

Spruce Brook Mill: Simeon North's Pistol Factory, Berlin, Connecticut

J. Larry Crain and Allen R. Saltus, Jr.

Locating and examining Simeon North's Spruce Brook Mill, the site of his first pistol factory, was extremely rewarding. This historic archaeological site is of local, state, and national significance for several reasons: not only is it the location where small arms were produced under the first federal government pistol contract, but there is also evidence of the changes which took place in manufacturing processes during the course of the Industrial Revolution in America. Buried in the ruins are data in the form of artifacts which reflect the mill's structural remains, activity areas, arms manufacturing processes, and the types of tools and machinery used in these manufacturing processes. The mill was in operation from the late 1700s to 1843, spanning the period of the Industrial Revolution and reflecting the activities and contributions of colonial artisans up to the time of factory manufacturing. Since its destruction in the winter flood of 1856-57, the integrity of the site has been remarkably preserved, having been disturbed by man only through our limited test excavations. Because of its archaeological and historic value, we are very grateful that the land is being protected by the present landowners.

Simeon North was a son of Jedediah North, who descended from John North. In 1635, at the age of twenty, Jedediah North sailed from London and landed in Boston; he settled in Farmington, Connecticut. Simeon was born in Berlin, Connecticut, on July 17, 1765, the sixth generation of Norths in America. He first married Lucy Savage, daughter of Jonathan Savage, who died in 1811. In 1812, he married Lydia Huntington of Middletown, Connecticut.

Like his father, Simeon North began his life as a farmer and in 1780 had acquired a farm of more than 66 acres. In June of 1795, he purchased an interest in an old-fashioned sawmill located on Spruce Brook, adjoining his farm. At this mill he started the business of making scythes, and subsequently completed his early pistol contracts. In the early 1900s, two of his descendants referred to him as "the first official pistol maker of the United States" (North and North, 1913). About half of his pistol fabrication career was spent at the Berlin factory; however, his total arms production spanned a period of fifty-three years, extending up to the time of his death in 1852.

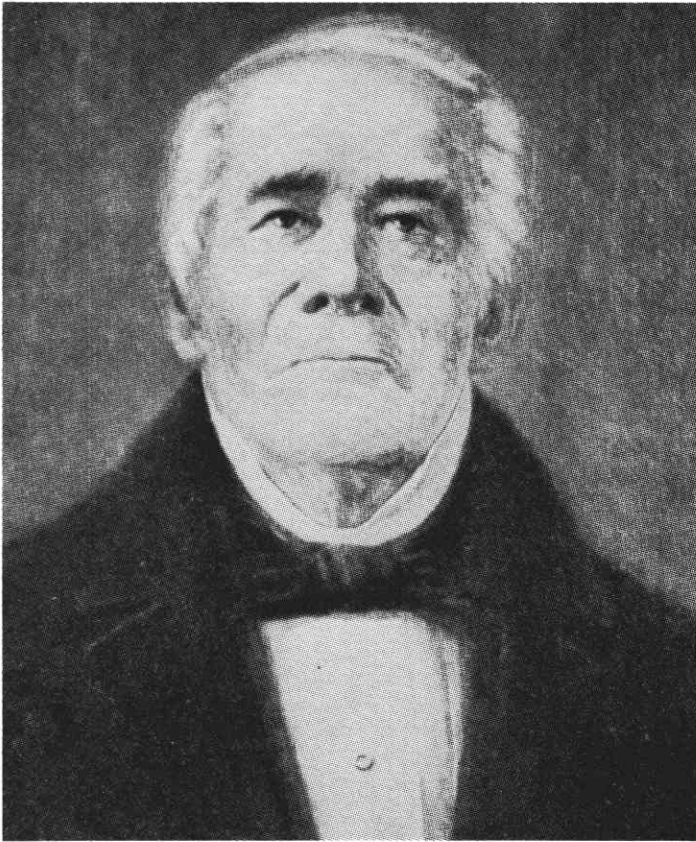
Simeon North, according to Dexter North (1921),



was the first to introduce interchangeable parts in manufacturing firearms and to use machinery in their manufacture. Jim Smith states that North was one of the first, along with Eli Whitney, to produce interchangeable parts for firearms (Cooper, Lindsay, Beach and Smith, 1980). Robert Howard, 1979, probably sums it up best by stating, "In 1813 Simeon North received the first contract from the U.S. Federal that specified interchangeable parts. North was quite innovative in the application of machinery and made great strides in uniformity." North has to be considered a leader in arms manufacturing for this period.

There are no records to show how Simeon North obtained his skills as a gunsmith or manufacturer of arms. We do know that a relative, Elias Beckley, was engaged in the manufacture of firearms at Beckley Quarter, near Berlin, a distance of only one mile. North and Beckley were related, as many Berlin families were at that time: they were second cousins, once removed. James Smith states, "We can't be sure that North learned the rudiments of the trade from Beckley, but the fact of their being related, in the same close vicinity and with interests in common, leads me to believe that this was the source" (Cooper, Lindsay, Beach and Smith, 1980).

Another possibility of North's knowledge of arms manufacturing could have come from his brother-in-law, Elisha Cheney of the Cheney-North pistol model. Elisha's father was Benjamin Cheney, a master clock-maker who lived with his son during his waning years until his death in 1815. John Fitch, early steamboat inventor, was apprenticed to Benjamin Cheney from



Simeon North, who started it all.

1761 to 1763, and later to Benjamin's brother, Timothy. Clockmakers in the eighteenth century were the leading artisans in America primarily concerned with the manufacture of precision machinery from metal. Blacksmiths made heavy goods of iron, but their technique was much less precise. If a plow blade or a scythe was a few inches off center, it would still turn a furrow or harvest hay; but if any part of the clockworks was off a fraction of an inch, the entire system failed (Flexner, 1944). During the time of Fitch's apprenticeship there was a metal lathe in the shop, and probably a "clockmaker's engine" to cut gears, examples of the only complicated metalworking tools that were common in 1763 America (Flexner, 1944). It is understandable, then, why Elisha Cheney and his father were associated with North's first government contract.

