Lisa Tomyl

From: Steve Ledoux
Sent: Thursday, August 28, 2014 2:01 PM
To: Lisa Tomyl
Subject: Fwd: Item for consent agenda

Sent from my iPhone. Please pardon brevity or typos.

Begin forwarded message:

> **From:** Mike Gowing <mikeg.acton@gmail.com>
> **Date:** August 28, 2014 at 1:49:19 PM EDT
> **To:** Katie Green <kgreen0528@gmail.com>
> **Cc:** Steve Ledoux <sledoux@acton-ma.gov>, Bill Klauer <abklauer@verizon.net>
> **Subject: Re: Item for consent agenda**
>
> I am good with it appearing on consent.
>
> On Thu, Aug 28, 2014 at 10:18 AM, Katie Green <kgreen0528@gmail.com> wrote:
> Hi Steve and Mike,
>
> The Historical Commission met last night to discuss, in part, the nomination of the Nashoba Brook Pencil Factory for the National Register. The Commission unanimously voted to endorse this proposal, which is being shepherded by the Mass Historical Commission. Next steps include seeking endorsement and a letter of support from town boards, primarily the Conservation Commission and the Board of Selectmen, as the town owns the land.
>
> The HC said that they would be happy to come present to us, but I know our next few agendas are quite full and I would rather this happen sooner than later. I can't imagine there being much controversy, so if there's no objection, I was hoping we could place the endorsement and letter of support on the consent agenda for our September 8th meeting.
>
> Please let me know what else you need from either me or the HC (Bill Klauer is cc'd on this email).
>
> Thanks!
>
> Katie Green
> www.katiegreenforacton.com
>
> ---------- Forwarded message ----------
> From: **Bettina Abe** <babe@acton-ma.gov>
> Date: Wed, Aug 27, 2014 at 2:11 PM
> Subject:

To: Historical Commission <HC@acton-ma.gov>

Dear Acton Historical Commission:

Attached please find three scanned documents pertaining to the eligibility of the Nashoba Brook Pencil Factory site's eligibility for National Register status.

These documents are also currently stored on the Town of Acton "O" Drive under ConCom. We are not able to post the documents on *Docushare*. Please feel free to post them to *Docushare* per your usual procedure.

Sincerely,

Bettina

Bettina Abe

Natural Resources Assistant (Part-Time)

Town of Acton Natural Resources Department

472 Main Street

Acton, MA 01720

Email: babe@acton-ma.gov

Website: www.acton-ma.gov

FORM D – ARCHAEOLOGICALSURVEY
HISTORIC ARCHAEOLOGICAL SITES

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

TOWN _____ MHC No. ACT-HA-10

FOR MHC OFFICE USE ONLY
UTM _____
Quad _____

NR ☐ ACT ☐ ELIG ☐ NO DISTRICT ☐ YES ☐ NO

IDENTIFICATION

1. SITE NAME(S) NORTH ACTON PENCIL FACTORY SITE — MAS. NO. ACT.HA.10 — OTHER NO.

2. TOWN/CITY Acton — COUNTY Middlesex

3. STREET AND NUMBER (IF NOT AVAILABLE, GIVE DETAILED DESCRIPTION OF HOW TO REACH SITE)
Main part of site lies between Nashoba Brook and former Framingham and Lowell rail line, approx. 2,000' north of the Great Road grade crossing; east side is accessible from trails on the town-owned Nashoba Brook Conservation Land, approx. 800' north of the entrance on Davis Road.

4. OWNERS(S) AND ADDRESS(ES) Town of Acton, Conservation Department, 472 Main Street, Acton, MA 01720 — ☒ Public ☐ Private

5. SITE LOCATED BY
☒ CRM Survey ☐ Avocational Collector ☐ Field School ☒ Other (Specify) Local informants.
Describe Sampling Strategy Used to Locate Site

DESCRIPTION

6a. PERIOD(S) (Check all applicable boxes)
☐ 17th C. ☐ 18th C. ☒ 19th C. ☐ 20th C. ☐ Unknown

6b. Estimated Occupation Range ca.1800 to ca.1961; pencil-making from 1830s to late 1880s.

7. DATING METHODS
MAPS: 1830-1915; see continuation sheets.
TITLE SEARCH: ☒ Yes ☐ No
ADDITIONAL DOCUMENTS: See continuation sheets.
Comparative Materials
OTHER

8a. SITE TYPE ☐ Agrarian ☐ Residential ☒ Industrial ☐ Commercial ☐ Military ☐ Unknown ☐ Other (Specify)

8b. DESCRIBE Remains of building foundations, dam, water-power channels, grinding stones, shafting and gears, and turbine components.

9. DESCRIBE SIZE AND HORIZONTAL AND VERTICAL BOUNDARIES
Horizontal: see Site Plan on continuation sheet.
Vertical: no excavation or other subsurface investigation undertaken, so unknown at present.

10. Stratigraphy
Surface Indicators: ☐ Standing Ruins ☒ Surface Finds ☐ Markers
Stratigraphy: ☐ Stratified ☐ NOT Stratified ☐ Below Ground
Structural Remains: ☒ Cellar Hole Building foundations/wheelpit

ENVIRONMENT

11. SOIL — USDA Soil Series: Swansea muck — Contour Elevation: 150 feet (45m) — % Slope of Ground: ☒ 0 – 5 ☐ 5 – 15 ☐ 15 – 25 ☐ Over 25
Acidity: 1 _____ 7 _____ 14 (Acid) (Base)

12. TOPOGRAPHY
☒ Flat ☒ Gentle undulation ☐ Other ☐ Rolling Hills ☐ Mountains

13. WATER — NEAREST WATER SOURCE: Nashoba Brook — SIZE AND SPEED: Small to medium-sized — DISTANCE FROM SITE: Flows through site. — SEASONAL AVAILABILITY: Year-round

14. VEGETATION — PRESENT Wooded — PAST Open fields

CONDITION

15. SITE INTEGRITY
☐ Undisturbed ☐ Good ☒ Fair ☐ Destroyed
IF DISTURBED, DESCRIBE DISTURBANCE: See continuation sheets.

16. SURROUNDINGENVIRONMENT
☐ Open Land ☒ Woodland ☐ Eroded Soils ☐ Residential ☒ Scattered Buildings Visible from Site
☐ Commercial ☐ Industrial ☐ Rural
☐ Coastal ☐ Isolated

17. ANY THREATS TO SITE ☐ Yes ☒ No — DESCRIBE POTENTIAL THREATS

18. ACCESSIBILITY TO PUBLIC
☒ Free Access ☐ Need Owner Permission ☐ Restricted ☐ No Access

RESEARCH STATUS	19. PREVIOUS WORK		
	☐ Surface Collected	By Whom / Affiliation	Date
	☐ "Pot hunted"	By Whom / Affiliation	Date
	☐ Tested	By Whom / Affiliation	Date
	☐ Excavation	By Whom / Affiliation	Date

20. PRESENT LOCATIONOF MATERIAL (INCLUDE ADDRESS)

N/A

21. REFERENCES / REPORTS

Ritchie, Duncan. 2009. Archaeological Reconnaissance Survey, Town of Acton, Public Archaeology Lab Report 2126. Acton: Town of Acton.

SIGNIFICANCE

22. RECOVERED DATA (Identify in DETAIL, including structures, related outbuildings, landscape features, etc.)

Site includes a rubble and earth dam, a bridge abutment, two water-power channels, stone building foundations, a set of grinding stones, bevel gears and shafting (both round and square), and remains of belt-drive pulleys. See continuation sheets for detailed descriptions of features and artifacts.

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE

The site is significant because of its associations with early American pencil-making, in which individuals from Acton and nearby Concord played an important part. Among those who owned the pencil factory were Ebenezer Wood (1792-1880), innovator of key production machines and methods that resulted in the mechanization of pencil-making, and William Munroe (1778-1861), who is generally recognized as the first American to make lead pencils commercially (Petrowski 1990: 95ff.). The waterpower features, building foundations, and power-transmission remains give the site an early-industrial character that allows it (with interpretation) to convey its historical significance.

Somewhat more tangentially, the site is connected with another Massachusetts pencil-maker, John Thoreau (1787-1858), whose son Henry D. Thoreau (1817-1862) carried on the family business, and with Eberhard Faber (1822-1879), who elevated American pencil-making to a truly industrial scale starting in 1861.

At this point in time, the full information value of the site must remain speculative. It is clear, however, that the materials readily visible on the surface can inform our understanding of both this site in particular and small-scale pencil-making in general. For example, the power-transmission elements suggest that pencil-making at this site both re-used elements from earlier mills (a carding shop and gristmill preceded pencil-making at the site) and invested in newer equipment. The number of powered pulleys on the line shaft indicates that there were at least five separate machines on one floor of the building, suggesting a substantial degree of mechanization.

SITE PLAN

24. ATTACH PORTION OF USGS QUAD WITH SITE AREA MARKED TO THIS FORM See Figure 1, continuation sheets.

25. SKETCH PLAN OF SITE

See Figure 2, continuation sheets

Scale: 1:240

26. PHOTOS: Attach if available
Label each with: Date of photo, photographer, view shown, name of site

See continuation sheets.

REPORTED BY:	NAME	Bruce Clouette and Eric Pomo	ADDRESS	569 Middle Turnpike – P.O. Box 543 Storrs, CT 06268
	ORGANIZATION	Archaeological and Historic Services, Inc.	DATE	May 2014

FOR OFFICE USE ONLY

FIELD EVALUATION

COMMENTS

21. REFERENCES/REPORTS (continued)

Acton, Town of
1850 *Valuation of Real Estate in the Town of Acton, November 2,* 1850. Boston, MA: Damrell * Moore.

Asher and Adams
1876 *Pictorial Album of American Industry, 1876.* New York, NY.

Beers, F. W.
1875 *County Atlas of Middlesex, Massachusetts.* New York, NY: J. B. Beers & Co.

Brown, Jabez
1794 "A Plan of the Town of Acton Taken in November 1794." Manuscript map, Massachusetts State Archives, Boston, MA.

Conant, Brewster.
1969 "Pencil Factories," *Assabet Valley Beacon*, December 11, 1969.

Ellis, Douglas J.
2010 *Concord Masons.* Concord, MA. Privately published.

Hale, John G.
1831 "Plan of the Town of Acton in the County of Middlesex." Manuscript map, Massachusetts State Archives, Boston, MA.

Harding, Walter
1970 *The Days of Henry Thoreau.* New York, NY: Alfred A. Knopf.

Hendrick, George (ed.)
1977 *Remembrances of Concord and the Thoreaus: Letters of Horace Hosmer to Dr. S. A. Jones.* Urbana, IL: University of Illinois Press.

Klauer, William A.
2001 *Images of America: Acton.* Charlestown, SC: Arcadia Publishing.

Knight, Edward H.
1884 *Knight's American Mechanical Dictionary.* Boston, Ma: Houghton, Mifflin and Company.

Munroe, William Jr.
1888 "Memoir of William Munroe," in *Memoirs of Members of the Social Circle in Concord, Second Series* (Cambridge, MA: Riverside Press), pp. 145-156.

New York, New Haven, and Hartford Railroad Company
1915 "Right of Way and Track Map, Old Colony R.R. Co., Operated by the New York, New Haven and Hartford R. R. Co., from Framingham to Lowell." Valuation Map V7 40 41, New York, New Haven and Hartford Railroad Collection, Dodd Research Center, University of Connecticut, Storrs, CT.

Petrowski, Henry.
1990 *The Pencil: A History of Design and Circumstance*. New York, NY: Alfred A. Knopf.

Phalen, Harold R.
1954 *History of the Town of Acton*. Cambridge, MA: Middlesex Printing, 1954.

U. S. Census Office [name of agency varies]
1850 Census of Population, manuscript schedules, microfilm, Massachusetts State Library, Boston, MA.

1860 Census of Population, manuscript schedules, microfilm, Massachusetts State Library, Boston, MA.

1870 Census of Population, manuscript schedules, microfilm, Massachusetts State Library, Boston, MA.

1880a Census of Population, manuscript schedules, microfilm, Massachusetts State Library, Boston, MA.

1880b Census of Manufacturing, Tenth Census, 1880. manuscript schedules, microfilm, Massachusetts State Library, Boston, MA.

Walker, George H. & Co.
1889 *Atlas of Middlesex County, Massachusetts*. Boston, MA.

Walling, Henry F.
1856 *Map of Middlesex County, Massachusetts*. Boston, MA: Smith & Bumstead.

Wood, David
2013 "Massachusetts Furniture: The Life and Times of Cabinetmaker William Munroe." Online at http://www.skinnerinc.com/news/blog/massachusetts-furniture-the-life-and-times-of-cabinetmaker-william-munroe/, retrieved May 9, 2014.

Wylie, Edith.
1963 "Industry and Acton, Handmaidens of History," *Acton Beacon*, June 20, 1963.

22. RECOVERED DATA (continued)

East of the foregoing is another stone wall (Photograph 12) that corresponds in part to a one-story building seen in the historical photograph reproduced as Figure 7. The overhang to the gable roof as seen in the photograph suggests that the downstream elevation of the building may be wholly or partly open, and no stonework that would correspond to a downstream wall was observed in the field. This building had a small brick chimney, the location of which may correspond to a 3'-by-4' concentration of brick, similar to that in the other foundation, near the north wall (Photograph 13). The west part of the foundation is 7' 6" high, stepping down 2' as it approaches the east corner along the former road. An earthen berm seen in the photograph is still in place along the downstream side of the former road, up against the north wall of the foundation. To the south of this foundation, a low stone wall runs between the tail race and the west bank of the brook.

East Side

The main feature on the east side of the brook is a stone-lined mill race, approx. 12' wide, that extends from the silted-up, swampy land north of the embankment for 120' in southwesterly direction before turning northwesterly to return to the brook (Photographs 14-16) . The mill race, currently spanned by a modern wooden trail bridge, is 5' 3" deep at its upstream end and 9' 2" deep at the bend. It was dry at the time of the fieldwork, except for backwatering at its downstream terminus. Like the west-side foundations, the race was constructed of a mix of fieldstone rubble and granite blocks. According to historic maps and deed research, the east side was the location of a gristmill that preceded the pencil works; the gristmill disappeared early in the second half of the 19th century. The location of the gristmill building could not be discerned, though an earth and rubble knoll south of the road and west of the race (See Site Map, Figure 2) could be evidence of the building.

