



# Council for Northeast Historical Archaeology NEWSLETTER

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*Northeast Historical Archaeology* seeks manuscripts dealing with historical archaeology in the Northeast region, including field reports, artifact studies, and analytical presentations (e.g., physical anthropology, palynology, faunal analysis, etc.). We also welcome commentary and opinion pieces. To submit a manuscript or request preparation of manuscript guidelines, write to Maria O'Donovan, Editor, *Northeast Historical Archaeology*, c/o Public Archaeology Facility, Binghamton University, Binghamton, NY 13902-6000.  
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## CNEHA Facebook Page

CNEHA has a Facebook page! Log onto Facebook and then search for Council for Northeast Historical Archaeology to see announcements about conferences and other updates.

The Council invites professional and avocational archaeologists, historians, material culture specialists, historic preservationists, and students to become members. An application form may be found at <http://www.cneha.org/membership.html>

## UPDATE--*Northeast Historical Archaeology*

Reported by: Maria O'Donovan

Hello! First, I hope everyone has a great summer! Sue McGuire has put together a wonderful collection of articles in Volume 45. This will arrive in your mailboxes in mid-June in time for summer reading. Summer is often the time when attention shifts from classes to field work, research and publication. I encourage all of you to consider publishing in the journal.

The journal has a new electronic location at the ORB, Binghamton University's digital commons site. Your previous bookmarks for Buffalo State should automatically redirect to the ORB but you should bookmark the new location for future reference. The new web address is: <http://orb.binghamton.edu/neha/>.

We have also been busy preparing Volume 46 to send out to you in the fall. This issue is packed with information on the production, identification, and distribution of Philadelphia Queensware ceramics.

Have you purchased the two newest posters in the *Telling Time* series? These posters cover historic lighting and the American Revolution. Posters can be purchased for \$10.00 each plus shipping. For ordering information during the transition, please contact me at [neha@binghamton.edu](mailto:neha@binghamton.edu). Updates on ordering information will be posted in the newsletter.

## NEWSLETTER EDITOR'S REPORT

Reported by: David Starbuck, Newsletter Editor

Please send news for the October issue of the CNEHA Newsletter by September 15 to the appropriate provincial or state editor. Our changeover to an electronic newsletter continues to go well, and we are delighted to be able to send news to our members much more quickly!

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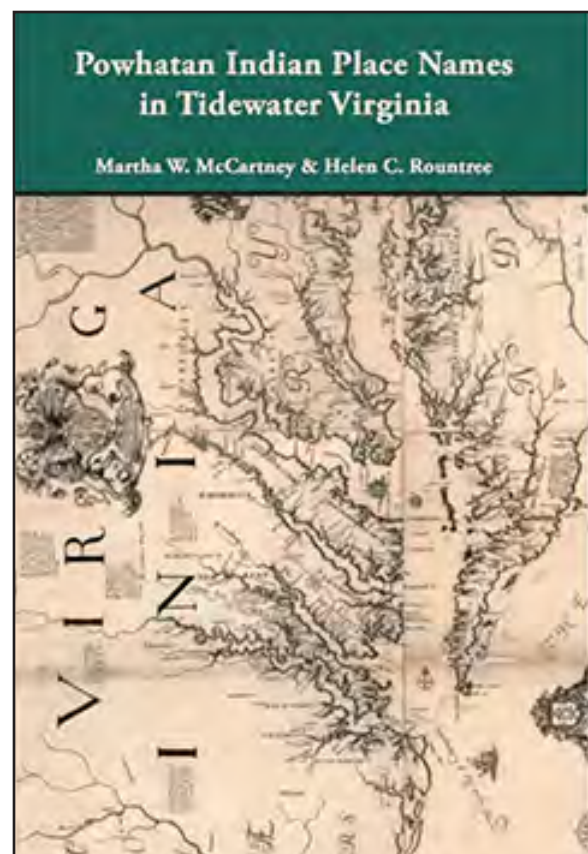
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**NEW BOOK**

***Powhatan Indian Place Names in Tidewater Virginia***

By Martha W. McCartney & Helen C. Rountree

Anyone doing research in eastern Virginia's historical records is certain to encounter Powhatan Indian place names. However, it is often difficult to relate these names to the modern landscape. Within this volume numerous variations of historic Indian place names are



gathered under their most common spelling or modern equivalent. The information included in the thoroughly annotated volume was drawn from land patents, local and regional government records, public and private archives, and several collections of historical maps. This enables researchers to see how Indian place names changed over time and relate them to their equivalents in the modern landscape. The authors have assembled Powhatan place names under a main heading, which consists of their modern equivalent or most common spelling. Beneath that main heading are variations in the place name's spelling, listed in chronological order. This allows researchers to see how names changed over time.

Collectively, the authors have brought to this volume more than eighty years of experience in working with primary sources. This book is available through [www.genealogical.com](http://www.genealogical.com) and through [Amazon.com](http://Amazon.com).

## CURRENT RESEARCH

### Connecticut

Reported by: Cece Saunders

**Masinda Ocean Pearl Button Company, Willington**  
[Data from the Connecticut State Register of Historic Places Form]  
[Submitted by Cece Saunders]

The Masinda Ocean Pearl Button Company/Sharp House and Mill Site is a small-scale, domestic-industrial complex in Willington, CT, developed from the mid-eighteenth through early twentieth century, in part because of Conant Brook water rights available on the site. Initially established as a homestead and sawmill, the property was expanded in the early nineteenth century to include a local gristmill and coffin factory. During the early twentieth century, it functioned as a cottage-scale button manufacturer, with international trade connections, that supported the town's Czechoslovakian immigrant population. The property is reportedly one of the last remaining, complete, button-making shops in the United States.

The surviving Button Mill is a vernacular, one-story, wood-frame building which measures about 26-feet-long by 24-feet wide and has a gable roof. It sits partially on a natural stone ledge at the edge of the dam and partially on stone piers. The southwest corner sits on what used to be the sawmill foundation that once stood in the same area. After the sawmill burned down

in 1907, William Masinda, an immigrant from Bohemia where he had learned the button business from his father, built the smaller button mill as a replacement. The windows are a significant feature that would have been essential for light and air flow; the building did not get electric power until at least 1929. The interior is one open room with exposed roof framing. Pulley systems and belts were attached to the beams in order to run the machines. Thirteen machines, or stations, were originally inside the building, with workstations positioned horizontally in rows east to west.