A third possibility is that both Beckley and the Cheney's provided North with knowledge of arms manufacturing, Beckley furnishing the arms technology and the Cheney's furnishing manufacturing technology which later may have enabled North to make advances in the production of interchangeable parts. In any case, these historical data suggests that these individuals were an integral part of America's Industrial Revolution.

Simeon North's purchase in 1795 of an interest in a sawmill was actually one-ninth of a mill privilege. The deed secured for him rights in the mill, the mill yard, and the dam. On June 3, 1805, Jacob Wilcox sold to Simeon

North, for twenty-four dollars, the mill site of forty-eight rods and three links "where North's Blacksmith Shop now stands" (North, 1916). North was then sole owner of the mill property on which he had built a large factory addition of two stories above the basement; the basement was used as a forging room. The bridge over Spruce Brook was located directly south of the factory. From the bridge, also serving as a dam which furnished water power, a sort of gangway led from the bridge-dam to the first floor of the shop. Workmen used it to enter the first floor of the building.

The business of sawmilling was continued for an indefinite period. The logs to be sawed were shoved onto the ground floor of the mill from the east side by a tram road. In Catharine North's book (1916), she gives the following description of the old factory years after it had ceased operations: "The size of the factory is unknown but it had two stories above the basement and was entered from the street. Work was discontinued there in the winter of 1842-3. As has been said, 'It is strange how fast a building goes to decay when out of touch with humanity.'"

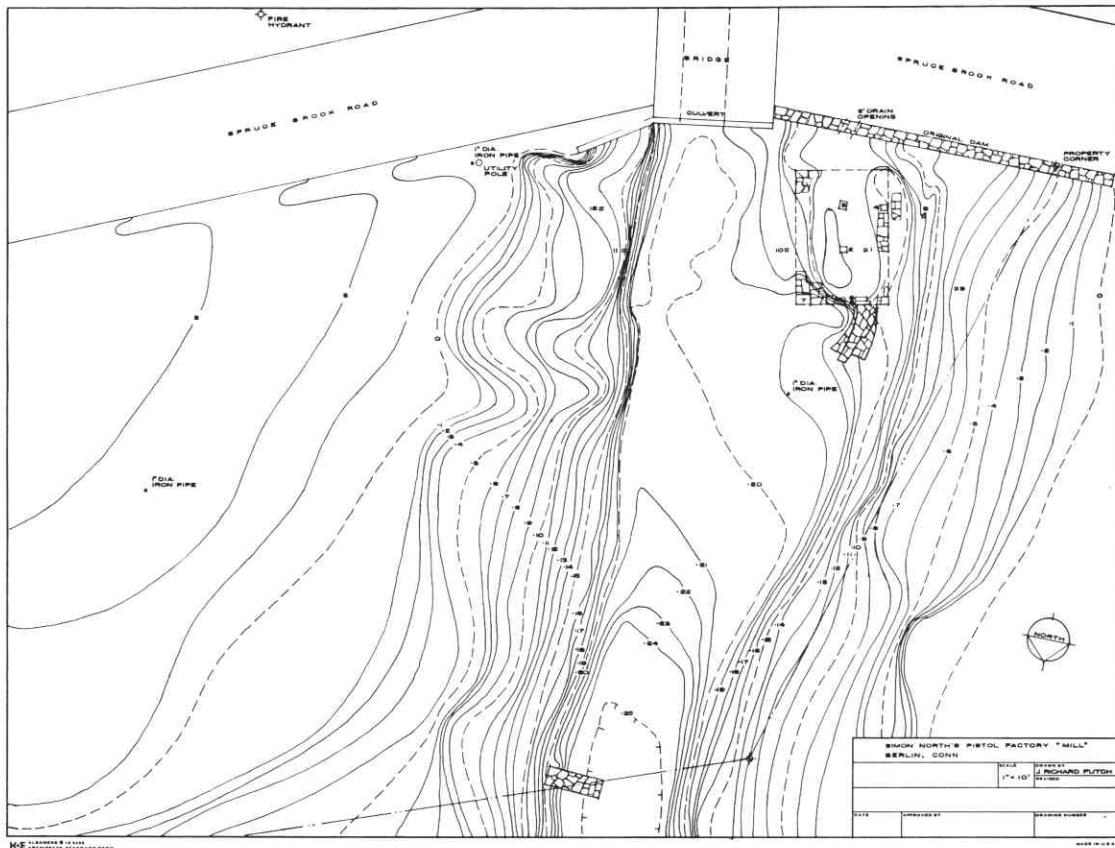
Catharine North goes on to say, "Twelve years or so later Deacon Alfred North went into the shop one day and, upstairs, a beam on which he stepped broke and he fell to the lower story astride another beam, which fortunately held and saved him from being dashed upon the rocks below. The factory was still standing in the winter of 1856-7 and George S. North, a grandson, went all over it. When his grandmother knew what the boy had done, she was frightened and told him never to go there again. Then he stood on the bridge and threw stones at the windows, and that hurt her feelings. Many tools and scraps of iron were lying all about at that time. Soon afterwards a flood came and carried off dam, shop and all."

In an 1808 letter Simeon North wrote to Mr. Robert Smith, Secretary of the Navy, he describes his plant facilities and activities at the Spruce Brook Mill as follows:

Sir: my new workshop will be completed within six or eight days from this time, and is thirty-seven feet long and twenty-eight feet wide, three Storey high divided into separate apartments, convenient for manufacturing every part of the pistol; I have the conveniencies of a trip hammer and all other water works & machinery sufficient to carry this business into effect.

