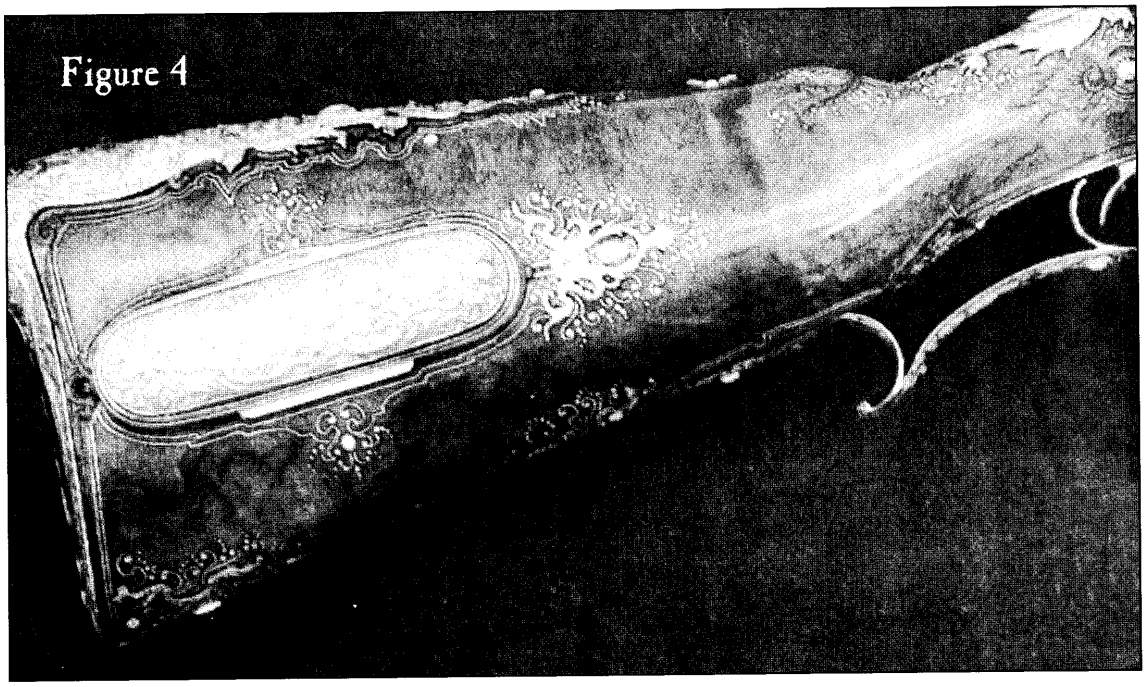
WHAT MAKES AN OLD GUN AMERICAN?

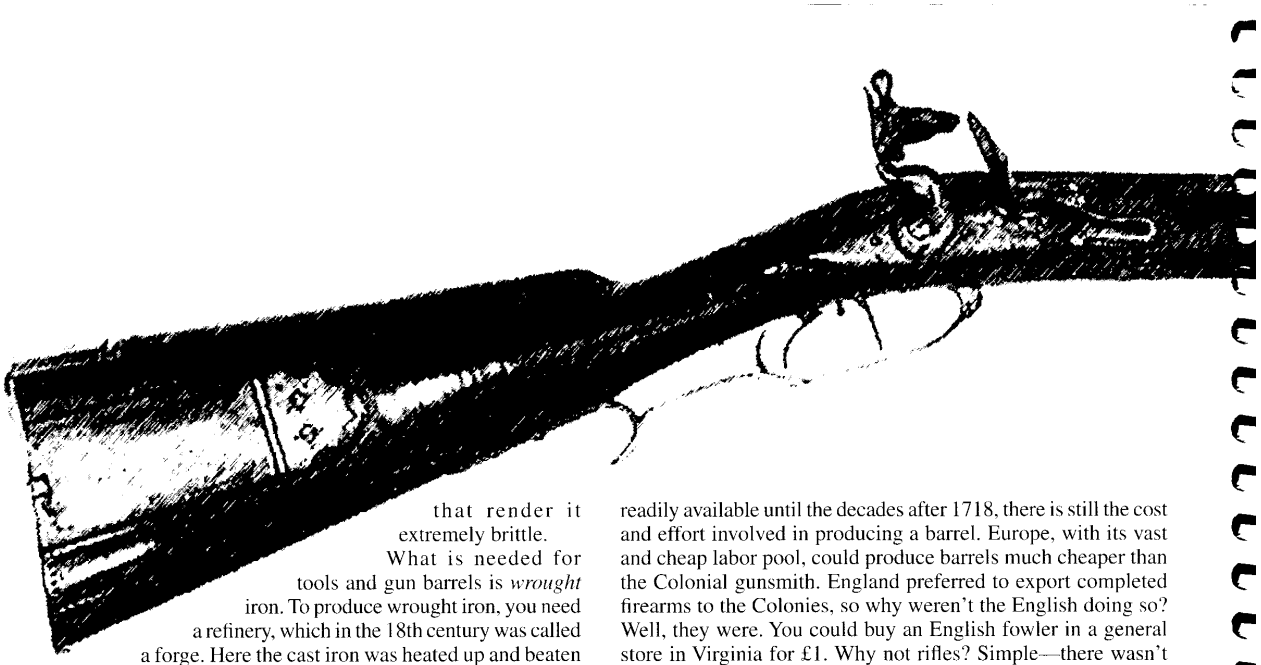
IN 1980 GEORGE SHUMWAY PUBLISHED *RIFLES of Colonial America*. At the end of Volume II, he discussed what makes an old gun American. I'd like to summarize here and extend a bit. Let's start with the parts.

THE BARREL

IRON WAS SMELTED AND CAST AS "SOWS" OR pig iron in America in the 17th century. The first ironworks was constructed in Virginia in 1622 but was immediately destroyed by Indians. However by the end of the 17th century nearly all of the Colonies were producing iron. In fact on the eve of the Revolution, all of the Colonies together comprised the fourth largest producer of iron in the world.

Cast iron, which is useful for making pans, pots, kettles and, later, stoves, is entirely useless for making nails, hooks, axes, plows or any other implement that has to take stress, especially a gun barrel. The reason is that cast iron is loaded with impurities





that render it extremely brittle.

What is needed for tools and gun barrels is *wrought* iron. To produce wrought iron, you need a refinery, which in the 18th century was called a forge. Here the cast iron was heated up and beaten into bars of various dimensions. The more you beat the stuff, the purer it gets. It was sold through iron merchants, and you could buy the quality of iron that you needed. So if you had to produce nails, you might buy "first-run" iron. For a gun barrel, you would prefer "third-run" iron. Of course a barrel is further refined when you forge it from the flat bar or skelp.

Wrought iron was valuable. It was a law in various colonies that when a house burned down, the ashes had to be sifted for nails. According to the prevailing economic theory, now known as mercantilism, the role of the Colonies was to produce raw materials (sow iron) and consume manufactured goods (wrought iron). However, Britain could not produce enough basic wrought iron goods profitably enough, so the Colonies began to build refineries or forges.

In 1732 William Byrd of Westover, one of the great men of Virginia, investigated the iron industry. During the course of his rambles, he talked to a Mr. Chiswell, which he reported as follows:

Having pretty well exhausted the subject of sow iron, I asked my friend some questions about bar iron. He told me we had as yet no forge erected in Virginia, though we had four furnaces. But there was a very good one set up at the head of the bay [Chesapeake Bay] *in Maryland that made exceeding good work. He let me know that the duty in England upon bar iron was 24s a ton and that it sold there from £10 to £16 a ton. This would pay the charge of forging abundantly, but he doubted* [suspected, believed] *the parliament of England would soon forbid us that improvement lest after that we should go farther and manufacture our bars into all sorts of ironware, as they already do in New England and Pennsylvania.* (354)

The Maryland forge was set up sometime after 1715. In New England Lynn Ironworks began smelting, forging and refining iron in 1643. In Pennsylvania forges started in 1718 with the Coventry Iron Works. "In the decades that followed many other forges and furnaces were established in the region, including the Oley Iron Works, Hopewell Forge, and Mount Joy Forge (Valley Forge)" (Shumway, *Rifles* 2: 636).

Quite apart from the fact that Colonial wrought iron was not readily available until the decades after 1718, there is still the cost and effort involved in producing a barrel. Europe, with its vast and cheap labor pool, could produce barrels much cheaper than the Colonial gunsmith. England preferred to export completed firearms to the Colonies, so why weren't the English doing so? Well, they were. You could buy an English fowler in a general store in Virginia for £1. Why not rifles? Simple—there wasn't the demand.

The rifle was a frontier gun. Generally, during the settlement period (1725–1750, as defined by Wallace Gusler and which we will discuss later), rifles were being imported into the Colonies from Germanic countries and were being made by German immigrants, who brought the rifle culture with them. During this time the number of people who wanted rifles was too small to make profitable English production.

I'm going to digress here to talk about the relative usefulness of the smoothbore versus the rifle. Remember, we're not talking about hunting as a sport but as a necessity. On the Eastern seacoast, there were far more wildfowl around to feed your family than the occasional deer, although a smoothbore loaded with a patched round ball is accurate enough to kill a deer at 50 yards. On the other hand, and quite apart from cultural bias, the frontier abounded in big game. It all comes down to what one needed in order to harvest most economically the most meat.

But I digress. If the English didn't find it profitable to make rifles, they certainly weren't reluctant to make and export rifled barrels. Various advertisements in Philadelphia newspapers from 1731 to 1769 offered rifled barrels for sale. The inventories of the Moravian gunshop at Christian's Spring from 1764 to 1780 list imported rifled barrels (Shumway, *Rifles* 2: 635–636). So it seems that gunsmiths as late as the Revolution were using foreign barrels.

THE LOCK

AS GEORGE SHUMWAY POINTED OUT IN 1980, "almost all of the flintlocks used on colonial American arms were imported from Europe" (*Rifles* 2: 634). Colonial gunsmiths could make their own locks. Most of a gunsmith's work, at least in the early days, was repair work. Guns broke down, and you couldn't buy a replacement part from Wal-Mart because it didn't exist, nor did interchangeable parts. So if a mainspring broke, a gunsmith made a new one and fit it to that particular lock. In order to repair a gun they had to be capable of making a gun. Gunsmiths were capable of making their own locks, but, with the exception of Jacob Dickert, John Walker and John Armstrong in the 1800s, I have found few locks signed by American gunsmiths. Gunsmiths found it cheaper to buy imported locks.

THE MOUNTS

WHAT I'M TALKING ABOUT HERE ARE THE butt plate and trigger guard. Most of the mounts on American longrifles are of brass. Most Germanic guns were mounted in iron, so it may be somewhat surprising that more iron-mounted guns did not survive from the Colonial period. That is until we remember that we were all British Colonies, and the British used brass.

That mounts were imported from England and the Germanic lands is obvious. If you look through *Rifles of Colonial America,* you can find guns where the engraving on the mounts is far more sophisticated than that found on the rest of the gun. George Shumway even quoted an advertisement in the March 1769 *Pennsylvania Journal & Weekly Advertiser,* which I'll repeat here:

IMPORTED in the latest vessels from London, Bristol, and Liverpool, and to be sold on the very cheapest terms by DANIEL and JOHN BENZET And THOMAS BARTOW, At their store, at the corner of Arch and Second-streets; the following large assortment of GOODS, viz . . . rifle, fowling piece and common gun barrels; brass mounting furniture for ditto, common, flat and half round fence gun locks . . . (2: 636)

However, Colonial gunsmiths did cast their own butt plates and trigger guards. James Geddy in Williamsburg advertised that he was casting brass in 1738. The inventory of Martin Meylin II's estate, taken in 1751, lists "Sum Casting Mowles" and a "Prass Riffel" (Shumway, *Rifles* 2: 631).

THE STOCK

IT SHOULD BE OBVIOUS THAT MOST COLONIAL guns were stocked from purchased parts, just like we do today. To consider a gun an American product, then, we had better look at the stock. One of the myths is that only the Americans used tiger maple, because it is such a pretty wood when stained. However, if you look into *Decorated Firearms 1540–1870,* you will see that the Europeans were using this wood as early as 1625. While most European maple stocks were "burl" maple, the Germans at least used tiger maple as an alternative to burl maple, which may or may not explain the preference for it among American gunsmiths (Gusler and Lavin 237). Certainly before claiming an American manufacture for an early gun, the wood must be tested for origin.

TO SUM UP THEN, IT SEEMS THAT MANY rifles were stocked with imported parts. Because of the low labor rates in Europe, such parts could be acquired cheaply by the Colonial gunsmith. Because of the relatively high labor rates in the Colonies, the gunsmith could make a profit, expand his business and buy land so that he could retire to his farm when his eyes gave out, in other words, generally move up in the world. Such opportunity did not exist in Europe where the trade had been specialized into at least 21 sub-trades, still at the cottage industry level. So a man might spend his entire life casting butt plates or forging lock parts or file-fitting lock parts. With the cheap labor rates, he had little chance of gaining any wealth. No wonder emigration was so popular.

Only the masters of gunshops in large urban centers, who had the patronage of the wealthy upper class, made a good living at the trade, stocking their guns with parts acquired from the sub-trades. The provincial gunsmith in old Germany would have had a poorer life, and his apprentices would have had little opportunity to open their own shops, since there was an abundance of gunsmiths.

The first generation of Germanic gunsmiths who emigrated to Pennsylvania, Maryland and Virginia in the first decades of the 18th century had to do it all after they arrived in the Colonies, and their work shows it. The varied specialities of their training back home accounts for the wide variation in the style and quality of guns made in America. For example Wallace Gusler, in discussing a rifle made in Rockbridge, Virginia, dating from the third quarter of the 18th century, points out:

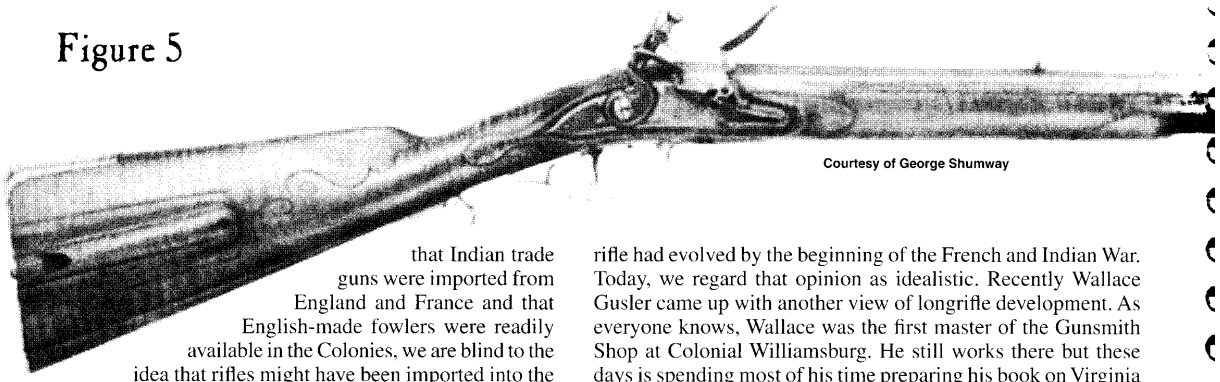
This carving is strong evidence that the originator of this art was trained as a gunstocker in Europe, not as a gunsmith. To produce such carving, this master used no less than nine carving gouges, five veiners, three flat carving chisels and three scratch stocks for cutting moldings. Compared with the carving tools (3 or 4) of the makers of the two Botetourt rifles discussed above, this is a sophisticated approach, one that we might expect from a European-trained gunstocker with an extensive tool kit. ("Early Rifles" 7)

I'd like to draw your attention to volume one of *Rifles of Colonial America.* Chapter one is entitled, "Rifles, Smooth Rifles and Smoothbores of Germanic Origin," and chapter four is entitled, "Rifles, Possibly American, Possibly European." With the exception of the Casper Zelner rifle (number two) in chapter one, all of the guns in chapter one could be exchanged with those in chapter four if we judge them solely by appearance. Consider George's comment, "However, we must not lose our heads and underestimate what the provincial gunsmiths of old Germany could turn out" (1: 70). This statement is highly indicative of the origin problem.

Although George conservatively dated these guns to the third quarter of the 18th century, they could just as easily have been the kinds of guns being made by the earliest Germanic gunsmiths to arrive in America.

Or they could have been imported. While we all know

Figure 5



Courtesy of George Shumway

that Indian trade guns were imported from England and France and that English-made fowlers were readily available in the Colonies, we are blind to the idea that rifles might have been imported into the Colonies from the Germanic lands. Yet there is evidence that such was the case right up to the Revolution. In other words white Colonists did have Germanic rifles, and for Europeans and European immigrants, the word "rifle" commonly referred to a short, fully octagonal-barreled gun. So while we might like to imagine the early frontiersmen carrying longrifles, they were far more likely armed with what we now call "jaeger" rifles. And this preference continued up to the eve of the Revolution.

The question then is when did the barrel lengthen on American-made rifles and why? As Wallace Gusler points out, "One estate inventory in Augusta County, Virginia of 1753 records 'One long rifle gun' and the same inventory lists 'One short rifle gun'" ("Early Rifles" 5). Thanks to the research of Alan Gutchess ("History"), I have the following:

—An iron-mounted rifle with a 41-inch barrel of .50–.54 caliber excavated from a 1740 grave site in the Indian Conestoga Town near Lancaster, Pennsylvania. This rifle has a sliding wooden patchbox.
—From the papers of George Washington in December 1756, a list of trade goods for the Ohio Company includes "1 doz. rifles 4' barrels, iron molds to each. 1 doz. smooth rifles."
—July 1766—lost a German rifle 2' in the barrel.
—December 1771—a rifle gun 2' 10" in the barrel.
—1773 Philadelphia—a quantity of guns made in this country and in Germany.
—Thomas Palmer of Philadelphia—makes rifles with barrels of various lengths.

If we analyze the references above, which admittedly are very few, we can note that the barrels might be lengthening around the 1750s but that most rifles used by white men continued to be short barreled right up to the Revolution. On the other hand, the rifles used by or intended for Indians were inclined to have long barrels. This is perfectly logical, as the Indian was used to a long-barreled trade gun. As we shall see below, the Indian trade was an important part of the Colonial economy.

The earliest *dated* American longrifle is the famous John Schreit rifle made in 1761. See **Figure 5**. John Schreit lived and worked in Reading, Pennsylvania, from 1758 to 1777. If you ignore the length of the barrel, 43-5/16 inches, this gun probably could have been made anytime from 1700 to 1780, but it is nice to have a dated rifle as a benchmark. Outside of the barrel length and the brass mounts (the trigger guard is an unfortunate replacement), there is nothing particularly American about this rifle.

Back in 1968 John Bivins, Jr., in the introduction to his book, *Longrifles of North Carolina*, claimed that the American rifle had evolved by the beginning of the French and Indian War. Today, we regard that opinion as idealistic. Recently Wallace Gusler came up with another view of longrifle development. As everyone knows, Wallace was the first master of the Gunsmith Shop at Colonial Williamsburg. He still works there but these days is spending most of his time preparing his book on Virginia longrifles, which hopefully will be published in the next few years. Wallace sees three stages in longrifle development, and I can't do much better than to quote them here. The three periods are: the Settlement Period 1725–1750, the Frontier Conflict Period 1750–1783, and the Federal Period 1783–1830. See pages 36–46 for a timeline featuring the gunsmiths whose rifles are used as models in this chapter.

SETTLEMENT PERIOD 1725–1750

Introduction of rifles and European-trained gunsmiths. Insufficient data on this period makes statements regarding rifle evolution impractical. Rifles are introduced, but no examples are known from this period.

(Gusler, "Early Rifles" 4)

INDEED THERE ARE NO KNOWN DATED examples from this period, but there are plenty of references such as the Conestoga Town rifle noted above. Here's another: "Several of the Neighbours and Particularly [John] Winthrow two of the Brandons and others came and hindered the sd James McManus from making any other Survey by drawing their Swords on him and threatening to Shoot him with Rifles which they had with them" (Bivins, *Longrifle* 7). Unlike the Conestoga rifle noted above, this quote mentions rifles but doesn't say anything about their appearance. Again, they might have been short Germanic guns. However it does show that by the 1740s rifles were in use from Pennsylvania to North Carolina.

LANCASTER

THE MYTHOLOGY HAS IT THAT LANCASTER, Pennsylvania, is the birthplace of the American longrifle, but this claim is somewhat naive. Still, Lancaster became known for its longrifles, so let's start our exploration of the Settlement Period with that town.

Lancaster was approved on May 1, 1730, and it was the

westernmost town in Pennsylvania at the time—a frontier town. The purpose of Lancaster was to establish a county seat, because the local farmers complained about the long distance to Chester County to the east. The Lancaster area was fairly well settled long before the town was established. In the beginning of the 1700s, a wave of Germanic peoples came to Pennsylvania seeking religious freedom. One of the most powerful men in the colony, James Logan, pushed settlers westward even into unceded Indian lands in order to raise money for the proprietors' (the Penn family) debts.

So the Lancaster area was settled largely by Germanic peoples. "Sixty per cent of the people who took up lots between 1730 and 1736 were of German or Swiss background; and by 1740 they constituted seventy-five per cent of the lotholders" (Wood 7). Of course some of these were gunsmiths. By 1759 there were four gunsmiths working in the town. Matthias Resor bought property in the town in 1740. William Henry, who may have learned the trade from Resor, was there about the same time. If the gunsmiths weren't living in Lancaster, they were in the area.

According to George Shumway, in 1719 a Robert Baker asked permission to erect a boring mill on Pequea Creek some three miles from Conestoga town (*Rifles* 2: 630). There's no record that he did so, but it's interesting that he wanted to. By the way, a boring mill is really a reaming mill. After the rough tube is forged and welded from the flat wrought iron skelp, the next job is to ream the rough hole round and enlarge it to bore size. I can attest that this is hard work. But in those days, all work was hard, and nobody would go to the expense of a water-powered mill unless there was a high demand for gun barrels or guns. Furthermore, Baker must have felt that there was a large enough production of rough-forged barrels in the area that he could make a profit reaming them.

At the same time, the legendary Martin Meylin was supposedly a gunsmith in the area. When his son (Martin II) died in 1751, his estate inventory listed a large number of gunsmith tools, including rifling tools, molds and even a brass (barrel) rifle (Shumway, *Rifles* 2: 631). Now some of these tools could have been inherited from his father, but there is no other proof that the first Martin was ever a gunsmith. Just outside Lancaster there is a small stone building with a historical marker designating it as Meylin's shop. When I visited it, I could easily see that it could never have been a gunsmith's shop. Nonetheless, from the research of Sam Dyke, George Shumway lists the names of some 22 gunsmiths who were working in Lancaster before 1760 (*Rifles* 1: 279).

The question is still why Lancaster became such an important rifle-making center. The answer seems to be that, as the westernmost frontier town in Pennsylvania, it became an important trading center. "Roads 'to the new Town of Lancaster' constituted a sizable part of the earliest business of the County Court of Quarter Sessions" (Wood 15). "To provide communications with a nearby industry, the court ordered in February, 1738, that a road be cleared from Lancaster to the ironworks on French Creek, 'with a Fork leading to the new Furnace called Reading furnace'. So iron for gun parts was readily available. By 1741, roads had been ordered surveyed which would eventually connect the town with Harris' Ferry (Harrisburg) to the northwest, Blue Rock Ferry to the southwest and Tulpehocken to the north" (Wood 16).

Once roads had been established, the town was perfectly situated to supply the local farmers not only with local manufacture but with retail goods imported by and produced by the great merchants of Philadelphia. More importantly Lancaster was "an emporium for the wide hinterland embracing western Pennsylvania and Maryland, as well as the upper portion of the Valley of Virginia" (Wood 93). It is interesting that in 1749 the town's traders were worried about the formation of Cumberland County because the county seat would attract customers from "the back parts of Maryland and Virginia who have for several years past dealt to a very considerable Value with the people of Lancaster for Hatts, Saddles and Gun Barrels &c" (Wood 102). The trade with the hinterland expanded in subsequent decades. For example the trader William McCord in 1766 paid John Spor for hauling 22 hundredweight of iron to Winchester (Wood 102).

MIGRATIONS

The Moravians began coming in 1741, after the consummation of the Walking Purchase [1737] and they were shocked to hear from the Indians that the land they had bought was not so clear of encumbrance on their title as had been guaranteed . . . They bought from William Allen the land on which Bethlehem was to be built.
(Jennings, *Iroquois Empire* 348)

THE MORAVIANS ARE AN INTERESTING group. They very quickly involved themselves in the Indian trade. I'll have more to say about them in connection with their famous gunshop at Christian's Spring. For now though it is interesting that they provided gunsmiths for the Indians at Shamokin (presently Sunbury, Pennsylvania). I have the following from George Carroll of the Kentucky Rifle Association:

John Hagen records that on June 21, 1747, that David Bruce (who had gone back to Bethlehem) returned to Shamokin with Christian Henry Rauch. On the way up he purchased, at Lancaster, the iron, etc., for the smithy, which was transported to Harris' Ferry. The Indians went down in canoes, loaded the anvil, iron, and tools, and paddled back to Shamokin. Gunsmith Anton Schmidt arrived (apparently later replaced by Marcus Kiefer) on August 3rd, 1747. This forge existed until the opening of the French and Indian War. (Carter 94–95)

Quite apart from the Moravian sympathy and affinity for the Indians, they were also businessmen, and repairing Indian firearms was good business, although the Moravians did find the Indians poor credit risks. When they complained to the chief,

Shikellamy, he replied, "I always said that the smiths should trust no Indian, but as soon as he mended a gun should keep it until it is paid" (Carter 94–95).

Now one can't prove that the Moravian gunsmiths at Shamokin were actually making rifles for the Indians, but the fact that they had the tools and supplies and came from the German rifle-making tradition is highly suggestive. Nonetheless, this is certain proof that the German gunsmiths who immigrated to Pennsylvania were very definitely involved in the Indian trade and from the very earliest times.

Meanwhile in 1747 John Fraser, a Highland Scotsman (1721–1773), became a licensed Indian trader and situated himself at Venango, some 75 miles northwest of present-day Pittsburg, according to the following, "27 August 1753 Shippen to Warton, Wenango is the name of an Indian town on the Ohio where Mr. Fraser has had a gunshop for many years" (159). While no John Fraser rifles or guns survive today, several pipe tomahowks, either stamped with his initials or attributed to his hand, do exist. That Fraser had a gunshop so far from the settlements is more evidence of the importance of Indian customers to gunsmiths.

John Bivins, Jr. has pointed out that the immigrants were in search of cheap land. The Lancaster area saw inhabitants already moving south by 1735. "In 1732 the cost of a fifty-acre farm in Lancaster County was £7 10s, while in the Granville District of North Carolina a farm could be purchased for 5s per hundred acres, regardless of the amount bought" (*Longrifles* 10). So settlers poured down the Great Wagon Road, down the Valley of Virginia and into North Carolina. Winchester, which began life as a trading post, was the first settlement west of the Blue Ridge Mountains. At the northern end of the Valley, it is on the Great Wagon Road. It is also a crossroads. There was a road (or trail) from Alexandria that crossed Winchester on its way westward to the Ohio River, more or less present-day Route 50.

In 1744 James Wood laid out the beginnings of Winchester—just four years before Reading, Pennsylvania—a courthouse square and 26 lots of half acre crossed by two streets, each 32 feet wide. By 1753 "Winchester, seat of Frederick County, consisted of sixty crudely built dwellings, stores and taverns" (Higginbotham 1). The point is that for Wood to lay out a town site and for the town to grow, there must have been a significant surrounding population. And by 1744 rifled guns were known and common in Virginia. Whether they were made in Virginia or imported from Lancaster or from Germany is not known.

All of the inland towns established during the Settlement Period were really villages. In 1741 Lancaster had a population of 300 to 400 inhabitants. This does not include the surrounding population of farmers, who might total several thousand more. It is helpful, too, to understand that for the first two centuries of its existence, America was a nation of farmers—more than 90 percent of the population did not work for wages. Barter was the lifeblood of the economy. Today, the very opposite is true. So these villages were trade centers where the farmer could exchange his produce for needed manufactured goods.

Recently, in a secondhand bookstore I bought an original copy of a book that I have been wanting for quite some time, *Conrad Weiser: Friend of Colonist and Mohawk* by Paul A. W. Wallace. I had known that Conad Weiser (1696–1760) was an important figure in early Pennsylvania, but until I got into this biography, I hadn't realized just how important he was. Adopted by the Mohawks in 1712, he learned their language and customs. After moving his family to Tulpehocken, near present-day Reading, in 1729, he entered provincial service in 1731, quickly becoming Pennsylvania's chief interpreter to the Iroquois and other tribes. As this biography shows, Weiser was not only an interpreter but also largely responsible for keeping the peace on the frontier during this period. This biography really emphasizes that the Iroquois were important to the colonies of New York, Pennsylvania and Virginia as a buffer between them and the French who, in the 1740s, were beginning their takeover of the Ohio Valley. The biography is also very clear in differentiating between "guns" and "rifles."

For example at an Indian conference at Philadelphia in July 1742, the Iroquois received presents for their help in cowering the Delawares who had been complaining about the Walking Purchase. These presents included 69 guns along with powder and lead (Wallace 127). In 1743 there was a crisis arising from some Virginians who had attacked and killed some Iroquois on a war party against the Catawbas. Unless peace could be made, there was a very real danger that revenge would quickly ignite a frontier war that would involve everyone. "The pacifist Assembly [of Pennsylvania] had prepared no measure of defence, and among the back inhabitants not one family in ten had a gun" (Wallace 146). Conrad Weiser was sent to Onondaga, the capital of the Six Nations, on a peace mission on behalf of Virginia. On July 12 near Muncy, Pennsylvania, "they met eight Shawness on horseback armed with rifles, pistols and sabres" (Wallace 156). These few references strongly underline the situation that very few settlers even owned guns, in contrast to the Indians who needed guns as a necessity to life and had rifles and even pistols.

THE FUR TRADE

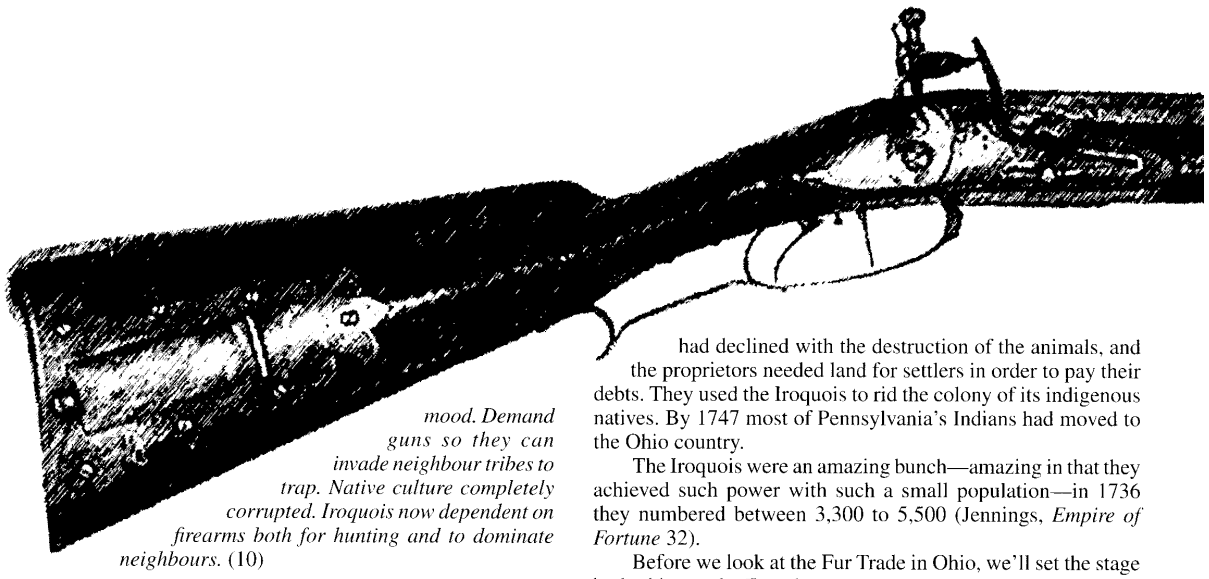
WHILE THIS STUDY MUST FOCUS primarily on the rifle-making colonies of Pennsylvania, Maryland, Virginia and southward, the single most important determining factor of the Settlement Period was the fur trade, so here's a brief summary of that subject.

Sometime around 1504 Frenchmen fishing off Newfoundland began to trade metal tools to the Indians for their furs. Furs were valuable in Europe, not only to keep warm but also as status symbols. But European fur-bearing animals were growing scarce. On the other hand, metal tools made life much easier for the Indians, a stone-age culture.

In 1608 Samuel de Champlain established Quebec. He chose that site because there the St. Lawrence River narrows to less than a mile in width. In that location he could defend his monopoly of the trade with the natives, something he could not do with his earlier attempt in Acadia (Nova Scotia). To the French at Quebec flocked the Indians from the interior, especially the Hurons, an Iroquoian people.

In 1618 the Dutch established Fort Orange, presently called New York City, and they attracted the trade of the Iroquois' Five Nations. Hamilton's "A Chronological Outline of the Colonial Fur Trade" in *Colonial Frontier Guns* gives us some startling examples:

—1625 Fort Orange receives 5,295 beaver and 493 otter from the Iroquois.
—1626 The Iroquois trade 7,250 beaver and 800 otter at Fort Orange.
—1628 10,000 furs traded at Fort Orange.
—1640 The Iroquois country is trapped out. Iroquois in ugly



mood. Demand guns so they can invade neighbour tribes to trap. Native culture completely corrupted. Iroquois now dependent on firearms both for hunting and to dominate neighbours. (10)

There are a few points that need to be emphasized here. First, we are only looking at a very small corner of the trade. The Iroquois were also trading with the French at Quebec and Montreal, and the French had an immensely greater area of fur supply than did the Dutch at Fort Orange. Second, we must note but not disparage the immense plundering of the wildlife, such that, in less than 30 years what is now New York State was completely denuded of beaver. Third, and this is an important point to which I'll return, the Indians did all of the harvesting. Fourth, the metal tool that most corrupted the Indian into dependency on the European was the gun. By 1640 the Indian needed the gun for his very survival.

For the Iroquois to survive, they had to become the middlemen in the fur trade. In 1649 they attacked and destroyed the Huron nation. In the next few years, they took care of the Petuns and the Eries. They also attacked the French. The "Beaver Wars" continued until 1700 when the Iroquois lost to the French and finally made peace at the Montreal Treaty of 1701. Here they allied themselves with the French in a position of neutrality. At the same time, they sent representatives to Albany to renew the Covenant Chain. The Covenant Chain was "an interlinked set of alliances of British colonies and Indian tribes. In this confederation, New York and the Iroquois League acted as a sort of steering committee with New York supervising Colonial negotiators while the Iroquois spoke in behalf of most of the tribes; but after an important treaty in 1736, Pennsylvania acquired a special status in the Chain . . . Pennsylvania recognized the Iroquois as exclusive spokesmen for all the province's allied Indians" (Jennings, *Empire of Fortune* 28).