The dam is breached at the location of a bridge that formerly carried Davis Road over the main channel of the stream. No evidence of an abutment is visible on the west side, but the east side has a 12"-thick poured-concrete wall up against the now-subsiding rubble stonework (Photograph 19); board form marks indicate an early 20th-century date. The concrete wall has 7"-by-3 1/2" mortises in the concrete, suggesting that the bridge's structure consisted of five parallel beams spaced inches on center. A low stone wing wall, 3' wide, extends for about 16' downstream on the east side of the brook.

There are a number of intriguing industrial artifacts on the east side. What appears to be a grinding stone is embedded in the earth on the south side of the former roadway (Photographs 20 and 21). The stone is about 7" thick and measures 31" by 34" overall. A circular area 27" in diameter is raised up and much more precisely finished; closely spaced concentric grooves are visible on its surface. A mortise, 2 ¾" square, is cut into the stone's center. The fact that the outer part of the stone is roughly finished suggests that this was the stationary bed-stone rather than the revolving runner. A corresponding stone on the north side of the embankment on the west side (Photograph 22) was probably the runner, as it is finished to a more consistent 27" diameter and 7" thickness. This stone has a 7" hole in the center, into which has been inserted an iron flange that is 12 ½" square and 3 ½" deep.

Nearby the east-side grinding stone is a gate structure and shaft from a turbine (Photographs 23 and 24). The 16 fixed gates are set between two circular iron plates ½" in thickness and 24" in diameter; the gates measure 6" long and 7" high. About 9" of 1 ½"-diameter round shaft is embedded in the embankment. The shaft, which is firmly rusted into the center of the gate structure, has one 5" coupling along its length.

All along the roadway are pieces of iron rod set into stones (Photograph 25). These appear to be anchors for a fence or guardrail, such as the rail shown on the north side of the road in the historical photograph. One such stone appears to have been displaced into the east-side mill race: it has a 20" length of 1 ¼" square-section shafting turned at both ends (Photograph 26).

22. RECOVERED DATA (continued)

The site includes both sides of Nashoba Brook near where Davis Road formerly crossed the tracks of the Framingham & Lowell Railroad. The brook is impounded at this point by a stone and earthen dam (mostly breached), the top of which accommodated Davis Road (Photographs 3, 17, and 18). The remains on the west side lie between the railroad tracks (soon to become the Bruce Freeman Trail) and the brook; those on the east side are between the brook and the point where Davis Road turned to the south, where now there is a trail in the Town of Acton's Nashoba Brook Conservation Land. A kiosk at this point, erected several years ago as an Eagle Scout project, provides extensive background on the natural and cultural history of the area, including one side dedicated to the history of pencil-making in Acton.

The following description of features and artifacts at the site is based upon one day of field inspection, photography, and measurement at the site. No subsurface investigations were undertaken, and nothing was removed from the site for further testing.

West Side

The dominant feature of the west side is the 18'-by 40' stone foundation/cellar/wheelpit for a two-story wooden factory that stood on the site (Photographs 1 and 2). The stonework is 7' 6" high and consists of fieldstone rubble interspersed with irregularly shaped quarried blocks of granite. The north wall of the feature is part of the embankment for the roadway/dam, through which runs a mill race. The 3'-by-5'opening for the race on the north side of the dam (Photograph 3) has a stone lintel, 6' long and 8" thick, and rubble side walls. A remnant of mortar clinging to the stone may indicate there was formerly a gate structure for the opening. As it passes under the embankment for the dam/road, the race is carried in a boiler-plate cylinder about 3' in diameter (Photographs 4 and 5). Although penstocks for turbines were frequently made of similar boiler-plate, the fact that it is partially closed off at the southern end suggests that this is not a penstock, but rather an object that was opportunistically used as a centering when repairing the embankment. The mill race exits the foundation at the east downstream corner by means of a curved tail race of low rubble walls (Photograph 6).

Numerous remnants of iron power-transmission components are found embedded in the mill race's streambed. A pair of cast-iron four-spoke bevel gears (Photographs 7 and 8) are set on 3 ½' round shafts (turned down to 3" on the ends) that are embedded in the mill-race's streambed. The gears are 2' in diameter and 4" thick and have 32 teeth; they are secured to the shafts by means of 1/2"-by-3/4" keys. The one on the shorter shaft (Photograph 7) includes an 8" bearing below the gear; a grease trough on the bearing suggests that it was originally mounted with the shaft oriented horizontally. Two 16"-diameter flanges, with ½" bolts and square nuts, suggest that the shaft was at one time supported by timbers spaced about 25" apart. The other bevel gear (Photograph 8) is embedded in the streambed in a nearly vertical position. This shaft also has an 8" bearing, located on the end on the shaft above the bevel gear. Also now embedded in the streambed in an upright position is about 6' of 1 ½" square-section shafting, turned round in two places for bearings (Photograph 9). The final power-transmission artifact is a length of 2 ½" round line shafting running through a large cast-iron overhead bracket (Photographs 2 and 11). A total of five hubs for cast-iron drive pulleys are secured to the shaft by large set screws; most of the spokes are completely broken off and now missing, but the ones that remain indicate that the pulleys were of a curved-spoke design.

The cellar/wheelpit also contains a large quantity of brick; the brick appears to be relatively soft-fired and is not molded or incised with a maker's name.

22. RECOVERED DATA (continued)

The ground surface throughout the site contains cultural material that may or may not be related to the early industrial enterprises that occupied the site. Things such as yogurt cups suggest ongoing littering connected with use of the nature trails. Glass bottle fragments of various ages appear, as does a small amount of window glass and fragments of brick. Numerous hand-forged nails appear in the streambed of the east-side mill race (Photograph 27), and there is a length of 3" round iron shafting lying in the main channel of the brook near the wing wall. A set of files appears inside the west-side foundation (Photograph 28), and there is a large fragment of a stoneware jar in the tailrace on that side (Photograph 29). Fragments of farm machinery and at least one iron bed frame and spring can be reasonably assumed to represent later trash deposition, but the relationship of other artifacts to the site, such as steam-heating pipes and a piece of an early cast-iron stove (Photograph 30), is more problematical.

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE (continued)

Historical Background

Pencil-making activities at this site were preceded by other small water-powered enterprises; a carding shop and gristmill, collectively known as "Foster's Mills," were operated here by Uriah Foster in the early part of the 19th century. The 1831 map of Acton (Hale 1831, Figure 3) has the notation "Mills" at this location, but the earlier map of 1794 (Brown 1794) has no indication of any manufacturing here, though mills are shown in other parts of Acton, suggesting that Foster's mills were established sometime between those two dates. The first connection with pencil-making may have occurred as early as 1832, when Ebenezer Wood, a cabinetmaker from Concord, and Daniel White, a wood-turner from Lowell, bought a half-interest in Foster's Mills, which included a house, 12 acres of land, a gristmill, and a carding shop (Middlesex South Registry of Deeds [hereafter MSRD], Vol. 319, pages 236-240).

During the War of 1812, Wood was working as a journeyman in the cabinetmaking shop of William Munroe when the latter made his first pencils. In 1819, Munroe (also spelled Monroe) began devoting himself to pencil manufacturing on a full-time basis; he himself concentrated on filling the leads and finishing the pencils, while subcontracting the preparation the wooden components to Wood and another journeyman, James Adams (Munroe 1888: 153). Given Wood's earlier and subsequent relationships with William Munroe, it is reasonable to think that his acquisition of the subject property in 1832 was for the purposes of continuing to supply Munroe with grooved cedar slabs for the latter's pencil factory in Concord.

According to Horace R. Hosmer (1830-1894), an Acton-Concord pencil-maker who wrote a detailed account of the early years of the industry around 1880[1], Ebenezer Wood "stands in the very first rank of American pencil-makers." Given Wood's accomplishments, Hosmer's judgment seems apt:

> *He was an inventor of a high order, and his hand and brain largely helped to make Munroe's fortune. He set up the first circular saw used in the business,. and it was a great curiosity for a long time. He saw a tool for cutting shoe pegs, and by applying the principle of the circular saw soon had a grooving machine which could cut six grooves at a time, and very rapidly. A moulding and trimming*

[1] Hosmer's history was first published in *Leffel's Illustrated Mechanical News* around 1880. No copies of the original article were located, but it was reprinted in the trade journal *Fibre & Fabric* on December 2, 1893 (18, no. 457, p. 482). Hosmer had sent a copy to Samuel A. Jones in 1891, and it is included in Hendrick's volume of Hosmer letters (Hendrick 1977: 23-25).

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE (continued)

> *machine soon followed; then a wedge press, holding 12 gross of pencils, took the place of the hand screws which Munroe used, and so on to the smaller details of the business. His machines were not crude attempts to do something, but were thoroughly made, practical machines. . . . None of his inventions were patented, but were freely used by all who came after him.* (Hendrick 1977: 24).

Wood's methods of making pencils were presumably adopted by other pencil-makers in Acton and Concord (though Henry D. Thoreau invented some alternative approaches), and they are essentially the same as those used today.

Wood's business may have been adversely affected by the Panic of 1837, for in January of 1838, Wood and White defaulted on their mortgage and surrendered ownership of the property (MSRD 319:242). Beginning in 1841, William Munroe bought up all the interests in the property, which were still being described as "Foster's Mills" comprising a carding shop, gristmill, house, barn, and several acres of land (MSRD 401:152, 428:45, 435:549). Munroe owned the property until 1859, but it appears that Ebenezer Wood was the one who occupied the premises for pencil-making. Wood is listed as a pencil-maker in Acton in the 1850 and 1860 federal censuses and in the 1855 state census, and in the 1850 Acton assessment list, he rather than Munroe was listed as the person responsible for the taxes.

Ebenezer Wood appears to have been a civic-minded, well-read man who was widely respected in the community. He served as moderator of the Acton town meeting in 1835 (Phalen 1954: 406), and he was a life-long member of the Concord lodge of Masons, holding the office of Senior Warden in 1824 and 1826 (Ellis 2010: 72). Hosmer called him a "gentleman in looks and behavior [who] led a peaceful and orderly life." Wood was an avid reader of books and magazines who committed long poems to memory, which he recited while at work (Hendrick 1977:25).

Another activity at the site, for which there is good documentary as well as the artifactual evidence, was the grinding of graphite, also called plumbago or black lead, for pencil leads. Munroe's first pencils used ground graphite mixed with glue, which he applied as a paste, but later pencils used the European formula of mixing the ground graphite with clay, after which the leads were molded or extruded to shape and then fired at a high heat. This process allowed the pencils to be made in several grades of hardness, depending upon the amount of clay that was mixed in. The importance of the graphite-grinding part of the operation probably accounts for the designation "Pencil Mill" on the 1856 map, as opposed to "Pencil Factory," which was what the pencil works on Brook Street nearby to the south was called (Figure 4).

Among the customers for whom Ebenezer Wood ground graphite were William Monroe and John Thoreau. After the German-American pencil-makers began to dominate the industry, both the Thoreau and the Munroe families[2] began to rely more on supplying graphite to the printing trade for the electroplate process. The Thoreaus are said to have persuaded Wood to grind graphite only for their business and not for Munroe (though they employed others to grind graphite besides Wood). Some writers have speculated that this dispute occurred as early as the 1830s, but it seems hardly likely that the Thoreaus could have monopolized Wood's output when William Munroe owned the property (Harding 1970: 16-17).

[2] The Thoreau business was managed after John Thoreau's death in 1858 by his son, Henry David Thoreau (died in 1862), and his wife, Cynthia Dunbar Thoreau (died in 1872). William Munroe's pencil business was carried on by his son, Francis, until the latter's death in 1870.

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE (continued)

Munroe sold the property to Hugh Cash, an immigrant from Ireland, in 1859 (MSRD 817:579). Cash, called a farmer and a miller in the 1865 state census, probably kept Ebenezer Wood on to operate the pencil side of the business, since Wood appeared in Acton as a pencil-maker in the 1860 federal census and as a laborer in 1865. The mill is known to have continued supplying the Thoreau family with graphite under Cash's ownership (Harding 1970: 17; Hendrick 1977: 93). Unfortunately, the deeds in this period (and later) do not provide much additional detail about the property's buildings and operations, other than referring to "buildings, mills, mill privileges and waterpower." Cash was the owner of the Acton property when a portion was sold to the Framingham & Lowell Railroad for its right-of-way (New York, New Haven & Hartford Railroad 1915).

Around 1860, Concord and Acton pencil-makers were feeling the effects of competition from German-American manufacturers. Eberhard Faber came to New York City in 1849 in order to market pencils made by A. W. Faber, his family's business in Bavaria. Established in 1761, A. W. Faber had achieved a world-wide reputation for high-quality goods, and Eberhard Faber's goal appears to have been to include America within the company's global market dominance. In 1861, Faber constructed a large steam-powered factory in New York; although labor was more expensive in America, Faber found that he could produce pencils cheaper here because of a higher degree of mechanization (Asher and Adams 1876: 171). Another Bavarian, Daniel Berolzheimer, established the Eagle Pencil Company about the same time, with a factory first in Yonkers and later in New York City (Petrowski 1990: 174).

Interestingly, the entry of the Germans into the American pencil market had some short-term benefits for pencil-makers in Massachusetts. Hosmer noted that Ebenezer Wood provided a pencil-trimming machine to "a New York company" (presumably Faber) that remained in use for many years (Hendrick 1977: 24). The company itself noted that its success derived from "uniting American ingenuity with European experience" (Asher and Adams 1876: 171), suggesting that much of its mechanization was provided by, or copied from, American innovators.

In the 1860s, some portion of the output of the Faber and Berolzheimer factories were finished in this shop by Henry Hosmer, who rented it for five years. Hosmer, who was listed as a "pencil finisher" in the 1865 state census, took a contract for finishing 1,440,000 Faber pencils. The work involved putting on a clear finish, adding rubber erasers, and packaging the pencils for market. Hosmer hired "six good girls" to do the work, which he described as "rather pleasant." The operation probably took place on the upper story of the building; Hosmer described the operation as taking place in a "long, light, clean work room, [with] lots of flowers in their season, lots of innocent fun, as well as work" (Hendrick 1977: 24, 86, 94). Hosmer himself earned more than $2,000 a year from the contract.

