Society for Industrial Archeology · New England Chapters

VOLUME 21 NUMBER 1 2001

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Patricia Fitzmaurice

In a field distinguished for its superlatives – first, longest, oldest – Pat Fitzmaurice's work in historic preservation possessed its own qualities: perseverance and vision. Pat's work extended back more than four decades to the 1960's, when she served as a trustee of the Society for the Preservation of New England Antiquities, and was involved with other preservation efforts including those of Old Sturbridge Village and the US Capitol Preservation Committee. Her principal focus was the Town of Arlington, where she was a founding member of the Arlington Historical Commission. The centerpiece of her preservation efforts was the Old Schwamb Mill. Pat had a long involvement with SIA - members of the Northern and Southern New England chapters will recall that chapter meetings were held at the mill on at least two occasions.

Pat's perseverance was exemplified in her work to restore and maintain the Schwamb Mill. In 1969 the Schwamb family was intending to close the Mill and sell the land to a buyer who needed space for parking his trucks. Pat convinced the owner to sell the property to a newly formed trust instead, and then involved Schwamb family members as trustees. During the early years the Mill came to be used for teaching various artistry classes, including quilting and chair making, as a means to support the Mill's operation. Later, in the mid-1980's, the shift was toward more interpretive programs and training for teachers. Pat consistently sought ways to operate programs or have tenants whose work was compatible with the Mill while not requiring the alteration of the building. In 1988 she negotiated an agreement with the developer of an adjacent property seeking to construct a multi-story condominium project that enhanced the Mill property by adding to its land holdings and outbuildings. Pat took pride in claiming that the Schwamb Mill was the oldest operating mill site in the western hemisphere.

Pat's perseverance was also evident in her efforts to save important town documents, as well as the Mill. When the Arlington Storage Warehouse caught fire in 1974 containing the town's archives, Pat and a friend, Marjorie Cohn, went up the fire ladder and into the building to pull out many water-soaked and smoke damaged materials. They then commenced the slow

process of drying documents or seeing to their proper conservation. In order to preserve certain documents until they could be properly dried, she arranged for freezer storage at the nearby Brigham's ice cream factory. The Schwamb Mill became a large drying room for documents, with all surfaces covered with materials and air continually circulated by fans.

Pat's knowledge and vision in historic preservation extended beyond Arlington. At various times she advised organizations including the National Trust for Historic Preservation, the Boston Museum of Fine Arts, the Forest Hills Cemetery and several shows produced by WGBH, including "This Old House" and the "New Yankee Workshop." In 1988 she was the recipient of a Preservation Award by the Secretary of State of the Commonwealth of Massachusetts. Last year the Bay State Historical League selected her as the recipient of the John F. Ayer Award, given, "to an individual who has made an outstanding contribution to the interpretation or presentation of Massachusetts history." Pat's most recently completed project was a series of historical markers which she researched and designed, and which will be displayed along the bike trail which extends through Arlington and passes close to the Schwamb Mill.

Pat attended the Massachusetts College of Art early in her career and later, in 1985, received a master's degree in education from Cambridge College. Pat died at the New England Medical Center February 15, 2001 after a short illness – she was 78. She leaves her husband John, of more than 45 years, a brother and sister, two daughters, three sons, seven grandchildren and nine great-grandchildren.

Jeff Howry
Lexington, Massachusetts

The Schwamb Mill site dates to the 1650's, when a gristmill and sawmill were first operated on the property, followed later by a spice mill. In 1864, the mill was purchased by the Schwamb family who adapted the original building to woodworking. Although initially the mill produced utilitarian items like towel racks and later piano cases, its eventual specialization in the manufacture of oval and round picture frames became its hallmark. Today, frames are still turned on specialized 19th century lathes, a tradition which Pat continued while operating the mill as a working museum. The frames produced are of such quality that they now hang in many of the world's notable museums and residences. The mill is operated by the Schwamb Mill Preservation Trust, 17 Mill Lane, Arlington, MA 02476-4189. Persons interested in receiving the trust's newsletter may send a request to the mill or make donations in Pat's memory.