I have employed in this business from ten to fifteen workmen for four or five months past, and shall increase the number of workmen as fast as circumstances will admit. I have twenty one thousand screws and other different parts of the pistols forged and ten thousand of them nearly finished. I also have bought the whole of my Iron, Steel, Cole, Files, and grindstones sufficient to complete my contract . . . and give this business a rapped motion.

This complete letter was published in *The Gun Report*, July, 1965 (Kuhn, 1965).



Topographic map of the area of North's mill.

U.S. contract pistols produced by Simeon North at the Berlin factory include:

1. MODEL 1799

(a) The first contract which was awarded to North on March 9, 1799, was for five hundred pistols, at a price of six dollars and fifty cents each, closely patterned after the French pistol Model 1777. The pistols were stamped on the underside of the brass frame "S. North & E. Cheney, Berlin." The name E. Cheney is for Elisha Cheney who was a brother-in-law of North. He was a well-known clockmaker of his day, and his actual participation in the manufacture of these pistols is unknown. It is generally felt that his interest was only a financial arrangement (Cooper, Lindsay, Beach, and Smith, 1980). Catharine North (1916) asserts, however, that "besides clocks, Mr. Cheney made by hand screws for the North pistols and gunlocks. In 1801 Cheney bought, for the sake of the water power, a tract of land on Spruce Brook, north of the pistol factory and there in a little shop he turned pinions and wheels by machinery" (North, 1916). The actual contract for this first North & Cheney model has never been found.

(b) The second contract of this model, dated February 6, 1800, called for an additional fifteen hundred pistols. The second contract is now in the National Archives. These pistols are stamped on the underside of

the brass frame, "North & Cheney, Berlin."

Simeon North's 1799 pistols became the first contract pistols delivered to the U.S. Government which were wholly fabricated by the contractor.

2. MODEL 1808

(a) The first contract was with the Navy Department and was dated June 30, 1808. It called for one thousand pair of pistols at eleven dollars and seventy-five cents per pair.

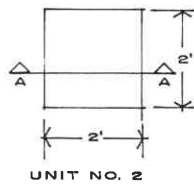
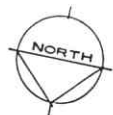
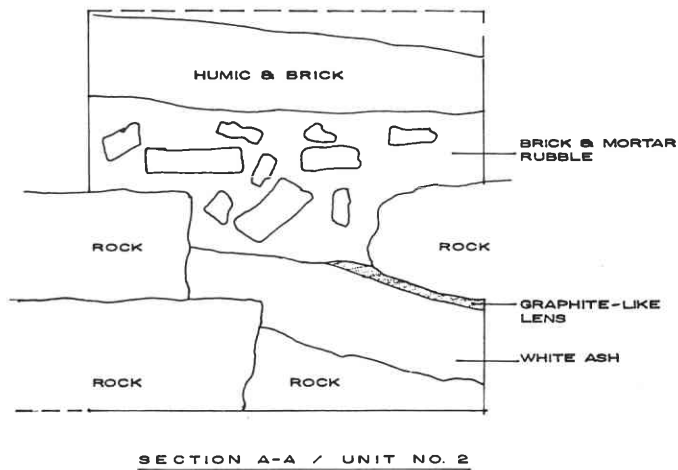
(b) The second contract of this model, dated December 4, 1810, was for an additional one thousand pistols at a cost of twelve dollars a pair.

3. MODEL 1811

(a) This contract was with the Army and was dated November 18, 1811. It specified one thousand pair of pistols at eleven dollars and eighty-seven and one-half cents.

(b) The modification of this model is one of a small number of pistols which were modified by the adoption in May, 1813, of a double ("Wickham") band on the fore end of the stock which secured the barrel to the stock and eliminated the pin fastening formerly used (Smith and Bitter 1985).

Immediately upon returning from Washington to Berlin with his new 1813 pistol contract, North purchased fifty acres of land located on Mattabesett or West



A cross-sectional profile of test unit 2, showing the ash, graphite lenses, brick and mortar.

River, with the privilege of flowing, at Straddle Hill, in Middletown, about a mile and a half southwest of Middletown Center (North & North, 1913). The water power at Berlin was apparently insufficient to take care of a factory as large as was now necessary to operate.

When the new factory was completed and equipped, North turned over the Berlin shop to his eldest son, Reuben, who had been long associated with him in the business there, and who continued to run it, in close affiliation with the Middletown factory, making forgings for the pistols manufactured in the new factory (North & North, 1913). Reuben North continued to run the Berlin shop as superintendent until 1842 when, his health failing, he retired, and the factory was closed (North & North, 1913).

Some of the early Model 1813 pistols have some parts from the 1811 model (the lockplate and barrel principally). These rare pistols are generally referred to as Model 1811/1813 or the "Transitional Model."

North is known to have fabricated several cased pairs of fine flintlock dueling pistols, at least one pair of cased percussion duelers, as well as an unusual over and under flintlock pistol. As far as is known, none of these was produced at the Berlin factory; however, certain parts could have been produced there.

North's military arms productions include muskets, rifles, and carbines. As far as is known, none of these were assembled at the Berlin factory, with the possible exception of a very small number of muskets simply marked on their locks "North" with a date of "1811"

(Reilly, 1986). A cadet presentation musket, .69 cal., dating about 1816, was described as having silver inlays, checkered grip, chased scroll work on iron butt plate, trigger guard and lock plate (*Outdoor Life*, 1944).

Simeon North produced the following military pistol contracts at his Middletown factory: Model 1813 Army; Model 1816 Army; Model 1816 Navy; Model 1819 Army; Model 1826 Navy, as well as rifles including: Model 1817 rifle; Model 1819 breechloading rifle, and Hall's breechloading rifles and carbines. Parts for some of these contracts were most likely made at the Spruce Brook Mill.