The process for making shells at Masinda's shop involved a number of individual steps. Shells were soaked for up to a week before circular drills were used to remove blanks of the desired size. The blanks were then tumbled to remove the rough outer layers, and sliced to the appropriate thickness. Pearl buttons to be carved were then artistically treated, polished, and a metal shank was attached. Sew-through pearl buttons were sized and color graded in the blank stage. They were then drilled, polished, and occasionally bleached or dyed. Various designs could then be made. The shop was producing two- and four-hole buttons. Four-hole buttons were worth twice as much and the ability to make them quickly improved with electric power.

The rise and fall of the pearl button industry occurred over a period of seventy-five (75) years. Several factors influenced the decline of the industry. First, the shells had been overfished and there was limited availability. The supply of fresh water pearl disappeared. Tariffs were then placed on imported shells making it too costly to obtain foreign Ocean Pearl shells. Secondly, changing fashion styles required fewer pearl buttons. Lastly, the development and refinement of plastic buttons ultimately caused Masinda's Ocean Pearl Button Company to close. Plastic flooded the markets and Masinda's equipment was unable to make the transition.

The machinery in Masinda's mill may be the oldest button-making machinery in Connecticut still intact in its original location. Many of the button manufacturers in Willington, and elsewhere in the United States, donated their metal machinery to the cause of World War II in order to produce weapons from the recycled materials. Masinda closed and boarded the shop before the war efforts, keeping the machinery intact. While some button-making machinery does exist outside of Willington, few remaining shops have every station used to make a button from start to finish.





*Button Midden, Masinda Ocean Pearl Button Company, Willington, CT (2017)*

The town of Willington provided immigrants from Southern and Eastern Europe the opportunity to become landowners in the beginning of the twentieth century. With the rise of Willington households employed in manufacturing during the nineteenth century, the number of farms decreased. As a result, farmland in Willington was put on the market. Real estate agents advertised locally, but also overseas in areas such as Poland and Bohemia. According to the U.S. Immigration Commission, the movement of Czech immigrants to the farms in Willington “was not due to any stimulus other than the advertising of real estate agents in Bohemian or Polish papers.” Few of the immigrants had any practical experience as agriculturists, but purchased the land and traveled together as part of a social network.

The composition of Willington’s population was completely transformed in the years between 1900 and 1930. The percentage of foreign-born residents dramatically increased in those years from about 10% to 80% as immigrants from Southern and Eastern Europe purchased farmland. Much of the land purchased by Czech immigrants was in very poor condition and practically every Czech immigrant in Willington faced exploitation and fraud during the sales.

Fortunately, William Masinda purchased property with

an existing mill facility, water rights, and farmland. This incredibly well-informed purchase benefitted his fellow Czech immigrants in need of supplemental income. Pearl-button making had many advantages to Czech farmers. For example, the farmers could attend to their crops when their attention was needed, and return to the factories when the rush for farm work was over. In addition to a flexible schedule, the machinery necessary for button making was very simple and the investment was not large. The raw material was also easily obtained and there was always a ready market for the finished product. More importantly, these Czech immigrants were from the Bohemia region, famous for their button making craft, and were highly skilled laborers. The company employed fifteen button makers, all of which were Czech immigrants. After Masinda began his button making shop, the town grew to have as many as eight button factories.

The Masinda Ocean Pearl Button Company mill site contains a large number of structural features such as stone walls, a cart path, dam, mill pond, and penstock. In addition, to these typical mill components, the site contains a button scrap yard with button-blanks, scrap shells, metal and pin punches relating to the industry on the site that transitioned the site from a grist and saw-mill to a button-making shop between 1740 and 1938.

Although the site has not been subjected to systematic archaeological testing, the integrity of the site appears to be intact. There is a visible midden located adjacent to the mill building and contains debris related to button manufacturing. No vehicles have been allowed on the property to damage the top layer. This midden has the potential to yield important information relating to early small-scale industrial development in general and detailed information regarding the manufacture of buttons. Despite the exotic nature of the raw material used for manufacturing buttons, the extensive midden documents a large amount of waste material and suggests that the abalone shell was easy to procure.

### New Jersey

Reported by: Lynn Rakos

#### Archaeology at the Van Wagenen/Apple Tree House in Bergen Village, Jersey City

[Submitted by Hunter Research, Inc.]

Beginning in 2004 and culminating in 2016, the Van Wagenen House, also known as the Apple Tree House (named for a backyard repast beneath an apple tree purportedly shared by George Washington and the Marquis de Lafayette), was the subject of a major restoration and site improvement project by the City of Jersey City. Listed in the New Jersey and National Register of Historic Places, this property occupies one of the original

lots laid out in the Dutch-American village of Bergen in 1660. Archaeological investigations were performed in conjunction with the restoration project at various times throughout the 12-year-long endeavor. The final episode of testing and monitoring, conducted in the spring of 2016, produced unexpected and tantalizing evidence of an early colonial house.

In 2004-05, the Van Wagenen/Apple Tree House was the focus of a preservation plan and National Register of Historic Places nomination completed by HMR Architects. These documents posited a three-phase sequence of development for the house that presently stands on the property. A one-story stone wing, today incorporated into the existing structure, was tentatively interpreted as a free-standing pre-Revolutionary building from the initial phase of occupation; the second and third phases of construction were more securely dated to around 1840 and 1860, respectively.

It remains unclear from the historical record exactly when this original Bergen village lot was first developed. It was initially held by Arent Laurens, but was acquired by Gerrit Gerritsen in 1688. Gerritsen, from Wageningen in the Netherlands, or his son Johannes (who took the surname Van Wagenen), may have been the first to erect a house on the property, but the earliest definitive evidence of Van Wagenen family members living there does not occur until 1721, courtesy of

Figure 1.  
*The restored  
Van Wagenen/  
Apple Tree  
House,  
February  
2017.*







Figure 2. *Foundations and filled cellar of late 17th/early 18th-century predecessor of the existing Van Wagenen/Apple Tree House, April 2016.*

marriage records relating to two of Johannis's sons. The property passed successively from Johannis to his grandson, also Johannis, in 1759, to the younger Johannis's widow Nesia in 1797, and then shortly afterwards to their son Jacob, and on to his son Hartman in 1839. It remained in the hands of the Van Wagenen family and their descendants until 1947, then enjoying a brief period as a funeral parlor, until it was acquired by the City of Jersey City in 1999.