Massachusetts' 10 Most Endangered List

Historic Massachusetts Incorporated (HMI) is seeking nominations for its 2001 Massachusetts' Ten Most Endangered Historic Resources list. Since 1993, dedicated individuals and community organizations across the state of Massachusetts have submitted nomination packages to HMI for inclusion on the annual Ten Most Endangered Resources List. This list recognizes historic places threatened by neglect and deterioration, insufficient funding, inappropriate development, insensitive public funding, or vandalism. To date, fewer than ten of the eighty sites listed have been lost to demolition, and seven have been saved.

If you know of an endangered engineering or industrial building, site, structure or object in Massachusetts, and would like to nominate it for the list, please call HMI at (617) 723-3383 for a nomination form. The deadline for form submission is Friday, May 18.

Keeping the SNEC Database Up To Date

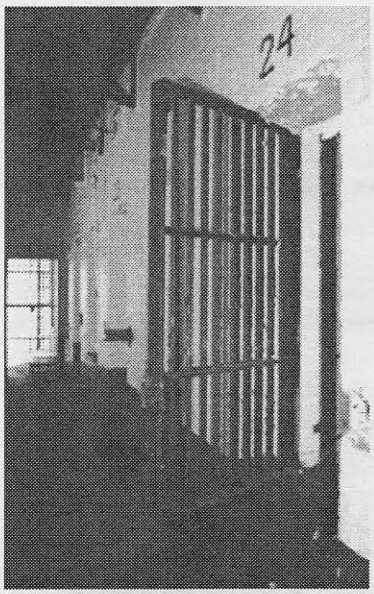
Within this newsletter is an article about a tour of the Charles Street Jail in Boston held by SNEC. If you are one of the unfortunate who did not receive notice of the tour, here is why: we don't have your current e-mail address! We received notice of this tour opportunity with very little lead time, certainly not enough time to effectively put together a mailing. Therefore we decided that the best method of notification of this tour opportunity was to use those e-mail addresses we have in our database. Those that we were able to contact responded well and agreed that this was an effective method of communication.

While at this point e-mail will remain a secondary means of communication, it does work well. E-mail has several advantages over regular mailings: it is fast and free! We will continue regular postal notification of tours; however, tour opportunities with short notice do periodically arise, and we will use e-mail in those situations.

What is the moral of this tale? Please provide us with your current e-mail address for our database. If you did not receive the Charles Street Jail information then we need an updated address. Please e-mail it to robert.stewart13@worldnet.att.net

For those of you without e-mail, I apologize for leaving you out in this situation. We will reserve e-mail for those cases when the options are e-mail notification or no notification.

Greg Galer



An Inside Look at the Old Charles Street Jail

On Saturday, March 16, SIA SNEC got an inside peek at the Charles Street Jail, Boston, before it begins its transformation into a hotel and outpatient facility maintained by its owner and neighbor, Massachusetts General Hospital.

The tour was organized by MGH's parent organization, Partners Healthcare, and Martha MacNamara of the Society of Architectural Historians, who generously extended an invitation to SIA members. Attendees were allowed some roaming of the facility (limited by safety concerns) and enjoyed presentations by Roger Reed of the Brookline Historical Preservation Commission and Tim Mansfield of Cambridge 7, the architectural firm retained by Partners to design the jail's rehabilitation.

Construction of the jail began in 1848 and the institution received its first prisoners in 1851. Originally intended for South Boston, the jail faced strong local opposition (a familiar tradition), and was relocated to the banks of the Charles River. The new site proved a blessing; its proximity to the river and to the original location of the Harvard Medical School created a demand for an attractive building. That aesthetic desire, combined with the popular prison reform theories promoted by the Reverend Louis Dwight, became the foundation for the prison's design.