He did make one more pistol, a breechloading percussion model, for his friend, Nathan W. Patch, who was inspecting North's Hall breechloading rifles and carbines at Middletown in the early 1830s. It was submitted for Government approval, but without success (Smith & Bitter, 1985).

Catharine North (1916) apparently had access to an account book kept by Reuben North. She stated that the book, which began in 1808, "threw much light on the business conducted in the factory at Spruce Brook. In that year, 1808, many scythes were made and sold, mostly one at a time, to farmers in Berlin, Meriden, Middletown, Chatham, and Glastonbury" (North, 1916).

In 1813, besides the work on pistols 2,000 spurs, 2,000 burrs for spurs, 2,000 back pieces for spurs, and 2,000 straps for spurs were forged and turned in the Spruce Brook shop (North, 1916).

Simeon North's Spruce Brook Mill was reported to have been located on a parcel of land known as the "Gun Lot" which is lot 41 located at the confluence of Spruce Brook Road and Spruce Brook, Berlin, Connecticut. The southwest corner of this property is located on the end of a rock dam, which spanned Spruce Brook basin. The bridge across this basin was rebuilt in 1797 at the expense of the town, along with many other bridges and abutments which were washed away in a flood earlier that year. The Town Council voted to agree with the owners of a mill on Spruce Brook to rebuild the bridge in such a manner as to answer for a mill-dam and bridge (North, 1916). At this time the property was owned by Jacob Wilcox with Simeon North having one-ninth privileges. This structure held until the winter flood of 1856-57 when the eastern 25 feet gave way. The dam is intact except for this modern bridge repair.

The "Gun Lot" is made up mostly of open pasture, with the basin of Spruce Brook occupying the western edge. The basin is some sixty feet wide in the area of the dam with the dam spanning this area. The mill-dam in the lowest portion of the basin is over twenty feet high. The mill-dam and bridge is comprised of two rock walls some thirty inches thick with an earth-filled roadway between them. The sluiceway opening in the dam face is still

visible, located 42 to 45 feet east of the property corner twelve to twenty-four inches below the top of the dam. The property is irregular in shape with about 410 feet of road frontage and extending some 110 to 125 feet wide from the Spruce Brook Road. The basin has typical bottom land foliage, including an inordinate amount of poison ivy. The field is in grasses.

Two other structural features lie in the basin. One, the standing ruins of the North Mill, are nestled in the southwestern corner of the property located on the west side of the brook. This feature is 28 by 19+ feet with its lowest course of rock 19.8 feet below the top of the mill dam. The rubble in the mound extends over six feet high. The other feature, a smaller rock wall, is located on the east side of the brook along the northern property line. The function of this feature is unknown. It is a rock wall some four to five feet high, four feet wide, extending out of the brook's eastern bank for some twelve feet.

The property is owned by two sisters and a brother: Mrs. Martha S. Vernlund and Mrs. Frances Irwin, both of Berlin, Connecticut, and Mr. William B. Shepard, North Whales, Pennsylvania. The structural ruins of the mill are not impressive, it looks like a mound in the Spruce Brook's basin. They are visible from the bridge over Spruce Brook, but access is restricted by the landowners.

The primary objective of the survey was to locate Simeon North's Spruce Brook Pistol Factory. Associated with this primary objective, assuming we found the site, were the delineation and evaluation of the site. In the evaluation of the site, we wanted to know such things as what types and quantity of material remained, the condition of this material, and the physical makeup of the site in general. We also wanted to know if there were sufficient materials left at the site to ascertain information such as early fabrication of firearms; types of arms and other materials fabricated at the site; how the site supported the Middletown Factory; what tools were utilized at the site; what the mill's physical setting and associated

activity areas were before the 1856-57 winter flood, etc. The two field trips to Berlin, Connecticut represented a rather optimistic agenda; however, to our surprise all of the proposed objectives were either attained or found attainable with further work.

On the first field trip we began looking for the mill's cellar on the east side of the brook, in accordance with historical documentation (North, 1916). The field was investigated by magnetometer, augering and metal detector with topographic mapping. In the field, bedrock was from eighteen to twenty-four inches below surface, with exception of the 30-35 foot area adjacent to the brook's edge near the road. Magnetics in this area were sharply disturbed by large ferrous materials including a pipeline, bridge, and power lines. Also in this area there is modern refuse in the road drainage which extends down the bank to the bank's rock face. This area, with the nine foot vertical rock face, seemed like a natural setting for the mill's water wheel and a sufficient area below the surface for a cellar.

On the second day, at the insistence of Mr. John Hanson and Mrs. Betty Valentine, adjacent property owners, we investigated a mound area down in the basin of the brook just below the old rock dam wall.

Originally we had ruled out this area as it was on the wrong side of the brook, according to the historical data we had read; and we thought the mound was of natural origin. The rock making up the eastern edge of this mound feature, and in the feature itself, is similar to the natural rock face of the basin wall on the eastern side of Spruce Brook. However, two one by one foot test units, #1 and #2, revealed flat glass, metal, brick, and mortar fragments. Several of the metal artifacts were small tools and pistol parts. A two foot by two foot test was excavated near the road end of the mound, where a pistol mainspring was found on the dirt surface under a large rock. This test unit, #3, was selected to determine potential downward migration of artifactual material in



Looking down Spruce Brook basin away from the mill dam.



Closer to the dam and some of the mill wall.

the soil and to ascertain the amount of modern contamination which may have been thrown into this area from the bridge roadway. The results of this test suggest that modern material has been thrown in near the roadway, but that the majority of this material, 89%, lies in the upper six inches. The converse holds with 91% of the historical material found below three inches.