So it was a good deal all around. The Iroquois benefited. The neutrality with the French meant that the French were not allowed to cross Iroquois territory in any war against the English, while the Iroquois could participate in the fur trade with the French. Further, it was Iroquois policy to give shelter to Indian refugees and settle them where they pleased as a buffer zone against the English. The arrangement with Pennsylvania gave them this power.

Pennsylvania certainly benefited. The fur trade in that colony had declined with the destruction of the animals, and the proprietors needed land for settlers in order to pay their debts. They used the Iroquois to rid the colony of its indigenous natives. By 1747 most of Pennsylvania's Indians had moved to the Ohio country.

The Iroquois were an amazing bunch—amazing in that they achieved such power with such a small population—in 1736 they numbered between 3,300 to 5,500 (Jennings, *Empire of Fortune* 32).

Before we look at the Fur Trade in Ohio, we'll set the stage by looking at the French.

THE FRENCH

UNLIKE THE ENGLISH COLONIES THAT were established to settle colonists, New France existed primarily for the fur trade. Colonization was occasionally attempted but with little success. Young men found it far more exciting and profitable to join in the fur trade than to establish farms. In 1673 the population of New France was 6,705, rising slowly to 50,000 in 1760. In comparison the English colonies had a population of 250,000 in 1700, exploding to 1,500,000 by 1750 (Miller 97–105).

The French were not content with establishing trading posts and letting the Indians come to them. They ranged outward to find new customers and were happy to live with the Indians and adopt the native culture. They became known as "*coureurs du bois,*" or "runners of the woods," and their explorations were amazing.

In 1659 Radisson and Groseilliers reached Hudson's Bay overland and returned with a fortune in fur, but because they were not licensed by the authorities, it was confiscated. Radisson and Groseilliers were displeased at their treatment by the French and went to the English. In 1670, under Prince Rupert, the Hudson's Bay Company was formed.

In 1672 La Salle, who called his estate that was just west of Montreal "La Chine" (China), got into the exploring game and opened up the trade into the Illinois country. In that same year, Father Jacques Marquette and Louis Joliet paddled the whole length of the Mississippi River, down and back. Then in 1682 La Salle explored the Mississippi and claimed the whole area for France.

Fort Louis de la Mobile was established in 1702 at the mouth of the Alabama River to protect the mouth of the Mississippi. The French leader D'Iberville also established New Orleans in 1718. His brother Charles le Moyne was famous for attacking and defeating the English on Hudson Bay. In 1719 Du Tisne was

in present-day Oklahoma to open trade with Santa Fe and the Indians. In 1722 the French had opened Arkansa Post near Pine Bluff, Arkansas. Another noted French explorer was La Verendry. In 1738 he had reached as far west as a Mandan village near Bismarck, South Dakota. In 1742–43 his sons had reached the Rocky Mountains.

So really it was the French who had explored the continent long before the English had left the seacoast. And all for the fur trade. Naturally, the main item of trade was the gun. As Hamilton has amply demonstrated in *Colonial Frontier Guns*, the French were everywhere. That can also be judged by the very large number of their guns found in Indian burial sites.

The French trade gun influenced English manufacture. In 1703 the factor at Hudson's Bay writes the home office in London, "All those Indians that traded with the French, nay all the Indians in general, desire that they may have such short guns as the French trades" (Hamilton 10). The barrel length of the various French trade guns ranged from 42 inches to 48 inches. In 1734 the French Intendant M. de Vaudreuil wrote the Duc D'Orleans, "It would be advisable to send to Canada each year, 40,000 livres of powder, 60,000 livres of lead in bars and 600 hunting guns from Tulle because they are the best. The Indians know them and do not want others" (Hamilton 10). For this particular gun to have impressed the Indians, it must have been available quite a few years before 1734. Its barrel length was 43-7/8 inches. In 1740 the factor at Hudson's Bay writes head office, "The guns are good but too much wood in the stocks, and Indians like them more slender and to be free of knots and also to have the guard larger, it being usual to draw the trigger with two fingers which our guns will not admit of" (Hamilton 11). What is interesting is that the French set the standard for trade guns and the English were forced to catch up. They did so, thanks to the Industrial Revolution, and were soon able to make and sell them more cheaply than the French. More importantly, and let me emphasize this point, it was the Indian customer who demanded and received the kind of gun he wanted—a long-barreled one.

So, we have the Indians, we have the French and we have the English traders from New York, Pennsylvania and Maryland. Before we go to Ohio, we'd better look at the other major factor: Virginia.

VIRGINIA

DURING THE SETTLEMENT PERIOD, THE last Indian War in Virginia ended in 1676. Explorations southward and westward began in the 1640s. John Lederer crossed the Blue Ridge in 1669, and in 1670 the first William Byrd was an Indian trader at the site of present-day Richmond. He sent traders with 100-horse pack trains 500 miles to the Cherokees and Catawba Indians in North and South Carolina. They traded the Indians rum, guns, ammunition, cloth, kettles and hatchets for deerskins, beaver skins and other furs. The Cherokees were important trading partners. A Cherokee embassy visited London in 1730. In 1752 Gov. Dinwiddie hosted the Cherokee emperor and empress at Williamsburg.

Now I'd love to claim that Byrd was trading those Indians rifles, but I'm afraid I can't. It seems that nobody was making rifles in Virginia or even importing them in 1670. On the other hand, the Indian trade begun by William Byrd didn't stop, and I feel sure that further research will prove that Virginia gunsmiths were making rifles for this trade in the third and fourth decade of the 18th century.

As Jennings points out, Virginia's, "expansion into the southern frontier region was hampered by a specific charter boundary and obstructed by the energetic activity of the Carolinians; in a different direction Virginians were frustrated by the giant estate of Lord Fairfax" (*Empire of Fortune*, 9, 10).

But Virginia's charter boundaries extended to the Pacific, so Virginia land speculators looked to the north and west. In 1749 the Ohio Company was given a grant for half a million acres by the Crown in Ohio, which "required the Company to plant a settlement of 100 families in the Ohio Valley within seven years, and to build a fort for their protection" (Jennings, *Empire of Fortune* 13). Now land speculators may have started the Ohio Company, but they were just as interested, if not more so, in the fur trade. The proposed company seal pictures two Indians, "the other with a riffle gun" (Gutchess, History). As noted previously, the 1756 papers of George Washington listing trade goods for the Ohio Company include "1 doz. rifles, 4' barrels, iron moulds to each" (Gutchess, History). Unquestionably, rifles with 48-inch barrels were being made specifically for the Indian trade. The Indians were accustomed to the long-barreled French and English trade guns, and they demanded the same style in their rifles.

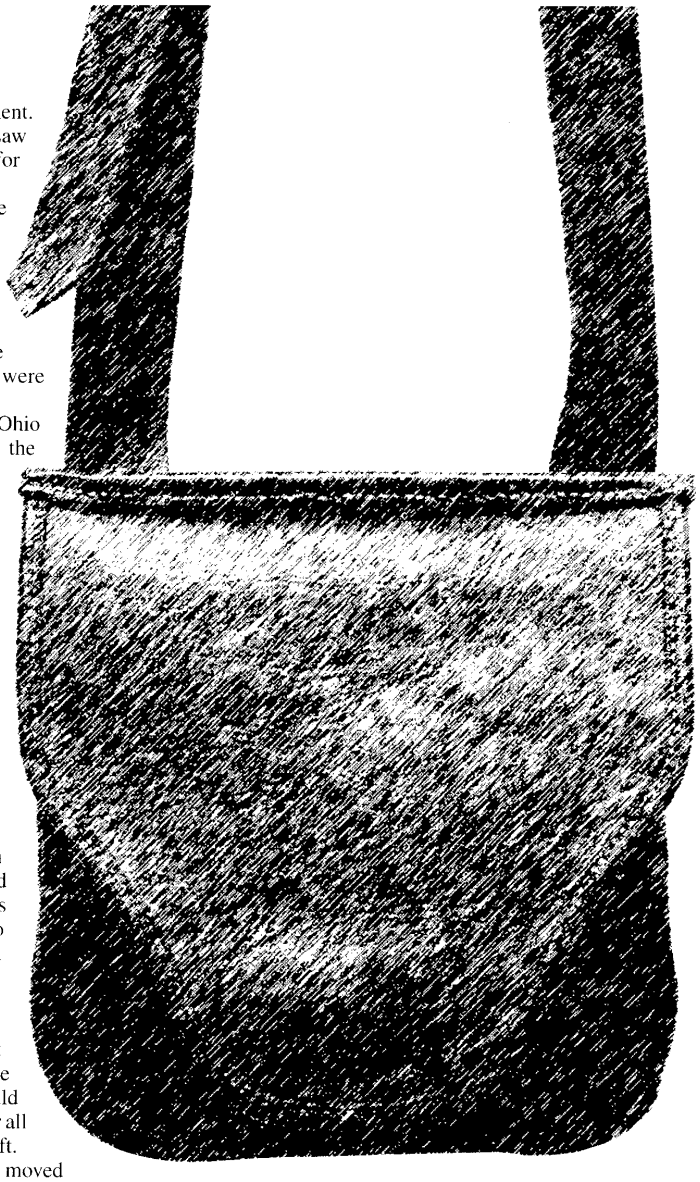
I find it interesting to imagine the Indians demanding, receiving and using the longrifle, while the Colonials, both farmers and longhunters were probably carrying short-barreled jaeger-type rifles. If you consider that the longhunters learned their bush craft, hunting, trapping and survival skills from the Indians, then it seems logical that the white frontiersmen also learned from the Indian that the longer barrel rifle was somehow better than the short one and got one too. My thesis is that it was the Indian who drove the evolution of the Germanic jaeger-style rifle into the longrifle. But it is not just my thesis. According to George H. Carroll, "The premise is that since the Indian hunters were the primary suppliers of hides and fur in the 18th and 19th centuries, it is probable that Indian populations contained proportionally as great a percentage of our legendary American riflemen as did the White pioneer stock. The latter were after

all vastly more interested in agricultural development. Daniel Boone and his Long Hunter compatriots saw hunting as preliminary financing and exploration for future cash crop land speculation" (6).

And while I will accept that one parent of the American longrifle was the Germanic "jaeger" rifle, I don't believe that the other parent was the English long fowler at all. Of similar appearance, I believe the other parent was the Indian trade gun.

Just who made these rifles for the Ohio Company is yet unknown. Some were probably made by gunsmiths in the Shenandoah Valley. Others were probably made in Maryland and Pennsylvania.

What is certain is that the formation of the Ohio Company and the invasion of the Virginians into the Ohio country was the fuse that lit the biggest fur trade war of all.



THE OHIO COUNTRY

DURING THE SECOND QUARTER of the 18th century, a rather large number of Indians had moved into the Ohio Country. They came from the west to get closer to the white man's trade goods. From the East they came, dispossessed of their lands, particularly in Pennsylvania. According to Jennings, Conrad Weiser, the great Pennsylvanian agent went out there in 1748 to see what the situation was (*Empire of Fortune* 31, 32). He took a survey and discovered that there were 789 warriors of various expatriate Iroquoian tribes or a population of 2,367 to 3,945. Also living there were the Twightwee or Miami tribe with 1,000 warriors. He quickly realized that the Iroquois Five Nations could not control the Indians in Ohio to the benefit of the Pennsylvanians. So on his arrival home and upon his advice, the government dissolved the Covenant Chain by arranging that the Delawares in Ohio (formerly of Pennsylvania) should have an equal voice with the Iroquois in speaking for all Indians. This change marks an enormous power shift.

The reason this occurred is that the fur trade had moved west. There in the Ohio Country was a huge gathering of Indians, who did almost all of the harvesting of furs. Formerly the trade had been centered on trading posts in the East. Now most Indians couldn't or wouldn't travel to the Eastern trading posts, so the traders were forced to carry their goods to them by packhorse.

The English fur traders came from the East, and the French descended from the North. Both sides wanted control of the Ohio Country not only for itself, but also because the side that controlled the Ohio also had control of the Mississippi. Into this mix came the Virginians and their Ohio Company—the match that lit the fuse. All it needed was Braddock.

LANCASTER . . . AGAIN

A LARGE PART OF THE BUSINESS OF Lancaster was the Indian trade. Although traders came to the Ohio Country from the Carolinas, New York and Virginia, the largest and most active group came from Pennsylvania. These "Anglo-American counterparts of the French voyageurs had by mid-century pushed the traders' frontier to the area near the Wabash and Maumee rivers, about five hundred miles beyond the most westerly farming settlements of the Juniata Valley. They had even made attempts to move toward the Mississippi—a cause for anxiety among the governing officials of French Canada" (Wood 113).

Lancaster was a depot for the Indian trade. There were

merchants, in association with partners in Philadelphia, who bought the European goods that the Indians preferred. Or they bought locally made goods. For example the trader Joseph Simon "employed a silversmith, Daniel East, to make trinkets for the Indian Trade" (Wood 116). Although I can't prove it, I'm sure these traders bought rifles from local gunsmiths.

Prior to 1744 Edward Smout was involved in the trade. Others include Joseph Simon, who was allied with Nathan Levy and David Franks of Philadelphia. Simon's son-in-law, Levy Andrew Levy, was heavily involved. It was said, "in the 1750's he was likely to be found almost anywhere a contract could be made for beaver skins on the frontier between Winchester, Virginia, and Fort Detroit" (Wood 114)

From these and other traders' warehouses in Lancaster came the trade goods. For example:

...a silk shirt, two dozen silk handkerchiefs, 19 dozen jewsharps, 14 snaffle bridles, 20 hunting saddles, 17 tomahawks and axes, 52 pewter basins, 2,400 gun flints, 36,400 pieces of "black wampum" (beads), 24,100 pieces of "white wampum," 27 hair plates, 136 wrist bands, 163 dozen broaches, and 107 pairs of "Ear Bobbs." (Wood 115)

To these warehouses came the hides and furs to be culled and shipped to Philadelphia. In 1748 "George Gibson supplied a wagon 'to Carry Eighteen Hundred weight of fall Deer skins' belonging to the trader George Crogan, from Lancaster to Philadelphia" (Wood 117). Another shipment in 1762 included the following:

13 Bundles fall [Deer] skins	*contg. 377 skins*	*Wt 1402 lb.*
1 small bundle do.	*11 damaged*	*37*
2 bundles summer do.	*82*	*230*
1 bundle damaged do.	*24*	*17*
3 bundles Beaver	*132*	*219*
1 bundle Racoons	*200 2 fall wrappers*	*198*

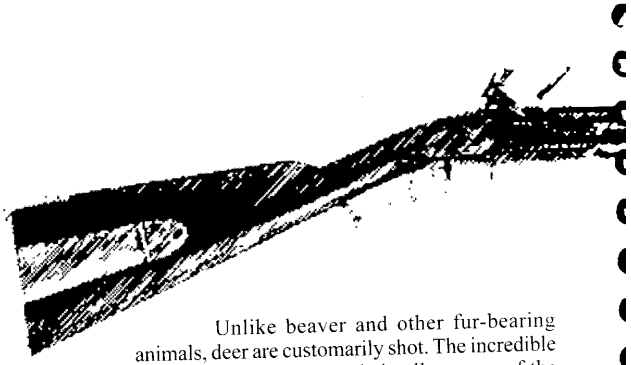
(Wood 117)

So the fur trade was big business in Lancaster. From Lancaster Indian truck was carried westward to the harvesters and to Lancaster came the hides and furs. I was surprised to discover that, after the French and Indian War, hides and furs from as far away as Fort Pitt were being brought to Lancaster. In 1767 Alexander McKee shipped some 280,000 deer hides through Fort Pitt.

This is not to say that Indians didn't come to Lancaster to trade. Some did. In 1755 "Edward Shippen advised Governor Morris, 'I am to acquaint Your [Honour] that there are seven or eight Indians who call themselves our friends who have sold what Skins they have brought with them, and converted their money into Guns, Powder and Lead'" (Wood 118).

So let's sum up. Lancaster was settled by Germanic peoples, among them gunsmiths, in the early 1730s. Lancaster was an important depot for the fur trade. It is logical that the early gunsmiths made their living largely from the fur trade.

But perhaps fur trade puts a mistaken emphasis on the whole business, at least in the Middle and Southern colonies. Time and again as I have studied this history, I have been impressed by the fact that deer hides vastly outnumber the beaver and other furs harvested by the Indians. Certainly in the Southern colonies of the Carolinas, the Indians harvested a phenomenal number of deer hides every year. One account states, "Carolina shipped 130,884 lbs. of deerskins in 1743–44, and 305,717 pounds in 1744–45" (Braund 36).



Unlike beaver and other fur-bearing animals, deer are customarily shot. The incredible hunting pressure on these animals in all seasons of the year would have rendered them extremely skittish, hence the necessity for and popularity of the long-range rifle.

Lancaster may or may not have been the birthplace of the American longrifle. I have presented evidence that the rifle was known and used from Pennsylvania to the Carolinas as early as the 1730s. However, it seems fair to state that, because of its importance in the Indian trade, because of iron furnaces and forges in the vicinity and because of the concentration of Germans, Lancaster produced more rifles than anywhere else, hence its reputation.

While rifle production was undoubtedly underway as early as 1730, I can't see it as gaining much importance until the late 1750s, principally because there wasn't the population to produce them or the harvesters to need them.

THE FRONTIER CONFLICT PERIOD 1750–1783

ACCORDING TO WALLACE GUSLER, DURING this period, "[r]ifles with longer barrels are developed, use of curly maple for stocks is established, and at the end of this period hinged brass boxes of various types develop. While great variations occur and patch boxes with hinges are clearly undergoing experimentation, most rifles of this time are recognizable as an "American long rifle" ("Early Rifles" 5)

America in the 1750s was a different world from the preceding decades. For one thing the new idea of science was expanding, and people were expressing a lively curiosity in their environment. Allied to this movement was the Industrial Revolution, which began to provide a wealth of cheap goods. Further, by mid-century the Colonies were connected to a worldwide trade. The middle class grew.

So did the population. In 1741 when York, Pennsylvania, was founded, Lancaster's population comprised of 300 to 400 people. By 1786 the population of the town had risen to 3,750. Carlisle, Pennsylvania, was established in 1749, and in the 1750s Hanover, southwest of York, was well-settled and became an important gunmaking center, being on the Monocacy Road that connected Lancaster to the Great Wagon Road. In Winchester, Virginia, Adam Haymaker began the gunsmithing trade in 1753. By the 1750s the Valley of Virginia was well-settled, and in North Carolina, with its cheap land, the population exploded from 30,000 whites in 1727 to 50,000 in 1752 to 120,000 in 1765.

With the growth of the population, the gunsmith and the Indian trade grew. In his article "Indians as Riflemen during the Golden Age and Before," George Carroll writes, "In October 1755 the captive James Smith described his adopted Caughnewaga brother Tontileaugo as being 'a first rate hunter' who 'carried a rifle gun, and every day killed deer, racoons or bears'" (6). Today Caughnewaga is an Iroquois reservation near Montreal, which is pretty far north of what we normally consider rifle territory.

Certainly, by the 1750s Indians were using the rifle. They needed it because the game had to be killed at longer ranges than previously known. Far to the south in Georgia, trader Daniel Pepper wrote to Gov. Lyttelton from Ockchoys, Upper Creeks, on 30th November 1756. Part of his letter follows, courtesy of the late Dan Wallace:

I think it highly necessary to inform your Excellency that the Indians are daily geting in to the Method of useing Riffle Guns instead of Traders which they purchase where ever they can at monstrouw [sic] *Price, as they can kill point Blank at two hundred Yards Distance. This, in my humble Opinion, puts them too much upon an Equality with us in case of a Breach, and presume to offer to your Excellency that if some Stop was put to their spreading through the Nation it would be prudent. As the People who sell them to the Indians are generally very poor, their Gun being the greatest Part of their Estate, a Fine would be of little or no Effect.* (McDowell 297)

Apart from showing that the rifle was so necessary to the Indians that they would pay the whites a huge price for them, this letter also shows that the white establishment was becoming worried about rifles in Indian hands. Secondly it shows that the rifle was the most valuable possession of a poor man. However with such high prices being paid by Indians, the poor man could possibly gain some measure of prosperity by selling rifles to the Indians. Certainly Daniel Pepper, the Indian trader, would be worried about his business if the Indians didn't want his smoothbore trade guns. Consider the following quote cited by George Carroll in his article for the *KRA Newsletter*. Carroll writes, "The North Carolina Catawba leader, King Hagler, was reported by eyewitness Maurice Moore as being buried in 1763 with 'his silver mounted rifle, a fine powder flask, gold and silver moneys, tobacco, and ...other personal possessions'" (6).

THE MORAVIANS

WITH THE PUBLICATION OF *Moravian Gun Making of The American Revolution* in 2010, by the Kentucky Rifle Foundation, we now know much more about the Moravians and their influence on 18th Century gun making. This is an extremely valuable book to own. The beautiful color photography alone is worth the price, but you also have an introduction to and commentary on the guns by noted collector Stephen Hench. In addition to all that, you have a well researched essay, based on the Moravian records, entitled "Moravian Gunmaking: Bethlehem to Christian's Spring" by Robert Lienemann. Within the limitations of space, I can report some of the author's research here.

The Moravians were a Protestant sect that started out in Czechoslovakia in the 17th century, but moved to Germany to avoid persecution and found refuge in the estates of Count Zinzendorf in the early 18th century. Their numbers expanded, and Zinzendorf financed missions around the world. Their goals included missions to slaves and Native Americans, as has been previously shown.

A variety of communities was established in the new colony of Pennsylvania, which under the Quaker, William Penn, promoted religious freedom. According to the author, one type was the "closed community," such as Bethlehem, where the brethren lived communally up until 1760 when the Count died and his financial support ended. Here, men and women were assigned where needed, received food and clothing, but no salary for their work. Only men were taught trades. On the other hand, Moravian communities, such as in Lancaster and Lititz, lived like everyone else, but had their own churches and schools. In other words, Moravian gunsmiths in Lancaster, like Peter Gonter, Mathias Roesser and Jacob Dickert, were paid for their work, while the value due to gunsmiths in Bethlehem, like Andreas Albrecht, was paid directly to the church.

Andreas Albrecht was born near Suhl, Germany, in 1718. In 1731, at the age of 13, he was apprenticed to a gunstocker. After five years the apprentice became a journeyman and was obliged to travel all around Europe with a fellow journeyman for protection. This travelling period lasted at least three years, with the journeymen working for short periods of time in gun shops. Thus, they were educated in the latest styles and techniques. Albrecht, for example, travelled and worked from 1736–1748. I had long hoped that some scholar would research Germanic firearms of Albrecht's period to discover which "school" of gunmaking he came from. However, this common travelling period of journeymen renders that hope ridiculous, since, by the time they reached the colonies, this first generation of Germanic gunsmiths would have developed their own styles based on their education.

Albrecht arrived in Bethlehem in 1750, a year after the Bethlehem community had built a saw and grist mill, a smithy and other buildings for a group of single men at Christian's Spring, named after Christian, the son of Count Zinzendorf, who was to be their spiritual advisor. Andreas Albrecht practiced his trade at Bethlehem from his arrival. "1754 Apr.: Today the big Shawanos was here. He was in Bethlehem two years ago… Br. Albrecht stocked a rifle for him, and he was very pleased and satisfied." (p.21)

Albrecht moved to Christian's Spring in 1759 as the music teacher as well as the gunsmith. He was Master of the gun shop until 1766, when he married at the age of 48, and became host of the Sun Inn on Bethlehem. In 1771, he moved to the Moravian community in Lititz, where he worked for himself as a gunsmith for the rest of his life.

I wish the was more space here to explore the records of the gun shop at Christian's Spring, which continued until 1787.

Robert Lienemann's essay is full of fascinating details of the smiths and their lives during this turbulent period, but also the inventories of the shop during those years show what the smiths were capable of doing. For example, as early as 1764 the shop had 9-1/2 lbs. of sheet brass. Where did they get it, I wonder?

The Moravian gunsmiths had an enormous influence on surrounding gunsmiths. For example, the rifles by Peter Neihart and John Moll (the first) show that they were very familiar with rifles made at Christian's Spring. Not being Moravians, they were not trained at the gun shop. But, during the Revolutionary War, there was an arsenal at Allentown making and repairing guns, which brought together many gunsmiths.

Jacob Dickert, a Moravian gunsmith who lived in Lancaster, had a close association with the gun shop at Christian's Spring. The May 1777 inventory shows that he still owed the shop for 18 rifle barrels. In 1782, he furnished the shop with several barrels. He obviously had a close association with Andreas Albrecht at Lititz, because his earliest surviving rifle, (shown and discussed below) and the only signed Andreas Albrecht rifle, shown restored, in *Moravian Gun Making*, pp. 119–123, are very, very similar.

To sum up then, by mid-century the Indians badly needed the rifle. They were willing and able to pay almost anything for it and quite obviously owned some pretty expensive rifles. I am not aware of many references to white men owning expensive rifles in this period.

THE FRENCH & INDIAN WAR

DURING THE WAR PERIOD, RIFLES BEGAN to assume more importance. According to Harold B. Gill, Jr., "In 1757 George Washington purchased a rifle from Aaron Ashbrook and the same year Joshua Baker, a gunsmith in Frederick County, repaired it" (19). He also reports several uses or losses of rifles by provincial troops.

I am in debt to Richard LaCrosse, Jr. When I asked him for help in my research, he promptly sent me a copy of his fine book, *The Frontier Rifleman*, published by Pioneer Press in 1989. In this book LaCrosse carefully analyzes every battle during the Revolution that involved American riflemen. He also provides in Chapter 5 a slew of "Contemporary Accounts of the Dress, Marksmanship and Character of Frontier Riflemen." If you are into reenacting, there are a whole bunch of illustrations of riflemen's outfits and accoutrements, all with proper sources.

During the French and Indian War, both provincial troops and Indians were armed with rifles. In 1758 Col. Henry Bouquet wrote, "A large part of the provincials are armed with grooved rifles, and have their molds. Lead in bars will suit them better than bullets—likewise the Indians—but they also need fine powder FF" (LaCrosse 76).

I find this reference to powder interesting. It suggests that the finest powder available was FFg—no FFFg or FFFFg. It also suggests that muskets commonly used a coarser powder.

In 1799 long after the French and Indian War and even the Revolution, Col. James Smith had this to say in *An Account of the Remarkable Ocurances in the Life and Travels of Colonial James Smith*:

Had the British King attempted to enslave us before Braddock's war, in all probability he might readily have done it, because, except the New Englanders, who had formerly been engaged with the Indians, we were unacquainted with any kind of war: but after fighting such a subtil [sic] *and barbarous enemy as the Indians, we were not terrified at the approach of British red-coats. —Was not Burgoyne's defeat accomplished in some measure by the Indian mode of fighting? and did not Gen. Morgan's riflemen and many others, fight with great success, in consequence of what they had learned of their art of war?*
(qtd. in LaCrosse 78)

Despite the patriotic exaggeration, what comes through is that for the frontiersmen to survive they had to learn from and imitate the Indians. I think it was the Indians who persuaded the whites that a long-barreled rifle somehow shot more accurately than a short barreled one.

The Rev. Joseph Doddridge, in his *Notes on the Settlements and Indian Wars of the Western Parts of Virginia and Pennsylvania 1763–1783*, has this to say:

In the latter years of the Indian war our young men became more enamored of the Indian dress throughout, with the exception of the matchcoat.

The young warrior instead of being abashed by this nudity was proud of his Indian like dress. In some few instances I have seen them go into places of public worship in this dress. Their appearance, however, did not add much to the devotion of the young ladies. (qtd. in LaCrosse 75)

This statement is fascinating for a number of reasons. First it assigns a specific date when the imitation of Indian life became noticeable. Second, it is the young men who are adopting the breech cloth, leggings and moccasins. The young men who do most of the fighting, push westward into hostile territory and so forth. By the Revolution there are lots of comments about the Indian dress of frontier riflemen.

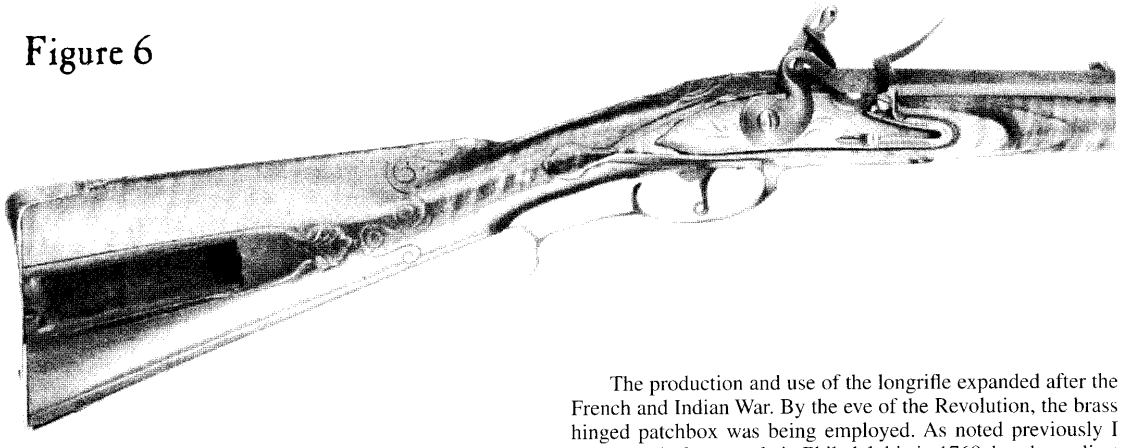
In 1761 Sir William Johnson wrote, "They are remarkable at Philadelphia for making rifled Barrell Gunns [sic] which throw a Ball above 300 yards, vastly well, & much better than any other Barrells" (qtd. in LaCrosse 76). This suggests that the rifle was already known in southern New York State and also that Philadelphia was an important center for rifle smithing.

With Braddock's defeat in 1755, Indians, especially the dispossessed Delawares, began raiding the outlying settlements. The unarmed farmers were easily slaughtered and the backcountry of Pennsylvania was in chaos. Many left their homes and as refugees huddled in Lancaster and Philadelphia. In 1755 John Bartram, a friend of Conrad Weiser's, reported, "most of ye Indians which are so cruel are such as was allmost dayly familiar at thair houses eate drank & swore together was even intimate play mates & now without any provakation destroyeth all before them with fire ball & tomohawk they commonly now shoot with rifles with which they will at a great distance from behind a tree fence ditch or rock or under ye covert of leaves take such sure aim as seldom miseth thair mark" (Wallace 403).

However, Weiser, who had taken over the defense of the backcountry reported, "if the White people will come up to Shamokin [present-day Sunbury, Pennsylvania, where Weiser had many Indian friends] and assist they will stand the French and fight them. They said that now they want to see their Brethren's faces, and well armed with smooth Guns, no rifled Guns which requires too much cleaning . . . I pray Sir don't slight it—The lives of many thousands are in the utmost Danger. It is no false alarm" (Wallace 398).

I find this letter very interesting. The Indians wanted white

Figure 6



help to fight a large body of French and Indians supposedly sighted east of the Allengheny Mountains, but they wanted the whites armed with smoothbore guns. It seems that the Indians foresaw a battle and knew very well that rifles would not be as useful as smoothbores in fighting one, a fact that Washington was to learn in the Revolution.

Gradually a line of blockhouses was built along the southern flank of the Blue Mountains from present-day Harrisburg to Easton, and Ranger companies were set up, but the Indian raids continued to wreak devastation until the treaty at Easton in 1758 brought peace.

In 1761 the Moravians, who had been making and selling rifles in Bethlehem, started the famous gunshop at Christian's Spring. The first master was Andreas Albrecht. A number of Christian's Spring rifles survive, and a number associated with the gunshop survive as well, as explored by George Shumway in his *Rifles of Colonial America*. More recently, Shumway has been able to attribute two unsigned rifles to Andreas Albrecht himself. Unfortunately, no existing rifles made at Christian's Spring have been dated earlier than the Revolution. However, if you compare the John Schreit of 1761 to an undated Christian's Spring rifle, or even a dated one, you can readily see that not much evolution had taken place. In other words guns made before and during the Revolution tend to have two-inch-wide butt plates, a straight comb, fairly long barrels and a caliber from .50 and up.

According to George Carroll, the British decided in 1764 to govern the trade with all Indians in North America. They acted on information supplied by Sir William Johnson and others. Traders were to be licensed, taxed and prevented from selling to the Indians the items of rum, swan shot and rifle barreled guns. It seems that the British were not worried about trade guns. However they were beginning to be aware that heavy swan shot—a type of buckshot—and especially rifles could be a threat. These and other moves by the British, and especially Sir Geoffrey Amherst, brought on Pontiac's Rebellion. But nobody could stop the Indians from getting rifles.

Thanks to Richard LaCrosse, I have a photocopy of a page from Dillin's *The Kentucky Rifle* that states, "In 1768 Sir William Johnson induced several skilled gunsmiths to migrate from Lancaster, and they set up shops at Esopus, Schenectady, Johnstown and Canajoharie" (n.p.). Canajoharie, at least, was a major Iroquois town, so there is no doubt in my mind that Johnson was busily making sure that "his" Indians at least could acquire rifles.

The production and use of the longrifle expanded after the French and Indian War. By the eve of the Revolution, the brass hinged patchbox was being employed. As noted previously I have heard of one made in Philadelphia in 1768, but the earliest I have seen is the famous brass barrel rifle of 1771 featured in *Rifles of Colonial America* (Shumway 2: 452–457). I know of several that date in the 1770s.

Let's have a look at another rifle that was made shortly before the Revolution. See **Figure 6**. I have admired this gun for many years. George Shumway showed and discussed this piece in his *Rifles of Colonial America* and conservatively dated it to the third quarter of the 18th century (2: 366–371). I was much keener to date it to the 1750s or even earlier. Such details as the early round-plate English lock, the stepped wrist, the early double-C spurred trigger guard and the baroque style of the carving pointed me to an early date. With no signature or another signed gun of similar style, all we could say about it was that it was made somewhere in the Lehigh Valley.

A few years ago another gun of similar style and decoration showed up. This one was signed by Isaac Berlin. Finally the mystery was solved. We know quite a bit about this gunsmith. He was born in 1754 or 1755 in Easton, Pennsylvania, which would have made him 21 years old just at the beginning of the Revolution. This rifle was probably made between 1772 and 1776. It couldn't have been made any later than 1776, because that was when he enlisted in Capt. Henry Alshouse's 5th Company, Northampton County militia, and went off to war. He was captured by the British and spent the rest of the war as a prisoner. After the war he lived and worked in Easton until 1788. It is during this time that he made the second signed rifle, which is a later gun than the one in **Figure 6**.