Archaeological work in this instance was conducted as part of the restoration project's compliance with the New Jersey Register of Historic Places Act. In 2004, 2006 and 2009-10, several episodes of archaeological testing and monitoring were conducted on the property under the direction of Dr. Ian Burrow. This work mostly took place in the area immediately surrounding the house and encountered a one-foot-thick, midden-like domestic yard accumulation beginning at a depth of approximately two feet below the present-day ground surface. This deposit produced an abundance of arti-

facts of early 18th- through late 19th-century date. The critical conclusion was reached that this was likely to be one of the few remaining sites within the core of Bergen village that might still yield intact late 17th- and early 18th-century features.

The most recent phase of archaeological testing and monitoring, conducted in 2015-16 under the supervision of James Lee, Josh Butchko and Andrew Martin, addressed the various site improvements planned for the yard around the house. An initial phase of archaeological work in late 2015 involved monitoring of tree and asphalt removal followed by excavation of 68 shovel tests and five excavation units in locations where deep ground disturbance was proposed. This work resulted in the discovery of a lime slaking pit to the rear of the house, probably associated with the circa 1840 construction of the southeast wing, and confirmed that a buried occupation layer dating from the 18th and early 19th centuries survived over much of the site at a depth of 18 inches to two feet below grade.

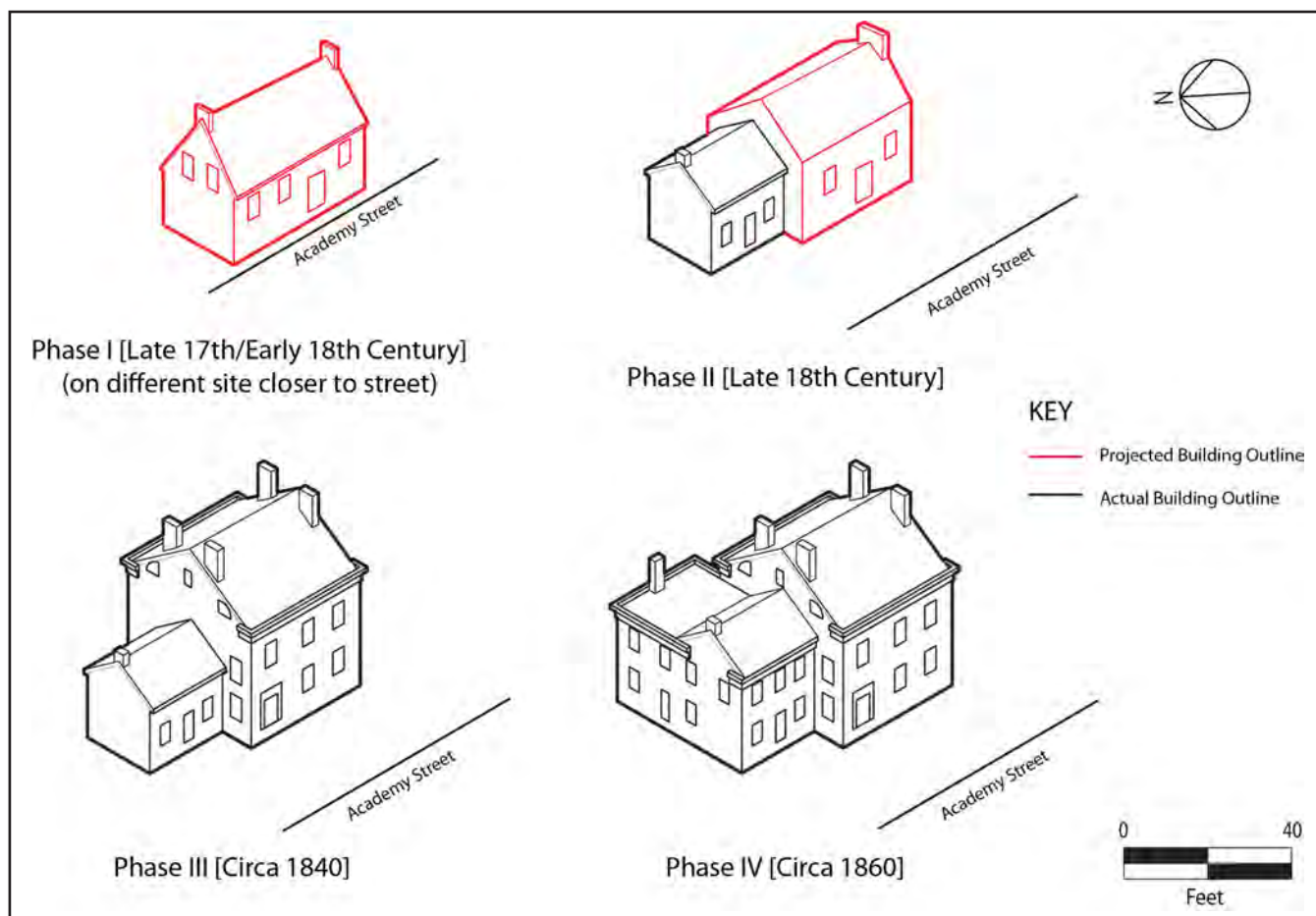


Figure 3. *Revised hypothesized four-phase sequence of houses on the Van Wagenen/Apple Tree House property.*

Monitoring of construction activity (chiefly trench excavations for a retaining wall, drainage pipes and electric lines, and excavations for tree plantings) then took place in the spring of 2016. This work resulted in the discovery of a cellar foundation from an earlier house that was positioned lengthwise along Academy Street in front and to the west of the existing house. The cellar measured 18 feet by at least 24 feet and its north-eastern wall survived to a height of almost three feet. The house associated with this cellar is thought to date from the late 17th or early 18th centuries and to have most likely been a one-and-a-half-story stone structure. As a result, a revised four-phase sequence of architectural development has been put forward for the Van Wagenen property in place of the previously postulated three-phase sequence. This new interpretation views the one-story stone kitchen wing incorporated within the currently standing building as a late 18th-century appendage to a predecessor (no longer standing) of the existing main section of the house.