Original courthouse records located by James Wertenberger during this trip confirmed that we were looking in the proper area. Mr. Hanson and Mrs. Valentine were correct in their belief. Artifacts recovered from our test units included thin window glass and hand-wrought nails from the proper period, and unfinished pistol parts. In the field, no major magnetic disturbances were recorded. Bedrock is more or less eighteen inches below surface, precluding any area for a cellar; and only one small light concentration of artifacts was found, consisting mainly of exploded pistol barrels. These artifacts may represent the location of an outbuilding to proof fire the pistol and musket barrels.

On the second trip two more days were spent mapping the site, completing the photographic record, and testing to determine the site processes and integrity.



Remains of the mill wall.

Site processes include possible artifact migration downward in the soil, modern artifact contamination especially in the mound area near the road, and the destruction process which created the present site condition. During both visits to the site, a total of less than ten hours were spent excavating, disturbing slightly more than one percent of the site proper, i.e., the inferred cellar structure, yet over nine hundred artifacts were recovered.

Depths of the test units were limited to twelve inches maximum due to the large displaced rocks which originally made up the cellar walls. The exception is the expanded test unit #2 which was extended on the second visit to a two foot by two foot unit. There, in a small area, we were able to excavate down twenty to twenty-four inches between the large rocks. Here the stratigraphic integrity was found to be extant with layers of brick and mortar rubble over a thin graphite-like lens over a thicker powdery-white ash layer.

We excavated areas of the north wall in an attempt to determine the level of the cellar floor, without productive results. It was apparent, however, that the west wall containing artifacts had collapsed on top of the rock. These artifacts were mixed within the shallow six to



Jim Smith and Stan Diefenthal reflect on the significance of this cultural resource.

twelve inches of dirt covering the collapsed rock wall. This cultural material had to have come from above during the 1856-57 winter flood episode as the east wall seems to have collapsed inward to the west. As the wall is higher and more intact on the east side, it can be assumed that the west wall collapsed first with the east wall falling over the rubble of the west wall. The whole destruction process seems to have imploded the cellar structure with the upper floors collapsing downward. Materials were left intact after the initial destructive force of the flood waters when the dam broke in the area of the new bridge. It is apparent that the integrity of the initial structural collapse remains intact, evidenced by the ash lens in unit #2 being intact along with the thin lens of a fine graphite material still existent over the ash. Both would have washed away in the flood if the mill had not imploded with this material falling into the center of the structural collapse.

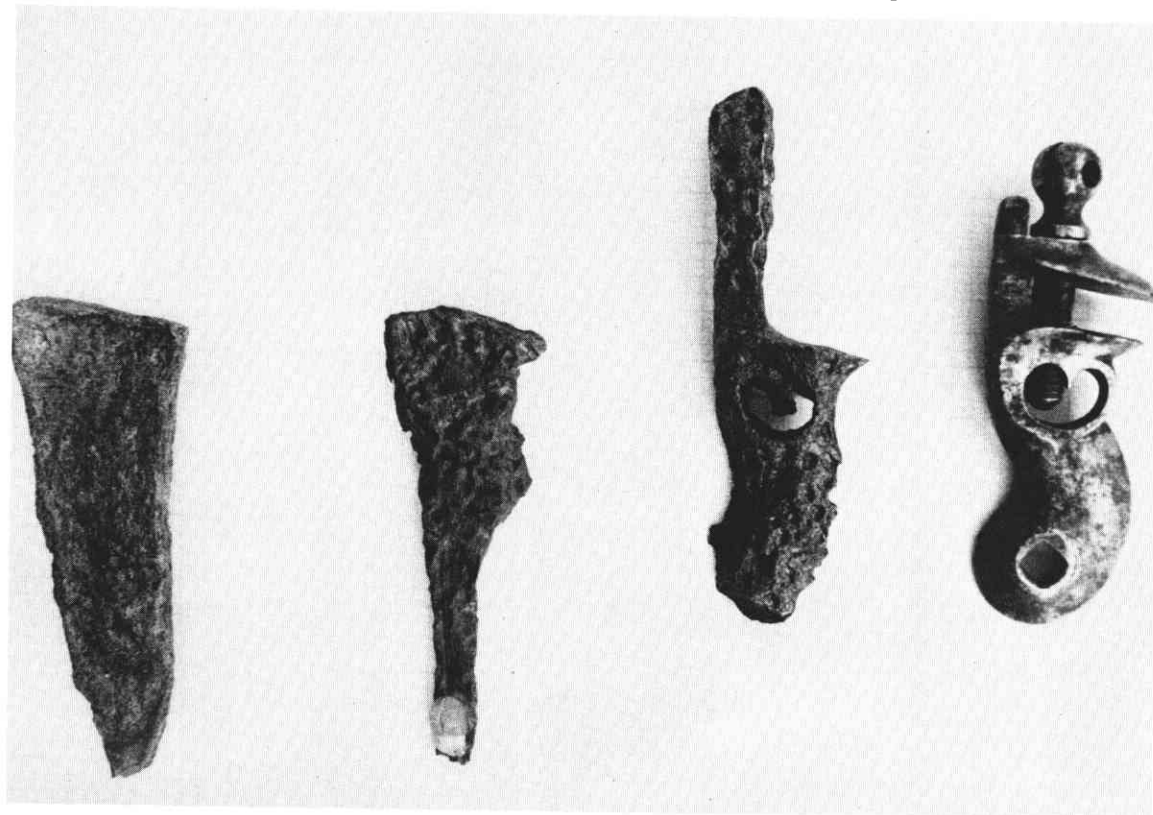
All artifactual materials were taken to the Southeastern Louisiana University laboratory facilities for cleaning, cataloguing, and analysis. Due to the large number of small artifacts, over half of which were rusty iron objects, an estimated 200 hours were devoted to this task and to the preparation of site maps. This reflects a ratio of 20 to 1 laboratory to excavation time.