The reason for illustrating this gun here is to emphasize that outside of longer barrels and the more widespread use of curly maple, there is essentially no development of form or decoration in the longrifle until after the war.

THE AMERICAN REVOLUTION

ON JUNE 14, 1775, CONGRESS AUTHORIZED six companies of expert riflemen from the frontiers of Pennsylvania, two from Maryland and two from Virginia. Response in Pennsylvania, at least, was so great that by June 25 the number was raised to nine. The name was changed to the Pennsylvania Rifle Battalion, although it continued to be known as Thompson's Rifle Battalion after its

first commander.

The facts are that few Pennsylvania counties, east or west, were able to raise more than one or two companies for any given regiment; that the sparse population of the frontier areas could not support large numbers of units even if the threat of an Indian attack had permitted more than a relative handful of men to be spared to the army; and that the rifle, while invaluable for scouts, rangers, and outposts, had distinct and serious limitations for close combat in a pitch battle . . .

It must be kept in mind that the organizations which made up the Continental Army were extremely small by modern standards; and moreover, that only a fraction of the authorized strength was usually present for duty. (Trussell iii)

For example, the nine companies of Thompson's Rifle Battalion were each organized as follows:

4 officers
4 sergeants
4 corporals
1 drummer
68 privates

81 men

Eighty-one men in each of nine companies totals 729 men. After the reconstruction of 1777, the total authorized strength was 720 men. However the actual numbers of riflemen would have been around 250 men (Trussell iii). So if your imagination pictures hoards of riflemen winning the war, think again.

Apart from the numbers, what I find interesting is where these men came from, what was considered the frontier in Revolutionary America. There follows a list of Pennsylvania companies:

A: Cumberland (Franklin County)
B: Bedford County
C: York and Adams County
D: Cumberland County
E: Northumberland County & what is now Union County
F: Northampton County
G: Reading, Berks County
H: Lancaster County
I: Dauphin County
2 Maryland Companies under Michael Cresap
2 Virginia Companies under Daniel Morgan. (Trussell 21)

Where did they get their guns? First of all, they owned their own guns, which had been made by local gunsmiths. These gunsmiths ranged from the first generation of Germanic gunsmiths who had immigrated to Pennsylvania in the 1730s and were at work from the 1740s, like Daniel Kleist, who inspected the arms of Morgan's companies on their way to Boston. The second generation of gunsmiths, born in the Colonies in the 1740s and 1750s were now beginning their careers and also would be hard at work. These included such men as Peter Neihard, Johannes Moll, the gunsmiths at Christian's Spring and Jacob Dickert, who had been working as a gunsmith in Lancaster since 1769. The list is a long one.

Further, the Committees of Safety quickly established gun factories. One was set up in Philadelphia, then later moved to Allentown where Johannes Moll worked. And the Committees of Safety hired anybody who could make a gun to produce them. Not all or even a major part of arms production was rifles—most of the production was muskets.

What was the impact of riflemen and their new weapon in the war? It wasn't exactly a new weapon; all armies had their riflemen or snipers. The French had them, as did the English. The English even hired Hessian, or German, riflemen. However by 1775 the American riflemen, with their Indian dress and mode of fighting, had grown a fearsome reputation.

Richard LaCrosse includes an excerpt from a letter written by an Anglican minister to the Earl of Dartmouth, which reads, "Maryland, December 20, 1775 . . . Rifles, infinitely better than those imported, are daily made in many places in Pennsylvania . . . In marching through woods, one thousand of these riflemen would cut to pieces ten thousand of your best troops" (82). This statement is interesting because not only does the minister not refer to rifles being made in Maryland, referring instead to Pennsylvania-made rifles, but also he refers to "imported" rifles. To me at least this shows that as late as 1775 rifles were commonly imported from Germany.

Another reference to the skill of riflemen reads, " . . . the Riflemen had in one day killed 10 men of a reconnoitering party, and it is said they have killed three officers. A sentry was killed at 250 yards distance." —*Pennsylvania Gazette* 1775 (LaCrosse 81)

LaCrosse also cites the following from a personal letter by Richard Henry Lee, dated 1775:

Rifle Men that for their number make the most formidable light infantry in the world. The six frontier countries (of Virginia) can produce 6000 of these Men (with) their amazing hardihood, their method of living so long in the woods without carrying provisions with them, the exceeding quickness which they can march to distant parts, and above all the dexterity to which they have arrived in the use of the Rifle Gun. Their [sic] *is not one of these Men who wish a distance less than 200 yards or a larger object than an Orange—Every shot is fatal.* (LaCrosse 80)

In the following quotes, Richard LaCrosse also shows the English apprehension of the American riflemen:

[The] shirt-tail men, with their cursed twisted guns, the most fatal widow-and-orphan-makers in the world. —London Newspaper. *1775* (81)

This province has raised 1,000 riflemen, the worst of whom will put a ball into a man's head at the distance of 150 to 200 yards: therefore, advise your officers who shall come out to America to

settle their affairs before their departure. —London Chronicle, *1775* (82)

Their guns are rifled barrels, and they fight in ambush, five hundred provincials would stop the march of five thousand regulars. And a whole army might be cut off, without knowing where the fire came from. —Gentlemen's Magazine, *1775* (79)

Certainly there were some amazing shots recorded during the war. One of the most impressive was written by the British Col. Hanger in 1814, where he describes an American rifleman shooting at Col. Tarleton and himself at a range of 400 yards. The ball passed between them, killing the horse of his bugler/orderly. On October 7, 1777, at the Battle of Bemis Heights, a rifleman killed Sir Francis Clerke and Gen. Simon Fraser at a range of 300 yards (LaCrosse 38). One fatal shot at that range might be a lucky accident but not two.

However, I am bothered by the account of Capt. Michael Cresap's Maryland Company entertaining the citizens of Lancaster and later Philadelphia with shooting demonstrations. The writers of these accounts are amazed at the riflemen's accuracy. They shot at dollar-size bull's-eyes at a range of 60-some yards, which was the traditional target match range. True, the paper bulls were mounted on boards held between the legs of comrades, nonetheless this is not terribly impressive shooting. I'm sure the writer was not from Lancaster, because this was an important center of rifle production, and the natives would be accustomed to that degree of accuracy. Moreover Lancaster itself sent a company of riflemen up to Boston where Cresap's company was headed.

A lot of the quotes from the American side seem to me to be more full of patriotism and exaggeration than fact and, on the English side, the result of the riflemen's reputation, more than their effect. Keep in mind that the foregoing is all dated in 1775, and the war hadn't really begun yet. Furthermore, not everybody in England was in favor of suppressing the Colonists.

One account in *The Frontier Riflemen* is a far more realistic description of the longrifle than most. It is from *Travels through the States of North America*, written by Isaac Weld in 1799. He says, "The rifled barrel guns, commonly used in America, are nearly of the length of a musket, and carry leaden balls from the size of thirty to sixty in the pound (from .53 to .42 caliber)" (qtd. in LaCrosse 79). He goes on to describe how the gun is loaded, the set triggers and the double sights. He states, "An experienced marksman, with one of these guns, will hit an object not larger than a crown piece, to a certainty, at a distance of one hundred yards" (79). He repeats the account of the shooting demonstration at Lancaster. However, and this is important, he concludes by saying, "Were I, however, to tell you all the stories I have heard of the performance of riflemen, you would think the people were most abominably addicted to lying. A rifle gun will not carry a ball much further than one hundred yards with certainty" (qtd. in LaCrosse 79).

As Richard LaCrosse points out, during the whole summer of 1775 around Boston, some 500 or less expert riflemen managed only to kill or wound some 60 British soldiers. Not quite the devastating impact the American writers boasted of or the British feared. Accounts show the riflemen were having fun target shooting at very long ranges, which prompted the following letter from Gen. Charles Lee to Col. William Thompson:

It is a certain truth, that the enemy entertain a most fortunate apprehension of American riflemen. It is equally certain that nothing can contribute to diminish this apprehension so infallibly as a frequent ineffectual fire. It is with some concern, therefore, that I am informed that your men have been suffered to fire at a most preposterous distance. Upon this principle I must entreat and insist that you consider it as a standing order, that not a man under your command is to fire at a greater distance than an hundred and fifty yards, at the utmost; in short, that they never fire without almost a moral certainty of hitting their object. (LaCrosse 81)

Now there was a general who fully understood the propoganda value of the riflemen—the British were scared of them, particularly the officers. What is also important about Gen. Lee's letter is that not all riflemen were dead shots, despite their boasts. In other words, they missed more than they hit, especially when you consider the summer's "bag" around Boston was only 60 dead and wounded enemy. Lee also gives what he considers to be the outside *effective* range of the longrifle: 150 yards or less ("moral certainty"), which agrees well with Weld's assessment, noted above. And these were shots taken from a rest at a standing target.

How did they fare in battle? In *The Frontier Rifleman*, LaCrosse presents all of the battles and skirmishes involving riflemen. For some of them, he gives the number of enemy killed and wounded. Here are a few examples:

—*November 9, 1775 Phipps Farm: Thompson's Battalion force 9 companies of British light infantry and 100 grenadiers to retreat. Five hundred riflemen were only able to kill 17 and wound 2 of the enemy.* (30)
—*July 20, 1776 Island Flats, Tennessee: One hundred and seventeen backwoodsmen (with rifles) defeat Cherokee Chief Dragging Canoe and a similar number of warriors. They killed 13 and wounded a number of others.* (32)
—*September 7–19, 1778 The seige of Boonesborough, Kentucky: Some thirty riflemen hold off some 450 enemy. They killed 37 and wounded many more. Note that this is a siege, not a battle, in that rifles were fired from a rest. Still, this is an example of accurate shooting.* (43)
—*September 26, 1780 Charlotte, North Carolina: Seventy riflemen engage Cornwallis' advance guard. They killed and wounded 15 enemy.* (49)
—*October 7, 1780 King's Mountain, South Carolina: 1400 riflemen surround and defeat Maj. Patrick Ferguson's Loyalist force, killing 157 and wounding 163. 780 Loyalists survived unscathed.* (49)

The battle of Saratoga from September 19 to October 17, 1777, was the one major battle (actually, two battles), where the riflemen were used effectively. The riflemen were Daniel Morgan's Rifle Corp, which he had formed in March, choosing 500 of the best and forming them into a disciplined force. In the first battle at Freeman's farm, the riflemen are stationed in the

woods and fire at the marching British, killing about 400 British. But they are supported by Continental troops. In the second battle on October 7, at Bemis Heights, they again kill many and again they are supported by the line. It is here that Tim Murphy does his amazing shots. Clearly, though, 500 riflemen alone do not win the battle (LaCrosse 38).

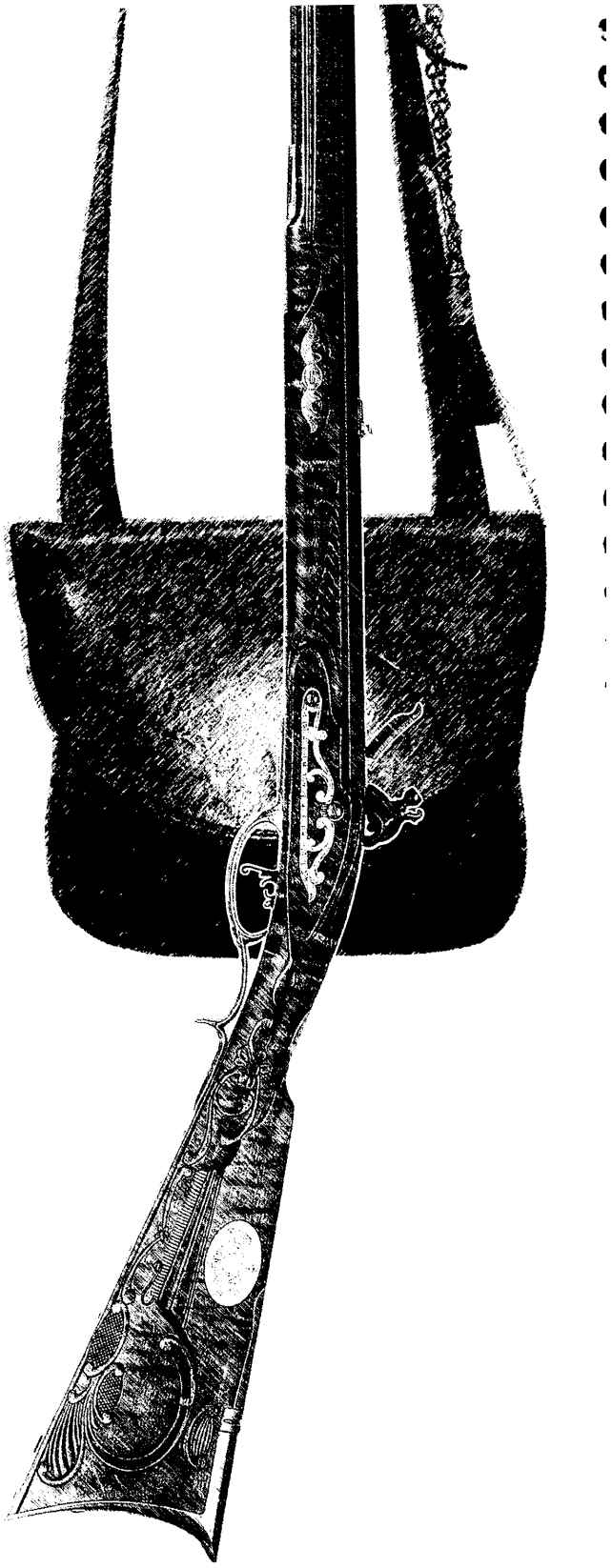
In January of 1777, the American Army had retired to winter quarters near Morristown, New Jersey. According to LaCrosse, "Colonel James Smith, after destroying two parties of British and German troops [no details given] on his way to join the army, brings his regiment [?] of Westmoreland County Pennsylvania riflemen into the camp and is rejected by Washington. The General does not 'fall in with the scheme of white men "turning" Indian.' He offers Smith 'a major's place in a battalion of rifle men already raised'" (35). Smith rejects the offer. It seems that the fearsome reputation of riflemen had already faded by the beginning of 1777.

Morgan's choice riflemen had disbanded in the fall of 1778. In November of 1779, the few remaining riflemen had their rifles taken away to be replaced by muskets. So riflemen in the United States Army lasted from 1775–1779. Riflemen continued to fight for the cause on the frontiers and in the South. Their opponents were also armed with rifles.

LET'S TRY TO SUM UP THIS PERIOD OF frontier conflict. At the beginning of the period, the heavy hunting pressure on deer by Indians engaged in the hide trade had necessitated a switch to the rifle, which is accurate at a far greater range than the smoothbore trade gun. Since the Indian was used to a long-barreled gun, I believe that they demanded long-barreled rifles from gunsmiths, who were happy to comply. I believe that the young men on the frontier, who learned their hunting skills from the Indians and who adopted their dress also adopted the long-barreled rifle. The short-barreled jaeger rifle continued to be imported, and made in Pennsylvania, right up to the Revolution. Certainly, it is in this period that the long-barreled rifle is noticed and commented on.

The growing number of gunsmiths could also supply more rifles with the fashionably longer barrel. Bartram's report of 1755, quoted above, is important because he says that the Indians were "commonly" armed with rifles and he emphasizes their capabilities. There were few reports of white men armed with such rifles in the 1750s, but I believe that the fearsome raids by Indians armed with such weapons stimulated the demand among whites for the same kind of gun. Unfortunately, it is the French and Indian War that caused the white colonists to hate all Indians, an attitude that persisted to the end of the 19th century.

Thus, if I try to answer the question of just when the "transition" rifle was made, I would have to say somewhere between the end of the French and Indian War, say 1760, and the beginning of the Revolution in 1776. It is no coincidence that the Moravians established the gunshop at Christian's Spring in 1760 and the Isaac Berlin rifle, featured above, was made by 1776.



RIFLES & SMOOTH RIFLES

WE KNOW THAT THE RIFLEMEN OF THE RIFLE companies raised by Congress came to war bearing their own firearms. Some of them, perhaps most of them, were probably smooth rifles. Smooth rifles look identical to real rifles, except their bores are not rifled. I did an analysis of all the rifles shown in Kindig's *Thoughts on the Kentucky Rifle in Its Golden Age*, and 49% of all the guns there are smoothbore. There is a myth that, as the big game, like deer, were shot out, rifles were reamed smooth to shoot shot. For one thing, such an operation would have been impractical. A .45 caliber smoothbore would not make an effective shotgun. For another thing the few surviving gunsmith account books show that they were making as many smooth rifles as rifles. A smooth rifle was, and is, as accurate as a rifle out to 75 yards. I wonder whether the normal target range of 60 yards was just that distance to accommodate competitors shooting smooth rifles. And smooth rifles might account for the missed shots by over-enthusiastic riflemen at longer ranges.

A further limitation to accurate long range shooting are the low sights commonly found on longrifles. The front sights, for example, are usually about 1/16 inch high. If you tried a shot at 200 yards, you would essentially be barrel shooting.

That there were rifles used by riflemen during the Revolution is also certain. The inventories show that gunsmiths were making rifles, as well as smooth rifles. The low sights are still a limitation, but there is an exception. A few years ago at the annual meeting of the Kentucky Rifle Association, I met Wallace Gusler, who had a display. He showed me the latest rifle he had collected. It was a Revoutionary War period rifle made in Virginia. It was quite plain, but did have a nice early Virginia style patchbox. Actually, as Wallace showed me, this was the third patchbox installed on the gun. The first was a sliding wooden lid. The bore was around .54 caliber with deep rifling. But the surprise was the original front sight. It was 1/4 inch high. That's right, *one quarter of an inch high!* It is Wallace's opinion, with which I agree, that this rifle was deliberately set up for long range sniping. There may have been others. However, after 40 sme years of examining longrifles, this is the first one I have ever seen.

The foregoing was not written to denigrate the efforts and heroism of the Revolutionary riflemen but is an attempt to penetrate the mythology. Yes, some riflemen were amazing shots, but I believe most were effective out to 60 yards—in other words, average. They certainly did not live up to their claims or reputation. Where they were best is when they were ably supported by line troops trained to use the musket effectively. And that includes the bayonet.

Let's do some math. I can load and fire my rifle twice a minute. I can fire about five shots before I have to stop and clean the fouling from the bore. If I want to shoot after five shots, pretty soon I will have to forget the patch if I want to ram the ball down the bore. Let's say that I am an average shot and can kill a man 100 or more yards away, and without a patch, at about 50 yards.

On the other hand, the musket is an effective weapon out to 40 to 50 yards. In its .75 caliber smoothbore barrel would be loaded a .690 ball and often three buckshot. The British, and later the Americans, were trained to fire every 15 seconds and fire continuously for four to five minutes. That's far more lead than a rifle.

Then there's the bayonet. How fast can a soldier travel 100 yards? Let's say that you shoot at the British line and they start charging. By the time you fire your second shot, 30 seconds after your first, they are within 50 yards and still coming fast with bayonets, and all you have is your tomahawk.

That's why the generals quickly turned the riflemen into musket men. The rifle simply cannot kill enough enemy fast enough to cause the enemy to retreat or surrender. But protected by woods and well-trained Continental lines, riflemen could destroy the command and control of the enemy, and this was their major value.

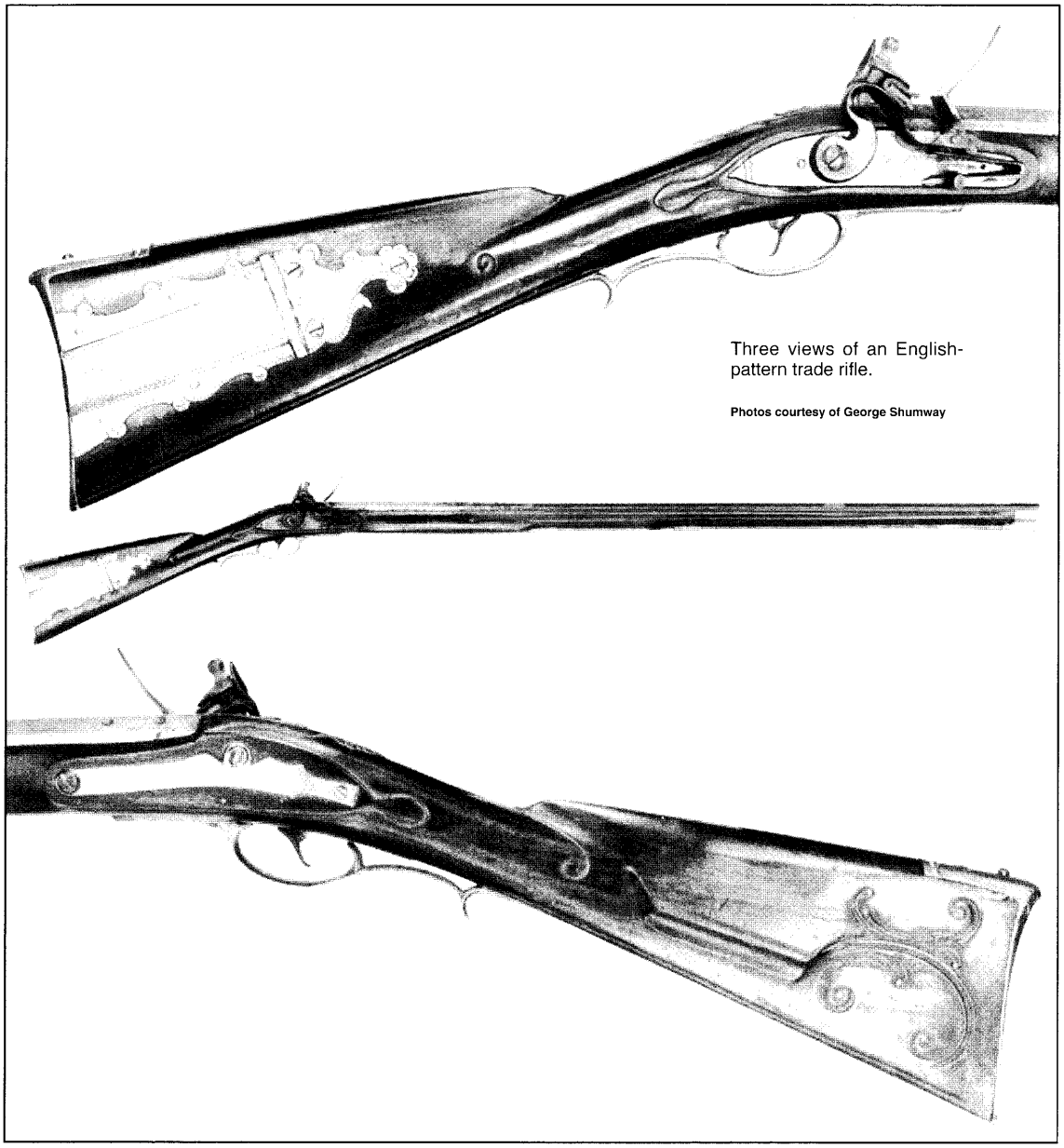
THE FEDERAL PERIOD 1783–1830

ACCORDING TO WALLACE GUSLER, THIS period sees the, "Emergence of a consistent style American rifle with long barrel, hinged patch box (usually in four pieces), curly maple full stock carved and inlaid more extensively than previously. This Federal period rifle completes the long rifle evolution and gives way to shorter examples with half stocks by the mid 19th century" ("Early Rifles" 7).

In the first edition of this book, I unknowingly perpetuated the myth that, at the end of the Revolution, the need for gunsmiths to provide firearms for the army dropped. Many gunsmiths returned to blacksmithing or farming, and the competition for customers was fierce, resulting in highly decorated guns of "The Golden Age." Noted collector and author Edward R. Flanagan, who had bought a copy of my book, very kindly sent me a critique, along with a copy of a speech he had given to the American Society of Arms Collectors, which was subsequently published in their journal. This article, "Anthony Fricker—A Pennsylvania Gunsmith in the Context of the Early 19th Century," like all of Ed's work, relies on well researched facts. I can do no better than give you some quotes from it.

The population of the United States in 1810 was 7.2 million of which 6.7 million were classified with rural residences. The population increased to 9.6 million in 1820 with a rural population of 8.9 million. This was a youthful population with the median age for all races at 16.7 years in 1820. In contrast to this the median age in 1998 was 35 years. The period between the end of the Revolutionary War and the second quarter of the 19th century was one of internal population expansion with a high birthrate and large families rather than growth from immigration. (p. 12)

The "Golden Age" of Kentucky rifle production lasted from the end of the Revolutionary War until the Crash of 1819, and was a result of the increasing discretionary income of the middle-class Germans. The close of the Revolutionary War was the start of an expansion of the American economy that continued with only minor interruptions until the depression of 1819. The economic expansion based on the production of cotton and wheat for export enabled the rural entrepreneurs to have the income to purchase fine arms. The German settlers brought with them from Europe the traditions of target shooting and hunting. Their increasing



Three views of an English-pattern trade rifle.

Photos courtesy of George Shumway

economic prosperity allowed them to indulge in their traditions. (pp.22.23)

The war had brought together gunsmiths and shooters from all over, and by the end of the conflict there arose a consensus of what an American rifle should look like. The "standard" length for a barrel was about 42 inches to 44 inches, no doubt assisted by the growth of barrel-making factories. Caliber sizes were reduced to about .50 but more commonly .45 caliber was used. Stocks became more slender and graceful. It is in this period of the 1790s that we see the development of "schools," which means that gunsmiths in a certain area developed a style specific to that area. For example it was only after 1790 that the Roman nose buttstock developed in the Lehigh Valley of Pennsylvania, and I have no idea why that occurred.

As noted above riflemen were not found to be terribly useful in winning the Revolutionary War. However in 1792 Washington created a select battalion of riflemen. "These men were to be outfitted with superior rifles" (Whisker, *Gunsmiths of York County* 30). Contracts were given to York gunsmiths such as Conrad Welshans, Jacob Doll, Henry Pickel and others. Government contracts for military arms, as well as Indian trade guns and rifles kept gunsmiths busy until 1814.

After the Revolution there is a terrific migration westward.

and gunsmiths, and more importantly their apprentices, moved also to be close to customers, spreading and modifying the stylistic schools. Lancaster rifles grew even more famous, as illustrated in the following advertisement, which I have courtesy of the late Dan Wallace and which appeared in the (Savannah) *Georgia Gazette* on February 7, 1787:

For Philadelphia the Brig Phoebe, David McCallough Master who has for sale on board said Brig Superfine and Common flour, ship bread and the usual Philadelphia type goods and Lancaster made rifle guns.

More importantly the white invasion of Indian territory in Kentucky throughout the Revolutionary War continued afterward into Ohio. Ferocious Indian raids in retaliation for the invasion produced a high demand from both sides for longrifles. It was only in 1795 with the Greenville Treaty that Ohio was pacified. In 1811 Harrison's victory at Tippecanoe ended the Indian threat in Indiana. Also important was the War of 1812. So the Golden Age of the longrifle was driven in part by the Indian wars.

In the settled areas to the east of the Ohio, farming was in progress. Land was being cleared, robbing deer of habitat. Deer were killed in great numbers, and bounties were paid by counties for wolves, foxes, crows and squirrels. If you were a farmer, you would know that there were a lot of animals out there that would want to eat what you grow or raise. So with the disappearance of big game, most rifles after 1820 were designed for squirrel hunting, or target shooting, which was the major sport for both men and women until the invention of baseball. So after 1820 the largest common caliber was .45, and squirrel rifles were made smaller. Thus the longrifle reached its most graceful proportions.

INDIAN TRADE RIFLES

BETWEEN 1754 AND 1777, THE HUDSON'S BAY Company sent 60 expeditions to the Arctic Ocean, the Rocky Mountains and southward to the Missouri. By 1777 there were some 2,431 licensed voyageurs working the trade out of Montreal and Detroit. In 1784 the Northwest Company was formed in Montreal and fiercely competed with the Hudson's Bay Company. After the Revolution the American traders moved west also to the Indians south of Lake Superior and the rich fur territory in the upper Missouri. Pittsburgh, for example, became an important gunmaking center (Rosenberger and Kaufmann xxiv, 3, 4).

Some years ago at the Baltimore Gun Show, I almost bought a Lancaster rifle. However I held back because I was suspicious. The brass daisy-head patchbox was canted too high, the walnut stock was carved in the Lancaster design but not by any hand that I recognized, and the top flat of the barrel had "London" engraved on it. The dealer assured me that it was a Lancaster gun with an English barrel. That night George Shumway told me that it was an English trade rifle. From his collection he handed me an identical patchbox.

In the 1984 Trade Gun Conference, George Shumway presented a paper titled "English Pattern Trade Rifles," which is an excellent study of these guns. He was able to distinguish at least four major patterns. The Type A seems to date as early as 1780 and looks very much like a Lancaster rifle with a sliding wooden patchbox. The Type B is the one that almost fooled me at the gun show.

The author also discusses the American response to the English guns, most notably the trade guns produced by the Henry family at Bolton, Pennsylvania, who copied the new pattern developed by the English. In other words, the English copied the Lancaster rifle, which shows how popular they were with the Indians, and when the English came up with a new pattern that they could sell to the Indians, the Americans copied it.

So here we have evidence of the Indians' continuing need for rifles. It was enough of a market that the English produced them for the trade. They could produce them more cheaply than the American gunsmith and, even allowing for the costs of transportation from England, could compete with American production. Further, here is more evidence of Lancaster rifles in the Indian trade, since the British copied the Lancaster style.

THE END OF THE GREAT GUNS

Martin Fry, III, was an associate of Jacob Doll, Jacob Leather and Henry Pickel in a federal government contract of 1804 to make 100 rifles. He was also a participant in the contract of 2 July 1806 for 50 Indian trade rifles, with Leather and Doll . . . [By 1809] All the York, and most of the Pennsylvania, gunsmiths were accused of providing substandard arms and few federal contracts were let to the York gunsmiths after the War of 1812. The crisis of 1812 caused the "york Arsenal" to produce arms for state militia and national army use. This was the last war in which the state and national governments depended on cottage industry production to provide needed arms. Some Philadelphia arms manufactories continued making arms on national contract, but most military and militia arms were produced in New England and especially the national arsenals at Springfield, Massachusetts, and Harper's Ferry, Virginia.

Few cottage industry gunsmiths of York seem to have been especially adept in marketing their wares in the west, and, with the decline in government contract work, gunsmithing in York was a matter of extreme competition for an increasingly small local market. (Whisker 12)

THE SAME SITUATION SEEMS TO APPLY IN the other areas of longrifle production. The world-wide recession after 1819 compelled a serious drop in demand for guns. Many gunsmiths left the trade for farming. Others were too old, like John Schriver. George Schreyer died in 1819. John Armstrong in Maryland went bankrupt several times. His super guns were probably made for local rich farmers. Others, like Philip Creamer of Taneytown, Maryland, left the state in 1805 during an earlier recession and wound up in Missouri, as did Jacob and Samuel, sons of Christian Hawken.

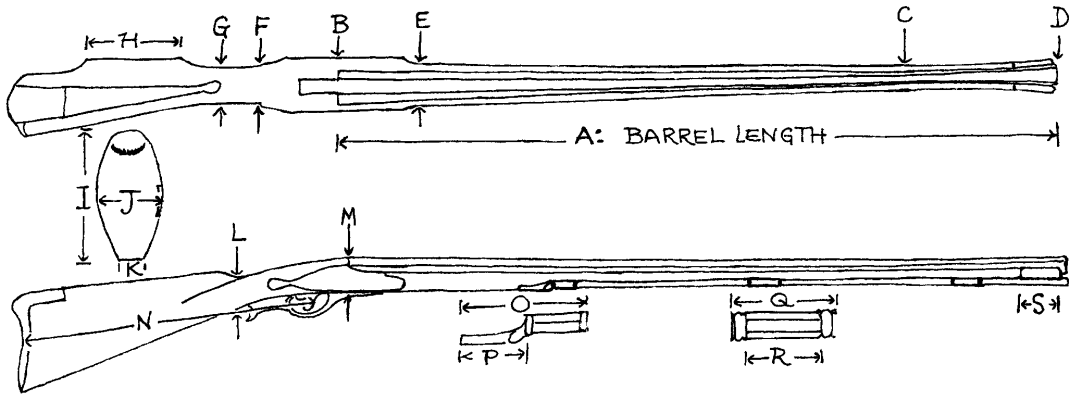
So it seems that the Golden Age of the longrifle lasted from the end of the Revolution to the 1820s. We can extend the end another decade or so in some areas, but after 1840 the great guns are done.

THE MODELS

THERE FOLLOWS THE PRESENTATION AND discussion of eight longrifles, most of which were made during the Golden Age from 1780 to 1840. **Figure 7** illustrates the basic dimensions of the longrifle that I record whenever I have the opportunity to examine and photograph an original rifle. These dimensions help to recreate the work of a certain gunsmith. Corresponding measurements are indicated by letter for each of the following rifles.