The effect of the German-American manufacturers was probably more that they pre-empted any further growth of pencil-making in Concord and Acton, rather than putting them out of business. Hosmer was still listed as a pencil-maker in Acton in the 1870 federal census, and another Acton resident, machinist Henry M. Smith (1831-1907), carried on the pencil-making business until the late 1880s. Smith owned the subject property from 1872 to 1893 (MSRD 1237: 618) and also operated the other pencil factory on Brook Street, which had been built in 1848 by Ebenezer Davis and then later owned by the heirs of Lewis Ball. Smith appears to have made lead pencils at the Brook Street location, using the North Acton facility for grinding the graphite (Wylie 1963, Conant 1969) and for making slate pencils (see Figures 8 and 9). Slate pencils, used for writing on slate tablets, involved a completely different manufacturing process, but combining the two into one business probably made sense because the school-supplies market and distribution chain for the two products were the same. Slate pencils were made from

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE (continued)

slabs of soapstone or soft slate using a milling process (see Figure 10); the resulting cylinders were then sharpened, wrapped in paper, and packaged in cardboard boxes.

Henry Smith's business was listed as manufacturing lead and slate pencils in the 1880 census of manufacturing, and it appears that the reported statistics combined the operations at this location with those at Brook Street:

Capital invested: $2,000
Greatest number of hands: 7
  Average number of male hands: 4
  Average number of female hands: 3
Hours worker per day in summer: 10
Hours worked per day in winter: 9
Average day's wages: $1.20
Total wages paid for the year: $1,415
Months in operation: 6
Months idle: 6
Value of raw materials: $1,000
Value of product sold: $3,800
Source of power: Nashoba Brook, 11' fall [which must include both water privileges]
Number of turbines: 2, one 2' diameter and one 3' diameter, one 5 hp., one 15 hp.
No steam power

The 1880 population census suggests that two of Henry Smith's workers were his teen-aged children, Albert and Hattie.

Smith is said to have retired from pencil-making in 1888 (Phalen 1954: 155), thereafter devoting himself to farming and nursery plants. After he sold the property in 1893, it was purchased by Albert and Francis Day and then in 1899 by Fred D. Morrison (MSRD . Although one historian refers to "Morrison's Mill" grinding graphite for Henry Smith's pencils (Conant 1969), it is likely that this is an anachronism, since Smith himself owned the property at the time. Morrison was listed as a railroad crossing tender in the 1900 federal census.

When the New York, New Haven & Hartford Railroad's valuation survey was prepared in 1915, the larger building at the pencil factory site was labeled a "House" and the smaller building, a "Shed" (see Figure 8), suggesting that there industrial purpose was no longer evident (the Brook Street pencil factory was called an "Old Mill" in that survey). According to Acton historian William A. Klauer (personal communication, June 9, 2014), the buildings were intentionally burned down by the property's owner during the winter of 1961-1962 because they had become so deteriorated.

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE (continued)

Industrial-Archaeology Importance

It would be premature to try to fully evaluate the industrial-archaeology significance of the site based upon one day's field inspection. However, it is clear that it has potential to yield information about both early American pencil-making in general and the specific enterprises that operated here. Among the research questions that could be addressed are the following:

How much from earlier enterprises was re-used for pencil-making and how much new investment was there?

The field inspection suggests that there was some re-use of power-transmission equipment, as evidenced by the square-section shafting, which was common in the first half of the 19th century but was superseded by round shafting in the second half. Further investigation of the site might be able to determine if the building shown in the historical photograph (Figure 7) was, in whole or in part, the carding shop referred to in early deeds. Typically, analysis of architectural remains such as nails, brick, and window glass can distinguish between episodes of occupation.

At the same time, other remains on the site--the round shafting, bearings, and turbine components--suggest that pencil-making and graphite-grinding were sufficiently profitable, even in the face of industrial-scale competition, to warrant serious investment to improve the waterpower system in the post-Civil War period.

How did graphite-grinding differ from similar processes of the period?

The grinding stones observed at the site clearly differ from those use to grind grain in that they lack furrows, implying that they worked primarily by crushing rather cutting. Further investigation might determine the source of the grinding stones, and comparative analysis might shed light on how much the stones resemble those used for producing gunpowder and paint pigments.

How was the waterpower system reconfigured?

No evidence was observed of a pre-turbine prime mover, but presumably the west-side building was earlier powered by some sort of water wheel, either internal in the cellar/wheelpit or external to the building. At other early industrial sites, mortises cut into stones for bearings have been interpreted as implying particular types of wheels; similarly, curve-shaped cut stones can imply the existence of a breast wheel and even indicate its diameter. Further examination of the site might shed light on both the earlier waterpower system and the turbine-based system that replaced it, as well as suggesting how much of an efficiency advantage was gained by the improvement (because wooden water-wheel components had to replaced on a frequent basis, it is possible that the turbine was installed just to avoid this burden).

What was the function of the smaller building's chimney seen in the historical photograph?

The simplest explanation is that its purpose was simply to vent a heating source for the work space within, but the fact that pencil leads' graphite-clay mixture was fired (as well as the rather unusual appearance of the building) raises the possibility that at one time or another lead-firing or some other heat process occurred there. Further investigation of the site might detect some by-product of the manufacture of pencil leads or some indication of what temperatures the brick found at the site was exposed to.

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE (continued)

How local were the raw materials used at this site?

Both Faber and Berolzheimer used Florida red cedar for their pencils; is it possible that remnants of wood could be preserved at this site that would allow one to distinguish local cedar? The Thoreaus got their graphite initially from a deposit in New Hampshire, but there are other sources, both local and remote, that could have been used. If raw graphite could be detected at the site, it could theoretically be matched with known deposits to determine its origin. Similarly, careful examination of the site might turn up remnants of the soapstone or soft slate that was used for making the slate pencils. Rejected products are also commonly found in early industrial sites; graphite leads or slate pencils might lie buried in the sediments of the mill races.

Figure 1: Location of site shown on USGS Westford and Maynard Quadrangles, 7.5-Minute Series, Scale 1:24000. Site is on the Westford Quadrangle, with the adjacent area of the Maynard Quadrangle shown for context.

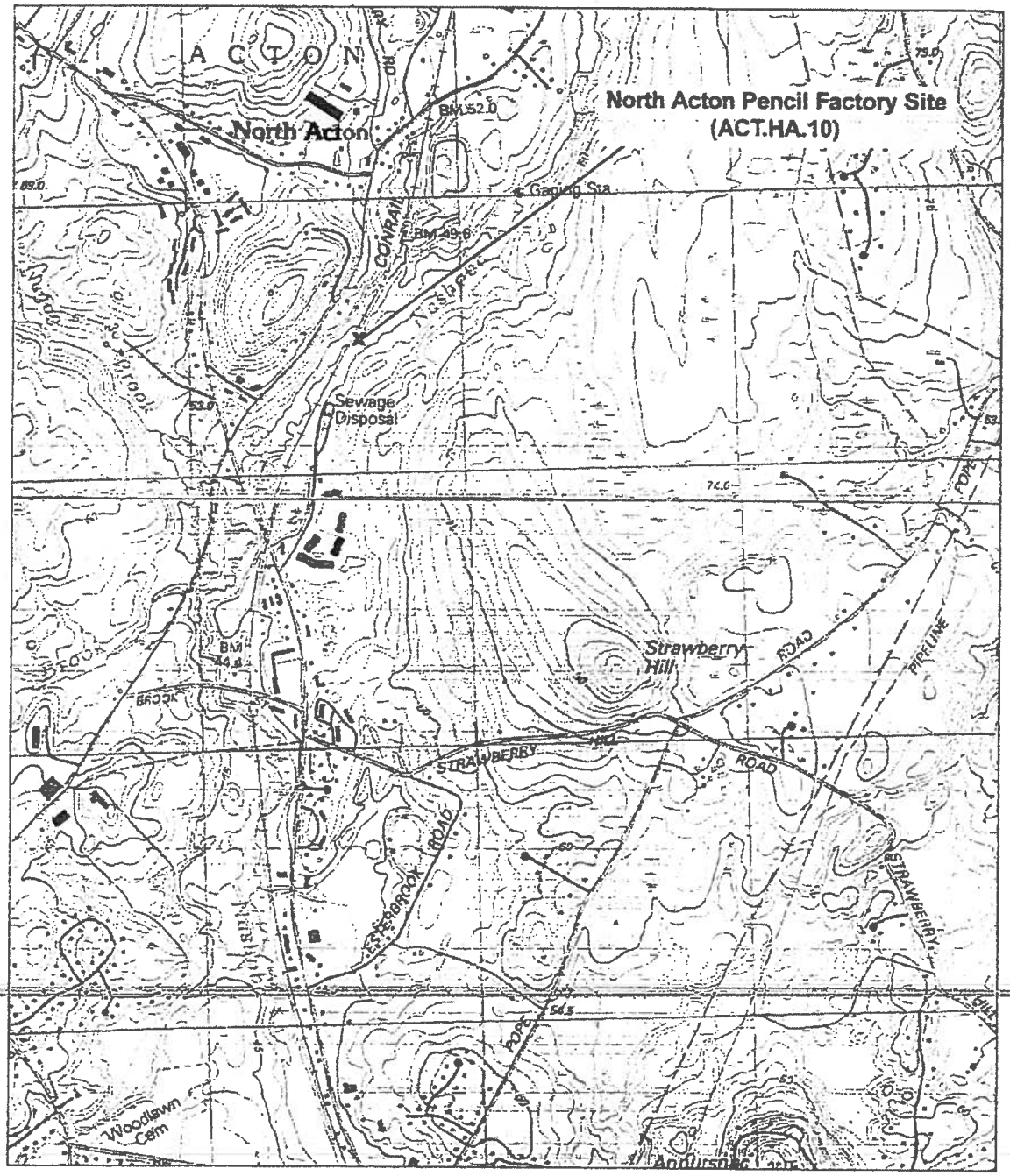


Figure 3: **Location of site (arrow) as shown on the Hale map of 1831. The notation "Mills" refers to the carding shop and gristmill known as "Foster's Mills."**

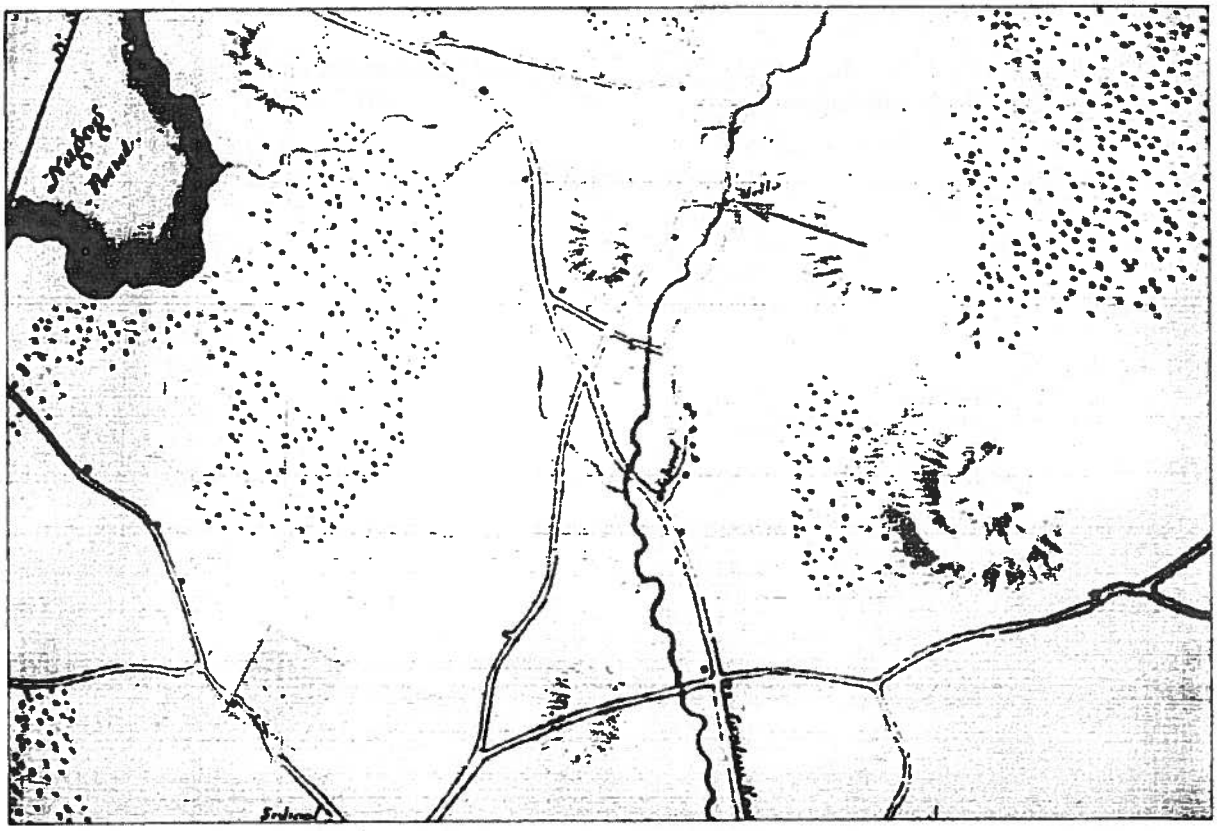


Figure 4: **Location of site (arrow) as shown on the 1856 Walling map. A "Pencil Mill" and "Grist Mill" are shown, powered by separate mill races, and [William] Munroe is shown as the owner of the house to the west.**