Over half of the 900 artifacts recovered were ferrous metal objects. It is apparent that some of this material is modern (such as the 36 can fragments and two wire nails), but the remaining historical material was organ-

ized into four categories: arms production, tools, hardware and nails. The first and largest category, 410 artifacts, enabled us to get an insight into the activities of the Spruce Brook Mill. In 1808, North was buying German steel for fifteen and one half cents per pound and blistered steel for sixteen cents, but the quantity for sixteen cents is not specified (North, 1916).

Before cleaning, this material looked unimpressive, rusted, with blisters of encapsulated earth and oxides obscuring the shape of the objects incased. But after cleaning it became apparent that we had the remains of the age-old habit of saving. Iron material seems to have been important and coveted, and thus saved. References to this habit have been recorded and observed over a long period of time, i.e., in 1685, along with life sustaining supplies left with the colonists or shipwrecked survivors were some iron bars and packages of iron (Kerrigan, 1951). Amorphous iron objects and musket breech plugs were found in concretions of 1715 shipwrecks (Saltus, personal observations). And today, high-carbon steel can be found along the highways and in vacant lots to add to your scrap pile (Weygers, 1973). It is apparent that very little iron material would have been discarded. At the Spruce Brook Mill arms parts from a variety of models, along with parts, triggers, and cocks of the same model in different stages of manufacture, were unearthed.

160 pieces of refuse looked like they were the by-product of the forging of metal. This was substantiated



North Model 1826 pistol cocks: three relics in various stages of manufacture and a complete cock from Larry Crain's collection.

when we found a rifle butt plate which still had the refuse attached. Subsequently, we identified this refuse as also coming from the forging of lock plates. Blanks and subsequent stages of production were identified for the Model 1811 and Model 1819 pistol triggers and Model 1826 pistol cock.

Recognizable arms parts include rifle butt plate, pistol butt plate, screw, triggers, cocks, mainsprings, sears, cams, breech plugs, decorative lock plate fragments, side screw, tumblers, band, belt hook fragments, barrel fragments, possible unfinished/undrilled barrel, possible jaw for cock and decorative parts. Parts for North pistols have been tentatively identified as being made for Models 1808, 1811, 1813, 1813-16, 1819, 1826, and a possible trigger for the North and Cheney. Model identifications were determined by the use of seven of North's pistols of the above-mentioned models.

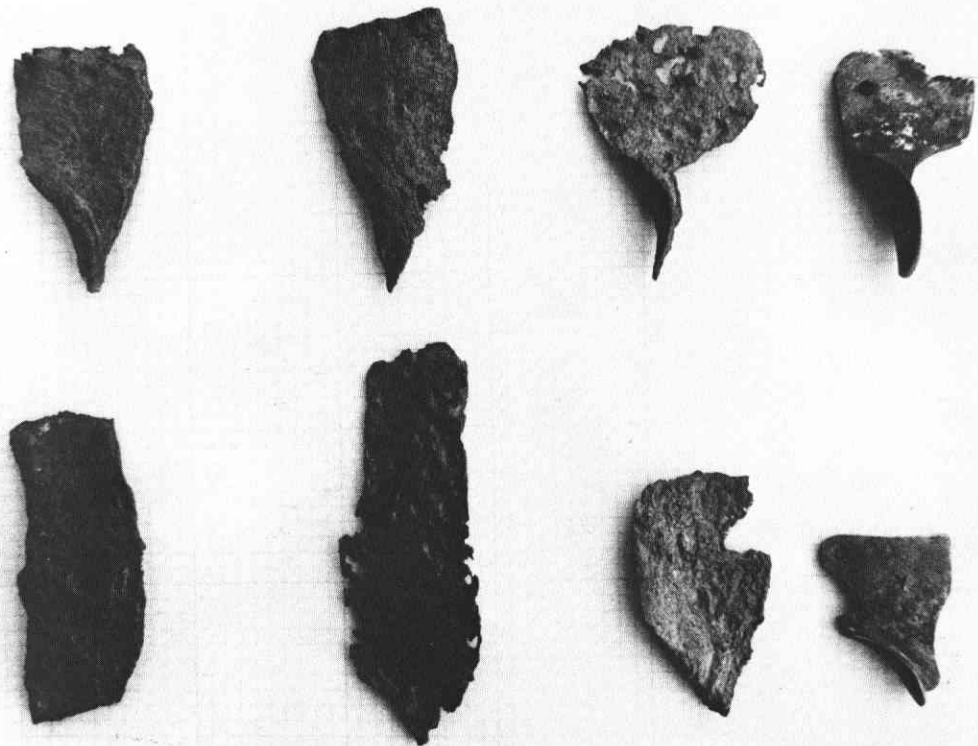
One hundred five small rectangular iron objects are all beveled at one end with most having a raised square end opposite the bevel. These may be the beginnings of top jaws for cocks not having been finished. We know that they are part of the manufacturing process, but where they are in the process and for what purpose they are intended, are not understood. There may be many more parts which could be identified if a larger sample were generated from the site, such as the fifteen wedge-like objects of various sizes. These could be either finished products to be used to secure handles, i.e., scythes, hammers, axes, etc., unused punches and chisels, or blanks for arms parts. Without the intermediate manufacturing examples,

the Model 1811 pistol trigger blank and Model 1826 pistol cock wedge-shape blank would have gone undetected.

The hardware includes nuts, bolt, bail loop, strap, handmade screw with an octagonal head, "U" clamp assembly, chain links, iron dog, ice skate runner, oil can, and stove parts. Two of the cast-iron stove parts have BERLIN CT. embossed on them. Another stove part found on the western bank associated with the modern debris next to the road is part of a chimney flue with /REVERSIBLL/PAT O JUL 20, 1916/ inscribed on it. It was interesting to find the ice skate runner, as the historical documents stated that the mill pond was enjoyed by the young people in the winter because they could warm themselves by the forge's fire after skating on the pond.