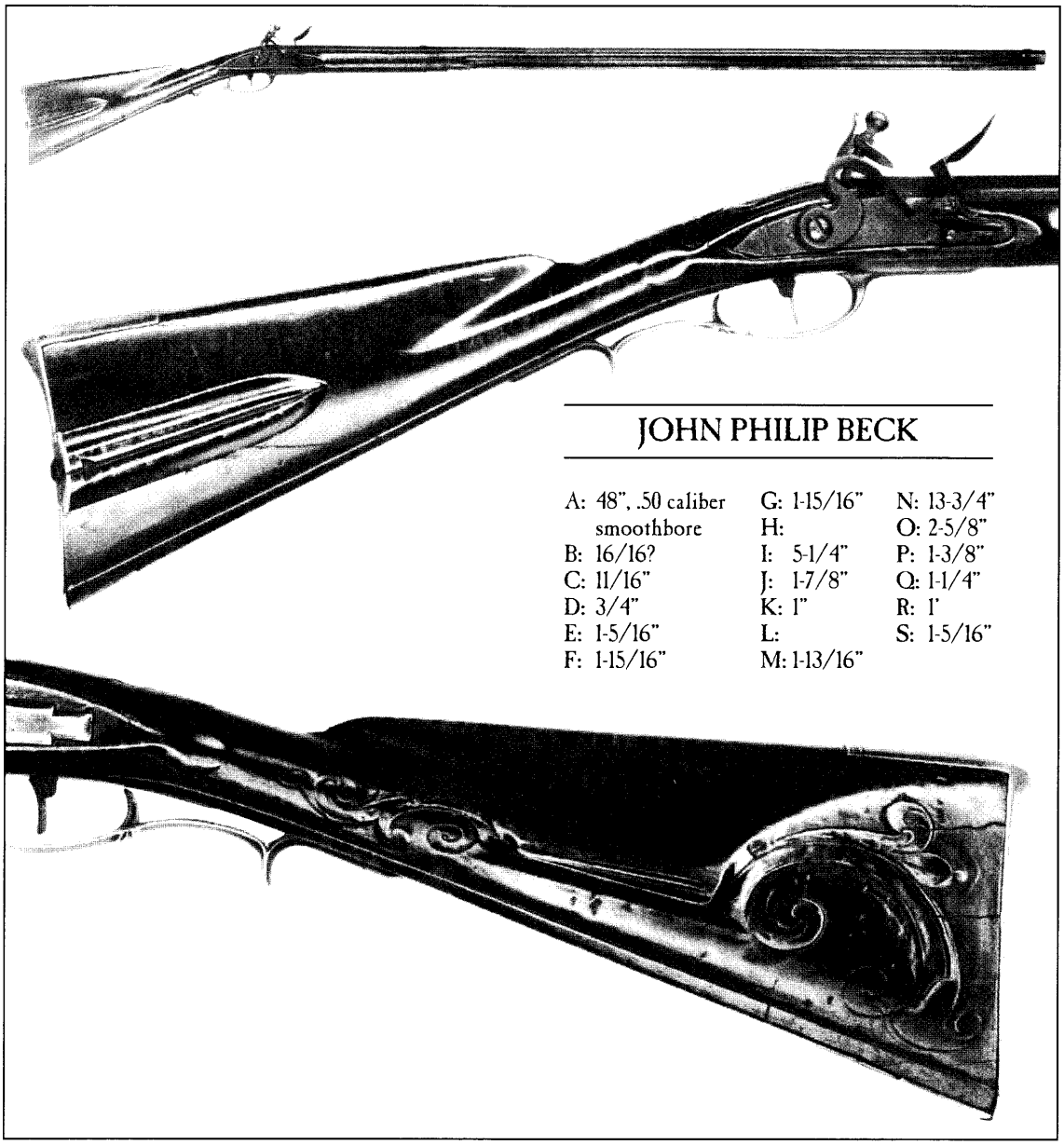
Not all of the dimensions are important to the reader. Your barrel may not be the same as the original gun, and your trigger reach and drop may be different too. Still one can adapt these measurements to one's needs by scaling. It is the constants that are important: the sizes of the butt plate, trigger guard, ramrod pipes, muzzle cap, and so forth. What a gunsmith did on one rifle, he tended to repeat. Of *relative* importance are: the width of the wrist in relation to the lower forestock ahead of the lock and side plate panels, and the height of the wrist at the breech relative to the height of the wrist at the nose of the comb.

Figure 7



THE KEY

A: BARREL LENGTH
B: BARREL, WIDTH AT BREECH
C: BARREL, MINIMUM WIDTH
D: BARREL, WIDTH AT MUZZLE
E: WIDTH OF LOWER FORESTOCK AHEAD OF PANEL
F: WIDTH OF WRIST BEHIND PANELS
G: WIDTH OF WRIST AT NOSE OF COMB
H: LENGTH OF CHEEKPIECE
I: HEIGHT OF BUTT PLATE
J: WIDTH OF BUTT PLATE
K: WIDTH OF BUTT PLATE TOE
L: HEIGHT OF WRIST AT NOSE OF COMB
M: HEIGHT OF WRIST AT BREECH
N: TRIGGER REACH
O: REAR RAMROD PIPE - LENGTH OVERALL
P: REAR RAMROD PIPE - LENGTH OF TANG
Q: RAMROD PIPE - LENGTH OVERALL
R: RAMROD PIPE - OCTAGONAL SECTION
S: MUZZLE CAP - LENGTH



JOHN PHILIP BECK

A: 48", .50 caliber smoothbore	G: 1-15/16"	N: 13-3/4"
B: 16/16?	H:	O: 2-5/8"
C: 11/16"	I: 5-1/4"	P: 1-3/8"
D: 3/4"	J: 1-7/8"	Q: 1-1/4"
E: 1-5/16"	K: 1"	R: 1'
F: 1-15/16"	L:	S: 1-5/16"
	M: 1-13/16"	

JOHN PHILIP BECK

I WANT TO DISCUSS JOHN PHILIP BECK FIRST, not because he is the earliest of the eight that I'm going to review, but because Lebanon, where he lived and worked, is a bit off the track that I'll follow. The following information is based on the research of Samuel E. Dyke, published by the Lancaster County Historical Society in 1968, entitled "The Beck Family of Gunsmiths, Lancaster County, Pennsylvania." Please remember that what is now Lebanon was part of Lancaster until 1813, when it became a county on its own. Therefore, J. P. Beck must be considered a Lancaster gunsmith.

Johann Christian Beck was born in Germany in 1712, came to America in 1749 at the age of 37, settled in Lebanon Township and worked at being a powder maker until his death in 1792. To him and his wife, Anna Marie, were born two sons, John Christian in 1750 and John Philip in 1751. John Christian, like his father, became a powder maker. The trade ended his life explosively in 1806. John Philip became a gunsmith.

By 1765 John Philip would have been 14 and could have

begun his apprenticeship. Just who his master was is unknown, but he was well-taught because, as the inventory of his estate shows, he cast silver butt plates, butt caps, and trigger guards. Some of his castings appear on his surviving pieces. The earliest he could have been making guns was 1769 to 1772, when he would have been 18 to 21 years old.

On August 15, 1778, Beck took the Oath of Allegiance. He fought with the Lancaster County Militia as, "6th class, 2nd Battalion" (Dyke).

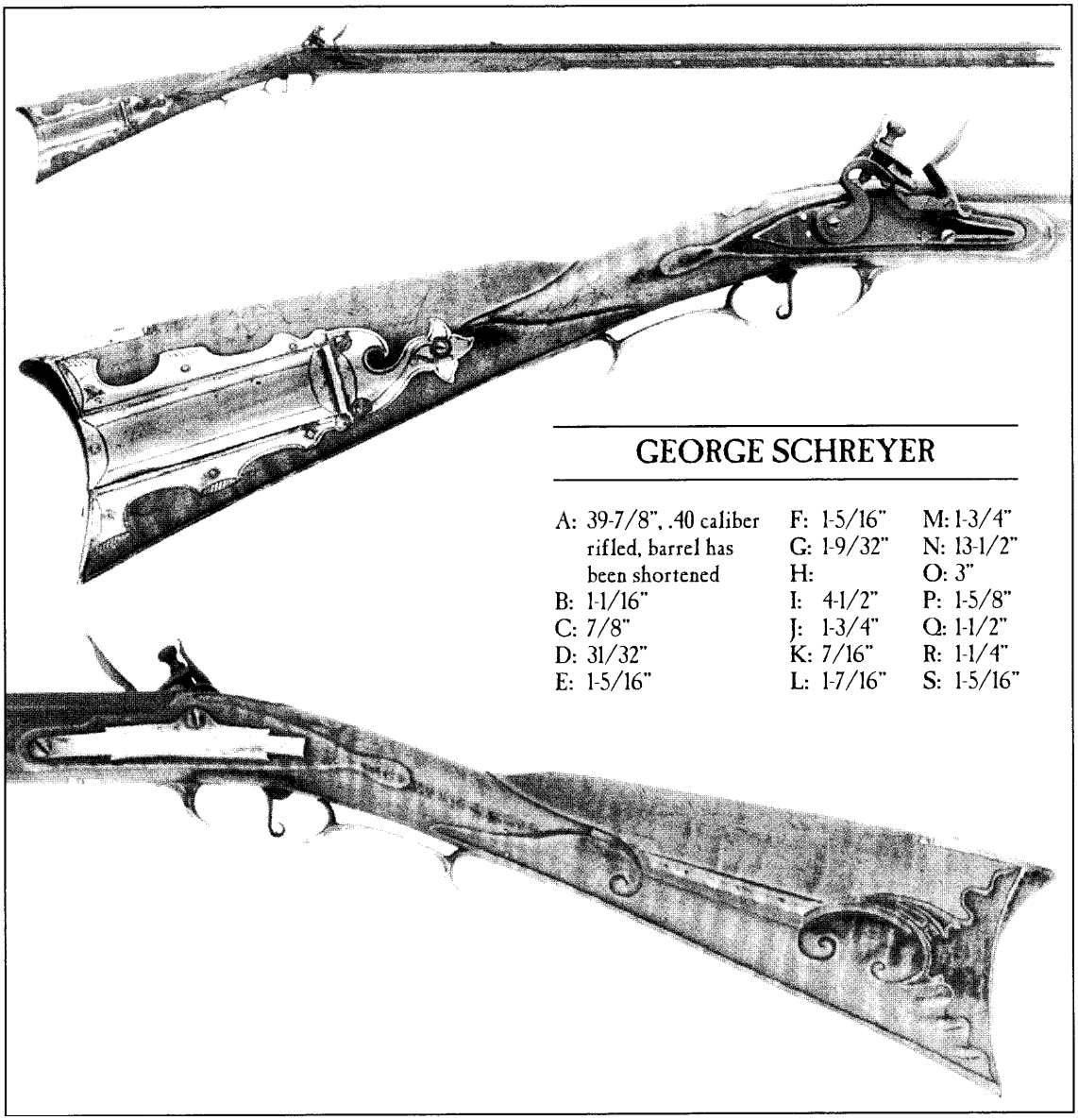
Sometime around 1785, when he was 34, he married Anna Maria Lauck, who I believe was a sister of Simon Lauck, the gunsmith, then working in Lebanon Township.

On November 13, 1793, he presented one of his own rifles to George Washington on the president's visit to Womelsdorf. This rifle still exists and can be seen at the Independence Hall Museum in Philadelphia, Pennsylvania.

John Philip Beck died in 1811 at the age of 60. His estate shows that he was owed money by gunsmiths Peter Berry, John Light and John Christian Beck.

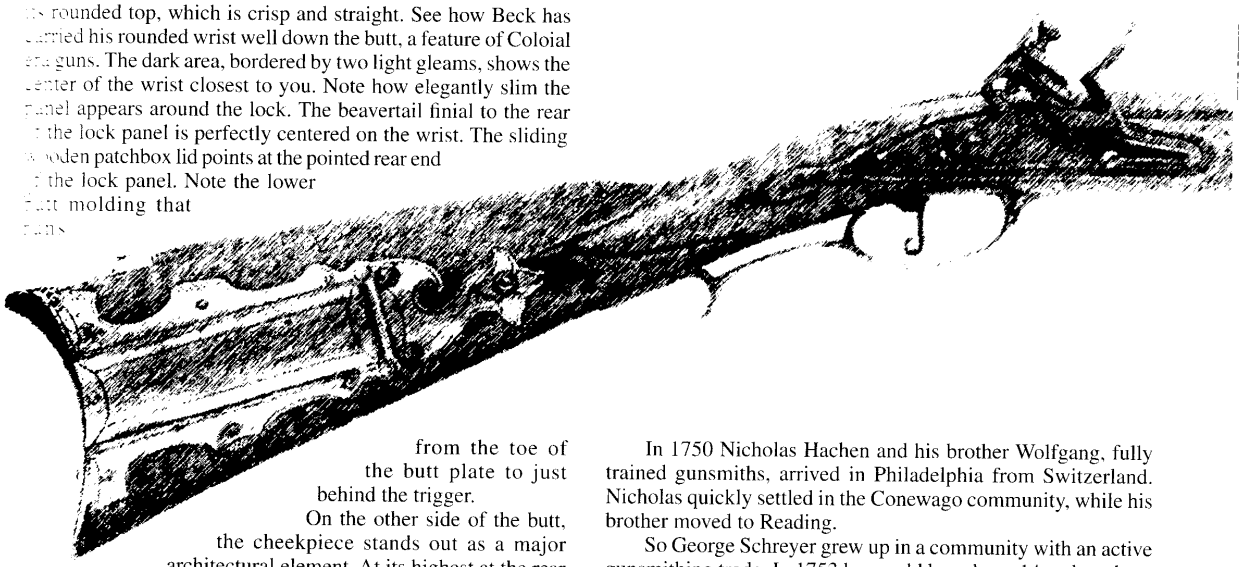
Rifles by J. P. Beck are admired for their strong architecture. Beck really belongs stylistically in the Colonial period, because while others were changing to produce the light Golden Age rifle, Beck didn't. Until the very end of his career, he made rifles with sliding wooden lids like the one shown on the previous page.

When you look at a photograph of an original rifle, pay attention to the gleams of light and dark lines. These contrasts reveal the shaping of the stock—its architecture. First, note that there is little drop to the buttstock; the line of the comb is almost



GEORGE SCHREYER

A: 39-7/8", .40 caliber rifled, barrel has been shortened	F: 1-5/16"	M: 1-3/4"
B: 1-1/16"	G: 1-9/32"	N: 13-1/2"
C: 7/8"	H:	O: 3"
D: 31/32"	I: 4-1/2"	P: 1-5/8"
E: 1-5/16"	J: 1-3/4"	Q: 1-1/2"
	K: 7/16"	R: 1-1/4"
	L: 1-7/16"	S: 1-5/16"



parallel to the bore, which is particularly good for shooting. Next, note the demarcation between the side of the comb and its rounded top, which is crisp and straight. See how Beck has carried his rounded wrist well down the butt, a feature of Coloial era guns. The dark area, bordered by two light gleams, shows the center of the wrist closest to you. Note how elegantly slim the panel appears around the lock. The beavertail finial to the rear of the lock panel is perfectly centered on the wrist. The sliding wooden patchbox lid points at the pointed rear end of the lock panel. Note the lower butt molding that runs from the toe of the butt plate to just behind the trigger.

On the other side of the butt, the cheekpiece stands out as a major architectural element. At its highest at the rear corner, it stands 1/2 inch above the stock, which was an early detail. Most longrifle cheekpieces rarely exceed 1/4 inch. Note too that the cheekpiece molding is set low on the stock, an early detail but one that makes the rifle comfortable to shoot. Typical of Beck's style is the panel behind the cheekpiece, which displays his carving. Note the curved "line," which begins at the rear corner of the cheekpiece and arcs to end just under the heel of the butt plate. Beck created this by carefully shaping two planes. His carving is bold and masterful and is a variation of the Lancaster pattern.

All in all, Beck was a master gunsmith. His architecture is so successful that his guns need little decoration to be impressive.

GEORGE SCHREYER

GEORGE SCHREYER IS THE OLDEST (OR earliest) of the eight gunsmiths reviewed here. Thanks to George Shumway and his excellent book, *George Schreyer Sr. and Jr., Gunsmiths of Hanover*, we have plenty of information.

The gunsmith's father, Hans Georg Schreier, was born in Germany in 1716 and came to Pennsylvania in 1722. He settled around Lancaster. In 1737 he married and a year later moved to the Conewago settlement around Hanover with his wife and first born, Johann. A year later on February 24, 1739, John Georg Schreier was born. He became the gunsmith.

Hans made his living as a farmer and tanner. He was associated with Frederick Shutz of nearby Heidleburg Township, because he sold him some land in 1759. Frederick was the father of Philip and Henry Sheetz, who later became gunsmiths in Virginia. Ludwig Schriver was also residing in the area, making his living as a miller and gunsmith. John Schriver, the gunsmith discussed below, was his son. George Ungefer bought 50 acres near Hanover in 1753 and was a gunsmith. In 1761 Philip Sheetz was an orphan and old enough to be apprenticed to Ungefer.

In 1750 Nicholas Hachen and his brother Wolfgang, fully trained gunsmiths, arrived in Philadelphia from Switzerland. Nicholas quickly settled in the Conewago community, while his brother moved to Reading.

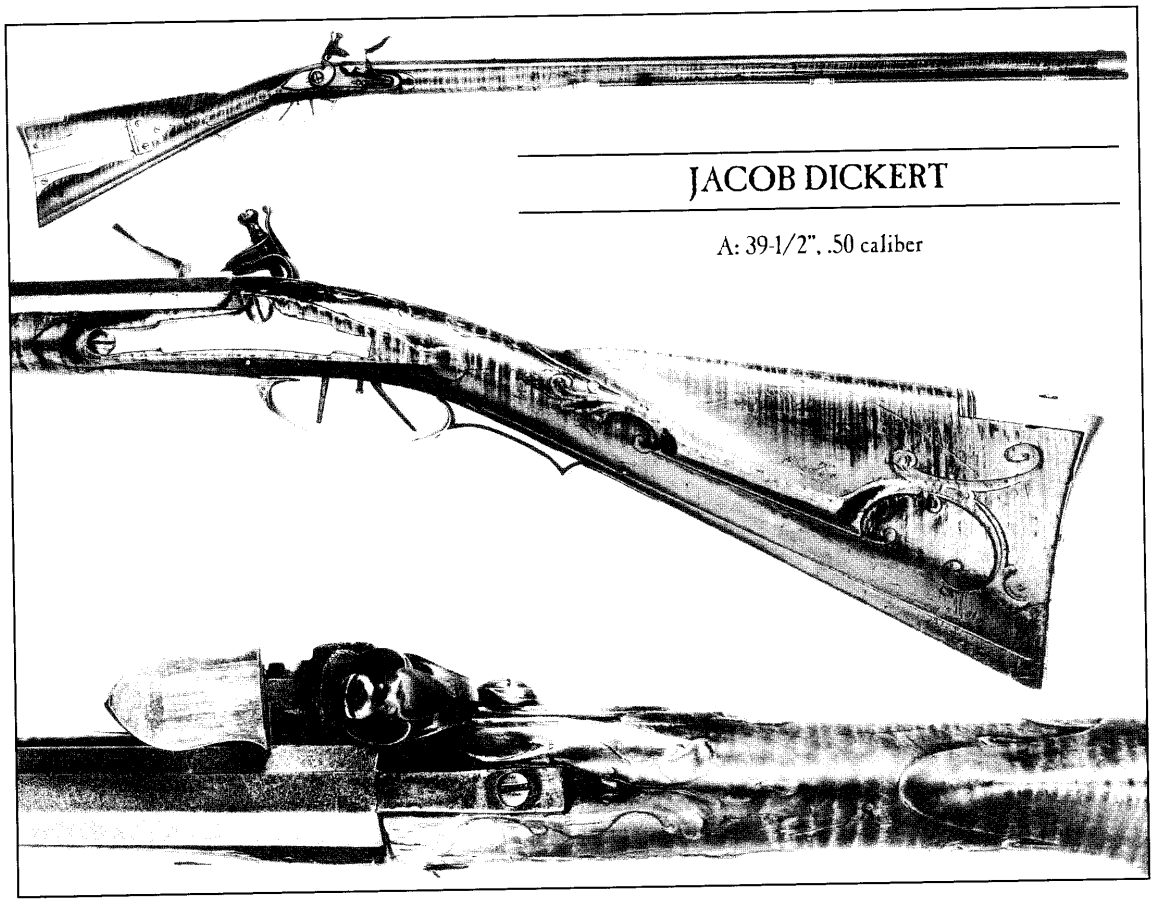
So George Schreyer grew up in a community with an active gunsmithing trade. In 1753 he would have been 14 and ready to start his apprenticeship. Shumway suggests that his master was Nicholas Hacken, who died prematurely in 1758 at the age of 40. Schreyer then went to Reading to finish his apprenticeship under Wolfgang around 1760. George Schreyer was taxed as a gunsmith in Reading from 1763 to 1768. At that time there were only four gunsmiths taxed in Reading: John Schreit, Wolfgang Hachen, William Graff, and George Schreyer.

Schreyer disappears from 1768 to 1775. Perhaps he went to Lancaster. Certainly in the late 1760s he married Margaret Pritz of Lancaster, sister of Adam Pritz, the gunsmith. On July 6, 1775, he bought a house in Hanover where he lived and worked until his death on January 9, 1819, at the age of 80.

Over his working life in Hanover, Schreyer had many apprentices. Although the documentation is lost, Shumway shows that Frederick Sell was one. I'm quite sure Philip Creamer, who later worked in Taneytown, Maryland, was another. I'm absolutely sure John Armstrong, who became the fine gunsmith in Emmitsburg, Maryland, around 1790, was a third.

What impresses first about Schreyer is his architecture. Like Beck the line of the comb is not far from being parallel to the bore. The next feature is his simple but elegant carving and inlays. He has a distinct style that is all his own. If you study all of the rifles in George's book, you will realize that while his style is distinct he never repeats himself, unlike other gunsmiths like John Armstrong who developed a successful rifle and did it over and over again with minor variations.

This rifle is a typical Schreyer gun of the Hanover period. It could have been made anytime from 1775 to 1819, although I am comfortable with a date of 1790. One of the distinctive elements of his style is the long teardrop finials at the rear of the lock and side plate panels. Another characteristic is the relief carved "step" that separates the rear of the wrist from the butt. At the rear of the barrel tang, Schreyer almost always carved a fleur-de-lis. On this rifle he also carved it behind the rear ramrod pipe. The patchbox on this rifle is simple but effective. He rarely made patchboxes with piercings. The four-petal flower was a design he used often. The carving behind the cheekpiece is his typical style, which is never repeated. All in all he was a master gunsmith.



JACOB DICKERT

A: 39-1/2", .50 caliber

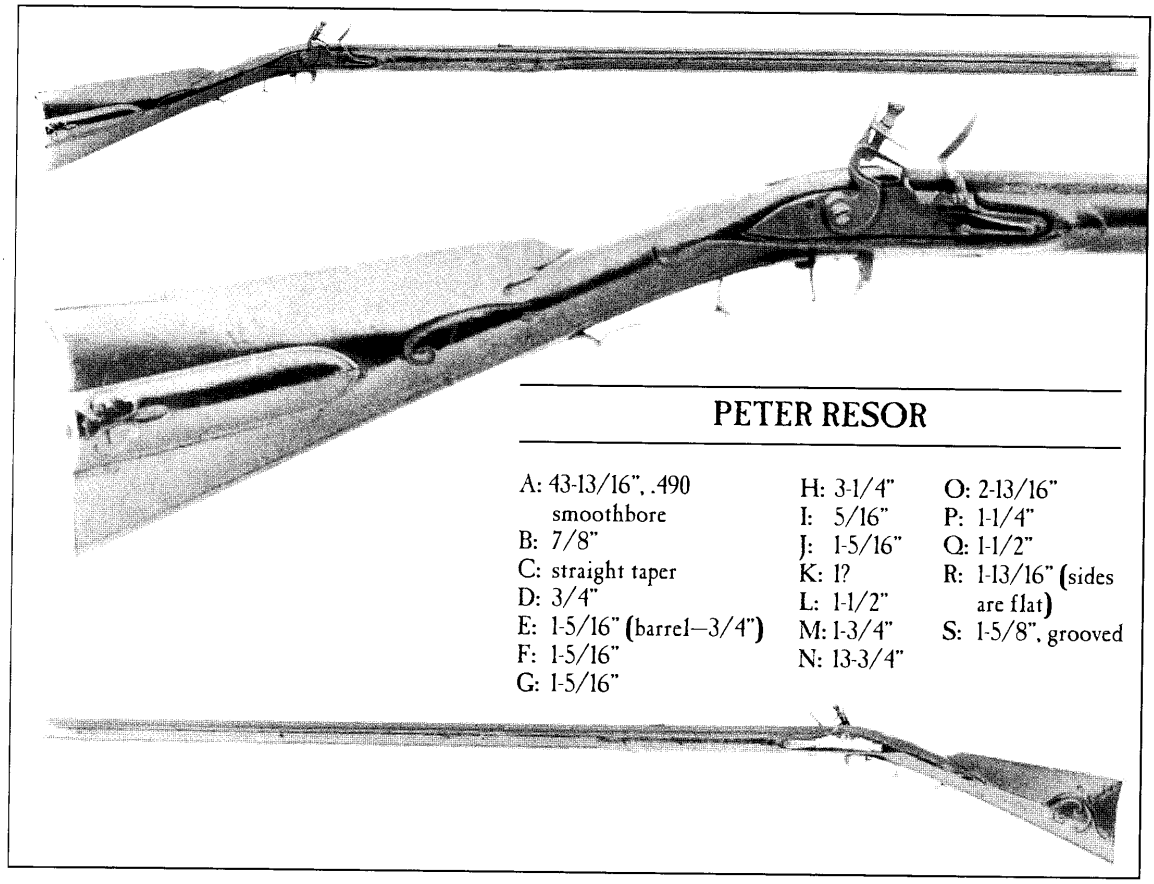
JACOB DICKERT

ACCORDING TO THE RESEARCH OF JOE KINDIG and George Shumway, Jacob Dickert was born in Maintz, Germany, in 1740 and came to Pennsylvania with his family in 1748 and settled in Berks County. His family moved to Lancaster in 1756. Just who Dickert apprenticed to, is unknown. Kindig thought he apprenticed to a Lancaster gunsmith, but allowed he might have apprenticed to a Berks County maker. Certainly, in 1795 he declared he had 40 years experience as a gunsmith, which would put the start of his apprenticeship at age 15.

Jacob Dickert and his family were Moravians, as we have shown. He was probably a journeyman by 1761. He married in 1764, which suggests that he was probably the master of his own shop by then. In 1765, he became a British citizen. Henry Kauffman owned Dickert's signed citizenship document, which he showed to me when I met him in 1982. Jacob Dickert was probably one of the most successful gunsmiths of his time. In 1776, he and John Henry bought a boring mill in Manheiim township. He probably made guns for the Continental Army during the war, but 1792 marks his first contract to build rifles for the United States. There were others. He died in 1822, at the age of 82.

This rifle, illustrated by photographs from *Rifles of Colonial America*, courtesy of the author, George Shumway, is one of Dickert's earliest surviving rifles. I'm sorry I can't provide you with measurements, beyond the 39-1/2 inch length of its .50 caliber barrel, since I have never had the gun in my hands. Stephen Hench,who knows the gun well, reports that the barrel was shortened by several inches during its period of use.

When was the gun made? Due to its close similarity to the only known signed Andreas Albrecht rifle, which I believe was made shortly after Albrecht moved to Lititz in 1771, I think this rifle was made somewhere between 1771–1775. It resurfaced in England, which suggests that it was taken there as a war trophy by some British officer. It is certainly a beautiful rifle, with its wide, straight butt plate. The comb line almost parallel to the bore makes for great architecture. Notice the tapered lower butt molding, which compels the eye to move forward along the stock. The trigger guard also deserves mention. The bow is longer than the grip rail, a feature found on some Virginia rifles, but rare in Pennsylvania. I wonder whether this early Lancaster form of guard found its way to Virginia via Winchester, while later Pennsylvania gunsmiths dropped it. The straight double set triggers are the early style of the mechanism. The cast brass patchbox pre-dates the daisy head finial which Dickert used during his "middle period" after 1780, along with most other Lancaster makers. All in all, a great gun, and I have taken great pleasure in making several recreations of it.



PETER RESOR

A: 43-13/16", .490 smoothbore
B: 7/8"
C: straight taper
D: 3/4"
E: 1-5/16" (barrel—3/4")
F: 1-5/16"
G: 1-5/16"
H: 3-1/4"
I: 5/16"
J: 1-5/16"
K: 1?
L: 1-1/2"
M: 1-3/4"
N: 13-3/4"
O: 2-13/16"
P: 1-1/4"
Q: 1-1/2"
R: 1-13/16" (sides are flat)
S: 1-5/8", grooved

PETER RESOR

WHEN I FIRST SAW THIS RIFLE, I recognized it from George Shumway's *Rifles of Colonial America*, where he attributed it to Schreyer (2: 416–419). The sliding wooden lid was made by Carl Pippert to replace the lost original. The owner surprised me by attributing it to Peter Resor based on another almost identical rifle signed Peter Resor. My first thought was that Peter Resor worked with Schreyer and learned his style, but I cannot find any connection between the two, making this gun somewhat of a mystery.

Matthias Resor, the father of Peter, was born in Germany in 1708. He arrived in Pennsylvania in 1738 from Rotterdam. On the same ship was John Hager, who later went west and founded Hagerstown. In 1740 Matthias bought property in Lancaster and worked there as a gunsmith for the rest of his life. He died in 1771, one of the first generation of immigrant gunsmiths.

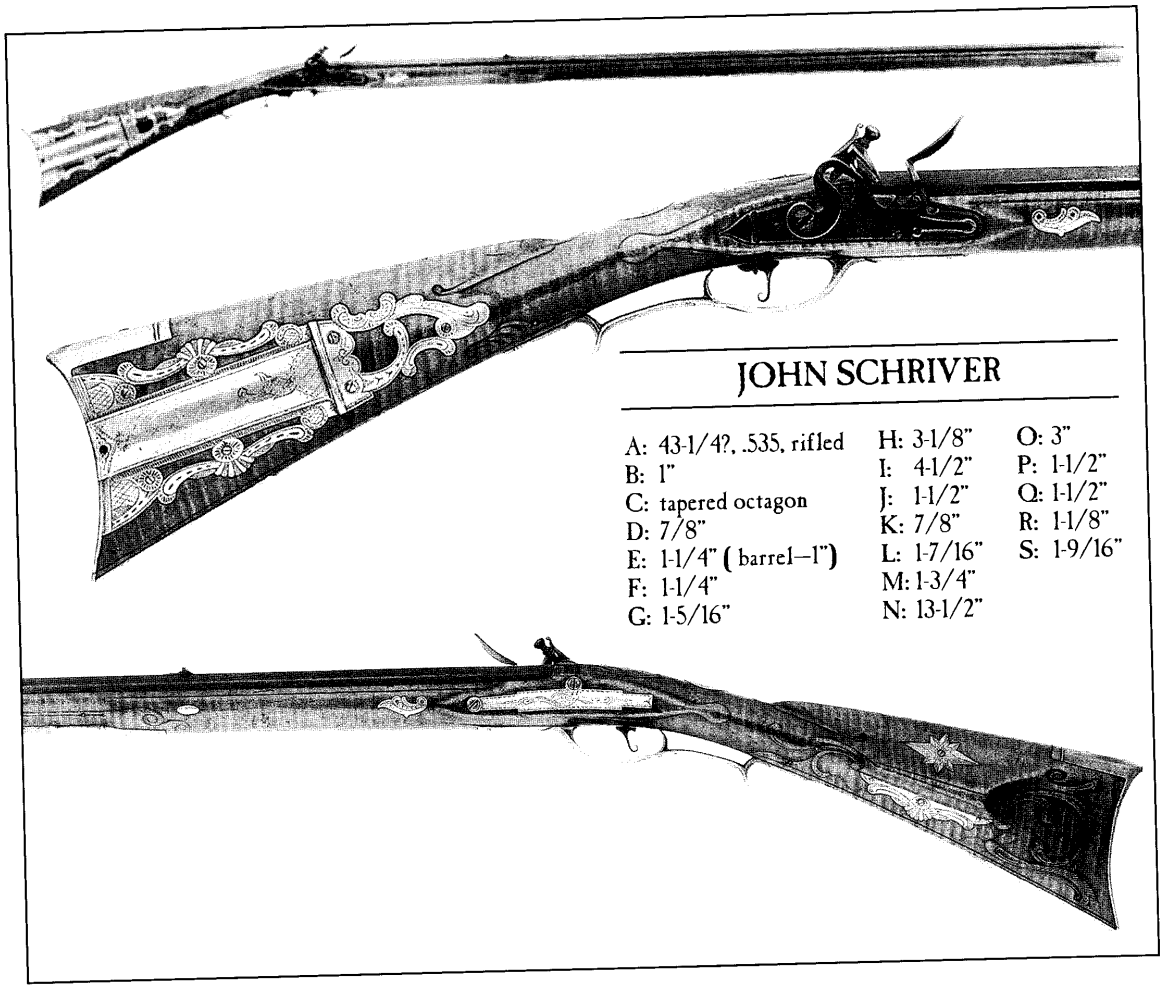
Just when Peter was born is not known, but he is listed in the Lancaster tax records as a gunsmith from 1775 to 1784. In 1775 he could have been 21 and just starting, but in that year on April 16, he married Catherine Welshanz, the daughter of Joseph Welshanz, an early York gunsmith. This suggests to me that he was probably more established in his trade. I believe that he could have been born around 1742, but more likely it was around 1750.

In 1764 he might have been 14 and beginning his apprenticeship, very probably under his father. If that were the case, he would have been 21 in 1771 and ready to begin his trade. Remember, Schreyer had disappeared from the records in Reading, although by then he had married Margaret Pritz of Lancaster. It is possible that Resor worked for Schreyer as a journeyman in Lancaster, although arguing against this idea is that Schreyer does not show up in that town's tax records.

So in 1775 Peter Resor was working in Lancaster, and Schreyer was a gunsmith in Hanover some 40 miles away. In 1785 Peter Resor moved to Hagerstown, Maryland, where he worked until 1810 and then moved a few miles away to Mercersburg, Pennsylvania. He was back in Lancaster in 1813, where he died in his eighties.

In my opinion this gun was probably made around 1780 or five years on either side because of its sliding wooden lid. That would put it in Lancaster, quite far from Schreyer. Carl Pippert, who knew the gun well, thought it had been made in Hagerstown, which would date it after 1785, when we would expect a brass patchbox.

I am forced to realize that the more I learn the less I know. However, my careful inspection of these two pieces, side by side, reveals some differences. Schreyer always fastened the stock to the barrel with brass keys, and Peter Resor pinned the



barrel. Another difference is the carving technique. It appears the same, but was executed quite differently, which is discussed further in Chapter 34.