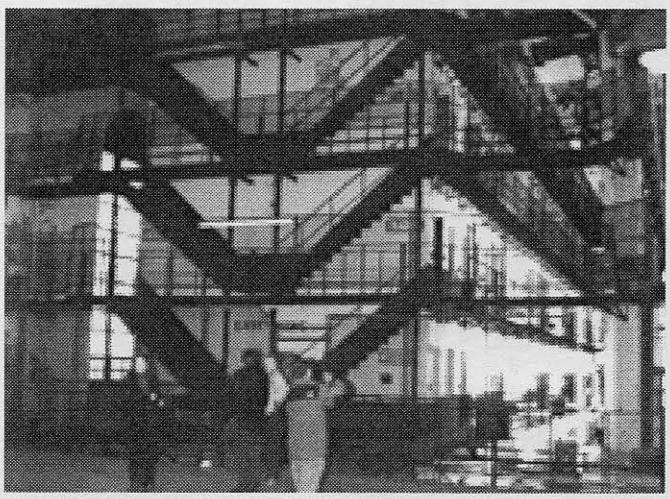
Inspired by his tours of Europe, architect Gridley Bryant based the jail's plans on a cruciform shape that followed Italian Renaissance principles. His ideas were both visually attractive and practical; the octagon formed at the juncture of the wings became an ideal common area for the prisoners, while also providing the guards with clear sight lines across every cell. The distinctive long windows, stretching through all five floors of the jail, provided natural light and a constant source of sanitary fresh air.

Inside, the cells occupy, in back-to-back rows, the interior space of the wings; the cells were accessed by a network of cast-iron walkways and staircases. The exterior is veneered in Quincy granite, a material intended for the cells as well. After some interior construction, however, the granite proved too expensive and the remainder of the jail interior was built out of brick.

Today, it may be difficult to see the jail as a "progressive" design intent on reform, but at the time of its construction the jail represented the latest in reform ideals for prisons, unlike other models which promoted complete isolation for the duration of a prison term. The cells at Charles Street measure no more than eight-by-ten steps, paced out toe-to-heel; the air is chilly and damp; and without the aid of artificial light, the interior is relatively gloomy, despite the long windows (though they probably admitted more light when they were regularly cleaned.) The pessimistic mood is deepened by the effects of age and neglect. (The jail's last prisoners were transferred in 1991, when the property was sold to MGH.) On the walls, the paint peels off in fist-sized chunks, and the floors crackle with broken glass and debris.

But MGH has ambitious plans for the space. While the designs are still very much in their preliminary stages, the basic intentions seem clear: to preserve the exterior granite walls and restore the rotunda -- and its cupola -- to their former glory. The brick wall surrounding the jail yard will be razed, and the interior will be gutted to make way for the hotel lobby, hotel rooms and function halls. The majority of hotel rooms are proposed to be located in a 15 story tower to be built adjacent to and connected with the renovated jail, which will hold the majority of the public spaces for the hotel. Current plans also call for the demolition of one large wing of the prison to accommodate a new outpatient facility to be constructed adjacent to the jail. When the restoration is completed, we may be able to return to the Charles Street Jail and enjoy it in a way its original occupants could not have dreamed: with a glass of wine in hand, music in the air and a beautiful view of the river before our eyes.

Jonathan Kranz, SNEC



Southern New England Chapter Hosts the

14th Annual Conference on New England Industrial Archeology

On Saturday February 3rd, the Southern New England Chapter hosted our annual New England IA conference at Central Connecticut State University in New Britain, Connecticut. About sixty members braved the slippery roads to attend yet another successful annual event. After brief comments and introductions by Matt Kierstead, President SNEC-SIA, and Dr. Michael Park, Acting Head of the Department of Anthropology at Central Connecticut State University, the paper session was led by Greg Galer, Vice President and Program Chair, SNEC-SIA.

Six individuals presented fascinating papers covering a wide variety of IA topics. A summary of papers follows, below. The papers were followed by a brief presentation by Paulette Kellerstedt and Lois Blomstrann, two volunteers from the New Britain Industrial Museum, a site toured after lunch. After breaking for lunch, the group visited the museum, an impressive all-volunteer facility which contains a large collection of artifacts from the wide ranging New Britain Industry. We also toured and were given hands-on robot programming experience at the CCSU Department of Engineering Technology Robotics Lab.

The schedule we instituted two years ago with morning papers and afternoon tours once again worked well. All participants seem to appreciate keeping the papers to the morning and the opportunity to see some local IA-related sites.

Many thanks to SNEC Secretary Bob Stewart for taking the bulk of the load in organizing the conference. He deserves much praise for his efforts. Also thanks to the facilities that hosted us: Central Connecticut State University, The New Britain Industrial Museum, and the CCSU Department of Engineering.