Twenty-three wood working and metal working tools or tool fragments were recovered. Four were metal wedges used to secure objects in vices. Two of these wedges were recovered in the field along with the exploded pistol barrel fragments. Other metal working tools include a small punch with /X/ inscribed, a thread tap, two files — a flat pointed nose file and a small rectangular clockmaker's file — with OAK inscribed. Blacksmith tools include a swage, an undescribed tool and a well worn blacksmith hammerhead fragment. Woodworking tools recovered include a 7/16 inch bent skew chisel, a 5/8 inch skew chisel, a whittling blade, two wood drill bit fragments, and a small bent screwdriver.

The remaining 373 nonferrous artifacts were distri-



North Model 1811 triggers, top, and Model 1819, bottom. Those at the right are from Larry Crain's collection.

buted unevenly between categories including glass, 72%; coal and slag, 21%; ceramic, 4%; worked rock, 1%; bone and shell, 1%; and nonferrous metals, 1%.

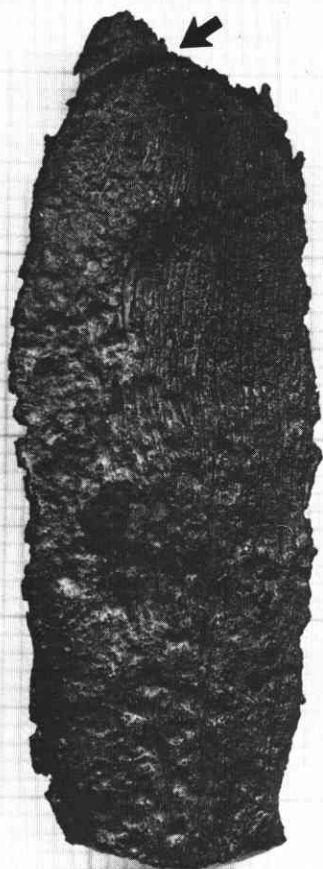
Coal and slag were distributed throughout the site. The coal is concentrated in unit #2 and the slag is concentrated in units #2 and #5. In 1808, North bought sea coal for fifty cents a bushel and paid \$7.00 for 100 bushels of charcoal (North, 1916).

The only definite stone tool recovered is a small honey-amber gun flint.

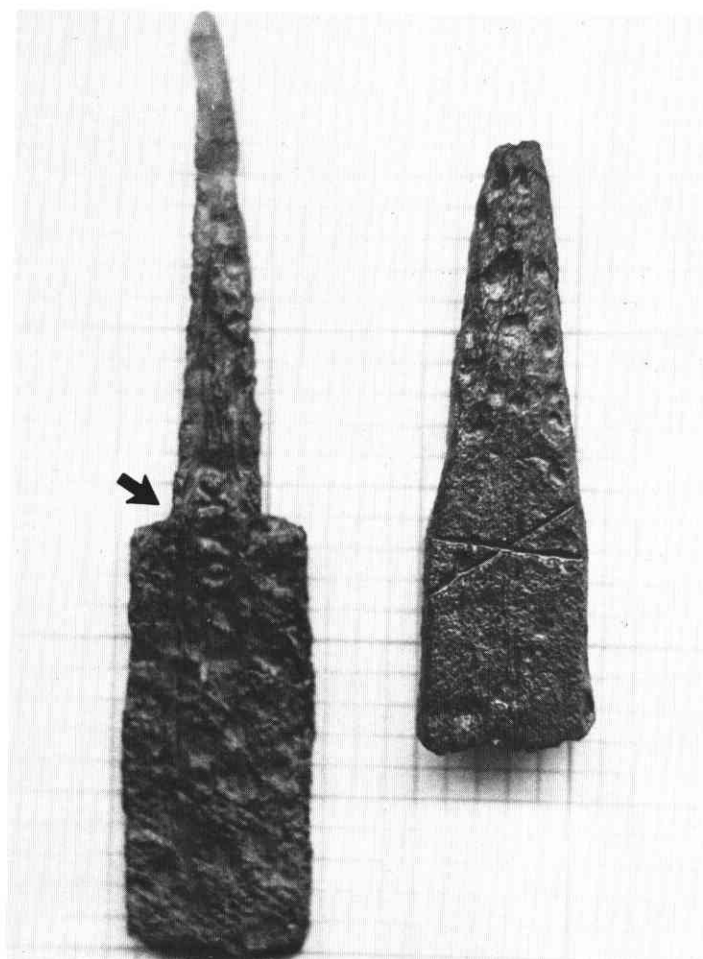
North's Spruce Brook Mill Site appears to be a very significant early industrial archaeological cultural resource. The site has been established and has stratigraphic integrity. Clusters of artifacts suggest activity areas within the structure, with the remains reflecting the industrial processes used at the site. These processes reflect an artisan group prior to and during the beginning of the Industrial Revolution in America. The site has an artifact density of 33+ artifacts per cubic foot. This density, when projected over the cellar structure, could yield well over 50,000 artifacts, half of which would be ferrous items reflecting the production processes taking place at this mill site. The materials located at the site

are of museum quality regarding display, study and type collections to serve directly to educate the public through displays or indirectly through collections research.