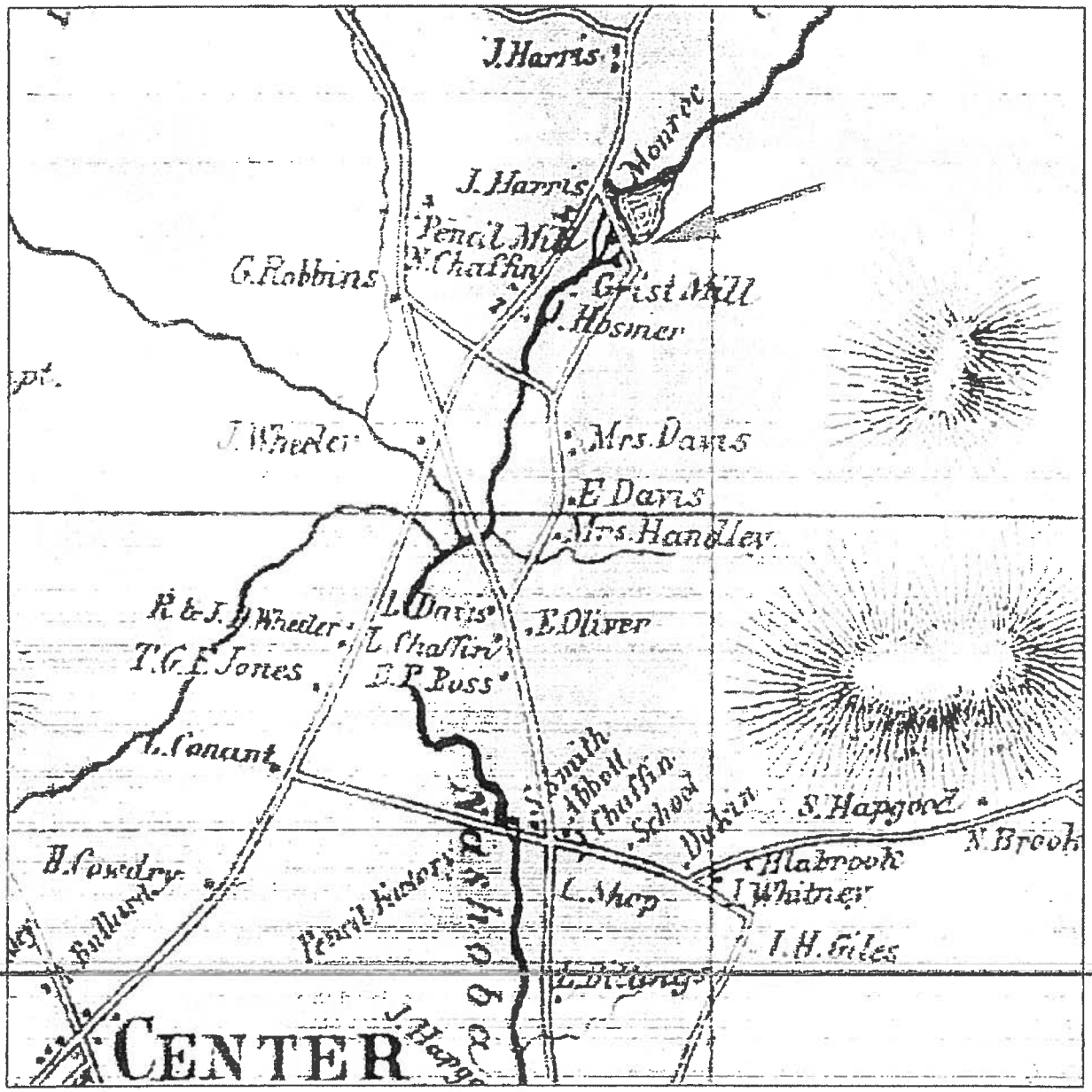


Figure 5: **Location of site (arrow) as shown on the 1875 Beers atlas map. The building on the site is identified as a slate pencil manufactory.**

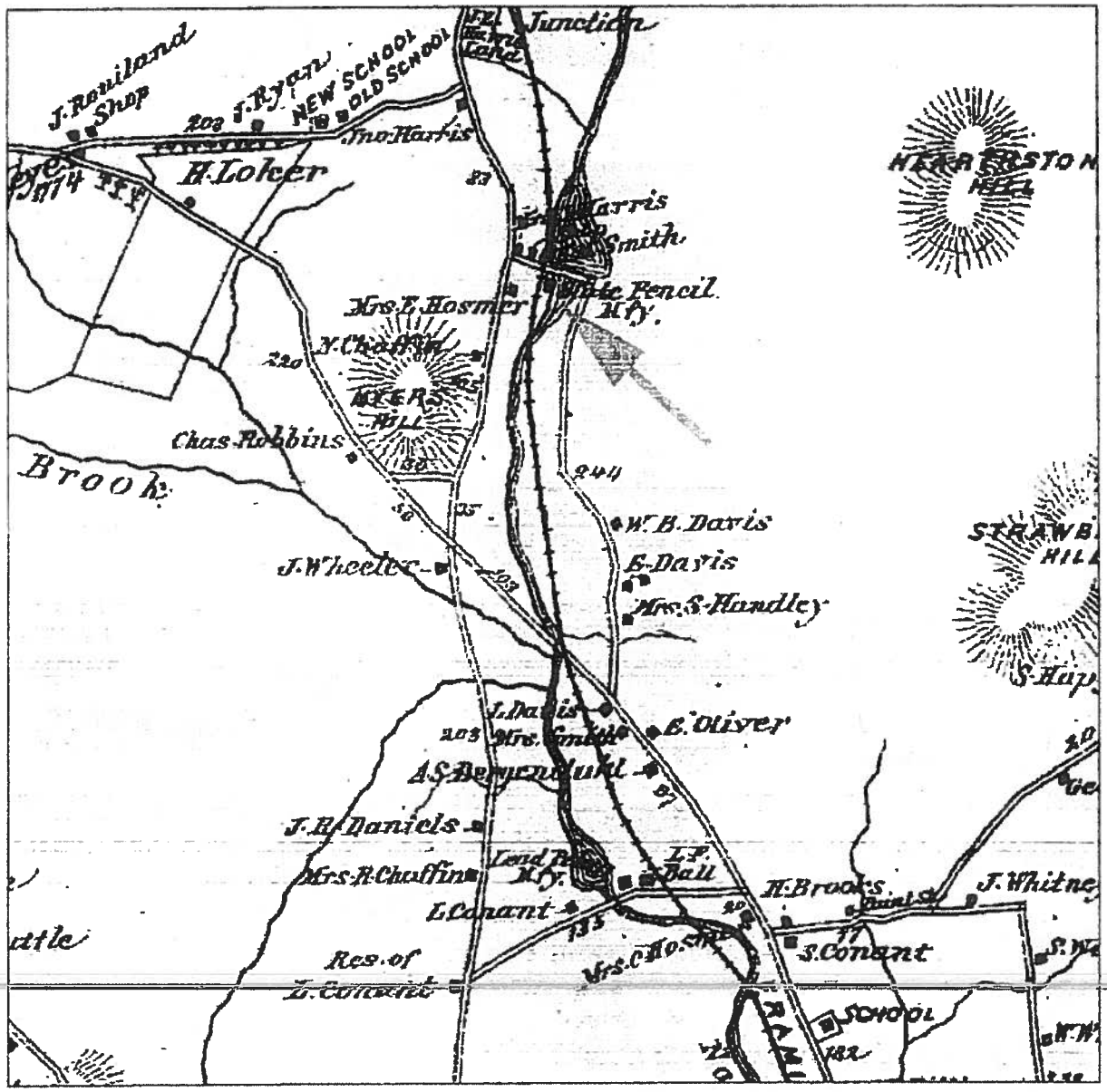


Figure 6: **Location of site (arrow) as shown on the 1889 Walker map.**

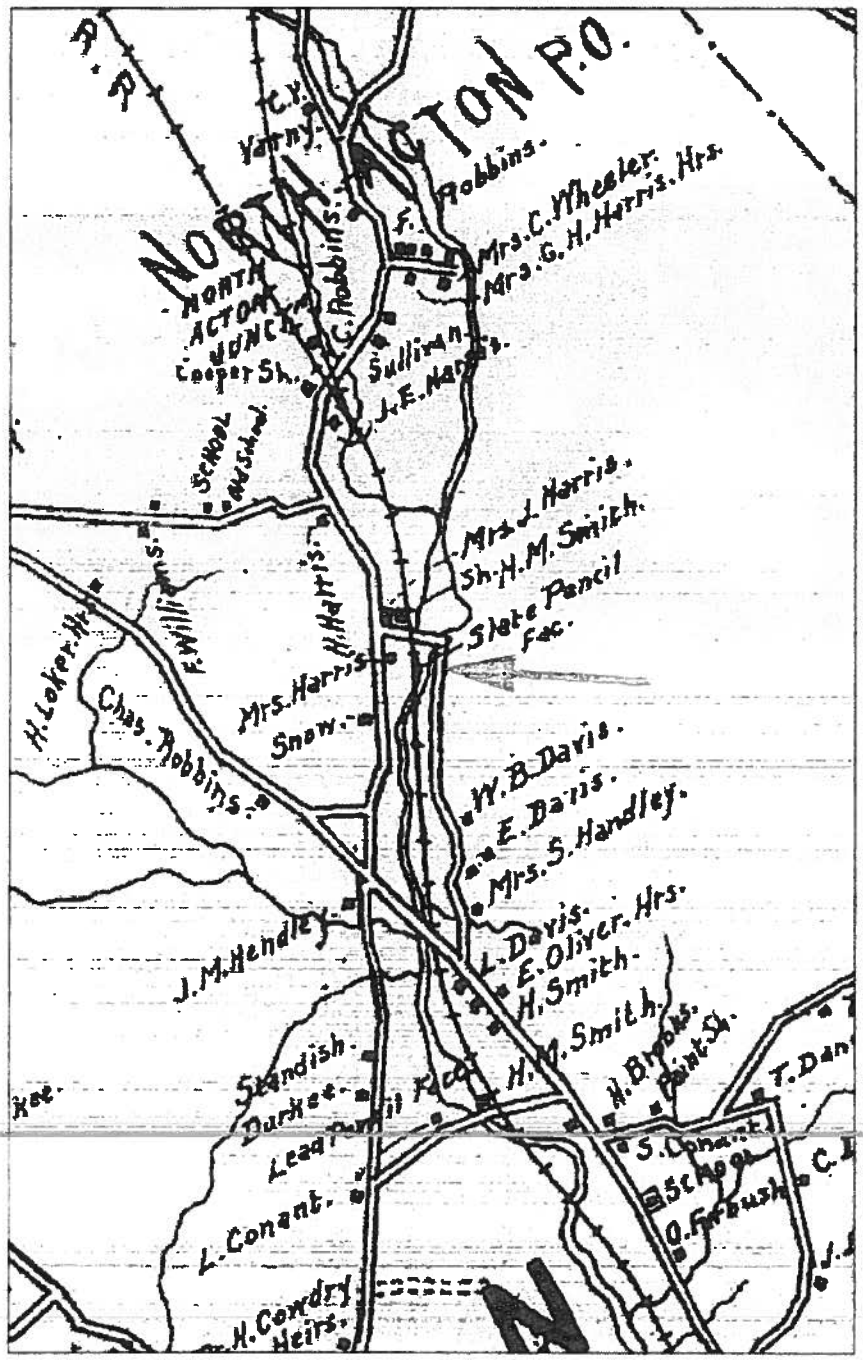


Figure 7: **Photograph of site looking west, undated but probably 1890s or early 1900s (Klauer 2001). The original print is owned by the Acton Historical Society.**

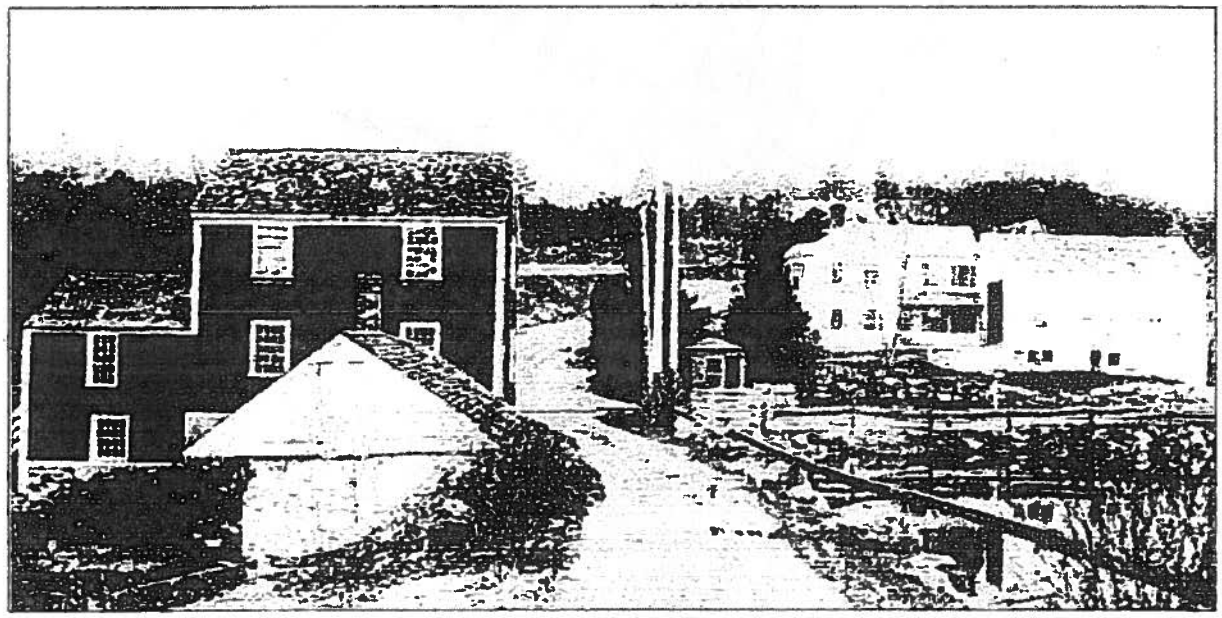


Figure 8: **Location of site (arrow) as shown on the 1915 New York, New Haven & Hartford Railroad valuation map. The main building is identified as a "house," the other building as a "shed."**