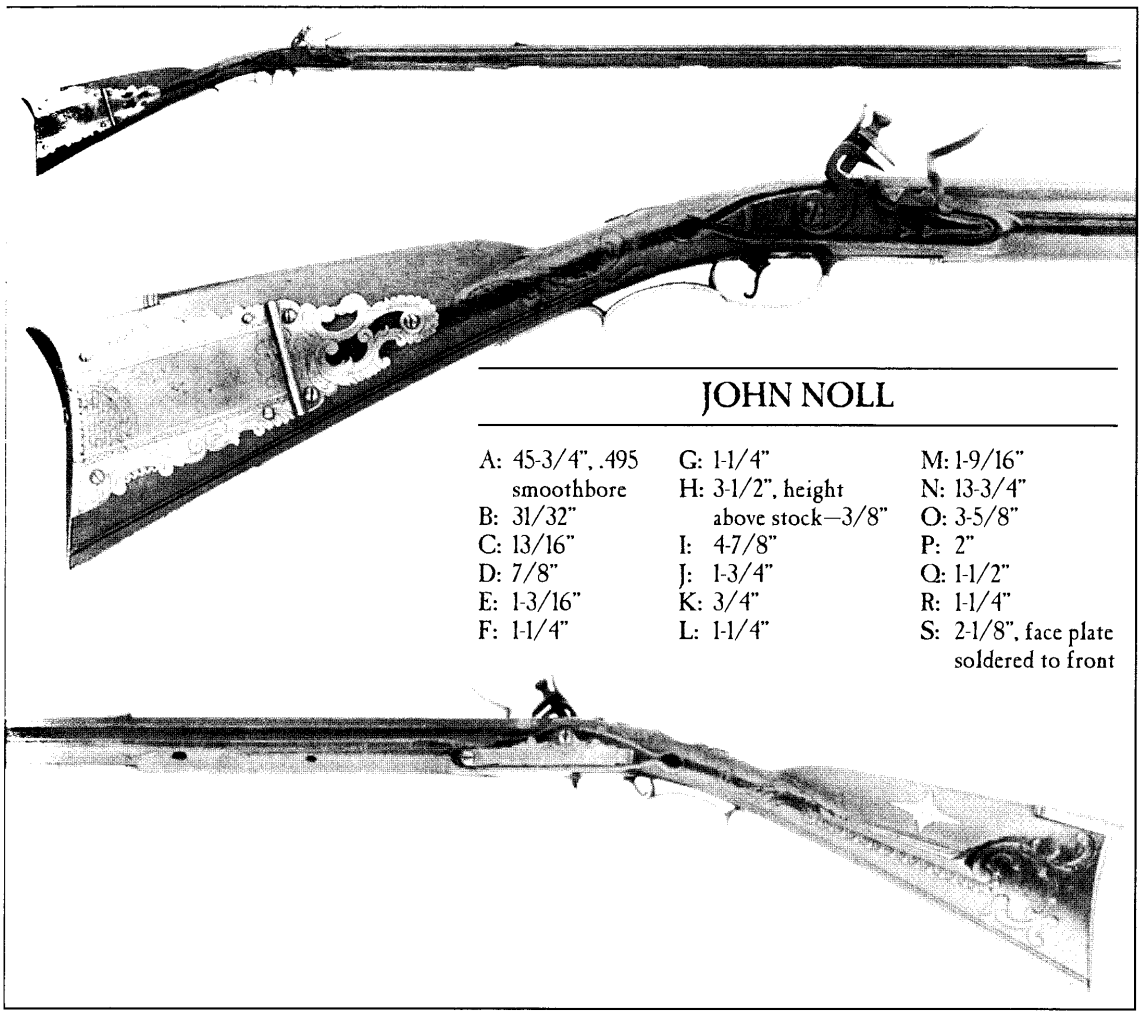
JOHN SCHRIVER

WITH JOHN SCHRIVER, THIS REVIEW moves into longrifles more characteristic of the Golden Age. John Schriver was born in 1753, the son of Ludwig Schriver, who lived a few miles northwest of Hanover and worked as a miller and gunsmith. In 1767 at 14, John would have started his apprenticeship. George Shumway speculates that like George Schreyer, he could have learned the trade under Wolfgang Hachen. But he most likely studied under his father. In 1774 he was 21 and ready to be a gunsmith, but he was operating his father's gristmill that year. He was first taxed as a gunsmith in 1778. He continued to work as a gunsmith until his death in 1829 at the age of 76.

John Schriver was a talented gunsmith. His earliest surviving guns are featured in *Rifles of Colonial America* by George Shumway and *Thoughts on the Kentucky Rifle in Its Golden Age* by Joe Kindig, Jr. These guns were made during the Revolution and are so completely different in style to the one featured here that Kindig believed there were two John Schrivers. This rifle was probably made in 1801, since it is very similar to another dated Schriver.

This is indeed a rifle of the Golden Age, based on its slim and graceful architecture and its fully developed brass patchbox. This patchbox, well designed in the rococo style, has two piercings in each side plate and two in the finial. The finial is a design that was popular in York County, although it spread to other schools. Schriver is a master engraver, and his control, particularly where he uses cross-hatching to effect shading, is a delight. The patchbox opens when you press the medallion engraved at the rear end of the upper side plates. The hidden release, like the one in the photo, is a feature of the fully evolved patchbox.

The cheekpiece holds a beautifully engraved star, again cross-hatched to create a three-dimensional effect. Below the cheekpiece there is another inlay that repeats the design of the patchbox side plates. His carving behind the cheekpiece is well-designed, well-executed and, like Schreyer, a blend of the baroque



JOHN NOLL

A: 45-3/4", .495 smoothbore	G: 1-1/4"	M: 1-9/16"
B: 31/32"	H: 3-1/2", height above stock—3/8"	N: 13-3/4"
C: 13/16"	I: 4-7/8"	O: 3-5/8"
D: 7/8"	J: 1-3/4"	P: 2"
E: 1-3/16"	K: 3/4"	Q: 1-1/2"
F: 1-1/4"	L: 1-1/4"	R: 1-1/4"
		S: 2-1/8", face plate soldered to front

and rococo. The carving ahead of the cheekpiece, especially around and behind the nose of the comb, forms a step between the wrist and buttstock. The beautiful scrolls ahead of the cheekpiece visually "connect" the long graceful beavertails at the end of the side plate panel to the cheekpiece and the carving behind it. The side plate, like the rest of the metalwork, is beautifully engraved. Truly a masterwork.

JOHN NOLL

I FOUND THE FOLLOWING INFORMATION about John Noll in *Gunsmiths of Penn Mar Va* by William Bowers, now sadly out of print. Jacob, John's father, was born in 1725, went to Philadelphia about 1740 and moved west to Bart Township, just southeast of Lancaster, where he made his living as a physician and apothecary until his death in 1805. He had a family of three sons and one daughter.

John Noll was born in 1747. His apprenticeship would have begun in 1761 when he was 14 and lasted until 1768. His master is unknown, but he must have had jewelry skills, since John Noll is one of the best engravers of all the gunsmiths. He was not taxed as a gunsmith in Lancaster, but I have seen a rifle that is signed on the patchbox lid "Made by John Noll in Bart Township, Lancaster County, August 9, 1774." This might be the only gun that he ever made in Lancaster.

On March 11, 1772, he bought a warrant for a piece of land in Franklin County, so he was planning a move westward even before he made the rifle mentioned above.

Jacob Noll's three sons enlisted and fought in the Revolutionary War. Only John returned. Just what effect the war and the loss of his brothers had on John is unknown, but he certainly never made much of a life for himself and his family.

John did not buy any valuable land in Franklin County. The property was 18 acres of "dry stony land near the mountain, not arable" (Bowers 32).

He was first recorded and taxed as a gunsmith in 1788. There is no record of him from 1789 to 1795, but he might have been exempt from taxes, since he was on the muster roll of Capt. Thomas Wallace's militia. By 1796 when he reappears on the

tax rolls, he has improved his property to the extent of owning one cow.

In October of 1823, there was a petition filed in the Court of Common Pleas of Franklin County by John Noll for the relief of insolvent debtors. He must have been hit hard by the recession of 1819. Nonetheless from the scant records available, I have the impression that John Noll was a troubled man. Unlike other contemporary gunsmiths, he did not seem to have made much of a living between 1788 and 1814, although he was one of the most superb gunsmiths of his age.

He died in 1824, bankrupt at the age of 77.

This rifle by John Noll, circa 1800, is one of his most beautiful pieces. Architecturally the stock is beautifully shaped and represents his individual style rather than the Chambersburg school. I can see some Lancaster influence in his earlier guns made in Franklin County and some definite York County features, but beyond that his style is unique.

The forestock ahead of the lock and side plate panels is perfectly proportioned and shaped. He fastens his stock to the barrel with four keys, and there are four ramrod pipes. He can get away with four keys and pipes because he placed his rear key like Schreyer, just above the tang of the rear pipe.

John Noll carved beautiful moldings. As you can see, the paneled molding with its double incised lines is repeated in the upper forestock. A characteristic of Noll's style is that he also cut a molding next to the barrel between the front of the lock and side plate panels and the rear ramrod pipe. This is a rare detail, although it is common on German jaeger rifles. In America Andrew Verner did it, and I have seen it on one Virginia gun. Its effect is to make the lower forestock appear slimmer.

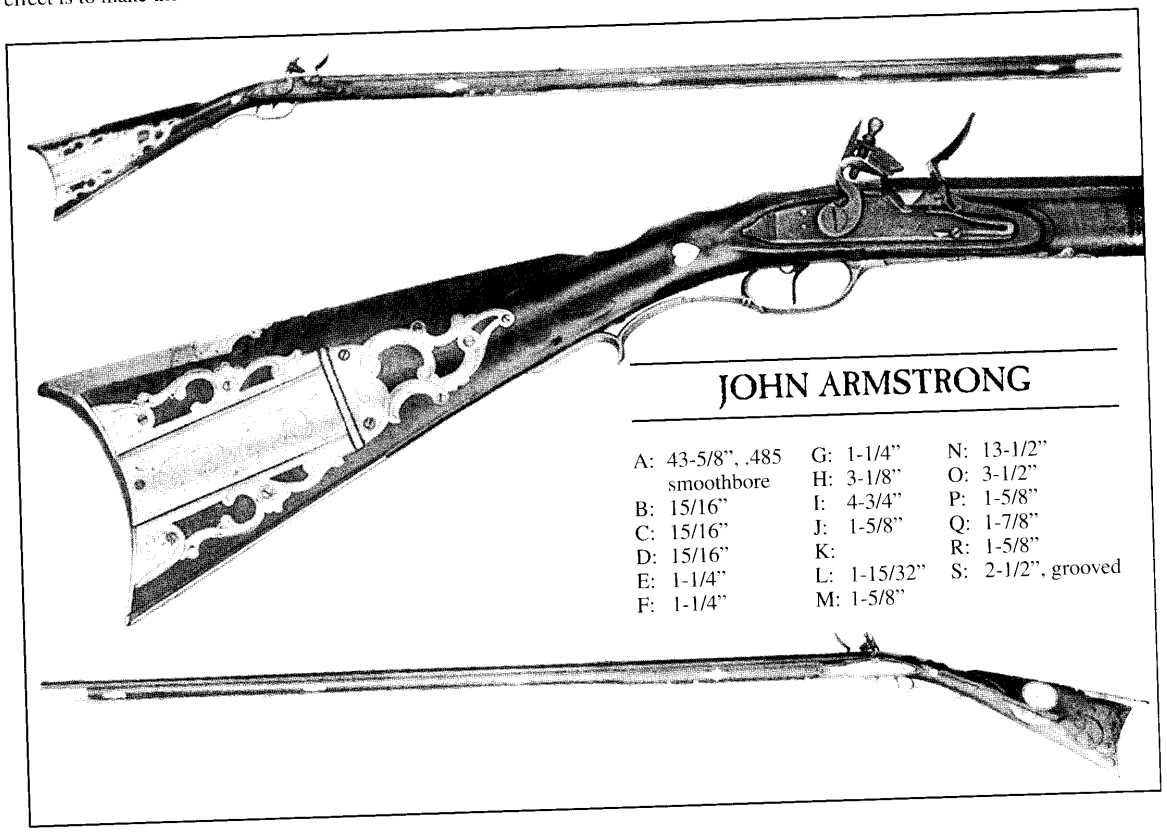
In both carving and engraving, Noll was a master of the American rococo style—far finer than any other I can recall. He certainly used push, or palm gravers, which takes much more practice and training than the chasing method. This is a great gun made by a great gunsmith.

JOHN ARMSTRONG

I MUST TELL YOU THAT THE MEASUREMENTS given below are not correct for the silver-mounted Armstrong shown here. Try as I might, I could not find them. These measurements are taken from another rifle by Armstrong, which I photographed more recently. However, these will do, because, except for decorative details, one Armstrong rifle is just like any other. Please note that the barrel is parallel-sided. If one finds a swamped barrel on an Armstrong rifle, it will be a very minute change and probably a slight mistake in filing or grinding. For those of you who think you can't make a beautiful rifle without a swamped barrel, look at this one.

Thanks to Dan Hartzler, who has published two books, *Armsmakers of Maryland* and *Longrifles of Maryland*, we know quite a bit about John Armstrong, the riflemaking scene in Emmitsburg and the Maryland gunsmiths in general.

There were many routes for settlers and migrants moving westward from Lancaster and York. We have already seen that they could go from York to Hanover, to Littlestown, to Taneytown just across the border in Maryland, and south to Frederick along

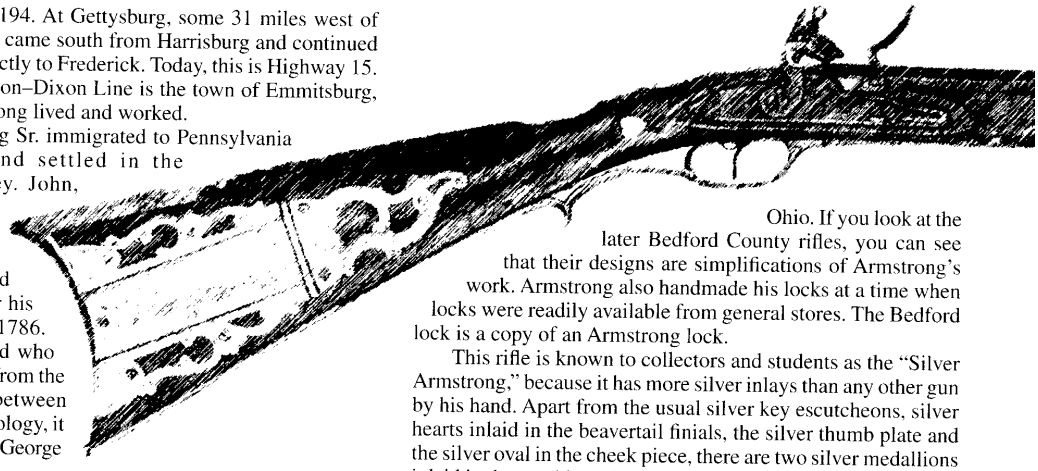


JOHN ARMSTRONG

A: 43-5/8", .485 smoothbore	G: 1-1/4"	N: 13-1/2"
B: 15/16"	H: 3-1/8"	O: 3-1/2"
C: 15/16"	I: 4-3/4"	P: 1-5/8"
D: 15/16"	J: 1-5/8"	Q: 1-7/8"
E: 1-1/4"	K:	R: 1-5/8"
F: 1-1/4"	L: 1-15/32"	S: 2-1/2", grooved
	M: 1-5/8"	

present-day Route 194. At Gettysburg, some 31 miles west of York, another route came south from Harrisburg and continued on more or less directly to Frederick. Today, this is Highway 15. Just across the Mason–Dixon Line is the town of Emmitsburg, where John Armstrong lived and worked.

John Armstrong Sr. immigrated to Pennsylvania from England and settled in the Cumberland Valley. John, the gunsmith, was born on September 5, 1772, and would have been ready for his apprenticeship by 1786. It is not documented who his master was, but from the many similarities between styles and the chronology, it was almost certainly George Schreyer.



The 1790 federal census lists John Armstrong as head of a household in Emmitsburg. What is extraordinary about this is that he was 18 years old. It appears that he finished his apprenticeship three years early. In those days gunsmiths would have been reluctant to release apprentices before their indentures were finished, particularly at age 18, when they were just getting useful.

On March 11, 1799, Armstrong accepted Tyler Wickham as an apprentice, and in 1801, George Piper.

On August 26, 1799, Armstrong bought three lots in Emmitsburg, which shows that he was doing well at the trade. Armstrong continued to buy land in and around the town, paying as much as $2,700 for 27-1/4 acres in 1813, which seems to mark the height of his fortunes. If you compare Armstrong's life to that of John Noll during the same period, it is hard to see why Noll couldn't do as well.

Hit with the recession in 1819 as badly as anybody else, Armstrong mortgaged some of his land to his friend Samuel Loudon. Although he redeemed his mortgage, his fortunes went downhill after that. On October 22, 1822, Armstrong sold all of the tools of his gunsmith shop to Jacob Harner for $28. Then he disappears from Emmitsburg.

He was back in town in 1828, when, according to a surviving document, Armstrong rented a store from his son-in-law. By 1835 he owned no property. He was still making rifles, however because one percussion rifle is signed under the butt plate and dated 1836. In 1837 Armstrong took on his last apprentice, Nathaniel Rowe.

In 1838 Armstrong bought a small 1/4 lot for $300, but by January 1841 he mortgaged it to Samuel Loudon for $100 and for another $100 in October. On Christmas Eve 1841, he sold household possessions, 25 gunstocks and one vise to Samuel Loudon (all Armstrong refs from Hartzler 118–124).

John Armstrong seems to have died in 1842 at the age of 70, but there is no obituary. The years after 1819 were tough on him, and his last years were apparently desperate.

John Armstrong, like many gunsmiths, evolved a successful design and stuck with it for his whole career. His carving is almost identical from rifle to rifle, and his patchboxes are rarely different. In comparison, while we can (almost) always recognize the work of George Schreyer, Schreyer never repeated a carving design or a patchbox. I am convinced that Armstrong had a few patterns that he used again and again. Nonetheless, his design was successful and imitated far to the south and westward to Ohio. If you look at the later Bedford County rifles, you can see that their designs are simplifications of Armstrong's work. Armstrong also handmade his locks at a time when locks were readily available from general stores. The Bedford lock is a copy of an Armstrong lock.

This rifle is known to collectors and students as the "Silver Armstrong," because it has more silver inlays than any other gun by his hand. Apart from the usual silver key escutcheons, silver hearts inlaid in the beavertail finials, the silver thumb plate and the silver oval in the cheek piece, there are two silver medallions inlaid in the patchbox side plates adjacent to the butt plate. Like the Schriver rifle, if you press the upper one, the lid will open. There is a beautiful silver comb plate ahead of the butt-plate return, and there is a silver inlay ahead of the trigger guard in the shape of a Maryland bellflower. This inlay repeats the bellflower at the end of the long tang of his rear ramrod pipe, which as far as I know he created on this rifle alone. This is one of two Armstrong rifles that I know of where he replaced the carving behind the barrel tang with a silver inlay, beautifully engraved.

As noted above, Armstrong always inlayed a silver oval in his cheekpiece that was engraved with an American eagle. On this rifle he surrounded the inlay with an engraved brass border. Below the cheekpiece is a silver inlay in rococo style. The side plate is also silver and engraved.

Armstrong's carving style is distinctive, consisting of flowing strapwork that shows his perfect control of curves. Unlike other gunsmiths, who included baroque volutes incised into the base plain, Armstrong's style is more rococo, all of it raised above the base plain. On this rifle, near the butt plate, his scrolls end in two flowers separated by a modified shell pattern.

The finial of the patchbox is not Armstrong's usual finial, which is found on almost all of his rifles; this is a York County finial.

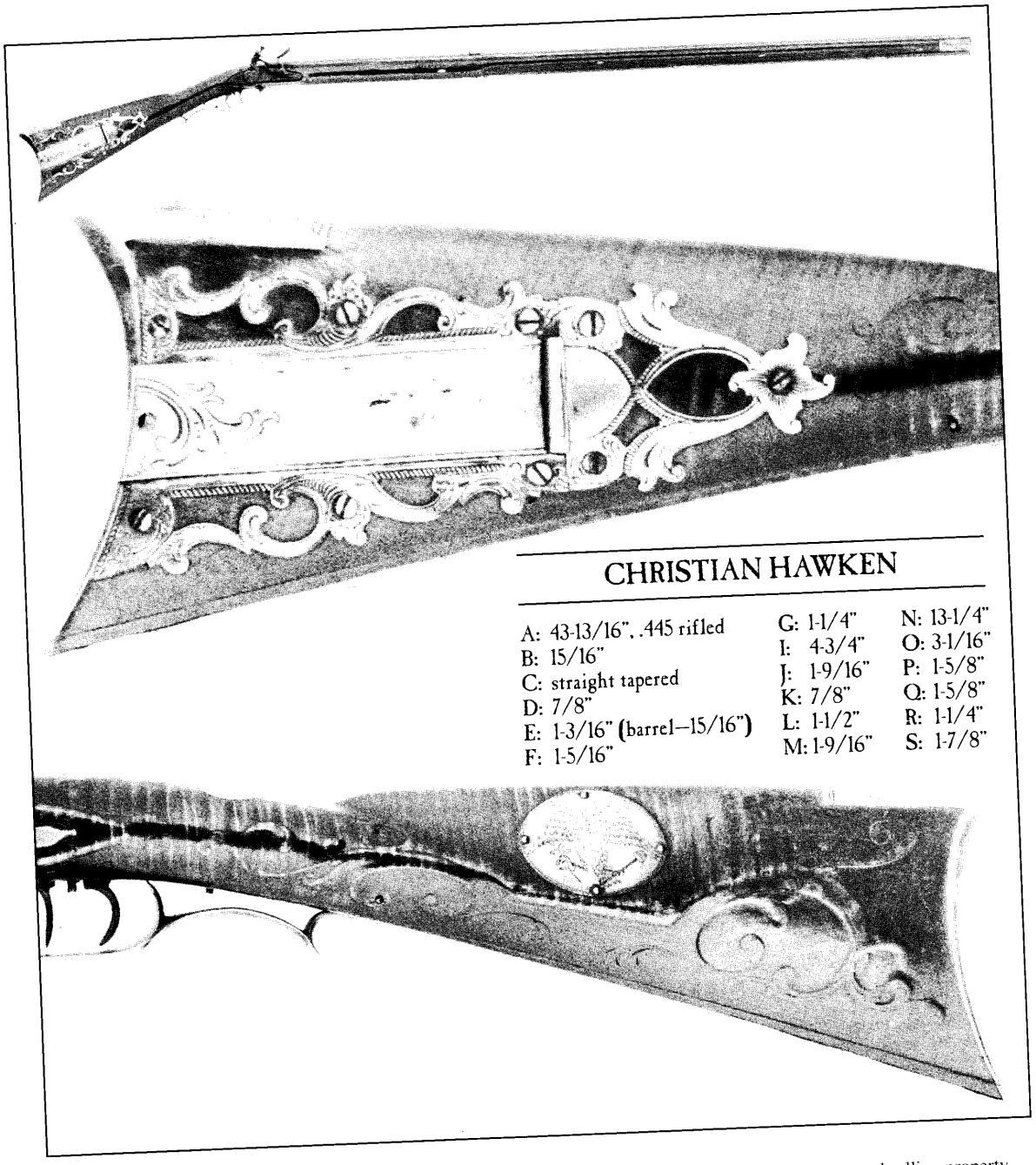
All in all this is a superb rifle that was probably made for a wealthy local farmer. The quality that I most appreciate about Armstrong's work is that he understood the fine line between rich and gaudy and never crossed it.

CHRISTIAN HAWKEN

TO BEGIN OUR DISCUSSION ABOUT Christian Hawken, we must return to Hanover, Pennsylvania. Christian, the second son of gunsmith Nicholas Hachen, was born on May 15, 1756. Two years later his father died prematurely at the age of 40, leaving his gunsmith's tools to his sons.

Christian would have been 14 in 1770 and starting his apprenticeship. Just who was his master is not known, but it could have been George Ungefer or even his uncle Wolfgang. Christian would have finished his apprenticeship in 1777.

In 1779, Nicholas, the older brother of Christian, was working as a gunsmith in Hagerstown, Maryland. Christian may



CHRISTIAN HAWKEN

A: 43-13/16", .445 rifled
B: 15/16"
C: straight tapered
D: 7/8"
E: 1-3/16" (barrel—15/16")
F: 1-5/16"
G: 1-1/4"
I: 4-3/4"
J: 1-9/16"
K: 7/8"
L: 1-1/2"
M: 1-9/16"
N: 13-1/4"
O: 3-1/16"
P: 1-5/8"
Q: 1-5/8"
R: 1-1/4"
S: 1-7/8"

have been there in 1780. He was probably married in that year, because he and his wife, Juliana, had their first son, John George, in 1781. At any rate he bought his first property in Greencastle, Pennsylvania, in 1783.

In 1784 after a holiday in North Carolina where his second son, John, was born that year, according to *Armsmakers of Maryland*, Christian bought his first property in Hagerstown from Johnathan Hager. Between 1794 and 1802, Christian was a member of the 24th Regiment of Maryland Militia. Otherwise, he was working at his trade and buying and selling property.

Christian had a large family: John George, born in 1781: John, 1784; Jacob, 1786; Margaret, 1789; Samuel T., 1792: Elizabeth, 1793; William, 1798; Christian Jr.; and Nancy Ann, 1802. By 1800, when Christian was 44, John George was a gunsmith in Hagerstown. William was probably trained by his father and took over his shop upon his death. In 1818 Jacob was a gunsmith in St. Louis, Missouri, after working at the Harper's Ferry Arsenal for a few years. Samuel T. arrived in St. Louis in

1822, and they repaired guns as well as making a few for the fur trade. They became most famous during the Gold Rush of 1849.

Christian died on May 5, 1821. He was almost 65. He apparently died unexpectedly and suddenly. Certainly he made a prosperous living at his trade; he left $4,400 in cash to be divided among his heirs, and his estate auction shows that he had a very nice household. His son William bought most of his tools and supplies (all C. Hawken refs from Hartzler 169–182).

The outstanding feature of this rifle is its beautiful patchbox. The finial, particularly, with its four-petal flower and three piercings shows that Christian was a master of the rococo style. Christian used this design on a few of his rifles, as did George Kreps, who was working in Hagerstown at the same time. As the following rifle shows, this design was also used in Virginia.

The side plates, each with two piercings, are beautiful. A look back at the Silver Armstrong might tempt one to think that it inspired Christian's design. The patchbox, the silver cheekpiece inlay with its eagle and the toe plate all show the excellence of Christian's engraving.

The carving, though worn, is beautifully done. Behind the cheekpiece is a variation of the simple Lancaster style, but its various depths and overlaps makes it impressive.

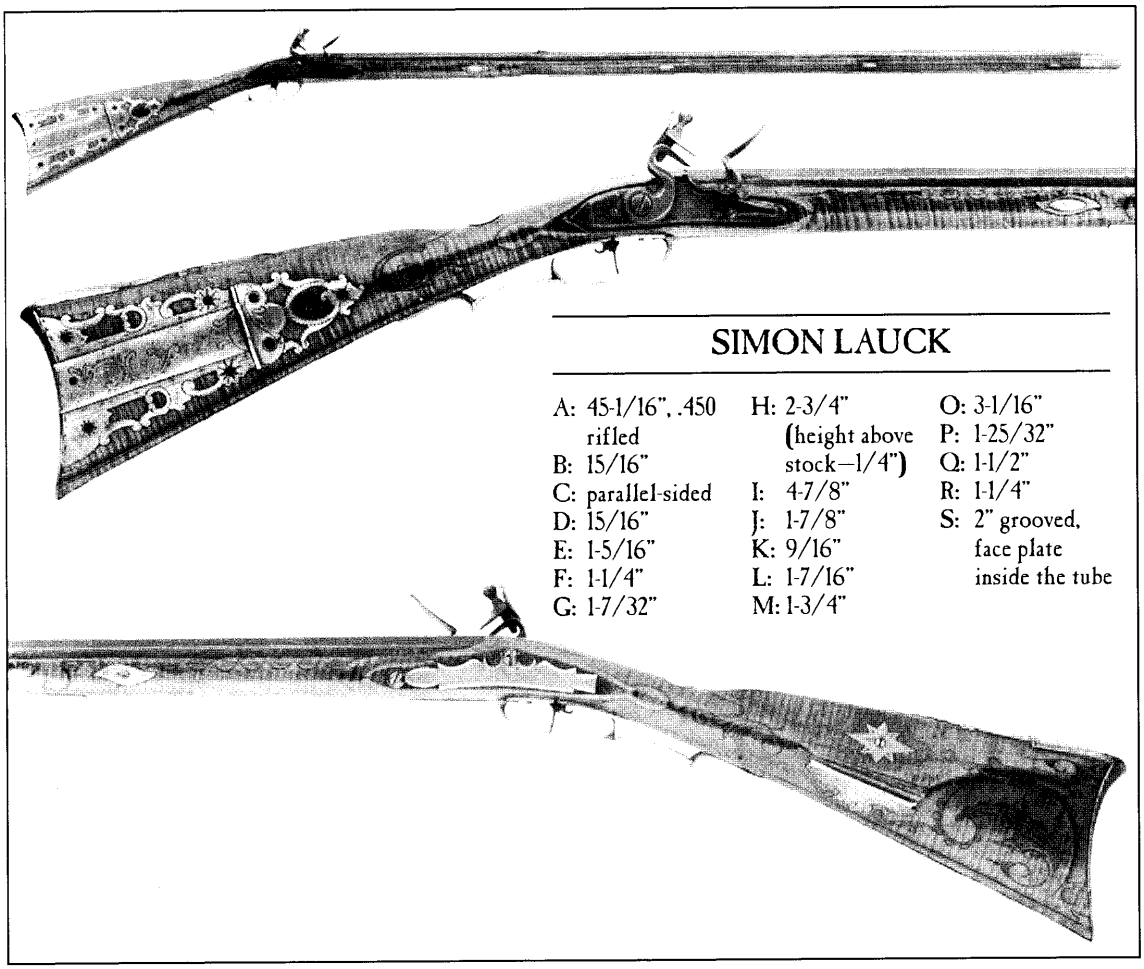
Overall, the rifle shows excellent architecture. The long wrist adds to the slimness and grace of the piece.

One disturbing feature is the trigger guard and the set triggers. Both look clumsy, and I suspect—or would like to believe—that they are replacements for an original trigger and smaller guard.

SIMON LAUCK

WHEN I HAD THE OPPORTUNITY TO examine and photograph this beautiful rifle by Simon Lauck, I realized that I knew nothing about Lauck or other Virginia makers. I was fortunate to meet and visit with the late Jim Butler of Lawrenceville, Virginia, who knew quite a bit about the Virginia longrifle makers and very kindly sent me photostats from James Whisker's *Gunsmiths of Virginia*. George Suiter of Colonial Williamsburg was also helpful, as was Wallace Gusler.

In *Gunsmiths of Penn Mar Va*, Bowers records that there were three Lauck brothers: Peter, born in 1753, Simon, 1760; and



SIMON LAUCK

A: 45-1/16", .450 rifled
B: 15/16"
C: parallel-sided
D: 15/16"
E: 1-5/16"
F: 1-1/4"
G: 1-7/32"
H: 2-3/4" (height above stock—1/4")
I: 4-7/8"
J: 1-7/8"
K: 9/16"
L: 1-7/16"
M: 1-3/4"
O: 3-1/16"
P: 1-25/32"
Q: 1-1/2"
R: 1-1/4"
S: 2" grooved, face plate inside the tube

Abraham 1767. Both Peter and Simon were living in Winchester in 1774, and both joined Morgan's riflemen and marched off to Boston in 1775. Peter was part of Morgan's riflemen who took part in the disastrous attack on the city of Quebec. Simon may have gone along, but I doubt it, as he was only 15.

Simon disappeared for 10 years. In 1785 he turned up as a gunsmith on the tax lists for Lebanon Township, Lancaster County. In *Gunsmiths of Virginia*, Whisker presents a picture of a Simon Lauck rifle (85). This is not a Virginia rifle. Everything about it screams J. P. Beck.

So where did Simon go for ten years? I believe that his family was a resident of Lancaster County and perhaps Peter and Simon went to Winchester to seek their fortune. Simon might have begun an apprenticeship with Adam Haymaker or another local gunsmith in 1774 when he was 14 years old. However I think he left Morgan's riflemen at Lancaster and returned to his parents. I believe that he learned from J. P. Beck, who married Anna Maria Lauck in 1785, probably Simon's sister. But this is speculation.

We do know that Simon married Catherine Starr in 1782, and over the years they had six children. Four of the boys—Simon, Jacob, John and William—all became gunsmiths.

In 1787 Simon was back in Winchester. In 1796 he insured four buildings that he owned in Winchester, which shows he was making a comfortable living at his trade.

Simon died February 21, 1815, when he made his will, leaving quite a fortune to his heirs and March 21, when an inventory and appraisal of his estate was taken. This document shows that he was active in the trade right up to his death at age 55. Incidentally, the inventory shows that he was using sheet brass and aqua *fortis* (all Lauck refs from Bowers 155–158).

The rifle shown here was made after 1787. I doubt that Lauck made it after 1790, because according to Jim Butler, decoration declined after that date. The lock is a British lock that began to appear on guns right around 1790.

This is a classic Virginia longrifle of the Golden Age. The long muzzle cap, grooved with its faceplate soldered inside the tube, is reminiscent of Armstrong and other Maryland smiths. Like Armstrong and Hawken, Lauck fastens the stock to the barrel with brass keys and their heads are on the lock side of the forestock.

One Virginia feature is the escutcheon underneath the rear key. Virginia gunsmiths rarely used escutcheons under the upper keys. Very few gunsmiths could design upper key escutcheons that didn't look like irritating blobs, and I believe they were aware of the problem and avoided it.

The forestock molding, like the lower butt molding, is a relief panel bordered on top with a parallel-incised line.

From the lock and side plate panels, adjacent to the barrel and extending forward, is a molding consisting of a wavy line enclosing ovals. These are incised lines. On another surviving Simon Lauck rifle made at about the same time, a similar molding holds silver wire.

The patchbox dominates the lock side of the buttstock and is remarkably similar to the one on the Hawken rifle. While I would like to claim that this design moved south from Hagerstown, that is a naive thought. All that can be said is that these two rifles were probably made about the same time, and there is the possibility that the two men knew each other. Certainly Lauck interpreted the design in his own unique style. If you look at the engraving, especially in the petals of the flower, you will see that Lauck used a liner, an engraving tool that cuts parallel lines. The liner seems to have been a common tool in Virgina, whereas I can find no use of it in Maryland or Pennsylvania. Finally, if you look at the hinge of the patchbox, you will see that the upper knuckle stands out a bit more noticeably—this knuckle is a fake. If you push it toward the butt plate, the lid opens. This is also a Virginia technique.

The carving behind the cheekpiece is a masterful interpretation of the standard Lancaster pattern, flowing from relief to incise and back again. However, on top of the main C-scroll is a curious round ball bordered by a horizontal figure ahead and behind. This figure is a Virginia characteristic.

The cheekpiece has a beautifully engraved star bordered by silver wire inlay. Wire inlay was rarely used on longrifles. Rupp, Verner and others around Allentown, Pennsylvania, used brass wire, and J. P. Beck used silver wire on a very few of his pieces. But you will find silver wire quite frequently on Virginia longrifles.

Below the cheekpiece, you can see the silver inlay that Lauck made to hold a vent pick. Note that the pointed bottom, bordered by two **S**-scrolls is a variation of the patchbox side plates. Note too that Lauck joined the carving behind and in front of the cheekpiece with two scrolls that end under the inlay.

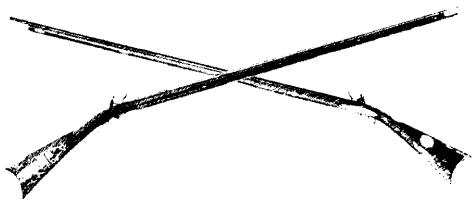
The side plate, beautifully shaped and engraved, stands above the panel. The trigger is beautifully designed. Since I enjoy making my own triggers, I really appreciate seeing a trigger that shows art as well as function—rare on longrifles. Not shown clearly in these photographs are the beautifully designed comb plate and the toe plate, which extends from the butt plate to the rear extension of the trigger guard.