Further work at the site could be extremely rewarding. However, the nature of the destruction and the large rock wall material would require large excavation units to reach the cellar floor. With this effort, a large artifact collection would be recovered requiring cleaning, cataloguing, analysis, storage, etc. This effort should be saved for such a time when specific questions about the site can be answered, such as: what was the relationship of stream flow needs and the Industrial Revolution? Why were the mills on Spruce Brook abandoned? Was it a change in the stream flow or in the needs of the users? What new tools or machines were introduced? What were their effect regarding the site? Is there a correlation between the number of pistons contracted and the identifiable parts recovered? If not, does this suggest manufacturing problems? These are, by no means, the only questions, but before the site is disturbed, what is to be learned from it needs to be well thought out to best utilize this rich historical resource.



Buttplate with forging excess in upper right corner.



Tools: top, file with "OAK" at junction of file and handle, and a punch with "X" filed into it.

ACKNOWLEDGEMENTS

Deep appreciation is expressed to Mrs. Martha S. Vernlund and Mrs. Frances Irwin, whose interest in the historic site was a catalyst to the authors to do a more thorough investigation to locate and study the remains of the North Berlin factory. These two ladies and their ancestors have owned the site since the mid-nineteen hundreds. They provided invaluable insight into the history of the area and assisted in every way possible throughout the entire period of research.

Without the advice and counsel of James B. Smith, this project would never have gotten "off the ground." Initially, James took us to the site where the factory was supposedly located, providing much information about its history and working with us continually throughout the project. Appreciation is also expressed to his wife, Alison, for feeding us and allowing us to stay in their home while working at the site.

James M. Wertenberger, in our opinion the foremost authority on United States military flintlock pistols, not only assisted us at the site, but also provided invaluable information and advice. Additionally, appreciation is expressed for his critical review of our manuscript.

Stanley Diefenthal also assisted us at the site and provided his expertise regarding metal and knowledge as to what the original site might have looked like.

John Hanson, whose tireless work with his farm equipment in delineating and "pinpointing" the exact factory site was imperative in the success of the project.

It was Mrs. Betty Valentine, along with John Hanson, who first told us we were searching on the wrong side of Spruce Brook (which was contrary to Catharine North's description). For that advice and her many other kindnesses in this effort, we are grateful.

Appreciation is expressed to Aaron Hart, whose interest in archaeology, as well as his work at the site, allowed us to get more work done in the limited time we had available for this subject.

Claire Larson provided much information from her study of Spruce Brook, Berlin, Connecticut: its geographic influence on industry and the land, as well as maps and other information of the region.

Special appreciation is expressed to Martha Saltus for her proof-reading and editing of the manuscript.

For the drafting of the site map and test unit profile, our gratitude is expressed to Richard Futch, Sr.

Deep appreciation is expressed to Diane Correjoles for her work in editing, typing, and record keeping from the time the project began to its completion.

The co-author, Allen R. Saltus, Jr., is a Research-in-Residence at the Center for Regional Studies, Southeastern Louisiana University, Hammond, Louisiana. He has a Bachelor of Arts degree in History from Florida Atlantic University and a Master of Science degree in Anthropology/Archeology from Florida State University.

BIBLIOGRAPHY

- Cooper, Carolyn and Merrill Lindsay with L.F. Beach and Jim Smith *Eli Whitney and The Whitney Armory*. Eli Whitney Museum, Whitneyville, Connecticut. 1980
- Cunningham, Janice P. and Stephen S. Dyson *The Historical Archeological Survey of Northern Middlesex County — Phase 1*. A report prepared for the State of Connecticut Historical Commission. 1979
- Flexner, James Thomas *Steamboats Come True, American Inventors in Action*. Little, Brown and Company, Boston. 1944
- Howard, Robert A. "A Short History of the Interchangeable Part" *Arms Gazette*, Beinfeld Publishing, Inc. 1979
- Kerrigan, Anthony *Barcia's Chronological History of the Continent of Florida*. University of Florida. Printed by the Record Press, Incorporated, of St. Augustine, Florida. 1951
- Kuhn, R.C. "Unknown Martial Pistols 1797 to 1830" *The Gun Report*. Official Publication of the Florida Gun Collectors Association Vermillion Trail Historical Arms Association, Vol. XI, No. 2, July, 1965.
- Larson, Claire *Spruce Brook, Berlin, Connecticut: Its Geographic Influence on Industry and the Land*. Unpublished manuscript prepared for Historical Geography December 7, 1971, Central Connecticut State College. 1971
- Lavin, James D. *A History of Spanish Firearms*. Arco Publishing Company, Inc., New York. 1965
- North, Catharine M. *History of Berlin, Connecticut*. The Tuttle, Morehouse & Taylor Company, New Haven, Connecticut. 1916
- North, Dexter *John North of Farmington, Connecticut and his Descendants*. Washington, D.C. 1921
- North, S.N.D. and Ralph H. North *Simeon North the First Official Pistol Maker in the United States*. The Rumford Press, Concord, New Hampshire. 1913
- Outdoor Life* "A Picture History of our Army Rifle from Lexington to the Second Front 1775 - 1944." *Outdoor Life*, March, 1944.
- Reilly, Robert M. *United States Military Small Arms 1816-1865*. The Eagle Press, Inc. Rhode Island. 1970
- Roenke, Karl "Flat Glass: Its use as a dating tool from nineteenth century archaeological sites in the Pacific Northwest and elsewhere." *Northwest Anthropological Research Notes, Memoir 4*. University of Idaho, Moscow. 1978
- Roth, Mathew *Connecticut An Inventory of Historical Engineering and Industrial Sites*. Society for Industrial Archaeology, Washington, D.C. 1981
- Smith, Samuel and Edwin W. Bitters *Historic Pistols — The American Martial Flintlock 1760-1845*. Scalandre Publications, New York, New York. 1985
- Solar, Isidro *Compendio Historico de los Arcabuceros de Madrid*. Madrid, Spain. In Lavin, 1965 pp. 195-196. 1795
- Weygers, Alexander G. *The Making of Tools*. Van Nostrand Reinhold Company, New York. 1973.