The monitoring program of 2016 also encountered remains of a square stone-lined privy, a brick cistern and a third possible shaft feature of uncertain func-



Figure 4. *Mid- to late 17th-century Westerwald stoneware sherd with molded owl motif, probably from a tankard or jug.*



tion, all probably of 18th-century date. These features have been left largely intact. In front of the existing house, traces of a late 19th/early 20th-century stone and brick stairway (now removed and replaced) were documented leading down to the street, while the brick and concrete footings of the circa 1900 residence at 304 Academy Street were recorded close to the property's northwestern boundary. Few significant items of material culture were recovered from securely stratified deposits in 2016 (in part a function of the monitoring process), but among the artifacts of particular interest are a sherd of probable late 17th-century Westerwald stoneware bearing a rare molded owl ornament and two pipe bowls of early colonial date.

In summary, the various archaeological investigations at the Van Wagenen property have yielded much valuable subsurface data. This work has enhanced our knowledge of the existing house and its immediate surroundings and produced vital evidence of the earliest occupation on the site. Despite the destructive effects of some of the recent restoration and site improvement activities, the property still retains considerable archaeological potential, most especially in the rear yard and in pockets of undisturbed ground in the front and side yards.

A technical report on the work conducted in 2015-16 can be viewed at the Hunter Research website: [www.hunterresearch.com](http://www.hunterresearch.com)



## Delaware

Reported by: Lu Ann De Cunzo

### The Chalybeate Spring of Brandywine Springs Park, New Castle County

[Submitted by Bill Liebeknecht, Regional Manager for Dovetail Cultural Resource Group, Wilmington office. <http://www.dovetailcrg.com/>]

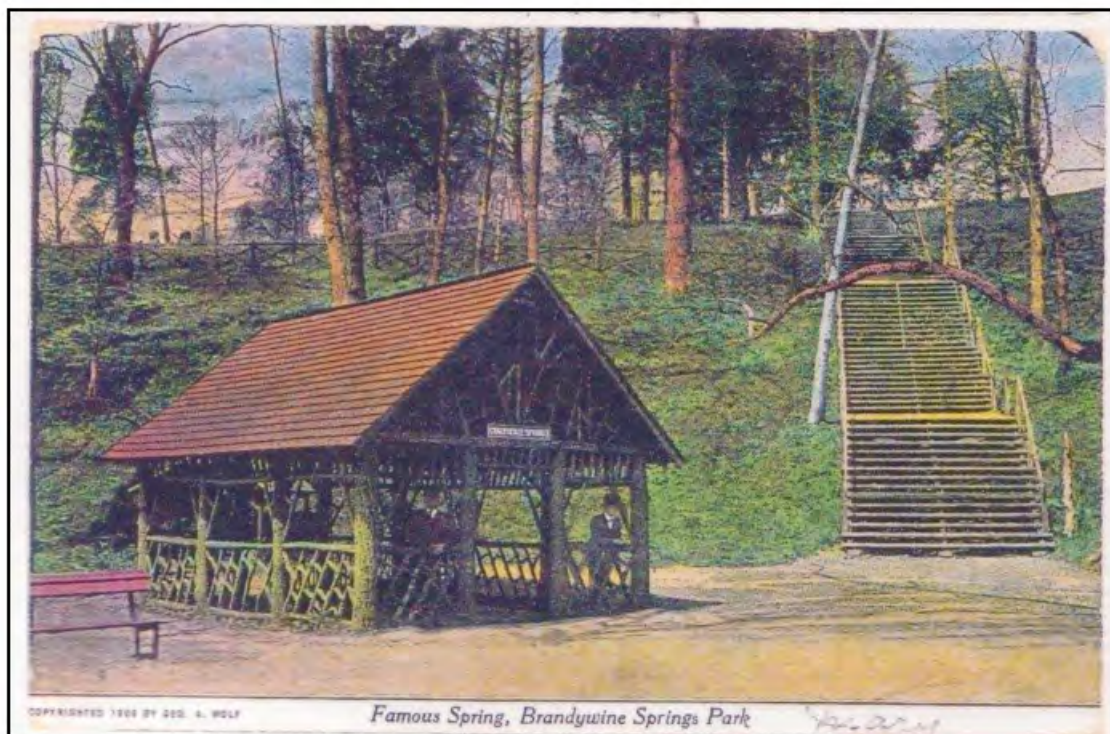
In 2016 Dovetail Cultural Resource Group was hired by the New Castle County Parks to conduct archaeological investigations at the Chalybeate Spring. An article describing the full excavations is in the works and scheduled to be in an upcoming issue of the Bulletin of the Archaeological Society of Delaware. <http://www.delawarearchaeology.org/> (See the links to the Bulletin and Membership pages.)

From 2013 to 2015, the Friends of Brandywine Springs (FOBS) conducted archaeological excavations at the Chalybeate Spring to re-expose the spring and restore it to its former glory. As part of their restoration efforts, the Friends also sought to build a picnic pavilion replicating the rustic early-twentieth century structure once located on site. Construction of the replica pavilion required grading across the believed building site for the construction of a new retaining wall. The FOBS brought Dovetail on board to explore the site archaeologically prior to any ground-disturbing activity to learn more about the earlier pavilion in this area.

As is occasionally the case, the archaeological investigations found evidence contrary to the most recent interpretation of the site. In this case it was assumed that the spring had been covered by slope-washed materials from the adjacent hillside. This is a logical assumption since there were signs of erosion consisting of a ditch-like rivulet running down the hillside towards the spring. The Dovetail investigations revealed data that suggests that the spring was covered by two substantial overbank flood deposits from the adjacent Hyde Run.