All in all, this is a masterpiece.

CONCLUSION

THE LONGRIFLE GUNSMITHS DID CREATE masterpieces, and I wish I could show you more. However, there are plenty of good books out there that show these longrifles, a number of which are listed in the bibliography. The guns discussed above will serve as models throughout this book, and you will find detailed photographs that will help to illustrate topics under discussion.

Some readers will note that I haven't discussed any Colonial longrifles above. This omission is partly because of lack of availability. Whenever I had a chance to examine a fine early rifle, my photographer friend Brian Allen wasn't and vice versa. On the other hand, this book hopes to teach you the basics of doing everything, and there is generally more art and decoration on a Golden Age longrifle than on a Colonial piece. Once you have learned to do everything, it's up to you what kind of longrifle you choose to recreate.



Timeline of Longrifle Development

Year	General History	George Schreyer	John Noll	Peter Resor
1725—1750	**The Settlement Period**			
1730	Kaspar Wister imports rifles. Lancaster, PA, is established May 1. Cherokee embassy visits London.			
1732	Byrd investigates iron production in Virginia. George II establishes Georgia. George Washington born.			
1733	The Molasses Act.			
1735	Migration from Lancaster to North Carolina begins. Daniel Boone born.			
1736	Pennsylvania becomes part of the Covenant Chain with the Iroquois.			
1737	The Walking Purchase in Pennsylvania.			
1738	William Johnson arrives in New York. James Geddy advertises in Williamsburg, VA. Roads begin from Lancaster.	Hans Georg Schreyer moves to Hanover, PA.		
1739	LaVerendry reaches Bismark, SD. War of Jenkin's Ear.	George Schreyer born Feb. 24.		
1740	Joseph Brant born. Jacob Dickert born, Maintz, Germany		Jacob Noll established in Bart Township, Lancaster.	Mathias Resor buys lot in Lancaster.
1741	Moravians establish Bethlehem, PA. George Croghan arrives in Pennsylvania.			
1742	LaVerendry's sons reach Rocky Mountains.			
1743	Carolina exports tons of deer hides.			
1744	King George's War begins. Winchester, VA, is founded. Croghan establishes trading post at Cuyahoga.			
1745	Bonnie Prince Charlie and the Stuart Rebellion.			
1746	Highlanders defeated at the Battle of Culloden.			
1747	Moravian gunsmiths at Shamokin, PA. Most of Pennsylvania's Indians in Ohio. Ohio Company founded in Virginia. Johnson leads Mohawks against Montreal.		John Noll born.	
1748	Pennsylvania dissolves Covenant Chain by recognizing Delawares. Shawnees and Miamis admitted to Pennsylvania Chain of Friendship at Lancaster. End of King George's War. Dickert family arrives in Pennsylvania.			
1749	La Presentation (Ogdensburg, NY) founded. Ohio Company given charter by King George. Cumberland County, PA, is formed. Andreas Albrecht arrives in Bethlehem, starts making guns there.			
1750	William Johnson retires as Indian agent in New York. Christopher Gist surveys Ohio for Ohio Company. End of the Settlement Period.	Schreyer 11 years old.	Noll 3 years old.	

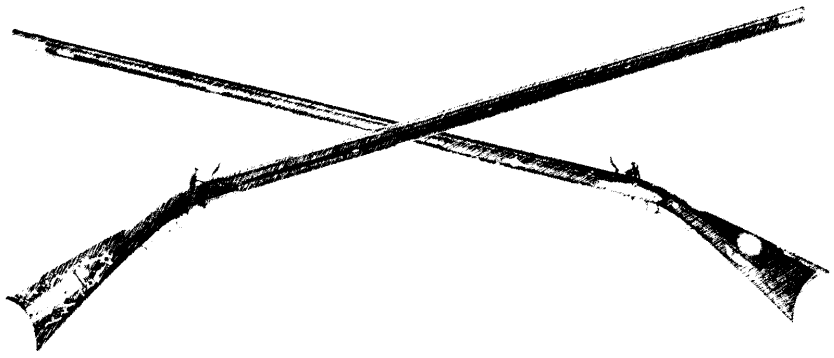
Year	General History	George Schreyer	John Noll	Peter Resor
1750—1783 The Frontier Conflict Period				
1750	American output of pig and bar iron exceeds that of England.			Peter Resor probably born this year, possibly earlier.
1751	Benjamin Franklin elected to PA Legislature.			
1752	Treaty of Logstown. Duquesne new governor or New France.			
1753	French drive British traders out of Ohio. Adam Haymaker is a gunsmith in Winchester, VA.	Schreyer, age 14, begins apprenticeship with Nicolas Hachen.		
1754	Beginning of Fort Duquesne. Washington surrenders Ft. Neccessity.			
1755	Braddock's defeat. Acadians exiled. Ohio Indians begin raiding Pennsylvania. Friendly Indians trade for guns in Lancaster, PA. Jacob Dickert starts apprenticeship.			
1756	The Seven Years' War begins. Iroquois declare neutrality with New France. Montcalm captures Oswego. Washington orders rifles for Ohio Company.	Schreyer 17 years old.	Noll 9 years old.	
1757	800 men in New York impressed by British Navy. Lord Loudon withdraws from Louisburg without attacking. Montcalm captures Ft. William Henry. Washington buys a rifle. D. Kleist repairs Indian rifles.			
1758	Abercrombie defeated badly at Ticonderoga. Amherst captures Louisburg. Forbes seizes Ft. Duquesne, renamed Pittsburg. Provincial troops armed with rifles.	Nicholas Hachen dies. George Schreyer goes to Reading to finish his apprenticeship under Wolfgang Hachen.		
1759	Johnson takes Ft. Niagara. Amherst captures Ft. Ticonderoga. Quebec surrenders to British. Albrecht first master of gun shop at Christian's Spring			
1760	Governor Vaudreuil surrenders New France. King George II dies.	Schreyer, age 21, finishes his apprenticeship.	Noll 13 years old.	Resor 10 (?) years old.
1761	William Pitt resigns. Jacob Dickert a journeyman.		Noll, age 14, begins his apprenticeship.	
1763	Treaty of Paris ends Seven Years' War. Paxton boys slaughter friendly Indians at Lancaster.	Schreyer taxed as a gunsmith in Reading.		
1764	British plan to outlaw sale of rifles to Indians. Dickert marries, probably a master of his own shop.		Noll 17 years old.	Resor, age 14 (?), begins his apprenticeship.
1765	Stamp tax to pay for cost of war. Dickert becomes a British citizen.			
1766	Albrecht leaves gun shop at Christian's Spring.			
1767	Mason & Dixon establish border between Pennsylvania and Maryland.			
1768	Johnson imports Lancaster gunsmiths.	Schreyer, age 29, a gunsmith in Reading.	Noll, age 21, could have been a journeyman.	
1769	Tecumseh born.	Marries Margaret Pritz of Lancaster.		

Year	General History	George Schreyer	John Noll	Peter Resor
1770	Boston "Massacre."			
1771	Albrecht moves to Lititz, works as a gunsmith on his own.			Resor, age 21(?), could have been a journeyman.
1772	Committees of Correspondence.		Bought warrant for land in Franklin County.	
1773	Boston Tea Party.			
1774	The Quebec Act. Lord Dunmore's War. Coercive Acts. First Continental Congress.	Schreyer 35 years old.	Earliest surviving Noll rifle dated August 9.	
1775	Revolution begins April 19. Rifle companies present at seige of Boston. They kill or wound 60 British.	Schreyer, age 36, buys a house and lot in Hanover, PA.	Enlisted and fought in the war with his two brothers.	Resor, age 25 (?), is a gunsmith in Lancaster. Marries Catherine Welshanz of York, April 16.
1776	Declaration of Independence. Congress resolves to commission Indians for military service. British occupy New York, Americans driven out. Jacob Dickert & Joh Henry purchase a boring mill. Washington attacks Trenton.			
1777	Battle of Saratoga.			
1778	Battle of Monmouth, New Jersey. Seige of Boonesborough, KY.	Schreyer 39 years old.	Noll 29 years old.	Resor 28 (?) years old.
1779	Battle of Newtown – rout of Iroquois. By year's end, few, if any, riflemen left in U.S.			
1780	Battle of King's Mountain in South Carolina.			
1781	Battle of Cowpens, SC. Battle of Yorktown, VA, ends. Cornwallis surrenders British army.		Noll returns to Lancaster without brothers.	
1782	Gen. George Rogers Clark routs the Shawnee in Chillicothe, Ohio, burning 3 villages.		Noll buys warrant of land in Franklin County.	
1783	Peace of Paris ends American Revolution. British vacate New York City. U.S. population: 3,250,000. End of the Frontier Conflict Period.	Schreyer 44 years old.	Noll, age 36, marries Susan Pressel of Lancaster.	Resor is 33(?) years old.
1783—1830	**The Federal Period**			
1784	Treaty of Fort Stanwix			Resor's last year in Lancaster.
1785	Land Ordinance Act for "Old Northwest." Ohio Indians begin resisting white invasion.			Resor's established in Hagerstown, MD.
1786	Shay's Rebellion. Ohio company founds Marietta, Ohio. Lewis Wetzel (Deathwind) and Samuel Brady's rangers are active. Longrifles are common.	Schreyer probably takes on John Armstrong as an apprentice.		

Year	General History	George Schreyer	John Noll	Peter Resor	
1787	Delaware is the first state to ratify the constitution.				
1788	Daniel Boone leaves Kentucky.		Taxed as a gunsmith in Franklin Co.		
1789	George Washington is first president. Frontiersmen free Lewis Wetzel from Gov. Harmar.	Schreyer is 50 years old.	Noll is 42 years old. Joined Capt. Thomas Wallace's militia company.	Resor is 39 (?) years old.	
1790	100,000 settlers west of Allegheny Mts. Harmar's expedition a fiasco. Cincinatti, Ohio, established.		Leonard Snider established gun barrel factory in neighborhood.		
1791	Bill of Rights. St. Clair's expedition slaughtered. Slater sets up first factory to spin cotton.				
1792	Kentucky becomes the 15th state.				
1793	Eli Whitney invents cotton gin. "Cotton Kingdom" expands throughout the South.				
1794	Battle of Fallen Timbers. Wayne defeats Ohio tribes.				
1795	Greenville Treaty: U.S. grabs most of Ohio.		Noll gets land warrant in Franklin Co.		
1796	John Adams is president.		Noll is taxed as a gunsmith.		
1798	Alien and Sedition Acts. Eli Whitney's contract for muskets—interchangeable parts. Springfield Armory established.				
1799	Washington dies.	Schreyer is 60 years old.			
1800	Thomas Jefferson is president. U.S. Capitol moved to Washington, D.C.				
1801	Harper's Ferry established.				
1802	Daniel Morgan dies.				
1803	Jefferson buys Louisiana. Lewis and Clark expedition. Ohio statehood.				
1804	Burr/Hamilton duel.				
1806					

Year	General History	George Schreyer	John Noll	Peter Resor	
1807	Robert Fulton's *Clermont* first steamboat on Hudson River.				
1808					
1809	James Madison is president.				
1810				Resor is probably 60 years old and he moves to Mercersburg, PA.	
1811	Harrison beats Shawnee at Tippecanoe Creek. *New Orleans* is first steamboat on Ohio River.				
1812	U.S. declares war on Great Britain.	Schreyer is 73 years old.	Noll is 67 years old.		
1813	Perry destroys British fleet on Lake Erie. Americans burn Toronto. Pittsburg Steam Engine Co. begins making steam engines.			Peter Resor dies in Lancaster at 63 years old.	
1814	British burn Washington. Treaty of Ghent.				
1815	Battle of New Orleans.				
1816	James Monroe is president. First new model factory in Waltham, MA.		Noll gets land warrant in Franklin Co.		
1818					
1819	U.S. buys Florida. Worldwide depression.	George Schreyer dies at age 80.			
1820	Missouri Compromise. Tidewater and Piedmont South worn out by cotton. Turnpike from Philadelphia to Pittsburg completed.				
1821					
1822	Jacob Dickert dies at age 82.				
1823	Monroe Doctrine. Ashley's first mountain man expediton.		Petition filed for Noll as insolvent debtor.		
1824	John Quincy Adams is president.		John Noll dies at age 77. Buried in an unmarked grave.		
1825	Erie Canal completed. First mountain man rendezvous.				
1828	Andrew Jackson is president. First 14 miles of railroad.				
1829					

Year	General History	John Armstrong
1830	200 plus steamboats on Western rivers. Slavery in South untouchable; in North, legislated out of existence.	
1831	Black Hawk War ends with 100 million acres in Wisconsin available for settlement.	
1835	Jackson pays off public debt.	Owns no property in Emmitsburg.
1836	Texas gains independence from Mexico. Colt's first revolver, the Patterson.	An Armstrong percussion rifle dated 1836.
1837	Van Buren is president. Financial crash.	Takes on last apprentice, Nathaniel Rowe.
1838	Worldwide depression. Oregon Trail.	Armstrong buys 1/4 lot for $300.
1840	William Henry Harrison is president. U.S. has 3000 miles of railway track. Last fur trade rendezvous.	
1841	John Tyler is president.	Mortgages lot to Samuel Loudon for $100 in January, $100 in October. Christmas Eve, sold household possesions, 25 stocks to Samuel Loudon.
1842		John Armstrong dies at age70. No obituary.
1845	Texas annexed to U.S.	
1840s in general	Saw the development of the sewing machine, vulcanization of rubber, Bessemer steel, petroleum and the telegraph.	



CHAPTER 36
THE RAMROD

THE RAMROD IS THAT WOODEN STICK which we use to push the ball down the bore until it is "seated" on the powder. If we forgot to pour powder down the bore before the ball, we can use the ramrod to pull the ball. And we use the ramrod to clean the bore of all the fouling resulting from burnt black powder. So it's an essential tool.

Before I go any further, I want to discuss tapered ramrods. Most of the fine original rifles that I have examined have had tapered ramrods. The standard small diameter seems to have been 3/8 inch, but quite often I have seen original rifles of .50 caliber or higher with ramrods that taper to 5/16 inch at the entry. These rods quite often have the cleaning tip at the end of the 5/16-inch portion, and I have often wondered how they could clean the bore with such a small and delicate tip. Finally I realized a few things that I'll point out at the end of the article.

For now, though, let me focus on the architecture of a fine longrifle. The key element of a fine rifle is slimness, especially from the breech of the barrel to the muzzle. Every 1/16 inch you can get rid of on the underside of the forestock enhances that quality. Think about it: the lower forestock, from under the breech to the ramrod entry, tapers and slims as you move forward. This is particularly noticeable if you are using a swamped barrel. If your ramrod hole and ramrod in this area is 5/16 inch instead of 3/8 inch, you will achieve some great architecture—for one thing, you can really round the lower forestock.

However, the hole size and the taper of your ramrod must ultimately depend on your skill in using the rod. For rifles of .50 caliber and larger, I suggest that you at least taper to 3/8 inch, which will give you good (not great) architecture. For rifles of .45 caliber, you can stick with 3/8 inch for the whole length of the rod but tapering to 5/16 inch will improve things. Rods for .40 caliber guns must taper to 5/16 inch, and those for .36 caliber should taper from .340 inch to .250 inch (1/4 inch).

Let me state at the outset that I have never used a fiberglass or other wonder-fiber rod. The original ramrods were all made of wood, and I have been quite content with hickory for the last 20 or so years. In all of that time, I have only broken one ramrod, and that was my own stupid fault!

Hickory has been the wood of choice for over two centuries because it is tough and durable and its long grain makes it quite flexible. A few years ago, friend Ron Griffie began making and selling ramrods of Osage orange. That's a pretty wood, yellow in color, and since it is and has been used for bows, it is obviously quite flexible and therefore quite suitable. My only problem with it is that I have never seen it on an original rifle. That doesn't mean that it was never used; it just means that I have never seen an original ramrod made of Osage orange.

Hickory ramrods are available in two ways: machine made and homemade. Machine-made rods are quite suitable and are sold by most of our dealers for a nominal amount. They generally come in the following sizes: 1/4 inch, 5/16 inch, 3/8 inch, 7/16 inch, and 1/2 inch. Provided that you examine each rod carefully and be sure to choose one where the grain runs the full length of the rod, you should have no trouble.

However homemade ramrods are far superior to machine-made rods. To make a machine-made rod, the manufacturer saws out squares of wood that are then turned round to the required diameters, and the grain of the wood may not parallel the axis of the rod, which makes it liable to breakage if you don't handle it with respect. On the other hand, a homemade rod, if properly made, always follows the grain and hence is always far more flexible.

To make your own ramrod, you must be in an area where hickory grows. I live in southern Ontario beside the St. Lawrence River, which borders Canada and the United States, and we do have some hickory but not a great supply. In my search for hickory, I consulted a tree identification book and discovered that the leaf shapes of hickory and ash are almost identical. I started to see a great number of ash trees but no hickory. I gave up and asked Jim Hash of Appomatox, Virginia, if he had any split hickory that he could spare, and shortly I received my care package. A few weeks later, I discovered a small stand of hickory trees, unfortunately on private property, so I couldn't cut myself a sapling or two. The mature trees are easy to recognize because the bark hangs on the trunks like long shaggy strips—hence their designation as "shag bark Hickory."

To make your ramrod, start by cutting a sapling with an average diameter of six to eight inches. Cut it just above the ground surface. You don't want one with branches for at least five feet above your cut. Trim it so you that have at least five clear feet. At home, split it in half lengthways, then take each half and split it in half. Keep splitting until you have as many squared lengths of good wood as possible. Naturally, you don't want the bark or the soft underbark wood. Now, tightly tie up your splits into a bundle and let the wood season, or lose moisture, which may take a few months.

When the wood has seasoned, choose a piece of a suitable size for the ramrod you need. If your split is a perfect square (which it isn't), you will need one with a 5/16-inch-wide side for a 5/16-inch rod, one with a 3/8-inch-wide side for a 3/8-inch rod and so on. But because your splits are not perfectly square and possibly not even parallel-sided, you had better pick one whose smallest width is one size larger than the maximum diameter of

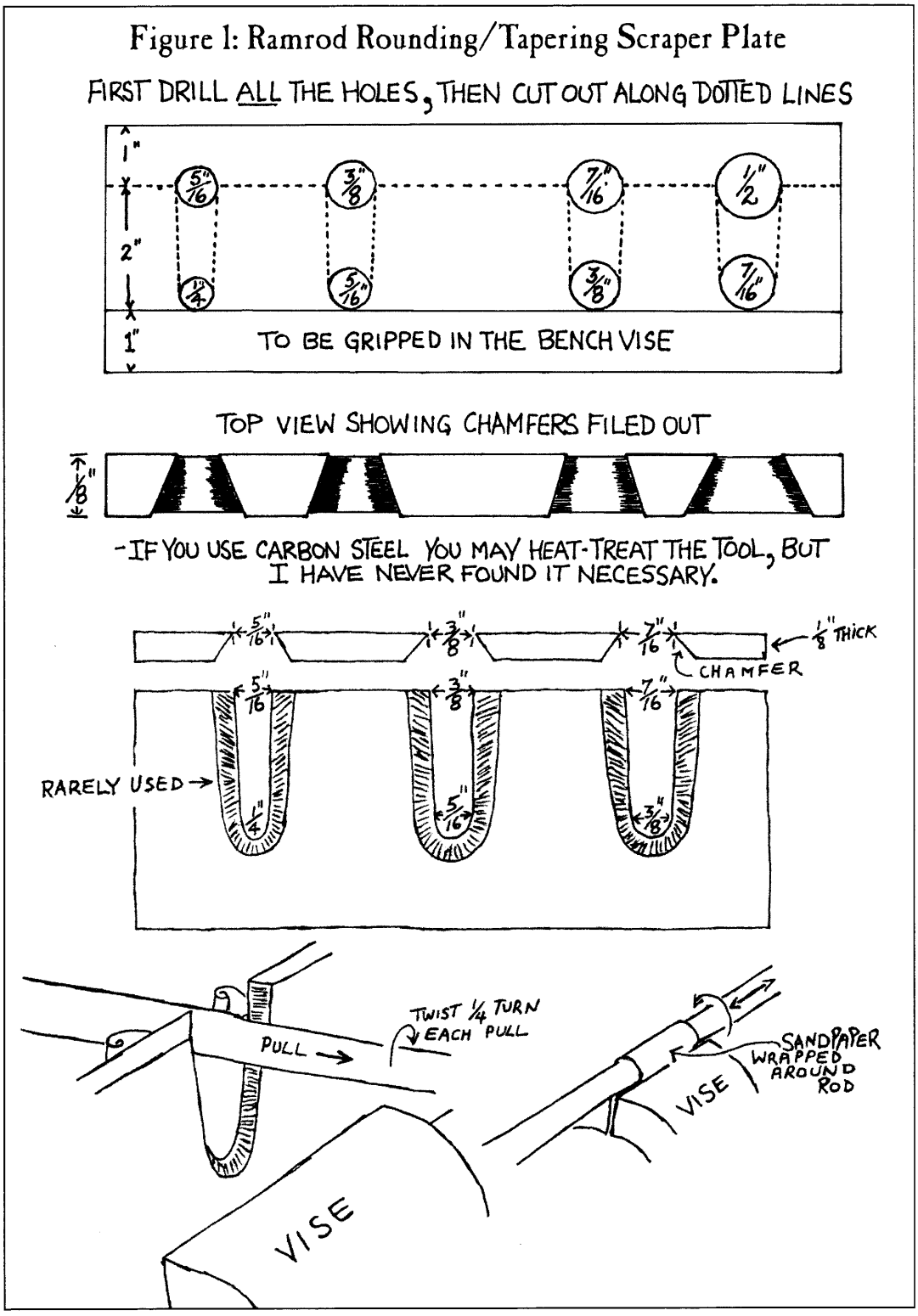


Figure 1: Ramrod Rounding/Tapering Scraper Plate
FIRST DRILL ALL THE HOLES, THEN CUT OUT ALONG DOTTED LINES
1"
2"
1"
5/16"
3/8"
7/16"
1/2"
1/4"
5/16"
3/8"
7/16"
TO BE GRIPPED IN THE BENCH VISE
TOP VIEW SHOWING CHAMFERS FILED OUT
1/8"
-IF YOU USE CARBON STEEL YOU MAY HEAT-TREAT THE TOOL, BUT I HAVE NEVER FOUND IT NECESSARY.
1/8" THICK
CHAMFER
RARELY USED
PULL
TWIST 1/4 TURN EACH PULL
SANDPAPER WRAPPED AROUND ROD
VISE
VISE

the rod that you need. In other words, if you need a rod 3/8-inch in diameter, choose a split whose smallest side width is 7/16 inch. If you need a rod that starts at 7/16 inch at the muzzle, tapers to 3/8 inch and then tapers to 5/16 inch for the ramrod hole in the lower forestock, then choose a split whose smallest size is 1/2-inch wide.

The next step is to square the split, which you can do by drawing guidelines and employing a plane, rasps and files. Then you round the squared piece. To do this job, make up an elongated V-block. Clamp the block in your bench vise and use a C-clamp or two to hold the rod in the block such that one edge is above the surface of the block. Lightly plane or rasp this edge into a small flat. Repeat for the other three edges. You are on your way to rounding the rod.

Now you can continue to round the rod by turning it slightly, clamping it and rasping off the edges formed by each succeeding flat you create, but this is the long way to do it. Besides, this technique may not, depending on your ability, produce an accurately round rod. There are two faster methods, one better and cheaper, and the other best, fastest and most efficient.

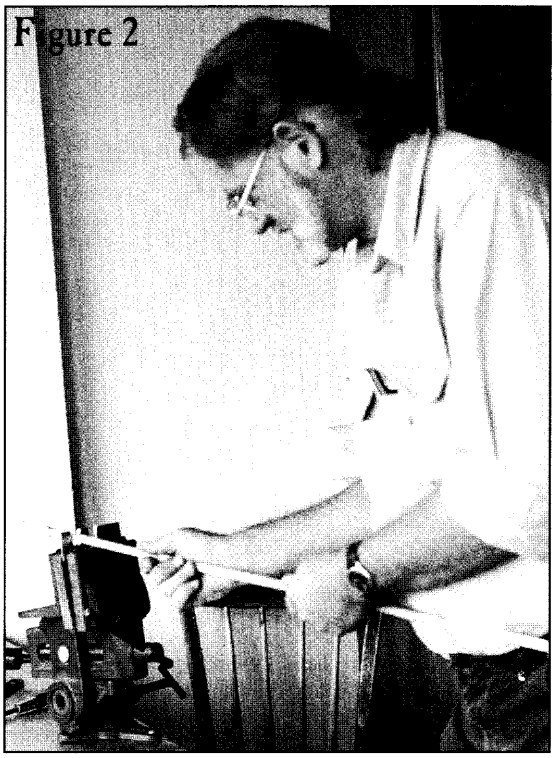
As you can see in Figure 1, I made a rounding plate out of a piece of 1/8-inch-thick of steel about three inches high by six to eight inches long. To make the plate, I cut a series of tapered slots that are rounded at the bottom. The first slot is 5/16-inch wide at the top of the plate and tapers to a rounded 1/4 inch two inches down from the top edge. To do this, start with a four-inch-high plate. Draw a lengthwise guideline one inch up from the bottom. (The bottom one inch of the tool is clamped in the bench vise after it is finished.) Draw another lengthwise guideline one inch below the top of the plate. Next draw a vertical guideline two inches in from the left side of the plate. Center punch the plate where the vertical line crosses the top one-inch guideline and drill a 5/16-inch hole through the plate. Then on the vertical guideline, 1/8 inch above the bottom horizontal line, center punch and drill through the plate with a 1/4-inch bit. Next draw a guideline from the left side of the 5/16-inch hole to the left side of the 1/4-inch hole and another line to mark the right side of the slot.

The other slots, about an inch or so apart to the right of the first slot, are made the same way. The next slot to the right starts with a 3/8-inch hole at the top and a 5/16-inch hole at the bottom. The next one has a 7/16-inch hole at the top and a 3/8-inch hole at the bottom, and so on. When all of the holes are drilled and the slot guidelines drawn or scribed, use a hacksaw to first saw off the top one inch along your top horizontal guideline and then to cut out the slots. True up and smooth all of your saw cuts with files. Finally, file a chamfer in each slot so that each slot is a knife edge at the backside, as you can see in **Figure 1**.

To use the tool, clamp it in the vise, select a slot that is slightly larger than the rough diameter of your rod. Place the rod in the slot, push down slightly and pull the rod toward you. In working with the rod up to this point, you have discovered the direction of the grain, so you better remember and work with it. You can see me doing it in **Figure 2**.

After the first pull through, turn the rod about 1/4 turn to the right and pull it through again. Keep turning and pulling until the rod fits in the bottom of the slot, and you are not scraping off any more shavings. Your rod is now perfectly rounded to the diameter of the slot at the bottom.

As you can see in **Figure 2**, I don't try to round the whole rod. I do about a foot at a time. Here I am reducing the diameter of a 7/16-inch rod to 3/8 inch. I needed a ramrod for a .50 caliber rifle that tapered from 7/16 inch at the muzzle to 3/8 inch for the rest of its length. After I scraped the 3/8-inch diameter, I filed the step from 7/16 inch to 3/8 inch. Then I wrapped a doubled piece of 180-grit sandpaper around the rod and clamped the tails of the



sandpaper in the bench vise somewhat loosely. By rotating the rod and pushing and pulling, I smoothed it out. I whiskered the rod and repeated the sanding exercise with 220-grit paper.

MIKE LEA'S RAMROD TAPERING TOOL

THERE IS NOW AVAILABLE AN EASIER, MORE efficient and faster, but initially somewhat more expensive, method of rounding and tapering a ramrod. Several years ago I started hearing rumors of someone having invented a tool that would round or taper a ramrod quickly and easily, but nobody could give me any specific information. I was particularly interested, having gotten rather tired of the many hours that I have spent scraping down ramrods over the years. Then I read an article by Lytton McKenzie in *The Journal of Historical Armsmaking Technology* that described a similar tool, and I thought the principle of synchronicity was at work. Finally, Mike Lea's tool got a review in the magazine **MUZZLELOADER** ("Prime Possibles," November/December 1994). The review only showed a photograph of the tool, but a phone call to Mike got me one to play with. See **Figure 3**. As things happen, I got to know Mike too, first at Dickson's Gunmakers' Fair and then later at the NMLRA's Eastern Rendezvous. Apart from being an inventive genius, Mike is also a fine gunmaker and an extremely nice guy. At both meetings he showed me how easy it was to use the tool. For example,

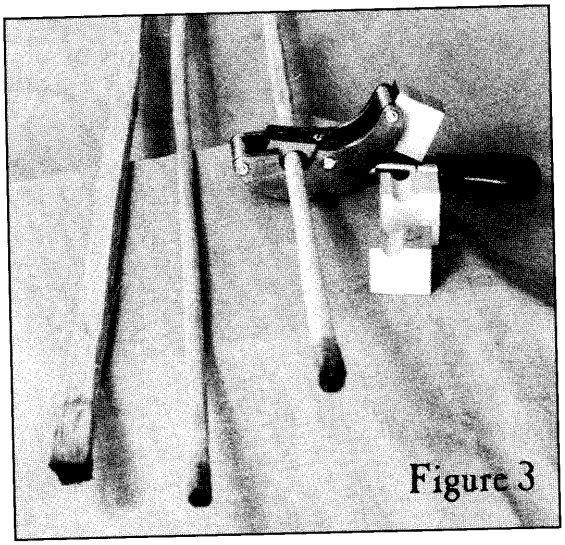


Figure 3

at Dixson's, he tapered a nine-inch pistol ramrod for me from 7/16 inch to 3/8 inch to 5/16 inch at the ramrod entry in just four minutes!

To use the tool, you need a 3/8-inch electric hand drill with speed control. Mike has made his own speed control that is variable and operated by a foot pedal, but you don't really need that. Clamp the drill in your bench vise, insert one end of the ramrod and tighten the chuck on it. It's handy to have one end of the rod 3/8 inch in diameter, and I use the scraper to reduce the ramrod end to that diameter.

I used one of the hickory splits that I got from Jim Hash to make my ramrod. Along with the tool itself come three blocks of wood with grooves in the tops. These are stops that prevent the tool from cutting any more than you want. Choose the size stop that you need and mount it in the tool. Slip the rod through the hole in the tool and get the drill turning up to about 800 r.p.m. Slowly close the handles until it starts cutting and then start moving down the rod. You know that you've cut enough when your stop prevents the handles from closing any farther.

I was amazed at how easily and how quickly the tool not only rounded my split, but also tapered it. You can see me smiling in **Figure 4**. Mike tells me that it will as easily turn a Mountain State plastic rod (I'm against the Plastic Generation, so I'd never use one), mahogany, ebony, Osage orange, black heart, cocobola, purple heart, libarnum and cottonwood. A number of arrow makers have bought the tool.

However, as I said above, it is initially expensive. The basic tool (with instructions) costs $76.95 as this book goes to press. A set of three stops costs $7.50. You can have a spare blade for $3.50, although I don't think you'll need one for quite a while. (See the source list to contact Lea for current pricing.)

"Initially" is the key word here. If time equals money, you'll save a great deal of effort and aggravation in using this tool. You might consider it as a long term investment. Perhaps you could use it to make tapered ramrods for other customers. It's the fast way to replace a broken ramrod. Certainly it's a quality precision tool: the jaws are made of solid bronze casting. So, for about the price of a nice dinner out with your loved one, you can have a tool that will give you years of lasting service. You could start hinting about Christmas or Father's Day . . .

THE CLEANING TIP

THE PLACE FOR THE CLEANING TIP IS ON the inner end of the ramrod. What I am going to talk about below is the cleaning *jag* that holds a square cleaning patch of cloth which you use to clean the bore. I admit that I have never tried a worm and tow to clean a gun. The worm-and-tow cleaning method has gained popularity lately as *the* traditional method of cleaning the longrifle. Some people I've talked to who have used it feel that it's messy and inefficient. Others say that it works very well. Nobody has been able to tell me how much tow a longhunter would have to carry if he were away from the settlements for over a year. Perhaps someone could research this topic. It seems an important question, because a man wouldn't survive long in the wilderness with a dirty gun. As you know, burnt black powder is corrosive, and there are a number of original gunsmith accounts which show that freshing (recutting the rifling) barrels and even replacing breech "pins" (plugs) were common jobs. Mind you, a wrought-iron barrel is much softer and more prone to corrosion than our modern mild steel barrels, and the accounts that I've read deal with Indian rifles, but the question remains.

You can make or buy your tip and jag. I have been buying them lately, because I don't have the same easy access to a lathe that I had for many years. However, I'm not satisfied with the ones I've been forced to buy. The price is reasonable, and they do work, but the twit who designed them made the front end concave. I guess he thought that the shooter would appreciate being able to push the ball down the barrel with his cleaning jag. A strange idea. I clean the bore with my cleaning jag; I load the gun with the muzzle end of the rod. I sure can't put the rod in

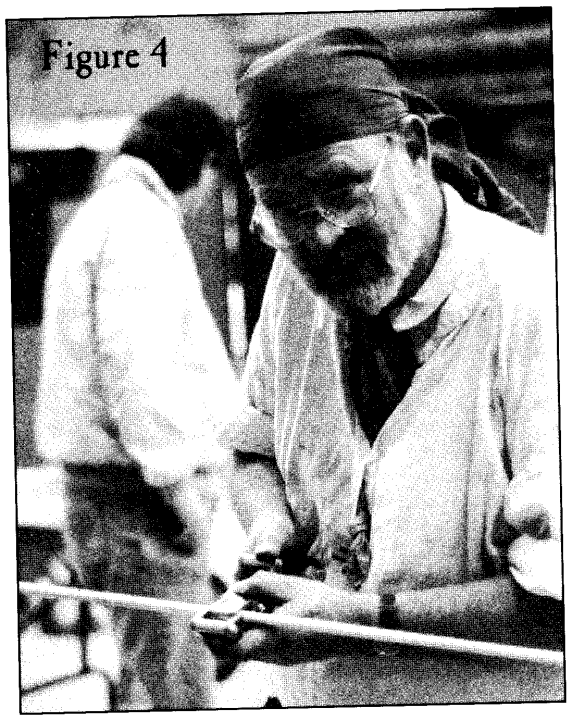


Figure 4

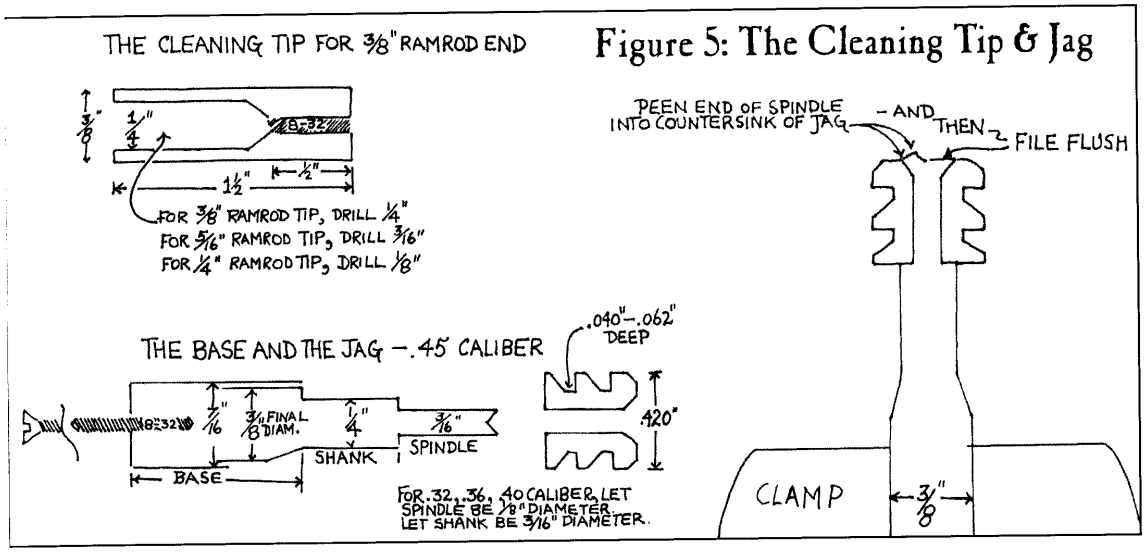


Figure 5: The Cleaning Tip & Jag

the stock with the jag attached. All the concave feature does is to allow burnt powder to build up on the face of the breech plug. I solve the problem by filling the concavity with silver solder, which I then file flat.