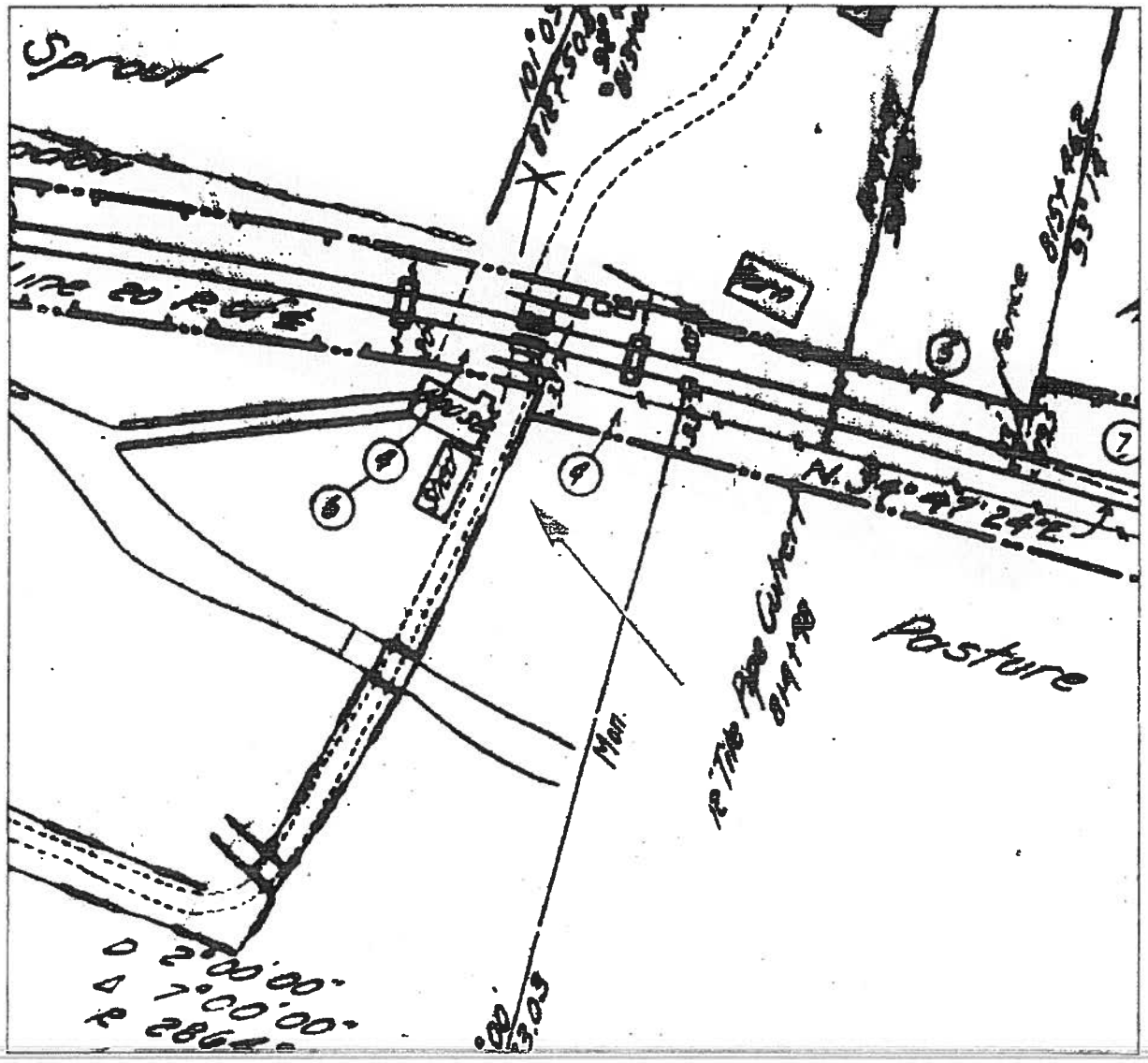


Figure 9: **One dozen lead pencils made by William Munroe, ca. 1840 (on exhibit at the Concord Museum, from Wood 2013). The stamped "HH" indicates extra hardness.**

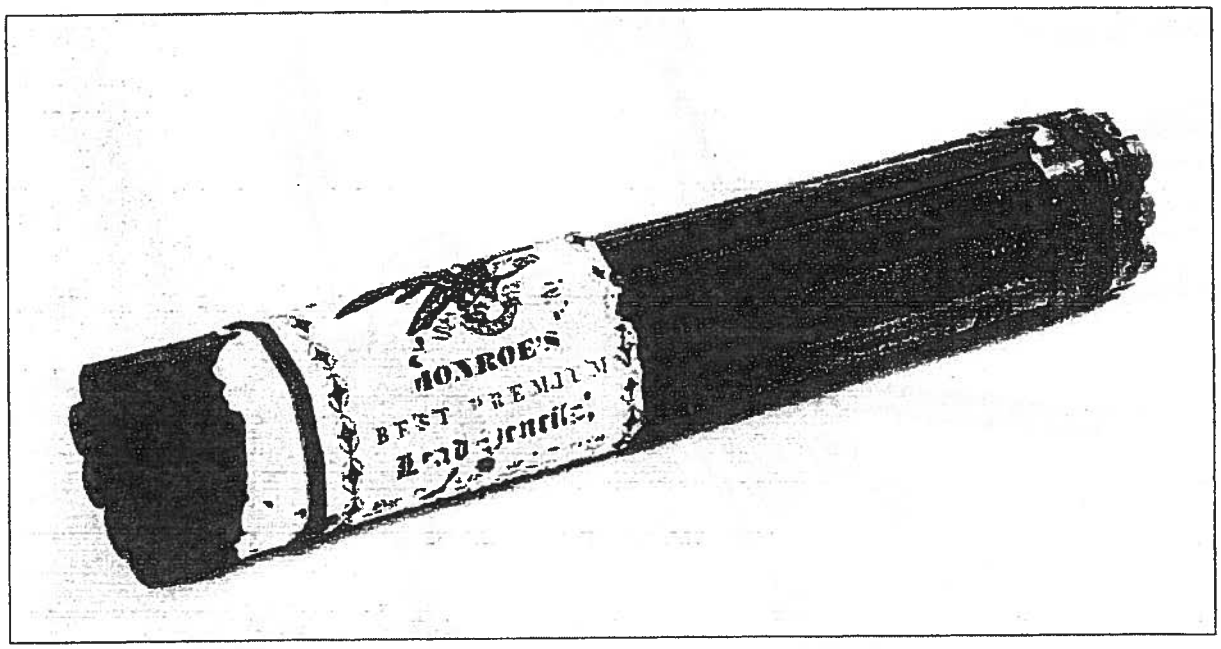
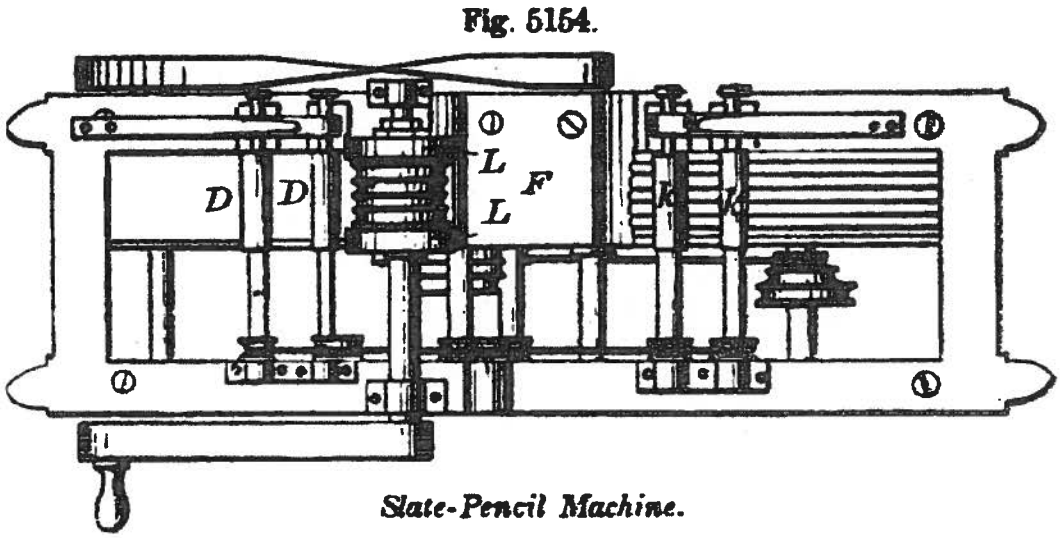


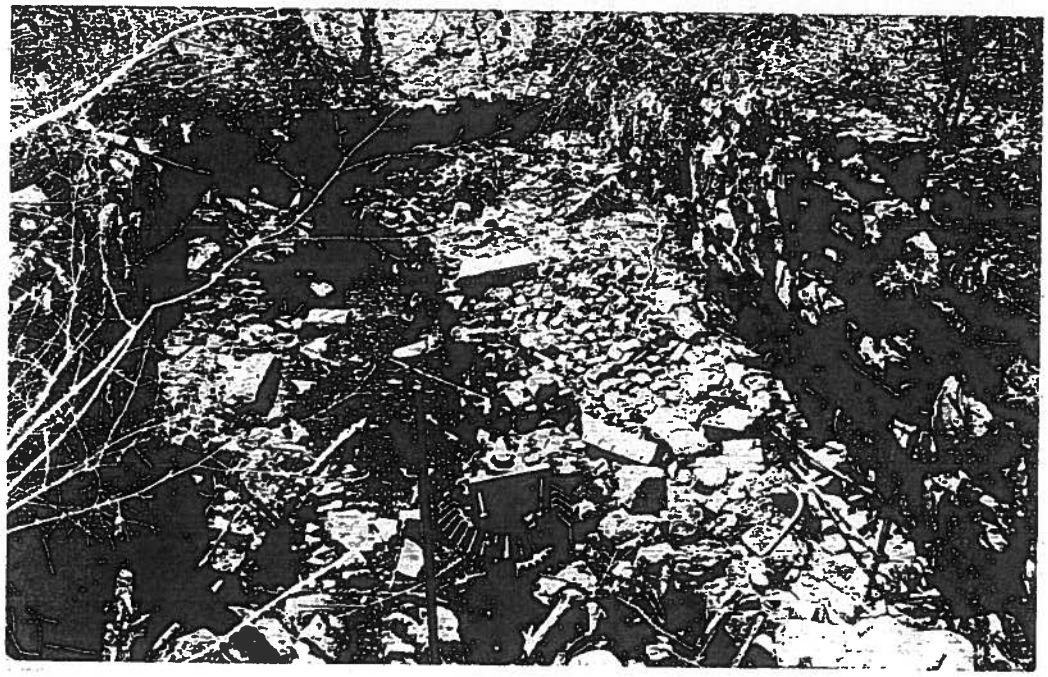
Figure 10: **Top-view diagram of a machine for making slate pencils (Knight 1884), such as may have been used at the site in the second half of the 19th century. Although the illustration shows a hand-cranked machine, presumably the one at this site was water-powered.**



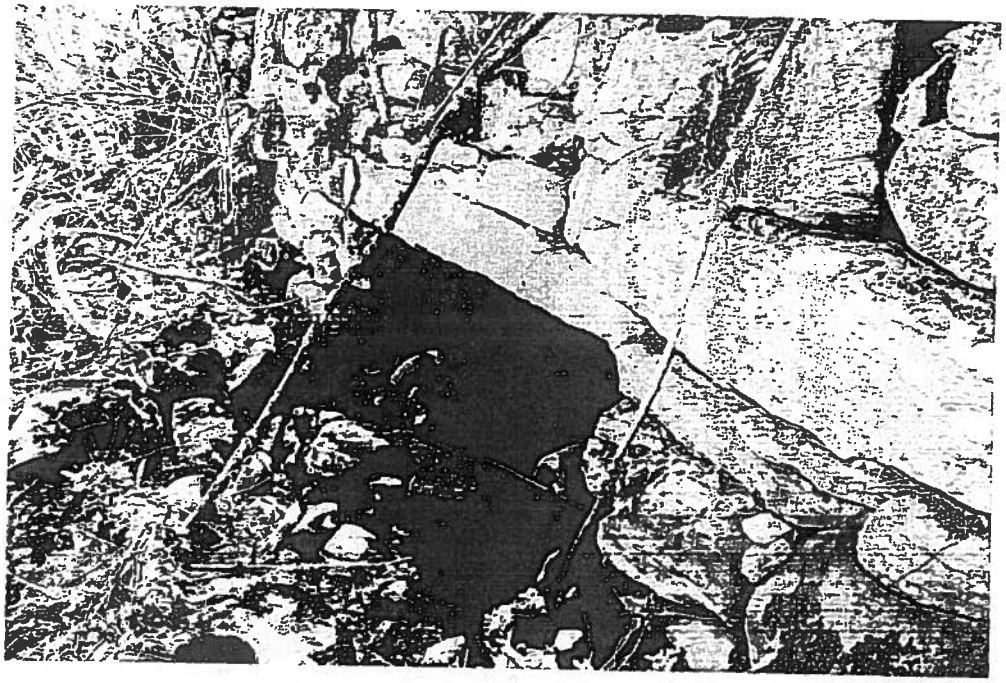
The slate is fed by the rollers *D D* to the grooved rotary cutter *L L*, which shapes their upper sides; other rollers convey them beneath the plate *F*, which is grooved to correspond with the upper halves of the pencils, and their lower sides are shaped by a similar rotary cutter beneath the plate. They then pass beneath the rollers *k* k_1 which convey them away.

Photograph 1: **Overview of machinery and foundation remains on west side of brook, camera facing north (AHS photograph, 5/2014).**

Photograph 2: **Overview of machinery and foundation remains on west side of brook, camera facing southwest (AHS photograph, 5/2014).**

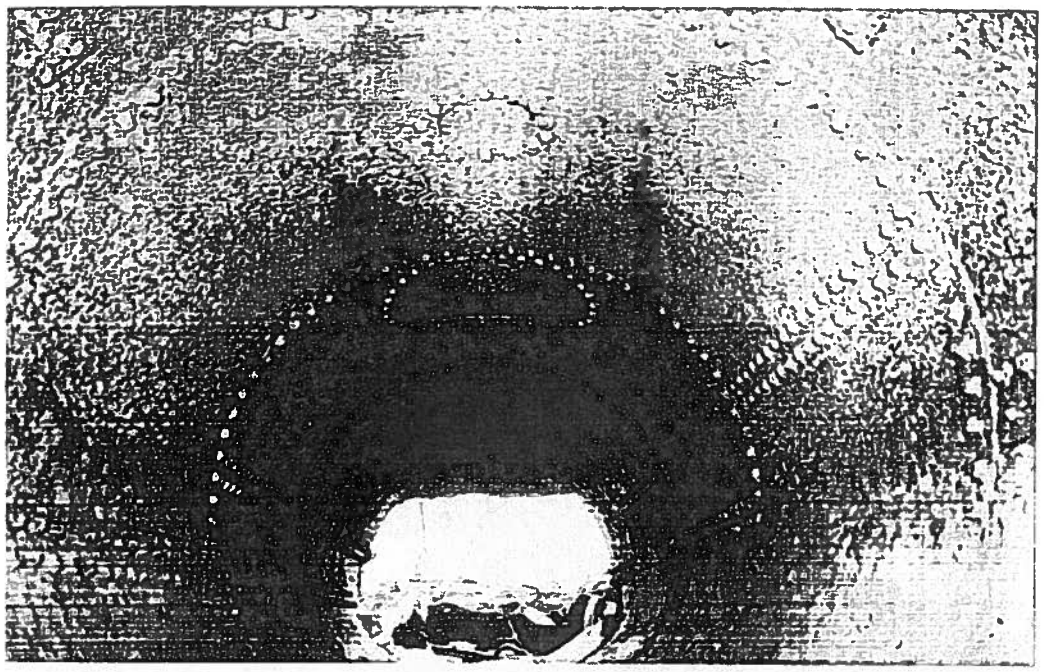


Photograph 3: **Upstream face of dam, west side of brook, showing opening leading to the foundation remains shown in Photograph 1, camera facing south (AHS photograph, 5/2014).**