The iron-rich springs with their apparent healing powers were first discovered by Native Americans. In New Castle County, Delaware, a "Yellow Spring" was located on Letitia Manor, a large estate owned by Letitia Penn, daughter of William Penn. During the early-nineteenth century, two stepped rows of large

Figure, left: An etching of the spring house by Robert Shaw in a view reported to date to 1904, but likely dates earlier (Lawlor 2013:1).



*Colorized postcard of the pavilion at the "Famous Spring, Brandywine Springs Park" copyrighted by George A. Wolf and dated 1909 (Wolf 1909).*

rectangular stone slabs made of Chester Park Gneiss were placed around the spring to protect the head. In all likelihood a spring house was positioned over the gneiss slabs following the square outline.

In 1826 the Brandywine Chalybeate Springs Company purchased the property and began construction of an elaborate Federal-style hotel and spa. A map by Benjamin Ferris depicted a spring house with arches and columns reflecting the colonial style which is strikingly similar to the seventeenth-century Chalybeate Spring in the village of Quarndon in Derbyshire, England. Construction of the spring house depicted by Ferris may never have come to fruition as a note on the map states "Omit now." By the early 1830s, documents clearly show that an eight-sided, two-story, Gothic Revival-style spring house was erected with a protective wrought iron railed enclosure capped at the corners with solid spheres anchored into the inner lower row of gneiss slabs. This spring house was depicted by well-known architect/painter Thomas Ustick Walter in 1833 and Robert Shaw in an undated etching. At this time, in keeping with contemporary architecture, it is likely that a protective marble collar was installed around the spring head.

During the late-nineteenth century, new proprietor Richard Crook shifted focus of the property from resort-spa to resort-amusement park, erecting a restaurant and a toboggan slide in a grove down from the

Chalybeate Spring. A photograph taken in 1895 shows that the spring house was no longer present and only the wrought iron railing enclosure remained. In 1901 and 1903 massive floods inundated the spring and the surrounding flood plain with between 8 and 10 feet of water. Shortly after the second flood the spring was dug out and surrounded by a 16-foot-square rustic picnic pavilion over the spring. At that time repairs were made which improved the flow of water and protected the spring from future flooding events. The marble collar was extended upward with white-washed brick/terra-cotta block. A wooden sump box and pipes were added at a higher level inside the collar to improve the drainage around the spring and retard erosion. The pavilion remained in use until 1923 when the amusement park closed its doors. By the middle of the twentieth century, the pavilion was no longer present and the area became overgrown.

Mapping of the gneiss slabs surrounding the spring exposed by the FOBS revealed eight pin holes. These holes, when connected, form an octagon 5.5 feet on a side. This octagon correlates perfectly with the early-nineteenth century, two-story building depicted by Thomas Ustick Walter in 1833. This building is an apparent copy of the well-known seventeenth century stone enclosure around the Chalybeate Spring in Quarndon, England.

This revelation gives the park staff the ability to now





*Exposed Chalybeate Spring prior to Dovetail investigations.*



*Excavation Unit 1 showing the top of the lower flood package with wood and organic debris facing south. This level has been interpreted as the 1901 flood.*

interpret the nineteenth and early-twentieth century structures at the same time. The new pavilion replicating the early-twentieth century structure, once completed, may display the circa 1826 watercolor map by Benjamin Ferris, the spring house and resort depicted by Thomas Ustick Walter in 1833, and the sketch by Robert Shaw. An outline of the earlier eight-sided structure could be visualized by connecting the eight holes in the upper row of slabs with a wooden frame to show the location of the former structure. Reconstructing the earlier structure is also an option, but would be less functional and may encourage consumption of the overly iron-rich spring waters which are considered no-longer healthy or even safe.

### References

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1909 Postcard. United View Company, Wilmington, Delaware

### Pennsylvania

Reported by: Wade Catts

### I-95/Girard Avenue Improvement Project, Philadelphia

[Submitted by George Cress and Doug Mooney]

AECOM is currently conducting ongoing Phase II and III investigations for the I-95/Girard Avenue Improvement Project in Philadelphia. This work is being performed for the Pennsylvania Department of Transportation (PADOT) and is associated with the comprehensive re-design and re-construction of a three-mile long section of the highway along the Delaware River. This segment of I-95 was built in the late 1960s and early 1970s at a time when Section 106 compliance studies were in their infancy, and was constructed without prior systematic cultural resource investigations. The recent improvements range from highway widening, new utilities, landscaping, and improving access to Philadelphia's Waterfront. The project winds along the western banks of the Delaware River through portions of the Northern Liberties, Kensington, Fishtown, and Port Richmond neighborhoods north of center city Philadelphia. These investigations represent some of the first comprehensive archaeological studies performed along this important transit corridor within the city.



Prior to European settlement this locale was home to a thriving Native American population for thousands of years, and was at the core of the Lenape (Delaware) homeland. In the 17th century this area was home to some of the earliest European (Swedish, Dutch, and English) settlements; in the 18th century it developed into a hub of the vital shipping industry; and in the 19th and 20th centuries it was transformed into an industrial manufacturing center and played a key role in transforming Philadelphia into the “Workshop of the World”. While the construction of I-95 had a devastating impact on archaeological resources in central Philadelphia, these investigations have demonstrated that impacts to sites northeast of central Philadelphia were much less severe and have documented evidence of multiple well preserved archaeological deposits, both adjacent to the highway and extending underneath the existing roadbed.

Since archaeological investigations began in 2007, 14 historic sites and 10 prehistoric sites have been docu-

mented. The earliest Native American site identified in Philadelphia was excavated with a hearth dating to 3600 B.C. Other Native American sites have been dated to the Late Archaic through Late Woodland. Of the historic sites, four are comprised of full city blocks representing over 100 properties with several hundred features identified in each block dating from the late 18th through the early 20th century. Investigations are currently underway in sections of city blocks in the Northern Liberties, and as the project sites are now located closer to the historic center of Philadelphia, the majority of artifacts date to the 18th century.

A significant early industrial site was also excavated, The Dyottville Glass Works, one of several glassworks in the area and recognized in the 19th century as one of the most impressive industries founded during the early Industrial Revolution in the Philadelphia region. The glassworks, located on the north bank of Gunner’s Run in the Kensington District of Philadelphia, was founded in 1816 and remained in operation throughout the 19th



*Excavation of the Dyottville Glass Works.*



century.