I learned to make my tips and cleaning jags from my mentor, Cliff Jackson, of Nedrow, New York. It's a relatively easy job on the lathe. All you need is some brass rod, a two-inch 8–32 or 10–32 screw and the use of a lathe. Cliff's design is shown in **Figure 5**.

For example, let's say you need a .45 caliber cleaning jag for a 3 8-inch rod. Get yourself a foot of 5/8-inch brass rod. Brass is softer than steel, but I can't see any reason you couldn't use steel, since the jag will never touch the bore. At any rate, we'll make the tip first.

Chuck the rod in the lathe so that three inches or a bit more is sticking out. Square off the end and, with a countersink in the tail stock, start the hole for your 1/4-inch drill bit. Use a bit of masking tape wrapped around your 1/4-inch bit to mark a one-inch depth and drill the hole into the brass rod. Now install a dead center in the tail stock and support the rod at the outer end while you lathe down the diameter of the rod to 3/8 inch. The length of your 3/8-inch diameter should be about two inches. Mark off a length of 1-5/8 inches and cut this off of the rest of the rod. Remove the solid rod from the lathe and install the tip that you have been working on with the solid end facing out. Once again square off the face, but this time remove about 1/8 inch so that your tip will have a finished length of 1-1/2 inches. Again, center drill in preparation for your tap drill.

Most jags are fastened to the tip with an 8–32 screw. This is apparently the traditional screw size, so you will drill right through into the hollow section of the tip with a No. 29 drill bit. However there's nothing wrong with a 10–32 screw if it makes you feel more secure, in which case drill with a No. 21.

I use a 1/4-inch drill bit for a 3/8-inch diameter ramrod end, because I want a wall thickness of 1/16 inch. If I were making a tip for a 5/16-inch rod, I would drill the socket in the tip with a 3/16-inch bit. And so on.

Unlike the jags sold today, the jag designed by Cliff Jackson rotates, which makes for much easier cleaning because the rod doesn't twist in your hand as you work it up and down the bore. So the jag is actually two parts: the jag itself, and the base that holds it.

Start with the jag. As before chuck your brass rod in the lathe so that about 1-1/2 inches is sticking out. Square off the front face. Use a center drill in the tail stock chuck to start the hole for your 3/16-inch drill, which you use for a hole depth of one inch. Replace the drill with a countersink drill and chamfer the outside of the hole somewhat. Replace the drill chuck with a dead center in the tail stock. Move the tail stock forward until the dead center enters the 3/16-inch hole and lock it in place, forming a rest for the lathing that you're about to do.

When George Shumway and I were revising *Recreating the American Longrifle,* he calculated the jag diameter for various calibers, which are as follows:

Caliber	Jag Diameter
.32	.300 inch
.36	.330 inch
.40	.370 inch
.45	.420 inch
.50	.470 inch
.54	.510 inch
.58	.540 inch

So for a .45 caliber, you lathe down the outside to .420-inch diameter. Next mark the surface for the grooves that you're going to cut. The jag will be about 1/2 inch in length, so you can cut at least two grooves with a thin square cutter. You don't need to cut the grooves much deeper than .040 inch. Use a three-cornered file to slant the tops of the grooves, as shown in **Figure 5**. Finally cut the 1/2-inch-long jag from the rod.

The base can be as long as you want, but I generally make mine about two inches. Once again, chuck the rod in the lathe so that about three inches is left sticking out. As usual, square the front face and apply the center drill. Put the dead center in the tail stock and move it up until it enters the hole made by the dead center. Lock it in place. Now measure 7/16 inch back from the front end of the base and carefully lathe this distance down to 3/16 inch, forming the spindle for the jag.

Now measure a farther 1/2 inch back from the rear end of

the spindle and lathe this distance down to a diameter of 1/4 inch. This distance and diameter allows plenty of room for the cleaning patch to bunch up behind the jag when you push it into the bore.

The rest of the base is lathed down to 7/16 inch and cut off of the rest of the rod. Replace the base in the lathe so that the back end is sticking out of the chuck. Again square the face and start a hole with a dead center. Drill a hole about 3/4 inch into the base with a No. 29 drill for an 8–32 screw (or a No. 21 for a 10–32 screw) and tap it.

Remove the base from the lathe and screw your machine screw into the base until it won't go anymore. Cut off the head and shank so that you have about 1/2 inch of screw sticking out the bottom of the base. Chamfer the tip of the screw, and screw onto it the ramrod tip that you made. At this point the ramrod tip is 3/8 inch in diameter and the base of the jag is 7/16 inch in diameter. Place the whole unit in the lathe. Chuck about one inch of the tip in the lathe, and support the front end of the base with the dead center in the tail stock. Lathe down the bottom of the 7/16-inch diameter base until it is flush with the ramrod tip. Smooth out the length with files and emery paper. Use files to slant or round the step between the now-3/8-inch diameter base and the 1/4-inch diameter shank behind the 3/16-inch diameter spindle.

Remove the unit from the lathe and clamp the base in your bench vise, spindle uppermost. Place the jag over the spindle with the chamfered hole uppermost. Use a ballpeen hammer and a 1/8-inch punch to spread the end of the spindle into the chamfer of the jag. Keep trying the jag to make sure that it rotates. The center drill hole in the end of the spindle was drilled to make it easy to peen out its end. Finally file the outer end of the spindle flush with the face of the jag. The finished product is shown in **Figure 5**.

For those of you who may want to use tow on a worm to clean the barrel, have a traditional-looking ramrod tip, and still have the flexibility to use a cleaning jag, I offer the following solution. I learned this one from Clay Smith in the gunshop at Colonial Williamsburg. See **Figure 6**. Clay was making traditional ramrod tips. First he cut out a piece of 1/16-inch-thick sheet steel. It was approximately three inches long, 1-1/4-inches wide at the top and one-inch wide at the bottom. He filed the sides in bevels to allow for a 1/8-inch overlap. Then, using a cone-shaped mandrel, he forged this tapered sheet into a cone such that the one-inch-wide front end had an interior diameter hole of 1/4 inch and the 1-1/4 inch wide back end had an exterior diameter of 5/16 inch. He then cut off a one-inch-long piece of 1/4-inch rod and inserted about 3/8 inch of it in the front end. Out we went to the forge, where the piece was placed to heat it red hot. At that point, he removed it and dusted the inside with Borax powder (the flux), which promptly melted on the surfaces. Next he got a piece of brass, probably .040-inch thick, about 1/16-inch wide and about 3-1/2 inches long. This he laid against the lengthwise crack, all the way down to the 1/4-inch rod on the inside. Replacing the piece in the forge, rod end down and tipped slightly so that the brass piece lay against the crack on the inside, he slowly brought up the heat until the brass flowed into the crack and around the rod.

I tried it, and it was easy. I must emphasize that braising is done at the end of the day, because it ruins the fire for welding. The cool piece was then brought into the shop and cleaned up and the 1/4-inch tip threaded with a 1/4–20 die.

If you don't have a forge, you can easily silver solder the tapered tube and 1/4-inch tip. If you have a lathe, I'm sure that you can turn one out of solid rod. Then all you have to do is to make the worm as shown, if you can't buy one from a supplier. You can also make the other tools, including the modified cleaning jag, shown in the figure.

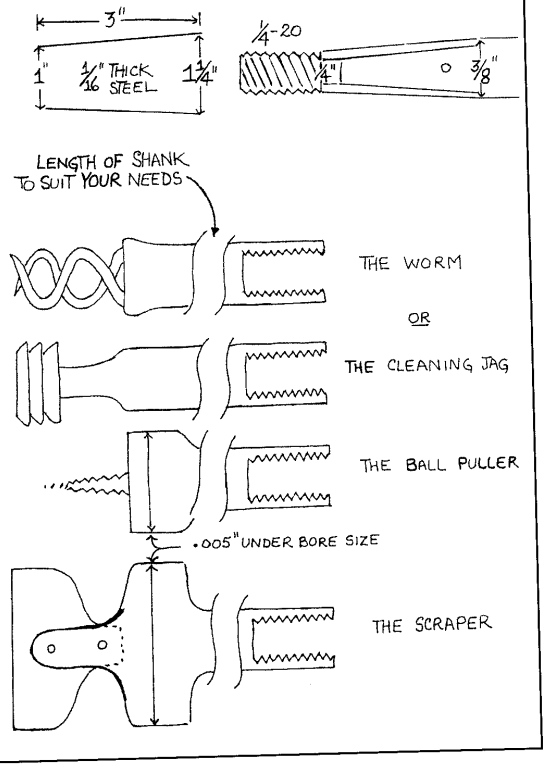
Speaking of other tools, you will need a ball puller and a scraper. You should be able to buy these from any dealer if your tip has a hole in it tapped for 8–32. If you are making the traditional tip described above, you will have to make them.

INSTALLING THE CLEANING JAG TIP

FOR MANY YEARS, BEING WITHOUT A LATHE, I have been forced to install the tip by filing down the end of the rod. I often envied Mike Lea, who has invented tip-cutting tools that he installs in his electric drill. However, while reading the "Gather 'Round the Stove" column in **MUZZLELOADER** some time back, I came across the following nifty technique, submitted by Richard Hare of Alberta, Canada, which I have modified somewhat (Nov/Dec 1998 issue, page 36).

First, round the end of the rod or even taper the end slightly. Next clamp the rod in your vise so that about six inches of the end protrudes, facing you. Take your parallel-sided brass tip and

Figure 6: The Traditional Ramrod Tip and Some Tools



chuck it in your electric hand drill, hollow end out. Now place the hollow end of the tip over the slightly tapered end of the rod and turn on the drill, gently pushing the tip on the rod. You will be amazed to see it cutting a perfect mortise for itself. When it won't go any farther in, keep the drill going and pull the tip off of the rod. Clean up the shavings.

If you have predetermined the final position of the tip because you have already shaped the muzzle end of the rod, you will probably notice that the mortise hasn't reached the pencil line. Measure the distance between your pencil line and the end of the mortise and remove just that much from the end of the rod. Then, reinsert the tip on the end of the rod and "drill" some more until the mortise reaches your pencil line.

Again, remove the tip. Unchuck the tip from your drill. Apply epoxy cement to the rod, tap the tip into place and leave it overnight. I would try the same technique with the coned tip by holding the 1/4–20 stud in the jaws of my electric drill.

Actually, if you want a more traditional method, do what Mike Lea does. He puts some rosin in the tip itself, heats up the tip with a propane torch and jams the tip down onto the rod. When everything is cool, the tip is locked as well as with epoxy.

Whether you use epoxy cement or not, you must cross-pin your tip to the rod, or you will be embarrassed someday when you lose it in the bore. Clamp the tip and rod horizontally in the bench vise, center punch and drill through the tip with a 1/16-inch drill bit. Countersink both drill holes. Cut off a piece of 1/16-inch-diameter drill rod a little longer than the hole, push it through the hole and peen both ends into the countersinks. File the steel bumps flush with the brass tip.

Now try installing the cleaning jag. If it won't go in all of the way, it may be that some epoxy got stuck in the threads, in which case, clean it out with a tap. Or it may be necessary to shorten the length of the screw.

A TIP FOR THE MUZZLE END

YEARS AGO WHEN I STARTED MAKING these old guns, I, like a number of others, thought that I needed a brass tip on the muzzle end of the rod to ram the ball down the barrel. We even got quite elaborate in making them the same length as the muzzle cap. After a few years of examining original rifles, I gradually became aware that I wasn't seeing any brass ramming tips.

Of course, it is very difficult to determine whether the old ramrod you are seeing installed in the old gun is the original ramrod made for the gun or some later (but still old) replacement. However, that aside, I can say that most of the original-looking ramrods that I have seen have had plain wood ramming ends.

So, to finish a ramrod plainly, make sure that you have installed the jag tip on the bottom end. Run the ramrod through the pipes and into the stock. By the way, make sure that your trigger plate, tang bolt and trigger guard are installed, because they may, in one way or another, stop the ramrod, depending on how far you drilled the hole a long time ago. Make sure, also, that you have installed the forward lock bolt. It sometimes interferes with the ramrod, and if it does so, you must file a groove in it to allow the ramrod to pass. However, when you can push the ramrod down the hole as far as it will go, take a pencil and mark the ramrod at the muzzle. You can rest the pencil on the muzzle and rotate the rod to draw a circle around the rod. Remove the rod and use your jeweler's saw carefully to cut away the excess just ahead of your pencil line. Now file the front face flat and round the edges. Sand smooth the front end of the rod.

Occasionally I see a fellow carrying a recreated longrifle with the ramrod protruding ahead of the muzzle by about four inches to six inches. This is quite wrong, and awkward. It certainly shows that he is worried about getting his rod stuck down the bore, but more importantly he's just asking for the rod to catch on a tree or somebody else's eyeball. I always trim my ramrods even with the muzzle, which is the way it was done originally.

What about cupping the ramming end? Well, what about it? They didn't seem to do so in the old days, and I've noticed no difference in accuracy from ramming the ball down with a plain wooden end as opposed to a concave brass tip. If your ramming end is anywhere close to bore size (another reason to taper your rod) and your bore is clean, you should have no trouble pushing the ball down the bore.

However, I have seen a few old ramrods with metal ramming tips, however they weren't made of brass but of iron. Considering the relative softness of the old wrought-iron barrels, this doesn't seem like an especially good idea. Even with our somewhat tougher mild steel barrels, I would be leery of ramming a ball down the bore with an iron or mild steel tip.

Another metal that was occasionally used for a ramming tip was pewter. You can see a few examples of this tip in *George Schreyer, Sr. & Jr., Gunmakers of Hanover, York County, Pennsylvania,* by George Shumway, on pages 40 and 45. Of course, pewter is much softer than iron or brass, but whether it is *too* soft I really don't know. A pewter tip is cast on the end of the rod exactly the way you cast a pewter nose cap on the end of a stock.

Very occasionally you will see a horn ramming tip. This was a well-established practice in Europe, and it probably came over to North America with the Germanic jaeger rifles. There's only one longrifle that I know of with a horn ramming tip and that is the fine John Sheetz rifle owned by Colonial Williamsburg. This rifle was probably made circa 1810 and belongs in the Golden Age of the longrifle. It was featured in Volume V of the *Journal of Historical Armsmaking Technology* in the article entitled "Riflemaking Workshop: A Rifle by John Sheetz" by Wallace B. Gusler and David Harvey. You can see a photograph of the horn rammer tip on page 47 of that article.

In the foregoing discussion, I have deliberately omitted discussing the shotgun tip used for ramming down wads to load that smoothbore gun. Obviously you will have to buy or make a ramming tip that is almost bore size so that the wads may be seated on powder and shot properly.

FINISHING THE RAMROD

BASICALLY, TO FINISH THE ROD, YOU NEED to whisker it and sand it smooth. After that, stain it a brown color and varnish it. I use the same staining and varnishing system on my ramrod as I do on my gunstock. Avoid boiled linseed oil because it is useless. Varnish versus oil finishes are discussed more fully in Chapter 34.

In the late 1970s, when I first started going to the NMLRA shoots at Friendship, Indiana, I noticed that a large number of contemporary longrifles had striped ramrods, and thinking that's the way it was done, I got to work striping. However, after getting to know George Shumway, I learned that this form of decoration didn't come into vogue until the mid-19th century.

However, in 1982 I came across a longrifle on a table at a gun show in North Carolina. Actually, I walked about twenty feet past the black gun when I suddenly felt that I might have seen the outline of a patchbox in the midst of all that oxidation. I retraced my steps and examined the gun more closely. Yes indeedy, there was a patchbox, and there was beautiful relief carving, and it was in original flintlock condition, and the barrel was signed "Jacob Sell"—and the owner *knew* what a prize he had acquired and was smiling from ear to ear! This was one of the few great guns that I have ever seen "in attic condition." In fact the owner had recently acquired it from an old house, where evidently it had spent most of its life in the attic. The black was surface oxidation, and later, after he had started to clean it, the original varnish finish was quite visible underneath.

However, during my first meeting with this gorgeous gun, which was made around 1800, the owner showed me that the ramrod was the original one. When he pulled it out, I could see that where the ramrod pipes had covered the rod the color had faded. Or had never had a chance to darken. I could also quite clearly see that the ramrod had been striped. This was the earliest striped ramrod that I have ever seen. However, the John Sheetz rifle discussed above also has a striped ramrod. These two rifles were made at about the same time, so it seems safe to say that the striped ramrod started with the artistic development of the Golden Age.

Figure 7

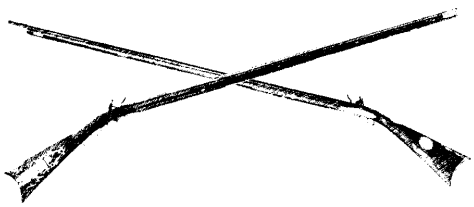
I'm going to quote from the article about the John Sheetz rifle. Gusler and Harvey write, "The hickory ramrod has a stained spiral (probably iron dissolved in nitric acid) running down its length and terminates in a horn tip" (48). It seems to me that if you stain the rod with nitric acid in a stripe, you would leave the rest of the rod in the white in order to make the stripe show up. This may very well explain the pale color of the rod on the Jacob Sell rifle.

I don't stripe my rods that way. As you can see in **Figure 7**, I simply wrap surgical tape around the rod in a spiral fashion and then char the exposed wood. As soon as I've charred the rod, I peel off the tape, which comes away easily if you do so immediately. Then I steel wool the entire rod to remove any excess char. That's followed by an application of stain because, personally, I don't like the stark contrast of black and white. Finally varnish finishes it off. However, I will admit that I'm not totally satisfied with this particular striping job. It's been a few years since I last did it, and if I ever do one again, I would make the stripes much narrower.

Nonetheless, the color you finish with will not remain constant. Over the years, as you use the ramrod, it will darken from natural oxidation as well as its contact with burnt black powder, which as we all know, is acidic.

In **Figure 7**, you can see a second duplicate ramrod. It's not much more work to make a second rod at the same time as you make your first one, and it's a good idea to have a spare, "just in case."

Another good idea is to shape out a second rod but, before you install the tip, place it in a leak-proof tube, fill the tube with coal oil or kerosene and leave it alone for a few months before removing it, letting it dry and finishing it. If you let the kerosene impregnate the wood fibers, you will be amazed at how much more flexible your rod is!



CHAPTER 40
THE CARE & FEEDING OF LONGRIFLES

THIS CHAPTER IS AIMED PRIMARILY AT beginners, so those of you who are experienced shooters may want to skim it or skip it entirely. There are plenty of how-to-shoot books on the market and plenty of writers who know more than I do on the subject. However, what follows are the basics that I've learned, which should be useful.

So you've finally finished your rifle, and apart from admiring it, playing with it, caressing it and modestly showing it off, you're naturally eager to run off to the range and bring it to life. Don't. Chances are that if you do rush off, you're going to have a very frustrating and disappointing session.

There are a number of things you can do at home that will make the first session with your new gun a pleasant one. Apart from anything else, there's nothing quite so frustrating as realizing, just when you begin shooting, that you have forgotten at home the one essential tool and that none of the other fellows has one either.

THE LOCK

LET'S CONSIDER THE FLINTLOCK FIRST. Start by putting a flint in the jaws. You're going to need a piece of leather. Some folks recommend a piece taken from the tongue of an old shoe. Cut off a strip about 1/16 inch narrower than the width of your flint. Now wrap it around your flint, front to back. The top of the strip should be about 1/8 inch to 1/4 inch behind the blade of the flint or at least long enough to cover the flat part before the bevel begins. On the bottom, mark across the leather the same length as the top and cut off the excess. Now take the two ends and hold them together. Use your X-Acto knife to cut out a notch in the center of the doubled back, as shown in **Figure 1**. This keeps the leather, and the flint, centered on the jaw screw.

You may also use lead instead of leather. Paul H. Vallandingham, who is quite a shooter, sent me the manuscript of an article that he wrote in 1997, entitled "Why Not a Flintlock?" In it he recommends making a sheet of lead by pounding a ball to a thickness of 1/16 inch and trimming it to the size of the flint. He gets much more and hotter sparks, because his thought is that the leather acts as a shock absorber, causing the flint to rebound or chatter on the frizzen. While I can't say that a lead wrapper is any more or less traditional, it does sound like a good idea. Thanks, Paul.

Now rotate the cock to half cock, open the jaws with your screw driver. Perhaps this is when you realize that your screwdriver won't fit in the slot. Grab your knife-edge file and open the slot. Now fit the flint and leather cover into place and tighten the jaws until they barely grip. Close the frizzen and put a finger behind it to hold it in place. Rotate the cock to full cock and, with your thumb on the hammer, release it and ease it down until the flint contacts the frizzen. The edge of the flint will then center itself to contact the frizzen across its entire edge. You may have to help it by wriggling it a bit. Now grab your screwdriver and tighten the jaws. Rotate the cock to half cock again.

People always ask which way you should install the flint, and I always tell them, " Sharp edge towards the frizzen." Seriously, whether you install it bevel up or down depends on the geometry of the lock and the size of the flint. On the whole I prefer bevel side down, because each firing tends to knap the edge, thereby keeping it sharp longer. Additionally, with the bevel down, the edge of the flint strikes the frizzen far higher, giving it a much longer scrape and hence, I believe, more sparks. However some locks I have owned wouldn't permit such a position, because the edge of the flint would hang up on the top of the frizzen. Anyhow, try your flint in each position to see which works better for your lock.

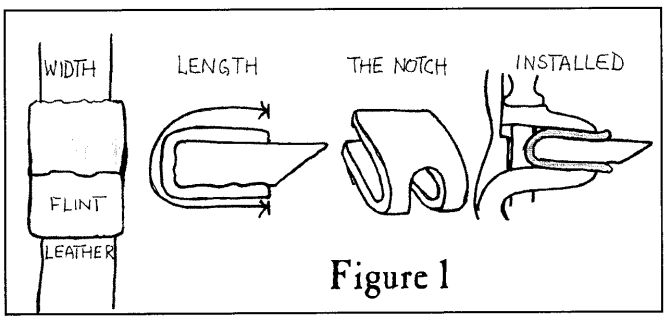


Figure 1

Let's speak of flint size for a moment. Thankfully, most flintlock manufacturers tell you what size to get for your lock, which is only really important for those "short hammer throw" locks. In these locks the half-cock position has the hammer basically vertical, which leaves only a certain space between the front edge of the flint and the frizzen. If you have too big of a flint, the frizzen won't close at half cock. However, locks like those produced by Jim Chambers have the hammer at half cock considerably farther back than vertical, allowing you much greater flexibility in flint size. These "long throw" locks are also much more reliable too, since the hammer can build up far more momentum before the flint contacts the frizzen. And more traditional, too, since nobody 200 years ago was overly concerned with flint sizes. At any rate, if your frizzen won't close with the hammer at half cock, you will need to buy some smaller flints.

Let's talk about flints for a moment. The best flints, in my opinion, are the cheapest, given that they are the right size, have top and bottom surfaces roughly parallel, a good edge at right angle to the length and no occlusions in the blade. I have never ordered a flint by mail. I prefer to pick my own at rendezvous, and since everybody else has the same idea, I make sure to pick flints the first day that I arrive.

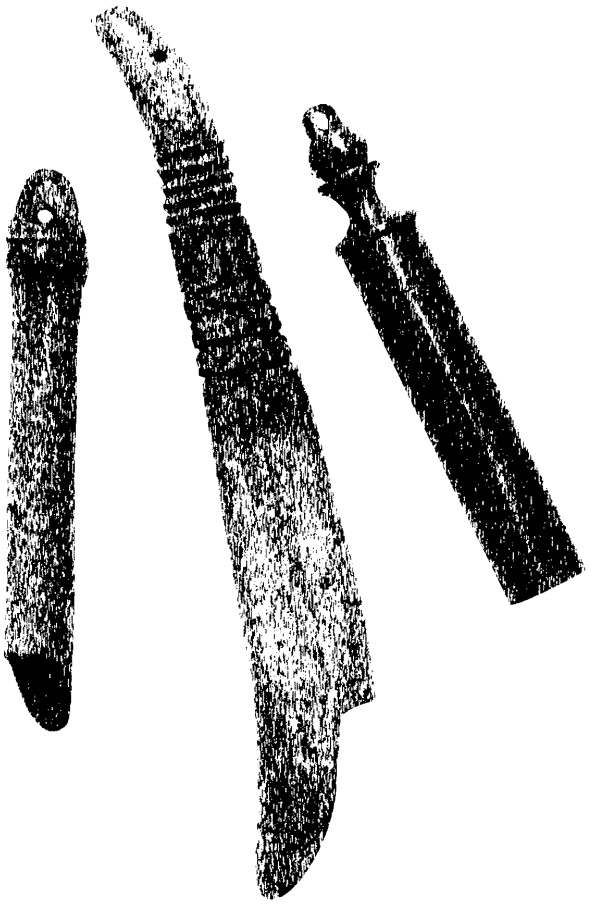
Now let's see how she sparks! When you fire the unloaded gun in your shop, you should see a shower of sparks hit the pan, preferably in the center of the pan. If you don't see a shower of sparks, try the lock a few more times. If there is no improvement, you at least need to case-harden the frizzen. Remove the frizzen from the lock. Get a can of Kasenit and pour a small quantity in a metal plate. Use vise grips to hold the frizzen and heat it up red hot with your oxyacetylene torch. Plunge the frizzen face into the Kasenit powder, which will melt to it. Now, holding the frizzen with its face up, heat the underside with the torch until it glows red again and the Kasenit powder melts and bubbles on the surface. Hold it thus for one minute before quenching it in water. Repeat this process three times and then polish the frizzen. You should see sparks!

If you have a rifle with a percussion lock, you need to test whether you are getting enough flame into the barrel. Take your gun outside, put a cap on the nipple and hold the muzzle an inch or so above some grass. Fire it, but watch the grass; it should move. If not, you need to check the length of your clean-out screw, if you have one, and possibly disassemble the nipple and drum to discover and solve the problem.

THE VARIABLES

THERE ARE THREE VARIABLES IN SHOOTING a muzzleloader: powder, patch, and ball. The secret to making your rifle shoot accurately is to reduce the variables to a combination that works best for your rifle and then all you have to do is worry about yourself. The process is called "working up a load," and it will take quite a while, mostly with sessions on the range. However, we can do some work in the shop that will cut down on time and frustration.

Powder—For rifle shooting we are concerned with two sizes, or granulations: FFFg, and FFg. The general rule is that FFFg (a finer grain powder) is used in rifles of .45 caliber and smaller. For rifles of .45 and larger, FFg is used. As you can see, there is a grey area around .45 caliber. I tend to use FFg in .50 and larger. But Brian Allen tells me that he always uses FFFg in his .50 calibers, and since he's won a few championships . . . So



you might as well buy a few cans of each, depending on your caliber. Obviously testing must wait for the range.

The second variable, as far as powder goes, is the charge, and that too must wait for your range session.

Patch—The patch is the piece of cloth that you wrap around the ball. It serves to hold the ball in place, seated on the powder. It also gets into the rifling grooves, thereby making the ball spin as it moves up the bore. It is by no means a gasket, or gas seal. High speed photography and chronograph testing have established this fact years ago. In fact your rifle will shoot with acceptable (deer-killing) accuracy out to 50 yards without a patch at all.

With this in mind, it is a real puzzle why shooters use such tight ball/patch combinations. When I first started, with a .45 caliber we all used a .445 ball wrapped in a .020-inch-thick pillow ticking patch. You really needed a short starter and after a few shots started to wish for a sledge hammer. Meanwhile, other shooters, like Brian, were smiling and winning with a .440 ball wrapped in a .005-inch to .010-inch-thick patch. And they didn't need a short starter. Short starters are not historically accurate anyway.

What you need to do is buy some strips of patching in different thicknesses. Try the following thicknesses: .005 inch, .010 inch, and .015 inch. Various makers sell them, although Ox-Yoke springs to mind. After you have established the right combination for your rifle, you can take your vernier calipers and go hunting through the piles of pure linen in a fabric shop until

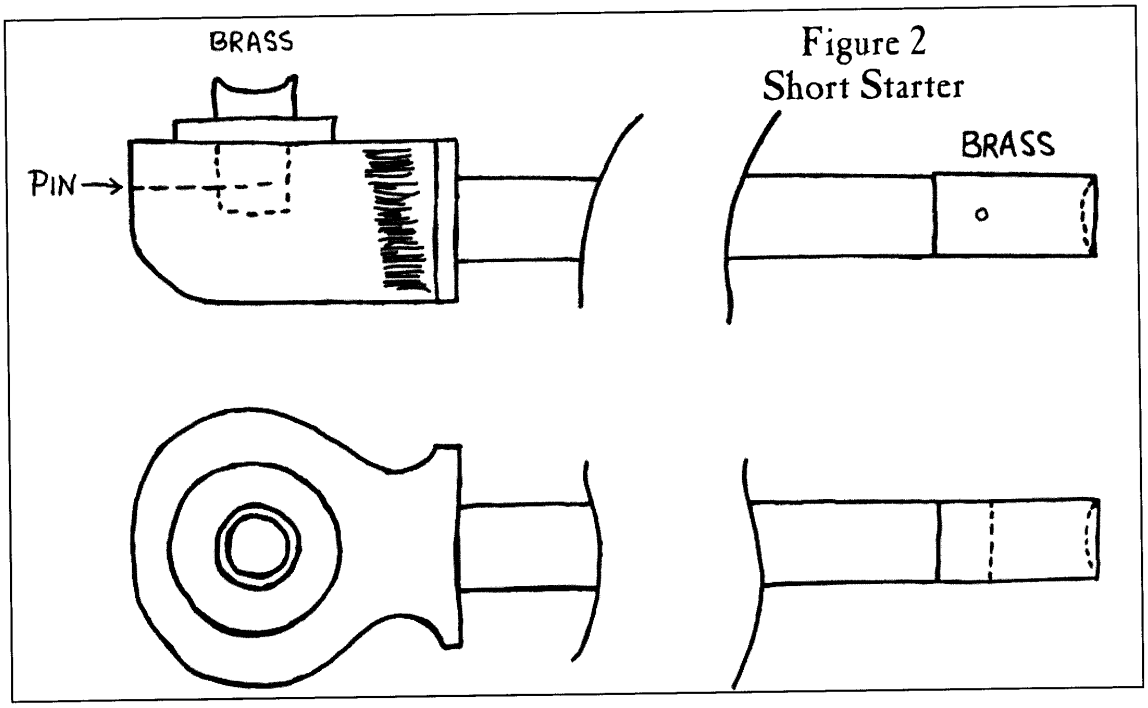


Figure 2
Short Starter

you find the right thickness and then buy 10 yards of the stuff, thereby achieving consistency in one variable.

Ball—Ball size is obviously important. As mentioned above, we all started with a ball .005 inch under nominal bore diameter. I say nominal, because not all .45 caliber bores are the same. However, I would suggest that you buy a box of balls .005 inch under your bore size and another .010 inch under your bore size. So, for example, if you have a .50 caliber, buy some .495-inch balls and some .490-inch balls. Later, you can buy a ball mold of the size that suits you.

With these materials in hand, grab your gun and go to the shop. There remove the barrel and breech plug. Clamp your barrel in your padded vise, muzzle up. Let's stick with the .50 caliber example. We'll start with the .490 inch ball. Choose one. Cut a piece from each of your strips of boughten patching that is large enough to wrap around the ball. Start with the really thin .005-inch patch. Wet it with saliva, place it over the muzzle and place the ball on top of it. See whether you can push the ball down flush with the muzzle with just your thumb pressure. If not, try a shortened piece of ramrod. Then use your ramrod to push it down.

Here would be a good place to talk about the use of the ramrod. The key idea is to be gentle. You don't want to grab it three feet above the muzzle and slam it. For one thing, the rod will flex like crazy and probably crack or even break, and your hand is descending to the muzzle at great speed right toward that jagged sharp break. No, the technique is to grab it three to four inches above the muzzle and push slowly and easily. Try to be consistent. By using a patch/ball combination that is snug but not tight, you can easily seat the ball on the powder, and you won't have to carry an ugly, non-traditional metal ramrod to the range or even, God forbid, on a hunting trip.

When you've pushed the ball all of the way through the bore, it and the patch will fall to the floor. Inspect both. If the patch is ripped or torn in any way, it may be too thin. It may even burn out during firing. It may be that there's a roughness in the bore or a burr at the muzzle that deserves inspection and solution—*now*. You are also looking for the "print" of rifling grooves on the patch itself. If you see such, you know that the patch is engaging the grooves, which is what you want.

Keep running the three different patches with the .490-inch ball. Then try the same three patches with the .495-inch ball. Make notes of the difficulty you had in pushing the ball down the barrel and the condition of the patches. For your first session at the range, you're going to take with you one ball size and no more than two patch thicknesses, so choose what you think is the best.