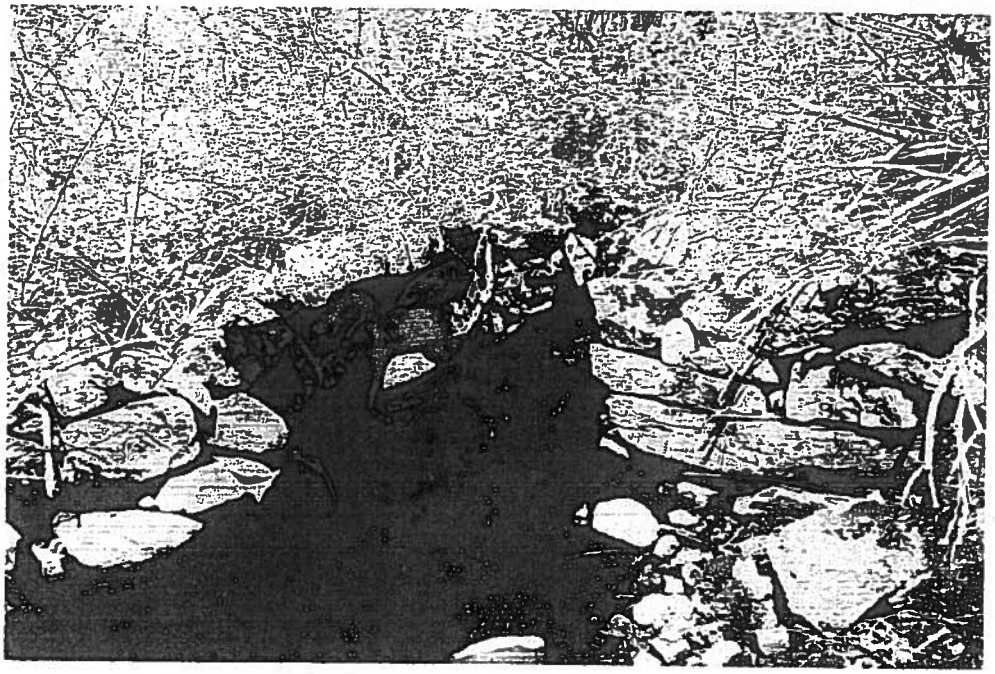


Photograph 4: **Detail of boiler-plate cylinder that forms the channel through the dam leading to the foundation remains shown in Photograph 1, camera facing north (AHS photograph, 5/2014).**

Photograph 5: **Interior of boiler-plate cylinder that forms the channel through the dam leading to the foundation remains shown in Photograph 1, camera facing northeast (AHS photograph, 5/2014).**



Photograph 6: **Tailrace and southwest corner of the foundation remains on west side of brook, camera facing north (AHS photograph, 5/2014).**



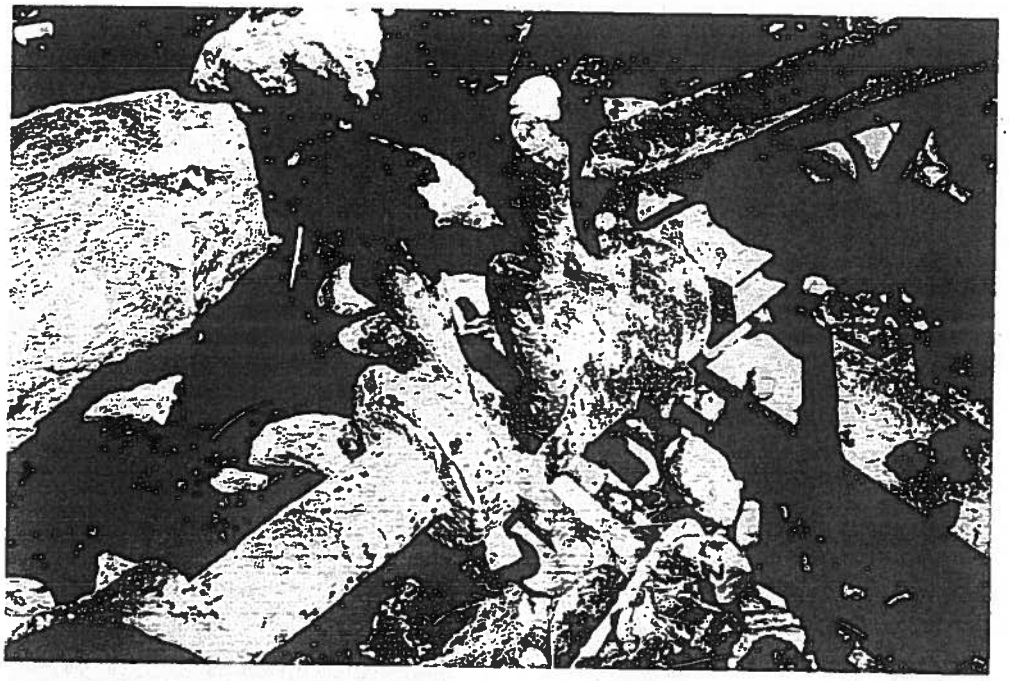
Photograph 7: **Detail of bevel gear, bearing, flanges and shorter shaft, west-side foundation remains, camera facing southeast (AHS photograph, 5/2014).**

Photograph 8: **Detail of bevel gear, bearing, and longer shaft, west-side foundation remains, camera facing northwest (AHS photograph, 5/2014).**

Photograph 9: **Detail of square-section shaft, west-side foundation remains, camera facing east (AHS photograph, 5/2014).**

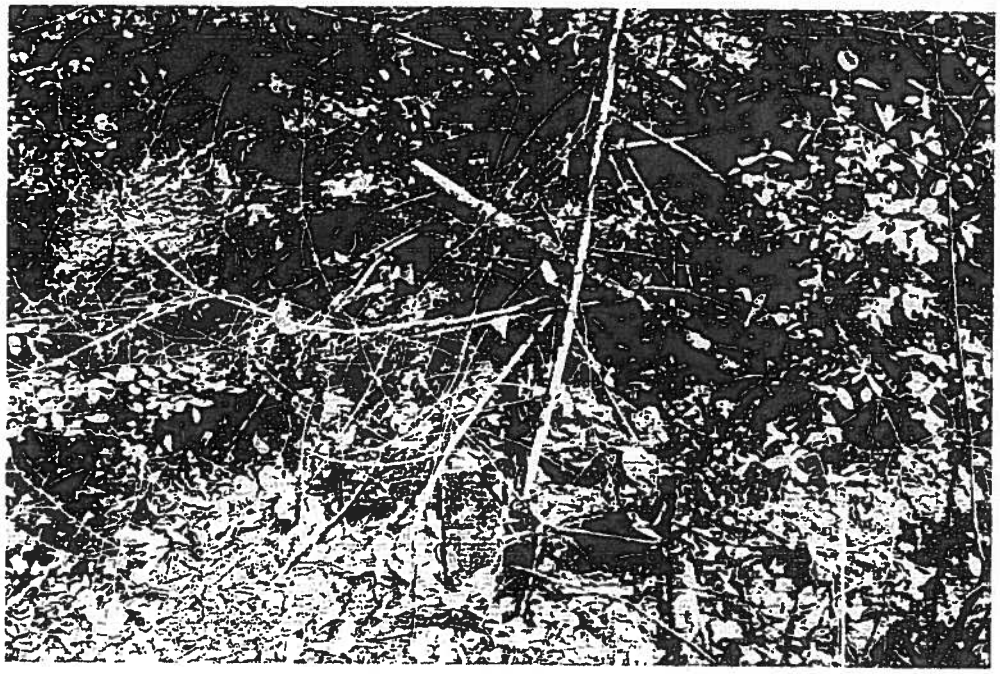
Photograph 10: **Detail of line shaft with shaft hanger, west-side foundation remains, camera facing northeast (AHS photograph, 5/2014).**

Photograph 11: **Detail of remnants of two spoked drive pulleys on line shaft, west-side foundation remains, camera facing northeast (AHS photograph, 5/2014).**



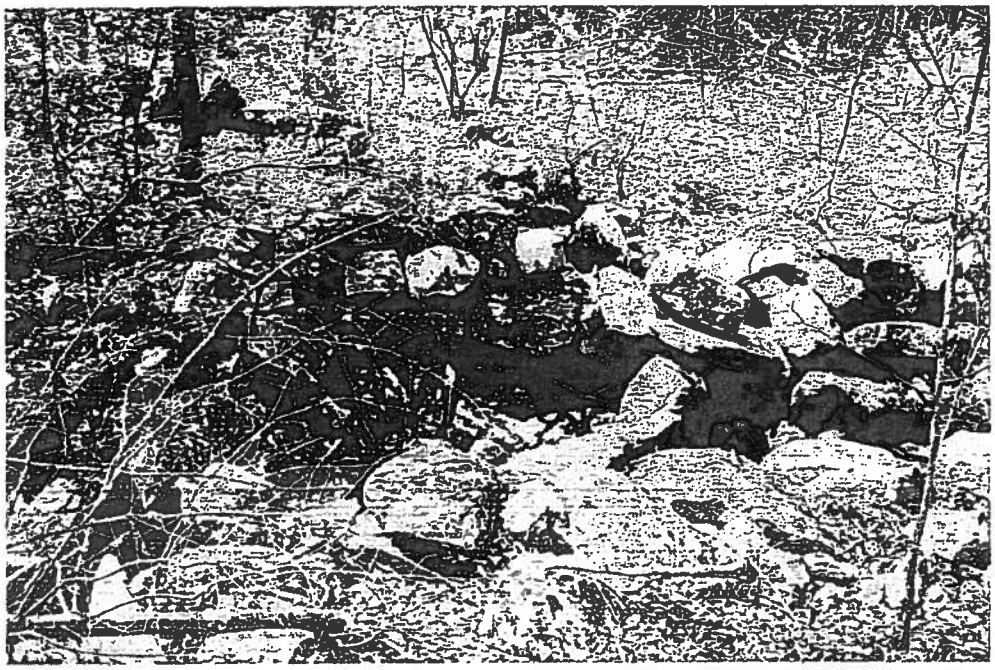
Photograph 12: **Corner of wall, east of the remains shown in Photograph 1, camera facing southeast (AHS photograph, 5/2014).**

Photograph 13: **Concentration of bricks within the foundation remains shown in Photograph 12, possibly corresponding to chimney location, camera facing northeast (AHS photograph, 5/2014).**

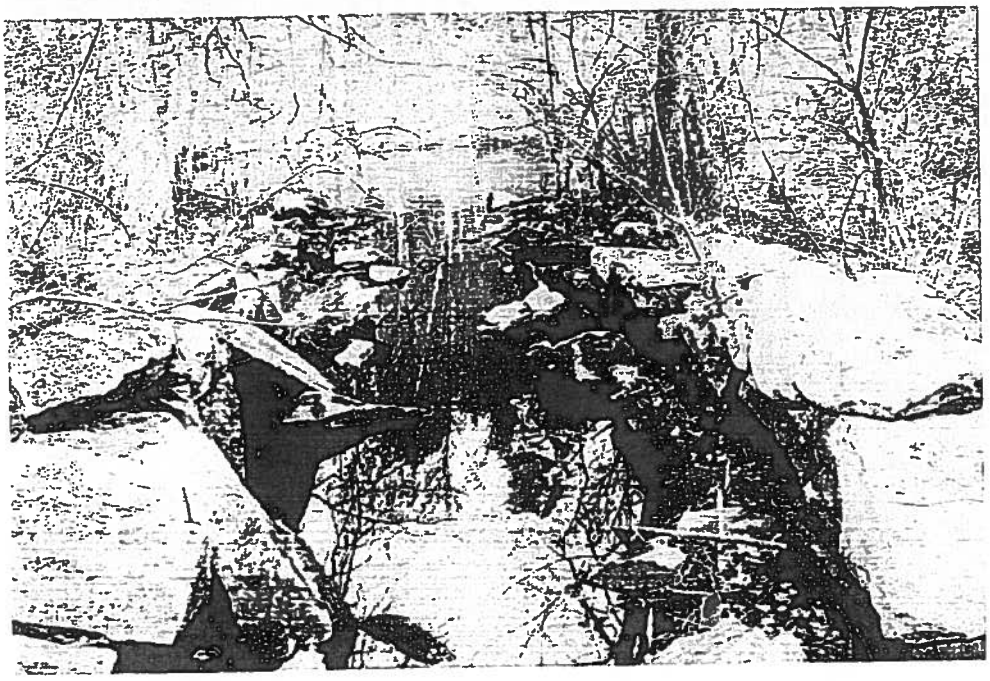


Photograph 14: Channel on east side of brook, camera facing southwest (AHS photograph, 5/2014).

Photograph 15: Bend in channel on east side of brook, camera facing south (AHS photograph, 5/2014).



