

Abstracts of Papers for the Eighteenth Annual Conference on New England Industrial Archeology

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“Nineteenth Century manufacturing in a country town: The Noble & Cooley Drum Shop 1854-2004”

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Keywords: vernacular manufacturing technology

Noble and Cooley, founded in 1854 as a manufacturer of toy drums, has continued to produce toys, professional drum sets and drum related furniture for 150 years. They produced marching drums for the Union Army during the Civil War. The "Old Drum Factory" as it is known in its home town of Granville Massachusetts was one of the highlights of SIA's 1998 fall tour of the Connecticut Valley. The historic enterprise is finding it increasingly difficult to manufacture drums at a competitive price. Intense foreign competition, changing marketing systems and competition from electronic and a wider variety of toys for children have decimated the toy drum market.

The drums are made with a fascinating group of historic vernacular machinery; much of it invented and built by the owners around 1900. The "new" mill building, dating c. 1870, is a well maintained example of "country factory" of the period and preserves some overhead pulley and leather belt drive systems and artifacts of the original water power system.

Noble & Cooley is now engaged in considering alternative plans for the factory. A committee of volunteers is developing a plan to examine possibilities for preservation as a museum dedicated to "Yankee Ingenuity" with a mission of preserving the manufacturing technology of small, late-19th century establishments. The committee welcomes preservation ideas from SIA members and the general public.

**“An Architect and Engineer in the early nineteenth century:
Alexander Parris’s engineering projects”**

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Keywords: structures, architect-engineers

Alexander Parris (1780-1852) today is known only as an architect, the author of monumental granite buildings such as St. Paul’s Church, Boston (1819-20); Quincy Market and stores, Boston (1824-26); and the Stone Temple, Quincy (1827-28). But Parris actually spent more of his professional life working as an engineer than as an architect. This paper will present Parris’s important although little known engineering projects, including lighthouses in Maine, beacons, and examples of novel structural engineering solutions in buildings, e.g., a solid masonry, vaulted gunpowder magazine in Chelsea, Mass. A purpose of the presentation is to call attention to the fact that in the nineteenth century, many architects also worked on engineering projects and some, like Parris, were accomplished engineers.

**"Somerville Electric Light Company: 1887 - 1903
The design and evolution of a successful enterprise"**

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Keywords: Early power plant, street lighting, electrical progression

The original powerhouse of the Somerville Electric Light Company was located on the corner of Webster and Concord Avenue, in Somerville Massachusetts. This was a temporary powerhouse, allowing the company to startup, to erect their signature poles - square poles ! - and string up miles of redundant circuits to arc lamps along city streets. Because of increasing demands for electricity, the company soon moved into a larger modern powerhouse on Willow Avenue. My presentation will discuss the evolution of the company’s Willow Avenue powerhouse during the period 1889 to 1903. After 1903 the company merged with The Edison Electric Illuminating Company of Boson.

The power plant was comprised of a brick boiler house, a square stack, engine generator building, coal storage, offices, shops and barn for six horses. The original 1889 equipment consisted of boilers set with the Jarvis furnace (pre B&W days), 80 pounds pressure steam regulated by an automatic damper, and three 90-horse power steam engines. The flywheel of each engine was connected to the pulleys of two electrical generators by linked leather belts. There were five arc light generators supplying street

arc-light circuits. The company also supplied five customers with incandescent lights: City Hall, Tufts College, a printing company, and two others. Each customer was given a large DC battery bank installed in their basement to supply the incandescent lamps wired in the building. Each battery maintained a full charge by running a special charging generator back at the Willow plant.

The power plant was upgraded a number of times to take care of growing loads, to accommodate more efficient equipment to reduce cost, and adopt newer technologies. For example, on site batteries gave way to generating alternating current 24 / 7. Old generators were replaced by large direct coupled AC machines. Wooden switchboard was replaced with the latest GE factory assembled slate switchboard. Circuit breakers, instruments, lightening arrestors, insulators, all overhead lines were gradually changed for three phase 2200 volt AC service. Pole mounted transformers were installed to reduce the voltage from 2200 for use at 120 volt AC. On the steam side, condensers were installed to reduce steam consumption and fuel costs. A cooling tower was also provided. Larger and more efficient steam engines were installed, featuring the vertical tandem compound Corliss steam engine. These upgrades were well documented in corporate records.

As expected, the original power generating equipment is long gone. The 1889 boiler building and stack were quickly demolished by BECO soon after the 1903 takeover. The generator building became an indoor substation until the twenties or thirties when a new substation was built at the rear of the property. Obsolete substation equipment was abandoned in place. My historical research is based on primary records, text books, technical journals, and newspapers. The presentation will include old and recent photographs. I will also report on the status of an initiative sponsored by the Somerville Museum.

"New Palmer River Iron Works of Rehoboth, Massachusetts"

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Key words: Bloomery, wrought iron, Cumberlandite, forge Author:

The early 1700's were marked in the Bay Colony by substantial growth in the number of bloomeries in the direct process of making wrought iron, as well as blast furnaces making brittle cast iron. The number of blast furnaces reported to the British appears to be reasonably accurate, but there were numerous bloomeries, being small, that avoided being on the Bay colonies trade reports. The New Palmer River Iron Works was one of these unknown bloomeries. It was located in Rehoboth, a town of the Massachusetts Bay Colony, between the bog ore swamps, lake bed ore sites of the southeastern part of the colony, and the mountain ore sites of Cumberland, (then part of Rehoboth, renamed Attleborough Gore, and now part of Rhode Island).

Water rights were declared, commencing Mar. 17, 1721 for the New Palmer River Iron Works, a bloomery making iron from bog ore. It was sold to Boston merchants in 1735. The bloomery apparently tried to revert to mountain ores from nearby Cumberland, and ceased operations as a bloomery in 1757.