By far the largest number and most significant artifacts have been recovered from privies. To date, approximately 450 shaft features have been excavated. The artifact deposits have been recovered from wood-lined box, barrels or brick lined privy shafts across eight city blocks of properties providing a cross-section of domestic life along the waterfront.

The I-95 project is providing valuable insights into the occupants of the 19th century waterfront neighborhoods of the Northern Liberties, Kensington and Port Richmond. Over one million artifacts have been recovered and as the ongoing artifact analysis proceeds, it is clear that many of the artifacts are directly related to the occupations of the residents. Many of the artifacts are being found in privies just west of the glass factories, in neighborhoods where glassworkers, fishermen, and shipwrights resided. The glass objects recovered reveal how strongly glassmaking shaped the identity of the neighborhood, and how the glass industry helped create a material culture signature that sets this vicinity apart from other Philadelphia neighborhoods.

Given the incredibly complex nature of the I-95/Girard Avenue project, AECOM was given permission by PennDOT and FHWA to develop an innovative, all-digital, and internet based report format as the primary means for documenting and sharing archaeological data generated by the investigations. The *Digging I-95* interactive report ([www.diggingi95.com](http://www.diggingi95.com)) provides access to enhanced digital information for members of the public, government agencies, and professional archaeologists, and does so in a manner that both meets current reporting requirements and makes use of 21st century technologies. Public awareness and interest is enhanced through the interactive report, where visitors can explore as they please via their computers or any web-enabled devices. Most importantly, this format strives to make the archaeological record of the Delaware Waterfront accessible in a much more timely and interactive manner than would be possible with traditional reporting formats. And this experiment in cultural heritage reporting can only take place because of PennDOT District 6-0's unflagging support and dedication to better share the results of the I-95 investigations with the world.

Most recently, AECOM has created its own professional archaeological journal, *River Chronicles*, as yet another means for sharing project findings and research



*AECOM Journal, Volume 1 2016*

with a broader audience. This journal provides a means for members of the project team to gain valuable experience presenting original research to the public and professional communities in a manner that is both informative and accessible. Volume 1 of the *River Chronicles* was published in 2016, while Volume II will be available later this year and will focus on the history, archaeology and artifacts of the Dyottville Glass Works excavation. To start exploring now, go to [www.river-chronicles.com](http://www.river-chronicles.com).

## **Maryland**

Reported by: Silas D. Hurry

### **St. Leonard: Announcing the “Maryland Unearthed” Website**

[Submitted by Patricia Samford, Maryland Archaeological Conservation Laboratory, Jefferson Patterson Park and Museum]

***Maryland Unearthed:*** A Guide to Archaeological Collections at the Maryland Archaeological Conservation Laboratory is a searchable online database of 268 archaeological sites curated at the Maryland Archaeolog-

ical Conservation Laboratory. This database, located at <http://jefpat.org/mduneearth/index.aspx>, details data about the specific research and educational potential of each site. The main menu gives users access to the three areas of the site:

**Browse Sites** – General information about each site, including site type, a brief description and number of archaeological features is available here. Users can also access the site summary pages here through the site number links, as well as access more detailed site descriptions from the Maryland Historical Trust's Archeological Synthesis Project.

**Map Search** – If a user is interested in archaeological sites from a particular county or city, he or she can easily search the database through the map search function.

**Search Database** – This area includes an on-line search feature that allows users to interrogate the context database, which contains over 4,000 records from 268 sites ranging in date from over 12,000 years ago to the mid-20th century.

The Maryland Archaeological Conservation Laboratory is an archaeological research, conservation, and collections storage facility located at the Jefferson Patterson Park and Museum in southern Maryland. The MAC Lab serves as a clearinghouse for archaeological collections recovered from land-based and

underwater projects conducted by State and Federal agencies throughout Maryland. The primary audience for this web site includes archaeologists and historians interested in learning more about the archaeological collections housed at the Maryland Archaeological Conservation Laboratory at Jefferson Patterson Park and Museum. These collections are available for study and research and this web site will make it easier for researchers, students, educators, museum curators, and others interested in Maryland's past to plan research visits to the lab.

## Atlantic Canada

Reported by: Amanda J. Crompton

### Finding Daub

[Submitted by Jonathan Fowler, Saint Mary's University, Halifax, Nova Scotia]

Recent tests with the Geonics EM38B ground conductivity and magnetic susceptibility meter in Nova Scotia, Canada, have demonstrated the instrument's ability to detect faint evidence of burning. This may be of interest to archaeologists searching for ephemeral sites, particularly those dating to the early colonial period. In our tests, we discovered the instrument could detect and map even very small amounts of fire-hardened daub (Figure 1), which in some cases may be all that remain of domestic architecture.