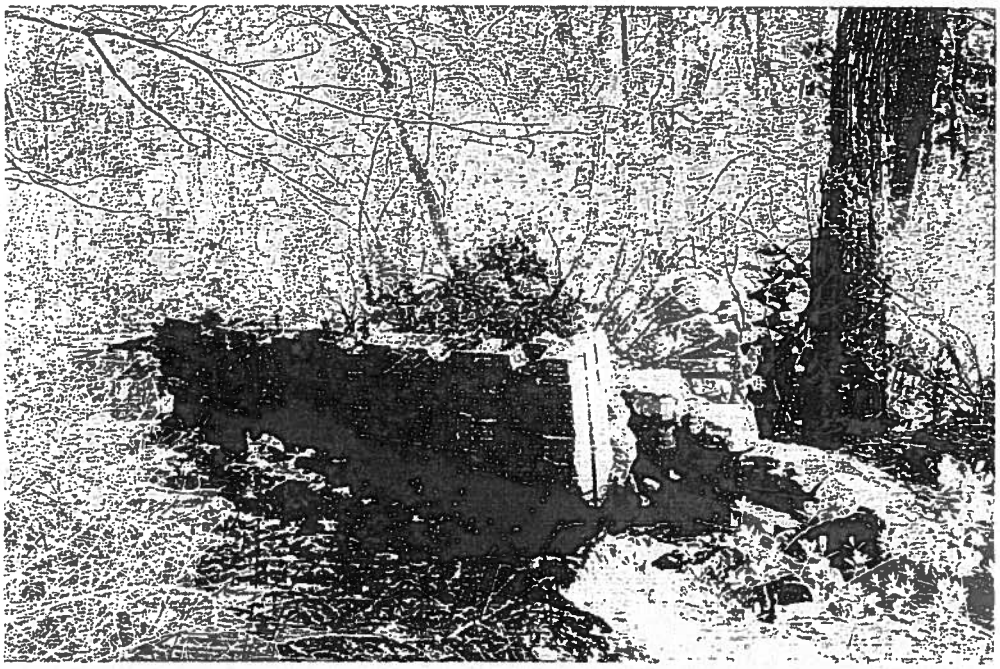
Photograph 16: **Channel on east side of brook as it re-enters brook, camera facing northwest (AHS photograph, 5/2014).**



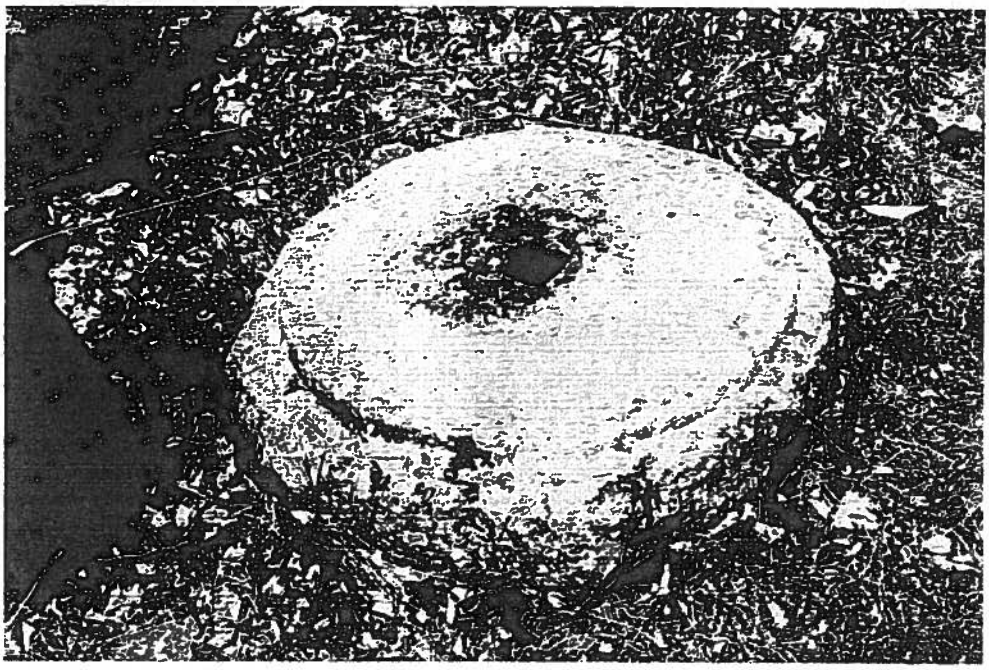
Photograph 17: **Downstream face of dam, east side of brook, camera facing north (AHS photograph, 5/2014).**

Photograph 18: **View of former roadway atop dam, east side of brook, camera facing northwest (AHS photograph, 5/2014).**

Photograph 19: **Concrete bridge abutment, east side of stream, camera facing east (AHS photograph, 5/2014).**



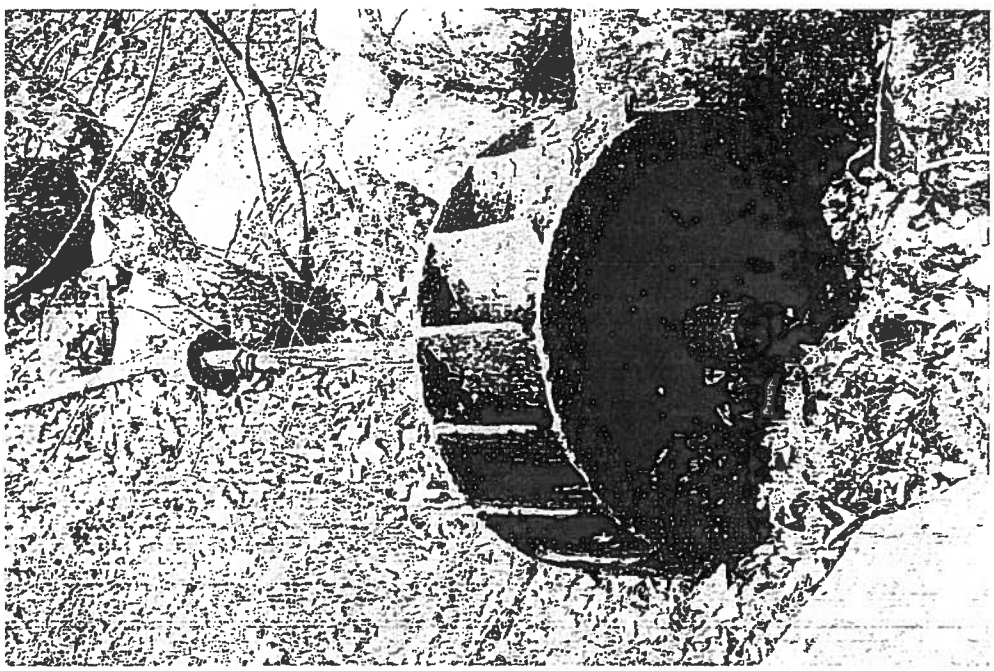
Photograph 20: **Apparent lower grinding stone, east side of stream, camera facing northwest (AHS photograph, 5/2014).**



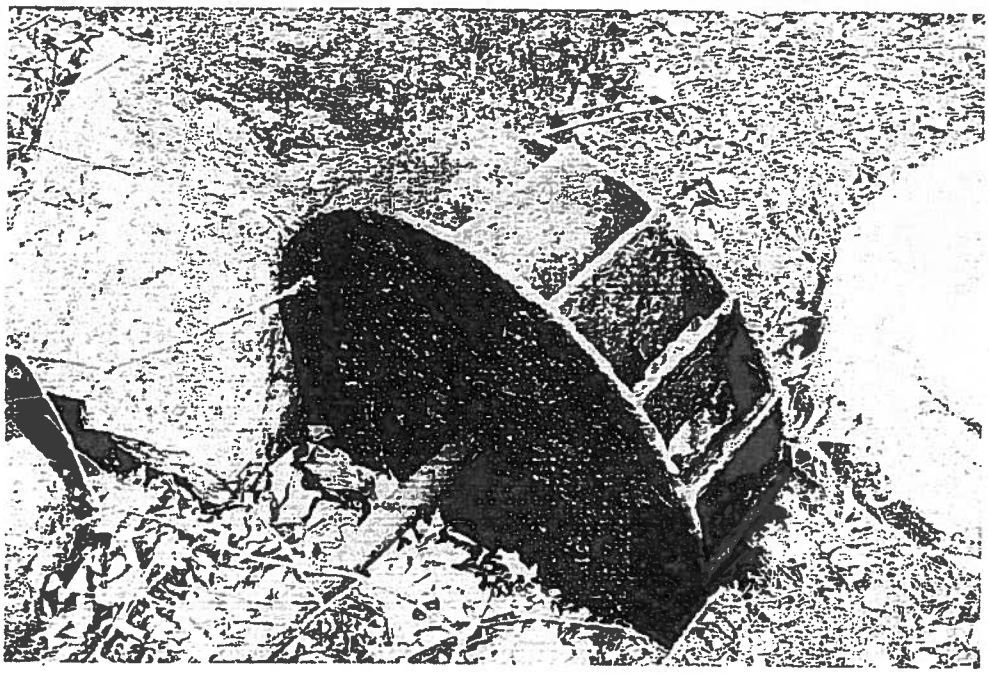
Photograph 21: **Concentric striations on surface of stone, camera facing north (AHS photograph, 5/2014).**

Photograph 22: **Matching grinding stone, west side of stream, camera facing southeast (AHS photograph, 5/2014).**

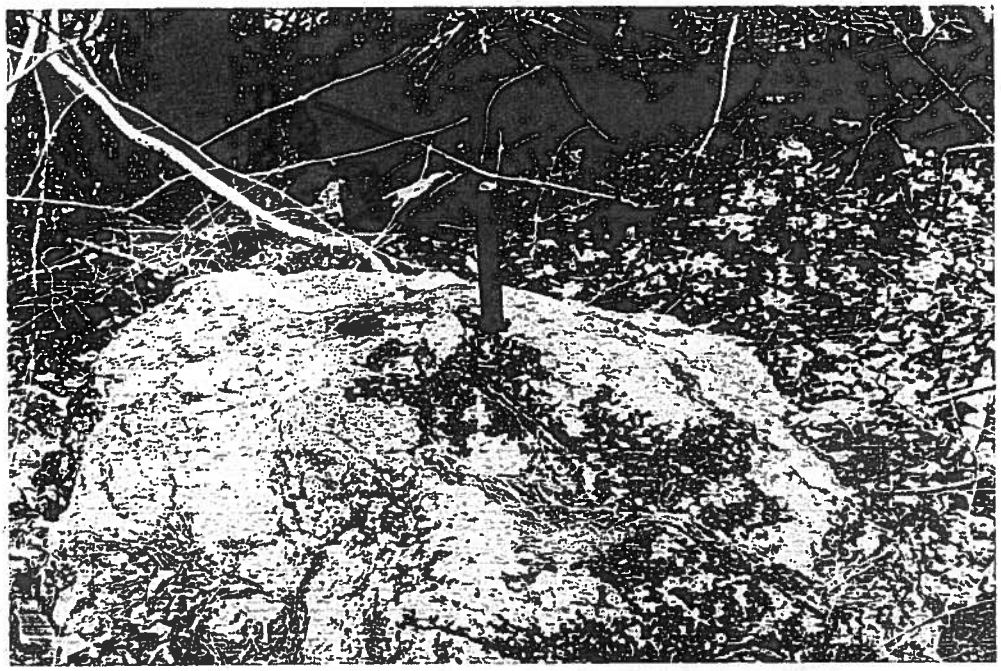
Photograph 23: **Turbine shaft and gate ring, east side of stream, camera facing south (AHS photograph, 5/2014).**



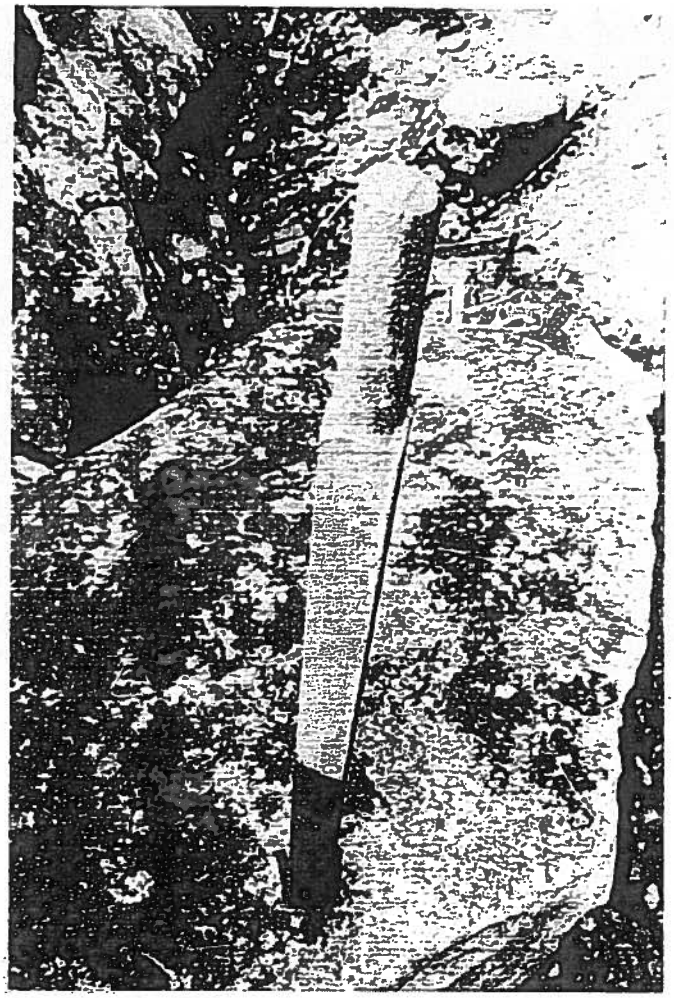
Photograph 24: **Turbine shaft and gate ring, east side of stream, camera facing west (AHS photograph, 5/2014).**



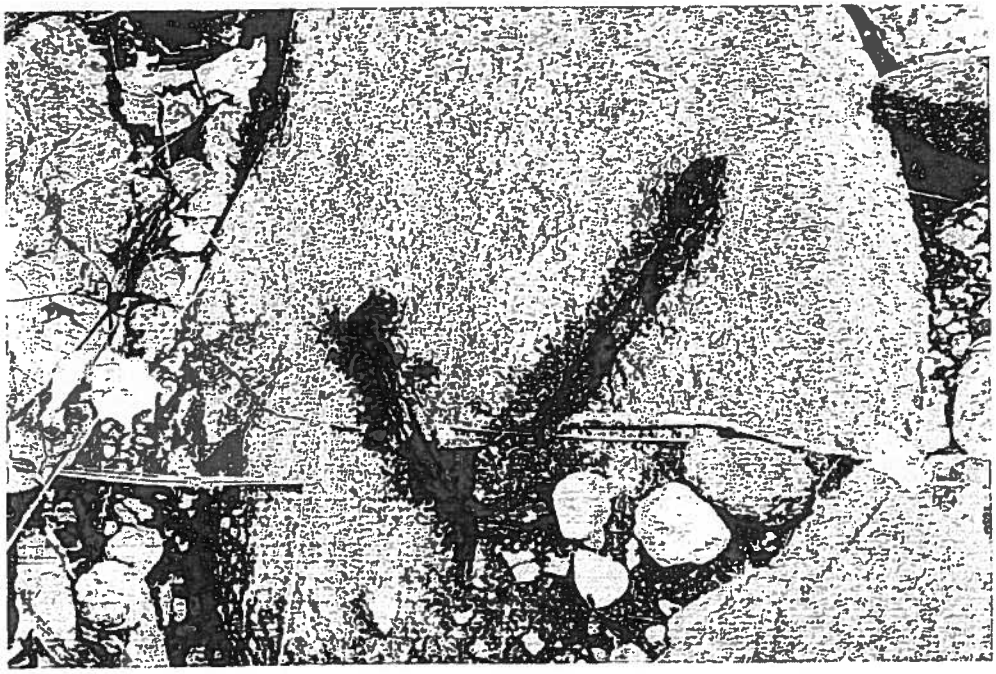
Photograph 25: **Typical iron rod embedded in stone as a support for a wooden fence or roadway guardrail (AHS photograph, 5/2014).**