The ore bed swamp, a beaver pond, adjoins the iron works, but appears to have been substantially used up. There are large pieces of Cumberlandite on the site, a unique mountain ore found only at Iron Mine Hill in Cumberland, RI., and deeds exist that show a probable connection between Cumberland ore sites and this site.

Deeds at the Taunton, Massachusetts Registry of Deeds identify the equipment of the New Palmer River Iron Works. It is possible to estimate the value of the iron works from these descriptions . Significant amounts of scoria residue from the iron-making process have been found at the site, one sufficiently intact to estimate furnace size. Also found under rubble in a barn at the site were a large pair of tongs, too big to be used for ordinary farm blacksmithing.

In 1680, the Kingsleys, who later spearheaded the establishing of the iron works, were identified as orphans by the town. The guardian has never been firmly identified, and it has never been established where the “old” Palmer River Iron Works was located. Both are significant because it is nearly impossible to jump into iron making without a technical resource as well as money. The candidates for role as guardian, mentor and teacher are under study. Also under study are 2 more small bloomeries as well as another site with a “hammer that goeth by water”, in this same part of the Rehoboth Province of this Massachusetts Bay Colony.

In conclusion, it is noted that if there are 3 to 4 uncounted sites in one town, what about other towns in the Colony? Got forges in your town? Investigate more closely: maybe they were bloomeries making iron from nearby ores.

**"Saving The 325 Dartmouth Street Building
A Case Study in Construction Failure and Preservation"**

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Keywords: Construction Technology

We will present a brief history of this unique seven story structure, located at the corner of Dartmouth and Columbia Streets in Boston. While installing 10' diameter piles, the work created a suction that damaged seven nearby buildings. CCA did a geotech analysis, and examined the seven buildings. The presentation discusses the investigation, diagnosis and designed fix for the Tackhoff building.

"The Air Line Railroad: Direct Route from Boston to New York in the 19th Century"

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Keywords: railroad history, Ghost Train, viaducts

The Air Line Railroad boasted that it provided that it provided the fastest route between New York and Boston during its heyday in the 1880s. It ran from New Haven to Middletown and on to Willimantic and then connected to trains for Boston. While the route looked ideal on a map, building the road required passing through rugged terrain. The line ran along high ridges, over deep valleys and across a major river. In several locations, massive viaducts had to be built to bridge local streams. In 1885 luxury train service, the *New England Limited* featured plush Pullman cars fitted out with old velvet seating and white silk curtains. A dining car served gourmet meals and fine wines. The train made the 213 mile trip in about six hours, cutting a full hour off the New Haven's Shore Line Route. The train became known as the "Ghost Train" after the Pullman cars were painted white with gold trim. Another technological advance was the ability to scoop up boiler water from shallow pans between the tracks while traveling at 45 miles per hour. While developed in England, the "Ghost Train" was the first to use the technique in America. This presentation will discuss the history of the Air Line Railroad, some of its impressive viaducts and establishment of the route as a Connecticut State Archaeological Preserve.

"Arsenic and Old Dirt: Hazmat Archaeology at Industrial Sites"

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Keywords: Hazmat Safety Practices, Railroad Sites, Carriage Works

Several years ago a colleague of mine at The Public Archaeology Laboratory, Inc. (PAL) wrote an informative article about safe working environments for an edited volume titled "Dangerous Places: Health, Safety, and Archaeology" (Garman in Poirier and Feder, eds., 2001). At the time, Jim Garman had been serving as a safety manager and senior archaeologist at our CRM firm for about five years. Prior to Mr. Garman's position as safety manager, there had been a strong corporate effort, led by myself and other senior staff, to identify safety hazards in the field and in the office, resulting in a general company safety policy. PAL had also successfully completed several federal hazmat projects in compliance with OSHA standards as early as 1994. Garman's article aptly put

into words the efforts that preceded and took place during his tenure as safety manager. He made note of the fact that since the 1980s professional archaeologists have been increasingly called upon to investigate "Brownfields" sites in former industrialized urban core areas of southern New England. In this increasingly hazardous work environment, Garman forewarned that archaeologists needed to be prepared to face these situations with the highest possible level of preparation. He called for a designated corporate safety manager and the implementation of a safety policy as minimum steps to providing a safe work site. While no OSHA regulatory standard demands that professional archaeological firms carry out either of these specific tasks, it is extremely difficult to demonstrate the presence of a safe working environment without these basic precautions.

This paper reviews the steps toward archaeological compliance with OSHA regulatory standards, as put forth by Garman nearly four years ago. With ever-changing political and economic climates, it is important to periodically review advances and missteps in safety practices at potentially hazardous archaeological sites. While most professional archaeologists in New England seem to be generally aware of the potential hazards at industrial sites, one still gets the sense that there is a wide fluctuation in the depth and breadth of understanding and implementing appropriate site safety plans. This paper will discuss the basics of safety practices at industrial sites through two recent case studies that demonstrate in-the-field applications of training and education, site specific safety plans, and measures that can and should be taken when unforeseen circumstances occur. The case studies will include a carriage works site in New Haven, Connecticut and a railroad roundhouse site in Cohasset, Massachusetts. In the former case, proactive steps were taken to ensure a safe working environment in advance of field excavations, and in the latter case, safety practices were primarily reactive to hazardous conditions that could and should have been foreseen prior to fieldwork. Both cases achieved the same overall result, which of course, was the health and safety of the workers, but the latter case caused an unnecessary expenditure of time and money that the client ultimately had to cover. The paper will conclude with some personal thoughts regarding the corporate management of archaeological projects at industrial sites.