Short Starter—Despite what I've said above, I do believe that the short starter is a good tool for a beginner who is unused to loading his or her first rifle or even for someone working up a load for a new rifle. It does save time and effort. However, if you have to use it forever, that's a darn good indication that your patch/ball combination is way too tight. You can easily make one yourself, and I illustrate it in **Figure 2**.

The little brass tip under the head is used to seat the patched ball flush or slightly below the muzzle. Its diameter should be about .030 inch less than the bore diameter. To use it, you place a strip of patching, lubricated with saliva, across the muzzle, a ball on top of the patch and place the tip on the ball, holding the long shank in your left hand. Hit the back of the head a sharp rap with the side of your right fist, driving the patched ball down and flush with the muzzle. Grab your patch knife (Is it sharp, by the way?) and trim off the excess patch.

If you don't want to bother with your patch knife, have on hand a supply of pre-cut patches—squares are fine as long as they are large enough to go around the ball. There is no difference in accuracy between square cut or round pre-cut patches and patches cut off using a patch knife. The only time that you can't use a

patch knife and *must* use pre-cut patches is with a barrel having a coned muzzle, which I recommend anyway.

Now, take the long six-inch shank and press its tip against the ball. Drive the ball down the barrel by pushing against or rapping the top of the head. Incidentally, six inches is the *maximum* distance above the muzzle that you should grasp the ramrod.

Having selected a few patch/ball combinations, you might as well test your cleaning jag and cleaning patches. Install the jag on the end of your ramrod, wet a cleaning patch and run it up and down the bore. Follow it with a few dry patches. Hopefully it won't grab or stick. If so, you had better fix it now.

Another tool to check out is your scraper. This cleaning tip, which you made (see Chapter 36), is used to scrape burned black powder crud from where the breech plug meets the bore. It's amazing how fast crud can build up there, even after cleaning with patches. Attach the scraper to the end of your ramrod. Tilt the barrel in the vise so that it's horizontal. Push the rod with the scraper so that the scraper ends up just in front of the breech threads. Inspect it with a bright light. Try turning it. It should rotate freely but still be wide enough almost to touch the lands around the bore.

Lastly, you might want to test your ball puller. You'll probably need to install the breech plug for this test. Once again, tip the barrel in your padded vise so that it is muzzle up. Ram down a lubricated patched ball. Next, attach the ball puller to the end of your ramrod and insert it down the bore until it contacts the ball. Press and turn the ramrod clockwise. You should feel the screw tip entering the soft lead ball. As it does so, the ball will expand a bit. Try pulling the ball out of the bore. If it breaks free, you didn't turn in the screw far enough. Try again. If you do get the tip far enough in but can't pull the ball, this is an emphatic indication that your patch/ball combination is too tight!

"Withdrawing the charge" was a common practice in the 18th century, especially in hostile territory. Today, we have gone to great lengths to avoid the practice: removable touch-hole vents, nipples, clean-out screws to allow you to pack in powder behind the ball so that you can shoot out the ball. There is even available a CO_2 cartridge to allow you to blow out the ball. Yet, even with a relatively flimsy ramrod, our ancestors were able to pull a ball from the barrel, which certainly proves to me that they were using relatively loose patch/ball combinations.

And if you believe you will never load a ball without powder, you're dreaming! Why not practice now and avoid frustration later?

THE SHOOTING BOX

NOW THAT YOU'VE TESTED EVERYTHING and reassembled and cleaned your rifle, it's time to pack up your shooting box. Your shooting box can be anything from a cardboard box to a metal tool box, a tackle box or a beautifully made wooden container. Not everything that I mention below will fit in a standard container, but it should be big enough to keep your tools and essential supplies organized.

As noted above, it's really frustrating to forget something at home, 20 plus miles away, so think before you leave. The following is a check list of stuff that I make sure to bring. See if you can think of anything I might have forgotten.

1) Notebook and pen: You need to note your experiments so that you know where to go next and so you don't repeat mistakes.
2) Cans of powder
3) Powder pourer: You can make this. Take a cap from an old can of powder. Get a high power modern cartridge case and cut off the base. Drill and file a hole through the center of the cap so that the back end of the cartridge fits. Soft solder it in place. It's ideal for pouring powder out of the can into the horn. I *never* load with powder from the can.
4) Small funnel
5) Shooting patches
6) Cleaning patches
7) Boxes of balls
8) Box of percussion caps, if necessary
9) Spare flints
10) Container of water
11) Patch lube
12) Cleaning Solvent
13) Tools: The selection of tools that I always take to the range includes needle nose, adjustible and vise grip pliers, screwdrivers, needle files, fine-cut mill file, three-corner file, small hammer and brass drift (for moving the rear sight)
14) WD-40
15) Staple gun and staples
16) 100-yard targets, 200-yard targets: You want the ones with a single bull's-eye that are available from the NMLRA and others.
17) Red aiming points: These are stick-on small red dots that are available from any gunshop.
18) Black laundry marker
19) Spotting scope or binoculars—saves a lot of walking.
20) Sandbag rest and sandbag: You can buy, borrow or make one of these to support the muzzle end of the rifle when bench shooting. Or you can use a number of four-by-fours topped with a blanket.
21) Blanket: Folded it makes a nice pad for your elbows on the bench.
22) Ground cover: A small piece of tarp or 1/2-inch plywood on the ground protects your shiny butt plate
23) Old pillowcase: Stapled to the bench, it collects used cleaning patches. After you have finished cleaning, tie a knot in the case, dump it in the washing machine—by itself please—and then the dryer. You can then reuse the patches.

My normal practice, when I'm shooting on the range, is to lubricate my patches with saliva. Saliva is fine for a session at the range where you are shooting as soon as you have loaded the gun. Your saliva is no good if you are not going to shoot the gun for a while after loading. If I'm hunting I lubricate my patches with shortening. I've even used neatsfoot oil in hunting. There is no doubt that changing your patch lube will alter the point of impact a little, so (eventually) you should settle on one patch lube. You should note that the products listed above are available and cheap. I'm a tightwad.

There are plenty of "miracle" patch lubes and bore cleaners out there on the market that I have successfully resisted—except for one, which was given to me as a free sample. Free is good. Now I'm buying the stuff, because it works extremely, miraculously well. This is Lehigh Valley Shooting Patch Lubrication. By lubricating your shooting patches with this stuff, you can shoot continuously without having to clean between shots. I think the record is 100 rounds. It has no effect on point of impact. It can be used on patches while hunting, because it is not affected by cold or humidity, and cleaning after a day's shooting is so fast it's

ridiculous. In fact I deliberately didn't clean a rifle after a day's shooting. Six months later, I removed the barrel and pulled the breech plug; the bore was shiny. There was no rust. None.

Water is the basic cleaning solvent that has been used for a very long time. It's cheap and readily available. After plugging the touch-hole with a toothpick, or plugging the nipple, you can pour a quantity down the barrel, let it sit for a minute or two and then pour it out. A few cleaning patches wet with water, followed by some dry patches, and you will have cleaned the fouling from the bore. Or you can buy a jug of windshield washing fluid, which works even better and faster, or you can spend more money and buy the Lehigh Valley solvent.

THE HUNTING POUCH

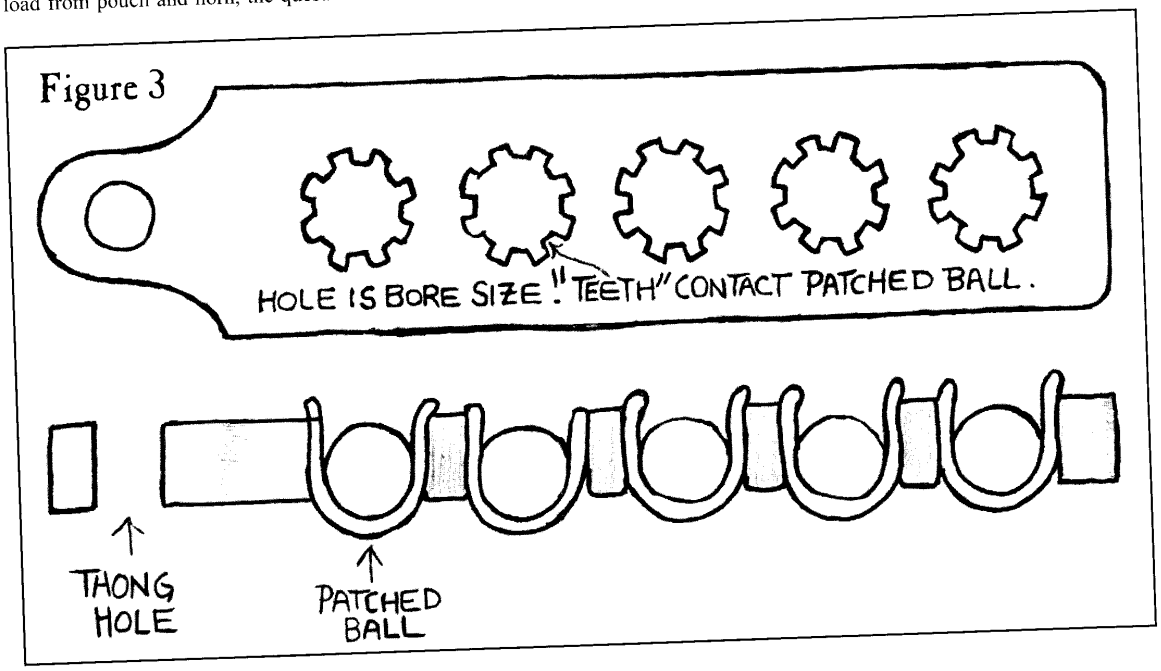
ANYONE WHO HAS EXAMINED ORIGINAL hunting pouches, or even read *The Kentucky Rifle Hunting Pouch* by Madison Grant, must realize that mostly they were very plain, utilitarian containers with none of the elaborate pockets and so on that we use today. I fail to see how they could carry enough stuff to feed and care for a longrifle on a six-month trek like Dan'l Boone and others made in the early 18th century.

Yet today, we are fortunate in having fine leatherworkers who produce beautiful pouches, double pouches with all the gussets, pockets, containers and so on that we would ever need to hold all of the stuff we might conceivably need for a year or two of shooting. And there are plenty of folks out there who are happy to sell you yet another piece of equipment that's absolutely essential. If you could load all this stuff in the pouch, you'd probably stagger around with a considerable lean!

So whether you're off for a day's hunting, you return to camp each night or you are doing a primitive shoot where you must load from pouch and horn, the question is what do you *really* need to carry? Here are some suggestions:

1) Your powder horn (full). Note that I'm not recommending a priming horn. If your lock won't ignite FFFg or FFg powder, the problem lies with your lock.
2) Your patch knife. The one I have, made by Madison Grant, is useful for cutting patches, knapping a flint edge, skinning a deer, cutting bacon, sausages or salami. I've even used it to tighten my top jaw screw.
3) A capper, caps, nipple wrench, nipples and nipple pick, if you are of the percussion persuasion.
4) Flints. I carry my spare flints in a flint wallet that Erwin Tschanz made for me. If they rattle around in a pocket, they're liable to chip and dull.
5) Your powder measure. At first this will be an adjustable one until you have worked up the right load for your rifle. Later, you can make one out of a deer horn, antler or even tin.
6) A ball bag. Made out of leather, it has a wood or horn spout and plug. Erwin Tschanz makes these too. I hate trying to find loose balls in my pouch. The only thing I have to remember is to change the balls when I change my rifle.
7) A loading block. I made this myself out of a piece of tiger maple. It holds five patched, lubricated balls. It has a leather loop so that I can carry it around my neck. The rest of the time it lives in its own pocket. It really speeds up reloading on a primitive run. No, I don't use it when hunting; if I've shot a deer, I want to take my time before going to it. I illustrate it in **Figure 3**.
8) Shooting patches. I normally carry a strip of the correct patching material for my gun. If I'm hunting, it's prelubricated. I also carry precut, prelubricated patches in my patchbox.
9) Cleaning patches. I carry a bunch of these in a pocket in the pouch. I rarely need them in a primitive shoot or while hunting, but just in case . . .
10) Screwdrivers. I have two, one to tighten the top jaw screw and a smaller one.

Figure 3



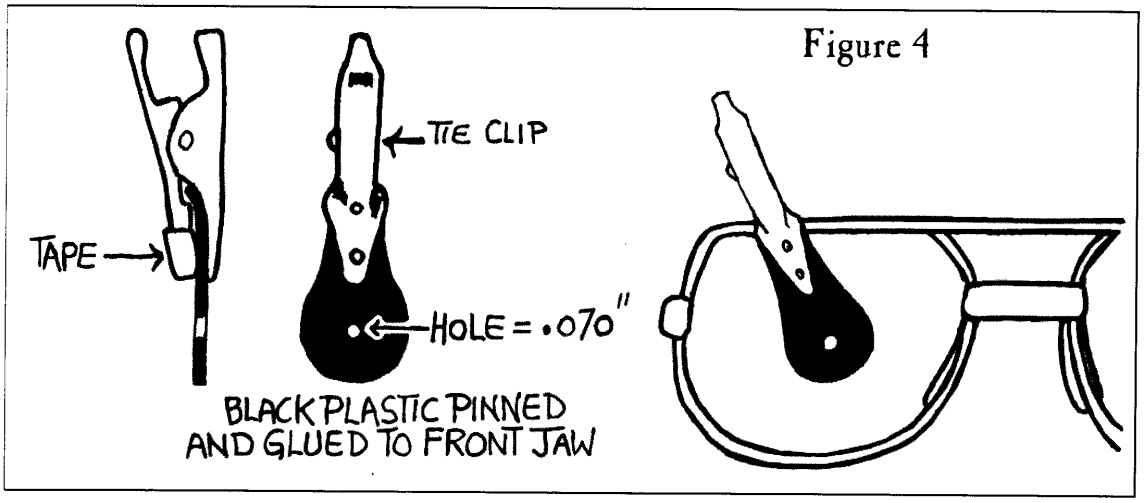


Figure 4

11) Cleaning jag, scraper and ball puller. Each of these is carried in its own pocket. I used to carry them in my patchbox, but they rattled and I was scared of losing them.

13) Vent pick. An essential tool. An old German proverb declares, "There's nothing you can do when an angel urinates in your touch-hole." Mine lives in its own little pocket. Actually, I even have a spare one. You can easily make one out of 1/16-inch drill rod or piano wire. I prefer to taper and square my pick. The pick should be long enough to go from the outside of the pan to the other side of the bore, and it should fit in your touch-hole. Better check that.

14) Ear plugs. You can buy some pretty amazing ear plugs that allow you to hear normally but bar any loud noises. I always use mine on the range, not because my muzzleloader is so loud, but because there's always somebody nearby shooting off a magnum.

15) Eye protection. Now I wear glasses, so I don't worry about saefty glasses. If I didn't, I would carry a pair on top of everything else in my pouch so that they would be the first thing out and the last in. Burning black powder—yours or somebody else's—or cap fragments can really ruin your day.

16) The old man's peep sight. I guess I qualify as a senior citizen, if not in age, at least in eyesight. I'm having real difficulty focusing on my sights and the target at the same time, at least on any continual basis. Then along came friend John Carruthers with the amazing gizmo illustrated in **Figure 4**. I don't know where he got the idea, but it sure works! All you do is drill a tiny hole—say .070 inch—in a piece of black negative film or other black plastic. Then you trim it and attach it to a tie clip with crazy glue. You clip the tie clip to the frame above the eyeglass lens of your shooting eye so that you see through it and it enables you to line up the sights. It really helped my eye concentrate and my scores improved dramatically!

And that's it. You'll notice that I don't carry a "bag mold" for casting bullets or a folding lead ladle or spare lead. I might carry these if I were going on a long trek but not in my pouch. I don't carry a mainspring vise or spare mainspring, because I can't remember the last time I had a mainspring break. They didn't carry spare mainsprings in the 18th century either, because they hadn't invented interchangeable parts back then.

In fact, there's a whole lot of stuff I don't carry. But what I do carry, I have found necessary. But more to the point, there is a place for everything, and I keep everything in its place, so I can find it easily and quickly. There's nothing like a timed Seneca run on the primitive range or at rendezvous to "shake down" your hunting pouch.

As noted, there are a lot of great hunting pouch makers out there. One I can recommend is Erwin Tschanz, whom I have known for a quarter of a century. Erwin makes superb pouches, horns, tools and treenware, all historically correct to the 18th century. He is rated a master hornsmith and cordwainer by the Brigade of the American Revolution. All of his leather work is handsewn, and what impresses me about Erwin is his almost obsessive attention to detail. Whenever I order a new pouch from Erwin, I can expect at least an hour's telephone conversation before he is satisfied that he knows what I want and can make what's right. Apart from anything else, he is a championship shot so he knows what's needed.

AT THE RANGE

NOW THAT WE'VE GOT ALL OF OUR STUFF, let's go to the range. Hopefully it's a nice sunny day with little wind. And, if you're smart, you have planned a day when there will be few other shooters around; you don't need distractions.

Make sure that you observe all of the safety rules. At our range the first person there is considered the safety officer, and what he says is law. We use flags; the red flag means that the range is "hot," in other words, that firearms can be handled and fired, but you can't go forward of the firing line. The green flag means the range is "safe," which means you can go retrieve and replace targets, but all rifles must be unloaded and in an upright position and you are not allowed to touch your firearms in any way. Relays are usually twenty minutes long. Make sure that you know the rules of your range.

Now find a bench opposite the 25-yard line. This is where we're going to start. Grab a target frame and staple up a 100-yard

target. Stick your red aiming point in the center of the bull and then post your target.

When the range is "hot," you can bring to the bench your shooting box, gun, sandbag rest, blanket and other paraphernalia. Put on your pouch and horn. Insert your ear plugs. Put on your safety glasses. Sit at the bench, feet spread, such that your shoulders are in line with the target. Adjust the sandbag rest so that your gun rests on it about six inches back from the muzzle. Bring the butt to your shoulder and sight on the target. If you have to twist about or raise or lower the butt, you had better adjust the sandbag rest or even move the bench itself.

The whole object of the exercise is that you want to shoulder the gun in the same position as shooting offhand. But in bench shooting, you don't have to hold the gun with the left hand behind the rear ramrod pipe: that's what the sandbag rest is for.

But you have to hold the gun steady. Here's how. Rest the weight of your torso evenly on each elbow. This is where the blanket pad becomes useful. Now shoulder the gun. Take your left palm and place it under the toe of the butt plate. That holds it steady. Your right hand holds the wrist, and your trigger finger is straight out beside the trigger. Now put your cheek on the comb and sight the target. If you are feeling a strain on your back or any tension, you need to adjust things.

And now for the "fouling shot." If you have percussion ignition, cap it and fire the cap, muzzle at the ground. We're checking to see that the passage is open. If you have a flintlock, prime the pan and fire it.

Now you load the gun for the first time. Set your rifle vertically against the back of the bench. Most benches have notches there. Make sure that you have placed something on the ground under the butt plate. You have to start with some charge of powder, so here are my suggestions:

Caliber	Charge
.32	20 grains FFFg
.36	30 grains FFFg
.40	40 grains FFFg
.45	50 grains FFFg or FFg
.50	60 grains FFg
.54	70 grains FFg

So choose a charge, set your powder measure and fill it from your horn. *Plug your horn!* Pour the charge down the barrel. Grab your patch, lubricate it and place it across the barrel. Put a ball on it and seat both flush with the muzzle.

Now, use the short starter and/or your ramrod to start the ball down the barrel. Take the ramrod out of the pipes, reverse it and use the front end to push the ball down in increments. Don't pound it. Be gentle. When it has reached the powder, a few gentle taps will seat it in place. If you are not sure that you have reached bottom, mark the ramrod at the muzzle with a pencil, remove it and lay it along the barrel. Check the bottom and at the breech. Very much into the future, when you have worked up the perfect load for your rifle, you will load it and leave the ramrod in the barrel. Take your patch knife and place the edge against the rod at the muzzle. Rotate the rod. Press the knife into the rod a bit. When you remove the ramrod, you will see a line across the rod that is your telltale mark indicating that the ball is seated on the charge.

Now replace the ramrod. I know this instruction sounds silly, but even sillier and more embarrasing is shooting your ramrod downrange. I've seen it happen. I hope you brought your spare ramrod with you.

Next, sit at the bench, gun resting on the sandbag, muzzle pointing downrange. Bring the lock to half cock. If you have a percussion gun, this is where you cap it. With a flintlock, use your vent pick to clean the hole. Then unplug your horn and pour a very little powder in the pan. Tip the gun so that the powder slides away from the touch-hole. Close the frizzen. *Plug your horn!*

Shoulder the gun. Aim it at the target. Set the set triggers, if your gun is so equipped. Bring the hammer to full cock, but keep your finger off of the trigger.

What I want you to do is relax. Take three slooow, deeep breaths. Take another one and let it halfway out. Concentrate on the sights and the bull's-eye. Move your trigger finger onto the trigger and add pressure. Concentrate on the sights. When the gun fires, it should come as a surprise. However not so much of a surprise that you jerk or move. Or close your eyes.

Congratulations. Yes, I know that you want to look at the target through the scope, but don't! You're not shooting for score. You're shooting for group, and it doesn't matter where the first one went as long as the next two go in the same place. What I want you to concentrate on and remember is the sight picture. So let's repeat the process twice more, exactly the same.

Anytime now, somebody is sure to come over to talk and admire your gun. Every time you load, I want you to say—out loud—"Powder! Patch! Ball!" Let's try that again. "Powder! Patch! Ball!" This little mantra will help you memorize the sequence. It will also drive away the talkers, who will think you're a nut. If somebody is persistent, dump out the powder, if that's the stage you have reached, or ignore him, say the mantra and continue the sequence. If you haven't started loading, you can explain that you are busy and can talk when the relay's over. Keep in mind the fun you're going to have if you load a ball without any powder.

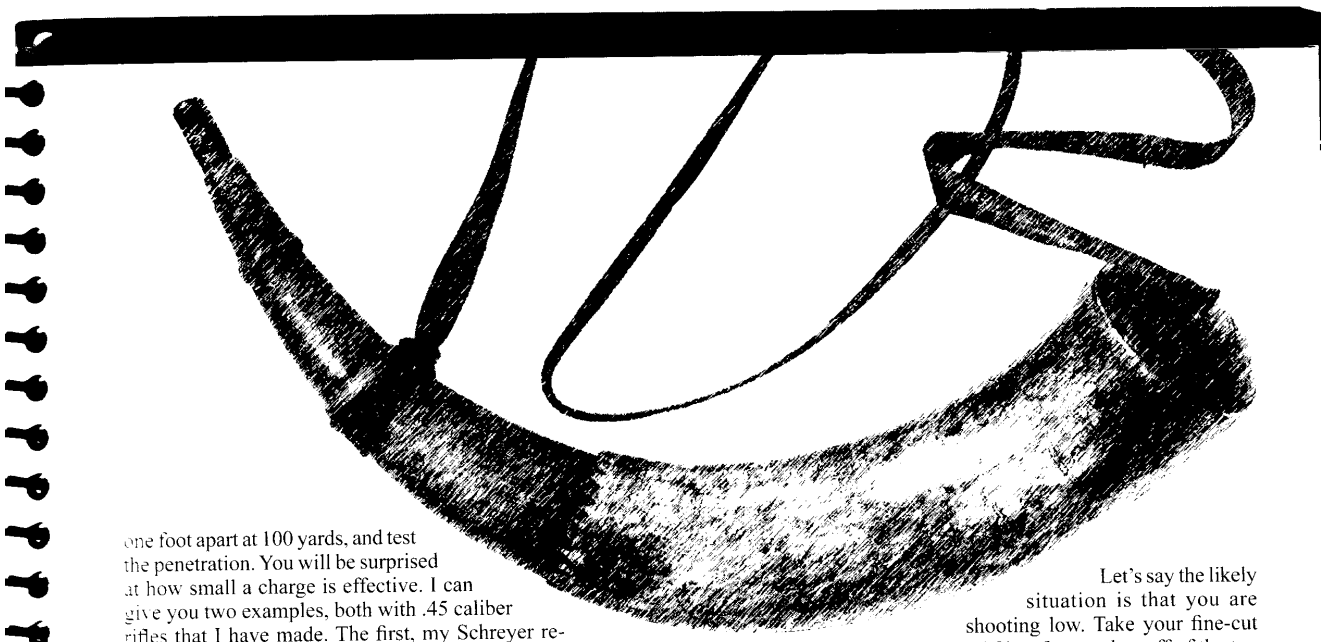
So you've fired the first three-shot group. The first thing you do is clean the barrel and lock. With a flintlock, remember to wipe the flint, especially the underside, the pan and the underside of the pan cover. Now look through the spotting scope. What you're hoping for is a one-hole group. But you didn't get it.

Let's get back to work. Adjust your powder measure to increase the charge by five grains. Fire another three-shot group, and so on. Eventually you will get a one-hole group. You may have to change targets. When you do, mark on the target all of the pertinent information and take a break.

When you have achieved a one-hole group at 25 yards, set your new target to 50 yards and proceed to achieve the same goal. Because of the increased range, this will take much more practice and thought. It is here where you start to play with that red aiming point. Let's say that your balls are holing the bottom of the target. Since you aimed at the center of the bull, your gun is shooting low. You may be tempted to play with the sights. Don't. Move the red aiming point to the top of the target. We're still shooting for group, not for score, and there's no point in adjusting the sights until you have worked up the best load for your gun.

But let's say that you have finally achieved that one-hole group at 50 yards. Great! What I want you to do is keep firing three-shot groups, increasing the charge five grains each time. Eventually, the group will open up. Back off five grains. You have just reached the maximum charge your gun can shoot. Somewhere between the first one-hole group and the last is your ideal charge. My .54 caliber will print one-hole groups at 50 yards between 80 grains and 120 grains FFg. There is no point in shooting maximum charges unless you are a big bang "mangalum" magnum addict and like depleting your bank account.

Rather pick a charge that is comfortable. If you are worried about killing game, set up a series of one-inch-thick pine boards,



one foot apart at 100 yards, and test the penetration. You will be surprised at how small a charge is effective. I can give you two examples, both with .45 caliber rifles that I have made. The first, my Schreyer re-creation, killed a yearling buck at a range of 75 yards. It went down instantly and when I reached it was quite dead. The ball had gone through above the right shoulder, through the chest cavity, through the left shoulder blade and exited. My charge was 70 grains of FFFg. The second example is equally instructive. My friend Brian Allen was plinking with a .45 caliber Verner re-creation I had made. He was shooting at ploughshare blades. These are tempered steel, at least 1/8-inch thick. The range was 60 yards. The balls went completely through the steel blades. He was shooting 60 grains FFFg.

O.K.? You don't need "mangalum" loads.

Now we can play with the sights. You have probably already decided just what sight picture you want, but I'll review it here anyway.

First, there's the "dead center" hold. Here you place the front sight in the center of the bull. Next, you adjust the gun so that the top of the rear sight comes to the top of the front sight. Note the sequence. This is how you always sight the gun. I used this hold for many years when I was making Pattridge-style sights.

Second, there's the "six o'clock" hold. Here you place the front sight so that the bull seems to be resting on top of it. Then you bring the back sight up and even with the top of the front sight. This is the hold that I tend to use now, particularly with a notched rear sight, which I now make. It seems to me that I was always having some trouble deciding on where the center of the bull was, especially at 100 yards. With the six o'clock hold, I can always see the bottom of the bull. At any rate, choose your hold and stick to it.

So let's say that you are shooting to the left, toward the nine o'clock area. You need to move the rear sight in the direction that you want the ball to print, that is to the right. Here's where another fellow comes in handy. Ask him to hold the empty gun, resting on the bench, pointing downrange. You grab your light hammer and drift. Set your drift against the base of the sight and give it a light tap or two with the hammer. Then fire another three-shot group, and so on.

One thing I should mention is the sun. If it is slanting across the range, it will gleam on one side of your front sight more than the other, giving you a false aiming point. This is when you use your black laundry marker to paint the front sight.

When you have reached the center area of the target, either below the bull or above it, it's time to play with height of the front and rear sight.

Let's say the likely situation is that you are shooting low. Take your fine-cut mill file and file a few strokes off of the top of the front sight. File from back to front. Repaint it with your laundry marker and fire a three-shot group. And so on.

Let's say that the gun is shooting high, above the center of the bull. Now you attack the rear sight. Use your mill file to remove a little off of the top of the sight blade. Use an appropriate needle file to deepen the notch as necessary. Fire another three-shot group, and so on.

Finally, and this may be several weeks after you have begun this whole process, you move to 100 yards. Here you set up your 200-yard target and use the red aiming point. You shoot a three-shot group just as you shot at 50 yards and discover, not surprisingly, that they printed low. Hopefully, all three holes are within one to two inches of each other, or you had better practice. Anyhow, it is obviously necessary to raise the top of the front sight above the top of the rear sight. The question is how much? There are a number of methods, but you can't go too far wrong in polishing the back slope of the front sight and then painting almost all of it, from bottom to top, with that black laundry marker. Now only the top portion of the sight gleams. Use your usual hold and place the front sight on the red aiming point. Now adjust the gun so that the top of the back sight is right on the line made by shiny silver and black. Fire the usual three-shot group, and so on.

When you can consistently hit the bull at 100 yards, you can always undercut the front sight as described in Chapter 35.

OFFHAND SHOOTING

OFFHAND SHOOTING IS DIFFICULT because you have to support the whole gun with your body, which is full of nerves and muscles that tend to protest at the demand to be still. This practice, which works for me, I learned from Roger Swift, who was a New York State champion.

Basically, you can't shoot accurately if your body is in the wrong position. (These directions are for right-handed shooters, so lefties will have to reverse the directions.) Because your left hand holds the forestock, your left arm, bent at the elbow, must always be directly underneath the stock. Your right arm can be

anywhere you want it, provided that it is comfortable and held consistently in the same position.

Let's take the gun, loaded, primed and on half cock, to our position. Let's stand there with our shoulders in line with the target. Our feet should be spread shoulder width, and our weight should be balanced between them. We're standing straight and relaxed with the gun hanging down.

Close your eyes. Mount the gun. Open your eyes. Where is it pointing? If it's aiming below the bull, move your right leg in toward your left. If it's aiming above the bull, move that right leg back. If it's aiming to the right at three o'clock, move your right leg to the right and vice versa. In other words you position your aim with your right leg.

When you're on center, lower the gun and relax. There is a right moment to shoot, and you'll know it. Wait for the wind to die down, the sun to come out. Take slow deep breaths. Set your triggers. Bring it to full cock. Concentrate on the target. Bring the gun up, acquire the sight picture and bring your finger against the trigger. Add pressure. You *don't* want to tell yourself to shoot. And you don't want to wait around for your body to protest either. Just let it happen.

When you find your body beginning to tremble and you find yourself trying to choke the wrist like a chicken, you've been there too long. Lower the gun and relax. Try again.

CLEANING THE RIFLE

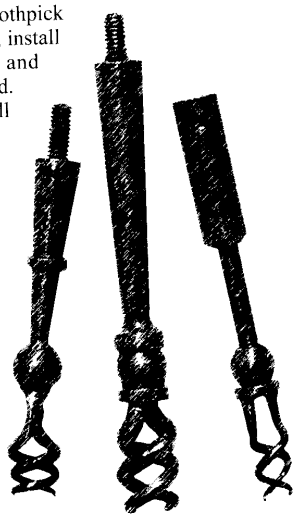
AFTER THE SESSION AT THE RANGE, YOUR first job upon returning home is to clean your rifle. As noted above, there are plenty of products you can buy, but outside of Lehigh Valley Shooting Patch Lubricant, which I know about, I would suggest you hang onto your money.

The first step is to remove your ramrod and then remove the lock. Put the lock on half cock. Next, turn out the lock bolts three or four turns. Lightly hammer the bolt heads with the handle of your patch knife or small hammer, which will push the lock out of its mortise somewhat. Repeat. When the lock is almost free of the mortise, remove the bolts and pull it out. This is a far better method than removing the bolts and wiggling the lock free, which may damage or break the edges of the mortise. Take your gun, ramrod, cleaning tips, patches, funnel, water and other equipment outside.

For a percussion gun, you're going to need one additional piece of equipment, which is a length of neoprene hose with 1/4-inch inside diameter to fit over the nipple. Some weight must be attached to the other end to hold it down in a bucket of water. Attach your cleaning jag to your ramrod. Grab a patch and wet it and then run it up and down the bore. Each time you pull the rod, you will be sucking water into the bore through the nipple, and each time you push it down the bore, you will be expelling it the same way. Watch the water turn black with the fouling. Change the water. When the water comes out clean, the bore is clean too. Remove the hose from the nipple and run a few more wet patches through the bore, followed with some dry patches. Add a final patch soaked with WD-40.

Remember to clean the outside of the barrel, especially in the breech area, and to wipe dry the stock if any water got on it.

For a flintlock rifle, you need a supply of toothpicks to plug the touch-hole. Pour water down the bore until it is almost full. Let the rifle stand vertically for a few minutes and then tip the barrel groundwards, remove the toothpick and pour the water out. Next, install the scraper on the ramrod and rotate it down the breech end. Replace the toothpick and fill the bore with water again. Let it stand and then pour it out. Do it again and repeat until the water comes out clean. Now you put the cleaning jag on the ramrod, remove the toothpick and scrub the bore with alternating wet patches and dry patches, until the patches are clean. One dry patch, followed by a patch soaked with WD-40 and the bore is finished. Clean the outside of the barrel, especially the breech.



You will note that I don't recommend soapy water or any other mixture. A barrel made out of iron or steel still has microscopic pores, and we don't want to remove the oils from these, which will promote rusting and corrosion. It's just like seasoning a cast iron frying pan. You never wash such an utensil in soapy water.

You will note, too, that I don't recommend hot water. If you use hot water, you can't dry the bore fast enough to prevent rust beginning.

So keep it simple. And don't be in a hurry, trying to save time. What are you saving it for?

I only use hot water to clean my lock. If the lock is a flintlock, remove the top jaw screw, top jaw and flint. Otherwise, the lock is placed in the sink, under the tap. Turn on the hot water, and while it is warming up, scrub away any fouling. This includes the top jaw screw and top jaw of the flintlock. After a few minutes of really hot water running over the lock, remove it and quickly pat away excess water with a paper towel. Then spray the lock with WD-40. Pat away the excess WD-40 with a paper towel and you're finished.

Reassemble your gun and rack it. Gather up all of those wet and dirty cleaning patches and toss them in your pillowcase, and into the washing machine it goes. And put away your cleaning equipment.

Then look at your hands. Black, aren't they? Burnt black powder is a mild form of sulphuric acid, and it will stain your skin for several days, no matter how much you scrub with soap and water. Grab some hydrogen peroxide and pour some into your palm. Rub it around on your hands. The black will disappear. Wash your hands with soap and water. This is the only time that I use hydrogen peroxide.

I hope all of this has been helpful, and I wish you all the best with your new rifle.