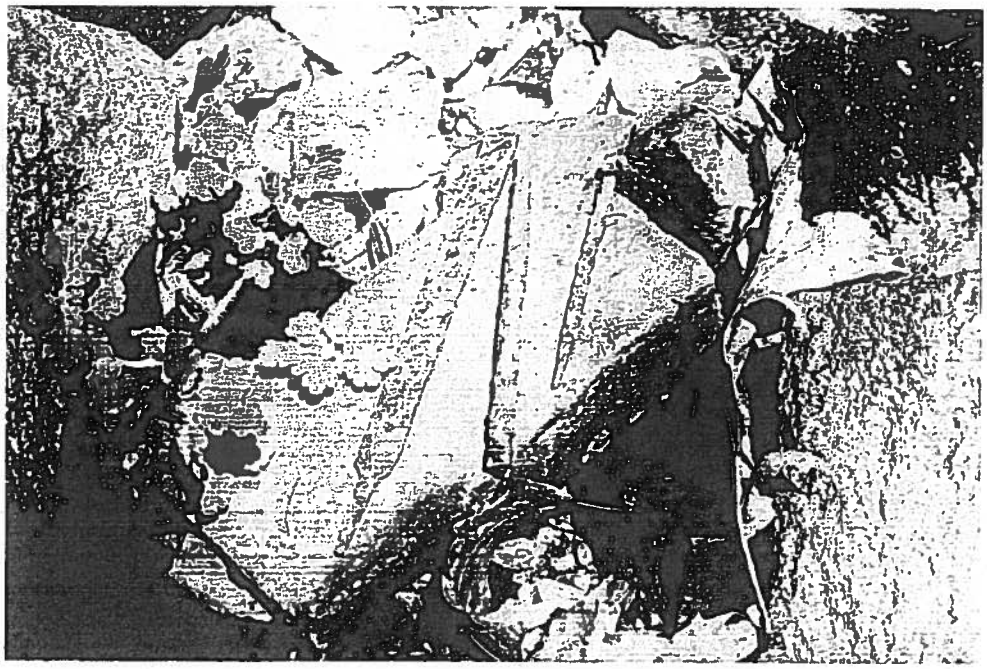
Photograph 26: **Early 19th-century square shaft re-used as a fence or guardrail anchor (displaced into channel on east side of brook), camera facing southwest (AHS photograph, 5/2014).**



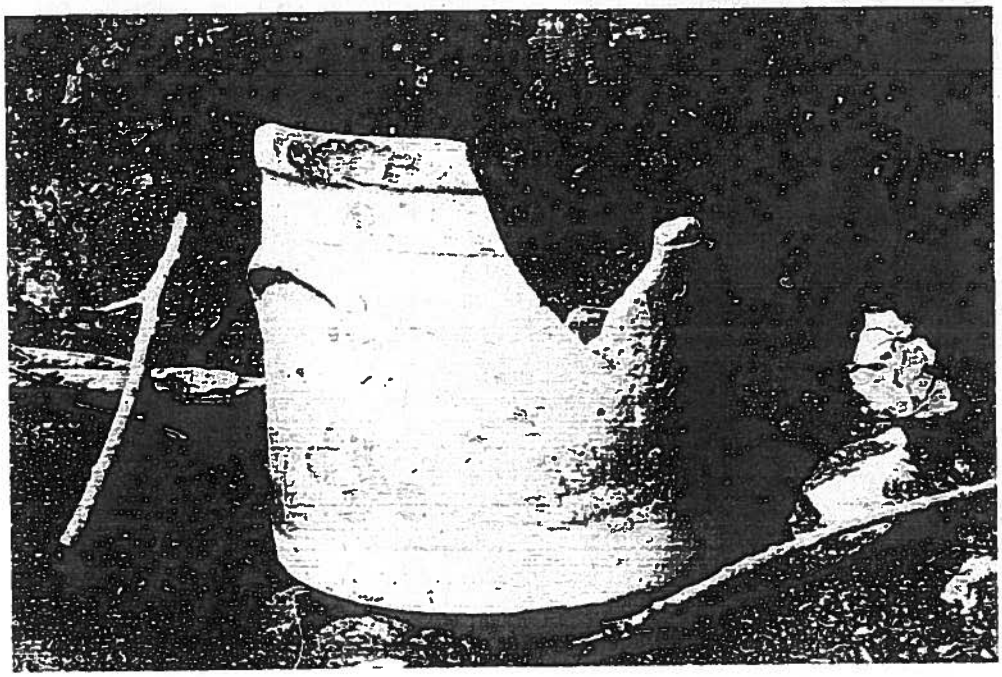
Photograph 27: **Surface find, wrought nails, east side of brook (AHS photograph, 5/2014).**



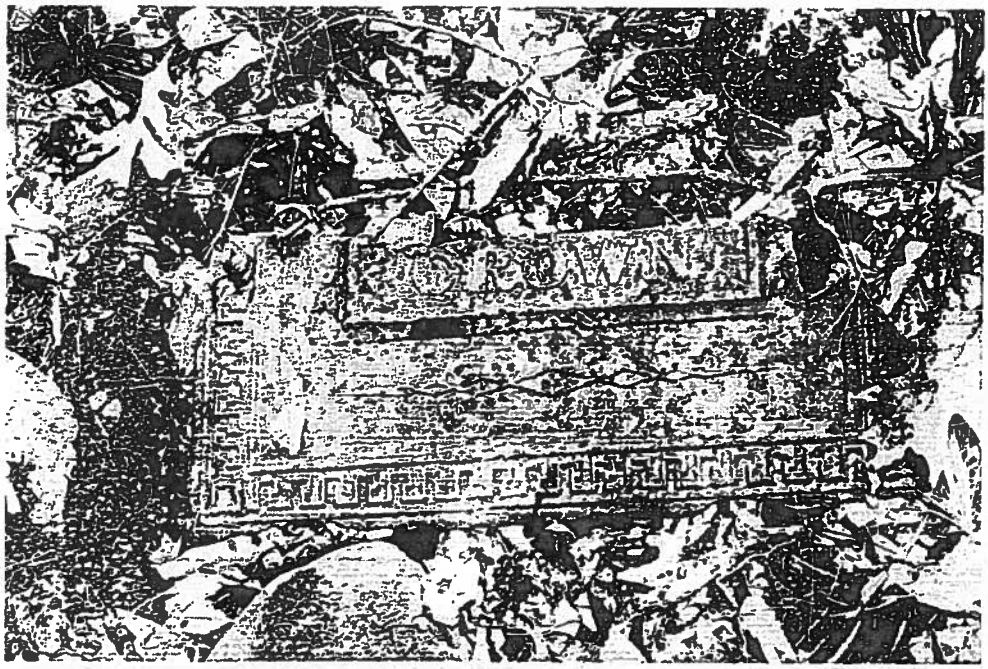
Photograph 28: Surface find, files, west side of brook (AHS photograph, 5/2014).



Photograph 29: Surface find, stoneware vessel fragment, west side of brook (AHS photograph, 5/2014).



Photograph 30: Surface find, cast iron stove (?) fragment, east side of brook (AHS photograph, 5/2014).



The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

August 15, 2014

Bill Klauer
Chair
Acton Historical Commission
70 Piper Road
Acton, MA 01720-4433

RE: Nashoba Brook Pencil Factory aka North Acton Pencil Factory National Register Nomination, Acton, MA.

Dear Mr. Klauer:

Thank you for speaking with me last Friday regarding the proposal to nominate the Nashoba Brook Pencil Factory to the National Register.

As requested, please find enclosed the MHC staff National Register evaluation form and the MHC historic archaeological site form for the Pencil Factory (MHC # ACT.HA.10) recently completed by Archaeological and Historical Services, Inc. on behalf of MassDOT.

I look forward to working with you and the Acton Historical Commission as we proceed with the National Register nomination process. Please contact me at this office if you have questions or require additional information.

Sincerely,

Jonathan K. Patton
Archaeologist/Preservation Planner
Massachusetts Historical Commission

Encl: MHC staff NR Nomination Form; MHC historic archaeological site form ACT.HA.10

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

Original yellow form: Eligibility file
Copies: Inventory form
Town file(w/corresp.)
Macris
NR director ____

Community: Acton

MHC OPINION: ELIGIBILITY FOR NATIONAL REGISTER

Date Received: Date Due: Date Reviewed: 8/14/14

Type: __Individual _X_District (Attach map indicating boundaries)

Name: North Acton Pencil Factory Site Inventory Form: ACT-HA-10
Town Of Acton, Conservation Department
Address: off Davis Road 472 Main Street
Acton, MA 01720
Requested by: TSD

Action: __Honor __ITC __Grant _X_R & C __Other:

Agency: Staff in charge of Review: Betsy Friedberg

INDIVIDUAL PROPERTIES

__ Eligible
__ Eligible, also in district
__ Eligible only in district needed
__ Ineligible
__ More information needed

DISTRICTS

_X_ Eligible
__ Ineligible
__ More information

CRITERIA: _X_A __B __C _X_D

LEVEL: _X_Local __State __National

STATEMENT OF SIGNIFICANCE by Leonard W. Loparto (largely paraphrased from the Form D – Historic Archaeology Sites submitted to MHC by Archaeological and Historical Services, Inc. dated May 2014).

The North Acton Pencil Factory Site (ACT-HA-10) is an industrial archaeological site located in Eastern Massachusetts in the Town of Acton in Middlesex County, Massachusetts. The main part of the site lies between Nashoba Brook and former Framingham and Lowell rail line, approximately 2,000' north of the Great Road rail crossing; east side is accessible from trails on the town-owned Nashoba Brook Conservation Land, approximately 800' north of the entrance on Davis Road. The site includes the stonework remains of building foundations, a dam, water

power canals, grinding stones, shafting and gears, and turbine components. The site was occupied from ca. 1800 to ca. 1961; pencil making occurred here from the 1830s to the 1880s. An archaeological reconnaissance of the site was completed in 2009 during which a field inspection, photography, and measurement of the site was made. Much of the information presented in this evaluation is paraphrased from the comprehensive site form submitted as the product of that archaeological reconnaissance.

The site area includes both sides of Nashoba Brook near where Davis Road formerly crossed the tracks of the Framingham and Lowell Railroad. The brook is impounded at this point by a stone and earthen dam that has been breached. The dominant feature on the west side of the brook is the 18′ X 40′ stone foundation /cellar/wheelpit for a two-story wooden factory that stood on the site. The stonework is 7′6″ high and consists of fieldstone rubble interspersed with irregularly shaped quarried blocks of granite. The north wall of the feature is part of the embankment for the roadway/dam, through which runs a mill race. The mill race exits the foundation at its east downstream corner. Numerous remnants of iron power-transmission components are imbedded in the mill race's streambed. The cellar/wheelpit also contains a large quantity of brick.

The main feature on the east side of the brook is a stone lined mill race, approx. 12′ wide,
that extends from the silted-up swampy land north of the embankment for 120′ in a southwesterly direction before turning northwesterly to return to the brook. Like the west side foundations, the race was constructed of a mix of fieldstone rubble and granite blocks. According to documentary evidence, the east side of the brook was the location of the gristmill that preceded the pencil works; the gristmill disappeared early in the second half of the 19th century. The location of the gristmill could not be determined, though an earth and rubble knoll south of the road and west of the race could represent the archaeological remains of that building. The site of the carding shop could also not be determined.

A number of industrial artifacts are also visible on the surface on the east side of the brook. They include

grinding stones, gate structure, turbine shaft, glass bottle fragments, hand forged nails, stoneware jars???, fragments of farm machinery, steam heating pipes, and a fragment of a cast iron stove.

Pencil making at the site was preceded by other small water-powered enterprises including a carding shop and a gristmill known collectively as Foster's Mills, operated by Uriah Foster during the early 19th century(not on 1794 map but "mills" on 1831 map). In 1832, Wood bought ½ interest in Foster's Mills that included a house, 12 acres of land, and a gristmill and carding shop. Wood may have been making pencils here by 1832. In 1841 Munroe bought Foster's Mills. In a 1915 Railroad valuation survey the larger building at the Pencil Factory site is labeled a house and the smaller building as a shed, suggesting their industrial purpose was no longer evident. The buildings were intentionally burned down by the property owner in the winter of 1961-1962 due to their deteriorated condition.

In the opinion of MHC staff, the North Acton Pencil Factory Site is eligible for listing in the National Register of Historic Places under Criteria A and D at the local level with a period of significance that extends from 1832, when the first pencils were manufactured at the site, to the 1880s, when pencil manufacturing ceased.

The North Acton Pencil Factory Site is significant under Criteria A because of its role in the settlement of the Town of Acton and the role of agriculture and industry in the development of the town and regional economy

The North Acton Pencil Factory Site is significant under Criteria D because it has the potential to contribute information important to history. The site's surface deposits, the high probability of subsurface deposits, the structural remains of the pencil factory and the surrounding landscape serve as an illustration of the evolving lifestyles and practices of several generations of ~~eastern Massachusetts industrialists/farm families.~~ Historic archaeological resources at the North Acton Pencil Factory site have the potential to contribute detailed information on the evolution, layout, and social history of this site in particular and small-scale pencil manufacturing in general. The site maintains integrity of

location, setting, feeling, and association. Three of the structural elements that remain on the site can, with some certainty, be assigned to the 1832-ca. 1885 period associated with pencil manufacturing at the site; they are the mill/house foundation, shed, water power and power transmission features. These elements along with the surrounding landscape could provide a physical context for most of the early stages of development of the commercial pencil manufacturing industry during most of the 19th century. Under criterion D the site is significant because it contains the physical material necessary to answer research questions indicated by documentary and artifactual cultural objects linked temporally and functionally to the site under question. It is clear that the North Acton Pencil Factory Site has the potential to yield additional historical and archaeological information about early American pencil making in general and the specific enterprises that operated here.

A National Register nomination for this property should also discuss the history of the property after the close of the pencil factory ca. 1885 and the survival and adaptation of factory resources up to their destruction in the early 1960s.