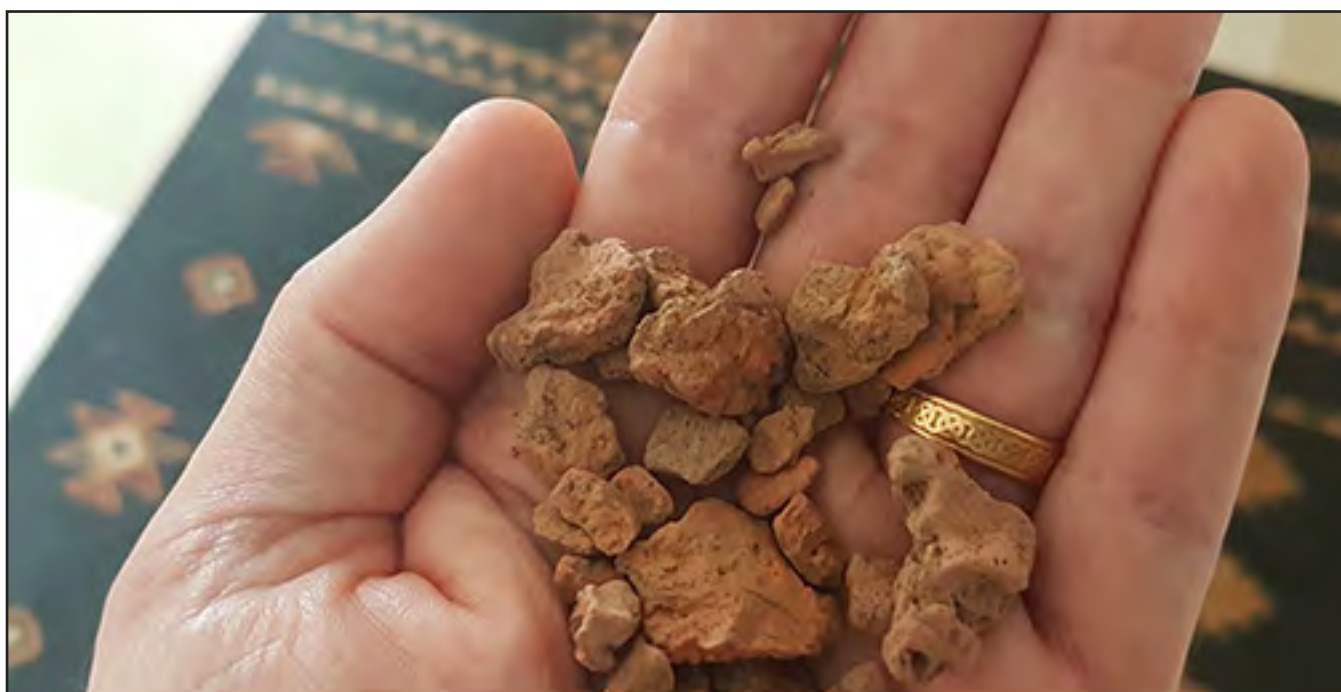


Figure 1: *Approximately 18 grams of fire-hardened daub, the remains of an early colonial building that had been destroyed by fire.*



The ability to detect burning with magnetic susceptibility has been known for a long time, and is possible because burning can transform hematite to maghemite and magnetite, a process is known as the Le Borgne Effect (Clark 1996). Hematite is ubiquitous in soils but is not highly magnetic, while maghemite and magnetite are magnetically susceptible. Thus, the residues of fire, whether they be in hearths, ash scatters, or at sites where buildings have been burned, create magnetic footprints that are visible to instruments like the EM38B.

The EM38B collects two types of data simultaneously: a quadrature phase response (conductivity), measured in millisiemens per metre (mS/m), and an inphase response (magnetic susceptibility), measured in parts per thousand (ppt) (Gater and Gaffney 2006:43). Soil conductivity is primarily a function of moisture content, which serves as a proxy for soil porosity, type, and the presence or absence of archaeological features. Magnetic susceptibility is a function of many variables that produce concentration of magnetic minerals. The presence of mafic rock will do this, which is one of the reasons why magnetic susceptibility can be a good method for detecting buried stone footings, hearths, and cellars (e.g., Fowler 2014; 2013; 2006; Fowler et al. 2016).

In vertical dipole mode (coils perpendicular to the ground) the EM38B effectively detects magnetic susceptibility to a depth of 50cm (Dalan 2008:4), which encompasses the plough zone in agricultural contexts as well as the zone immediately beneath, and conductivity to a maximum depth of 1.5m (Clay 2006:83), but most effectively to less than 1m (Dalan 2006:177). Data are recorded as a series of x,y,z values that may be displayed in tabular form, where x and y represent survey grid co-ordinates and z represents the geophysical response. These values may in turn be displayed as line data resembling a seismograph or electrocardiogram (see below), but are generally plotted as 2-dimensional contour, greyscale, or hillshade maps.

Complementarity is one of the fundamental lessons of archaeological geophysics: no single geophysical method is 'best,' for each measures different soil properties. The most instructive picture of an archaeological site is generally revealed when it is surveyed by multiple methods. The EM38B achieves complementarity with each survey by measuring two geophysical properties simultaneously. Figure 2 shows the conductivity and magnetic susceptibility responses as the instrument passes over a buried stone wall footing during a recent survey at Fort Edward National Historic Site (<http://www.pc.gc.ca/en/lhn-nhs/ns/edward/index>). Note

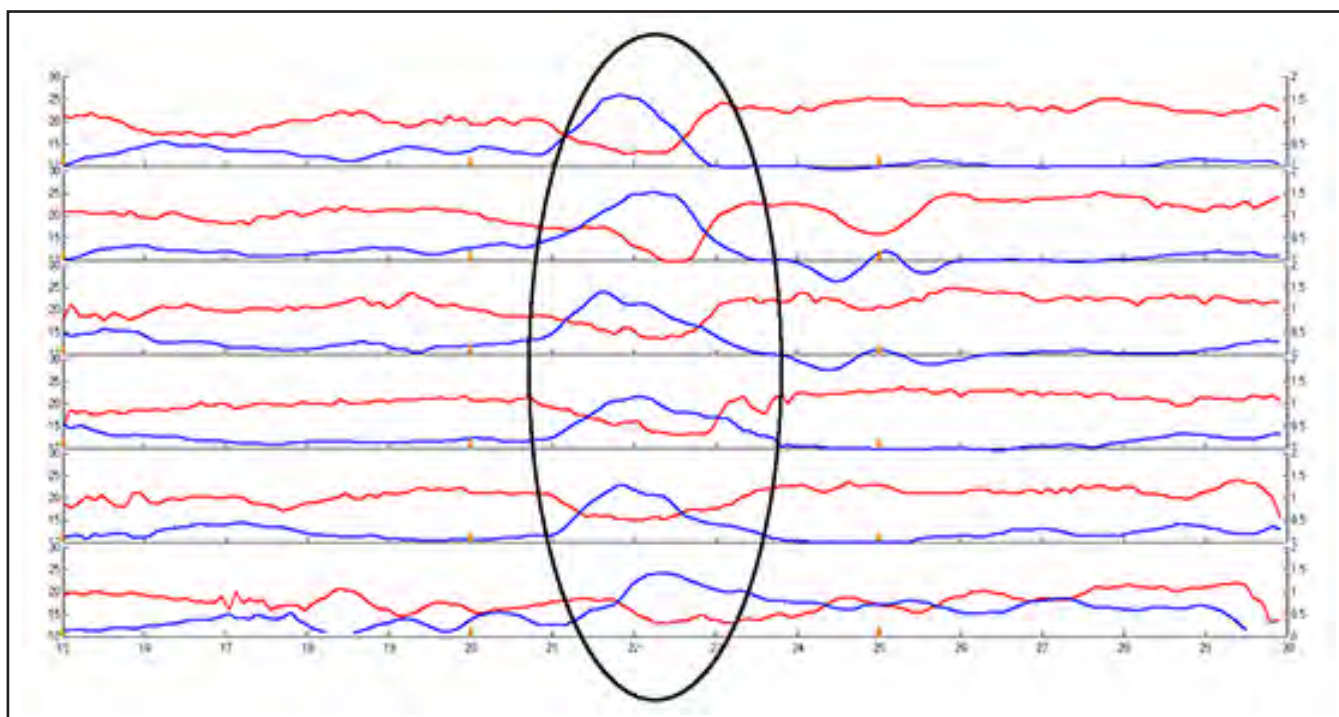


Figure 2: Line data demonstrating the inverse relationship between the conductivity (red) and magnetic susceptibility response (blue) as the instrument makes several parallel transects over a buried wall footing at Fort Edward National Historic Site. The x-axis counts meter marks along the survey lines. The magnetic susceptibility of the stone wall footing produces a strong anomaly measuring between 1.2-1.5ppt.

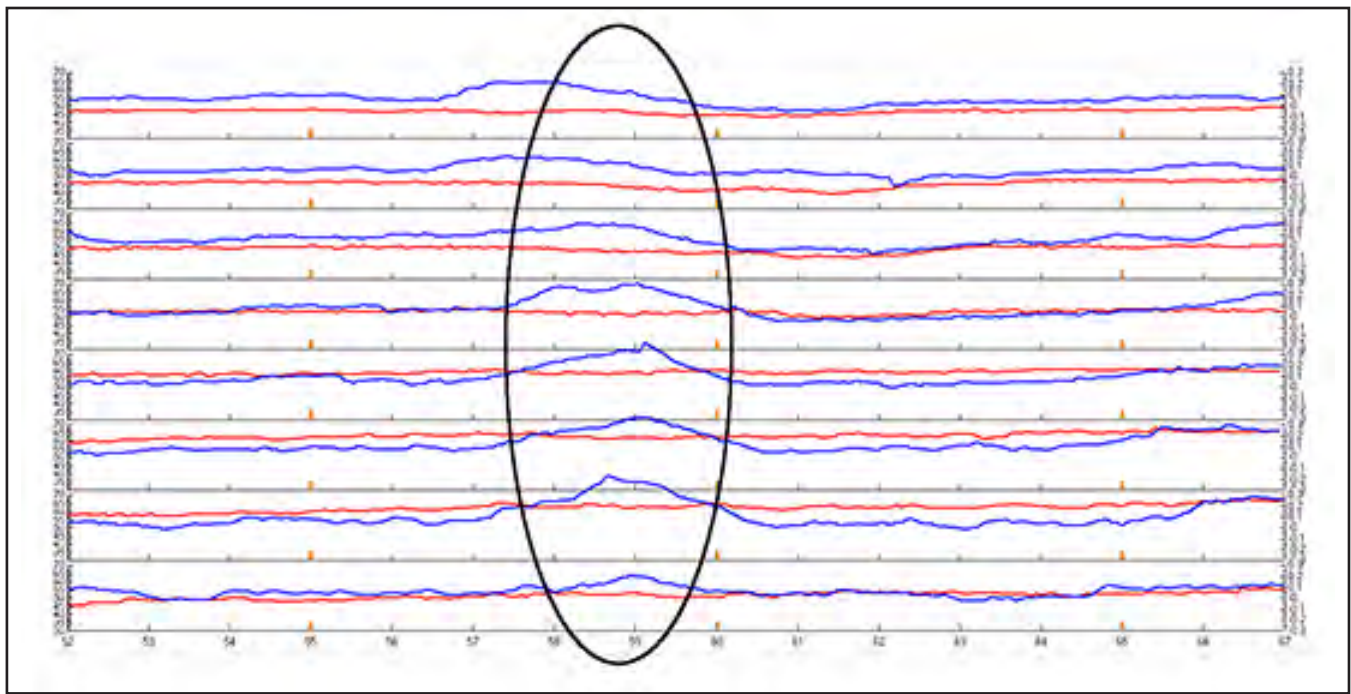


Figure 3: Line data indicating the position of a wall of a timber building burned in situ. The burning enhanced the magnetic susceptibility of the soil (blue line) and left intermittent traces of fire-hardened daub. However, because the building did not have a stone footing, there is no significant conductivity anomaly (red line), nor any other significant archaeological evidence of the structure. Note that the vertical scale of Figure 3 differs from that of Figure 2. In this case, the magnetic anomalies caused by the burning measure only ca. 0.15-0.4ppt (approximately 20 per cent of the size of the anomalies caused by the stone footings).

how the response from the stone elevates the magnetic response (blue) while at the same time depressing the conductivity response (red). This is expected, for magnetic susceptible minerals are more concentrated in the stones than in ambient soils, while soil is also more conductive than stone because soil pores contain much more moisture than the stones.

During our 2015 season at Grand-Pré National Historic Site (<http://www.pc.gc.ca/en/lhn-nhs/ns/grandpre/index>), we detected a different kind of feature (Figure 3). It was very slight, but nonetheless very real. In this instance, a more muted magnetic response appeared, rather perplexingly at first, without the accompanying significant depression in conductivity values.

Test excavation revealed the cause to be a scattering of fire-hardened daub fragments, forming the outline of a rectangular building (the survey lines in Figure 3 cross one of its walls). Our excavations could find evidence of neither stone footings nor post holes, which suggests the structure may have stood upon a wooden sill. Architecture like this can be devilishly difficult to see archaeologically. However, because this building was burned, a faint scattering of daub, like fire-hardened confetti,

outlined its footprint. This ghost structure would have been nearly impossible to trace with normal excavation techniques, and in fact over a century of antiquarian and archaeological investigation had missed it, but magnetic susceptibility recovered its footprint even where physical evidence eluded the naked eye.

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