Papers Presented at the Conference:

Bob Stewart -- "Electricity on the High Iron: The Catenary System of the New York, New Haven & Hartford Railroad"
In railroad usage a catenary is the comprehensive assembly of wire construction supplying power to electric locomotives. The New Haven's catenary design demonstrates the progressive development of a railroad traction power transmission system. It evolved from a rigid complex design requiring numerous components to a simpler, more flexible system that demonstrated cost and maintenance savings. The New Haven catenary is significant as an intact example of a railroad traction power transmission system. Its design exhibits the stages in development of an engineering concept. This paper examined the history and evolution of the catenary system.

Faline Schneiderman-Fox -- "From Turntables to Parking Permits: The Excavation of the Poughkeepsie Railroad Roundhouse"
During the mid-nineteenth century, the New York and Albany Railroad was established along the Hudson River. By the 1870s, the Poughkeepsie Railroad Station, associated warehouses, and an immense roundhouse had been constructed in the residential/commercial waterfront locale. The roundhouse and associated structures stood until the 1950s when they were razed to create a commuter parking lot. Excavation of the roundhouse site offered the opportunity to examine the buried physical remains of the massive transportation complex and answer a variety of questions about its construction and preservation. Faline discussed archeological research conducted by herself and Sara Mascia, both of the CRM firm Historical Perspectives, at the site of his late nineteenth century railroad roundhouse located in Poughkeepsie, New York.

Gilmore Cooke -- "Central Power Station (CPS): The first power station of the MBTA"
CPS was on the cutting edge. When it was built from 1889 to 1891 to generate electricity for the growing streetcar system being developed in Boston, it was the largest electrical power station in the world. With CPS as flagship, the West End Street Railway Company, predecessor of the MBTA, became the "hi-tech startup" of the electric industry. Within a few years, the company became the largest electrical traction system anywhere. In the 1890's, CPS was considered an engineering masterpiece with generators custom made for the "T" that were the largest ever built. The facility included a complex system of linkages, allowing power from any one steam engine in service to be connected mechanically to any generator. Many of these cutting edge features were well publicized in engineering journals from which most of the information and drawings for this paper come.

Rob Martello -- "The Patriot in the Copper Mill: Paul Revere's Canton Operations and the Growth of American Industry"
Although Paul Revere is best known for his patriotic endeavors, his greatest contribution to American history arose from his long metallurgical career. Beginning as a silver craftsman, Revere learned to work with cast iron and bronze before working with malleable copper. He designed, built, and managed America's first copper rolling mill in Canton, Massachusetts. Revere's integration of old and new production methods illustrates America's transition from crafts to industry. Rob discussed this industrial side of Paul Revere.

Lauren Cook -- "Landscapes of Waste: Ongoing Industrial Archeology at the Granite Railway Quarry"
The Granite Railway Quarry in Quincy, Massachusetts, is best known for its involvement with the Granite Railway, a significant milestone in bulk material transportation. The

quarry operated for more than a century as an industrial enterprise in its own right. Unlike other quarries in the region, the Granite Railway site has a wealth of features and artifacts remaining, which assist in interpreting the quarrying processes. The quarry is in the process of being filled and converted to a park, and the author is part of a team conducting an inventory of remains at the site. The project will fulfill Section 106 requirements, as well as providing a basis for interpretive activities at the park. Lauren discussed the "process approach," contextualizing material remains through their function in the quarrying process, as well as landscape analysis the project is utilizing to better understand this complex landscape.

Richard Greenwood -- "Uneasy Siprits: Salvage Archaeology at an Early Distillery"

In the fall of 2000 the remains of an 1802 rum distillery on the Bristol, Rhode Island, waterfront were uncovered in the course of a redevelopment project. The salvage archaeology that followed provided a valuable look into an industry that was once common in New England ports but has left few material remains. Rick discussed the history, archaeology, ongoing analysis and developing interpretation of this fascinating site.

Greg Galer

CHAPTER PRESIDENTS' REPORTS

Southern New England Chapter

The Southern New England Chapter had a quiet winter, and is looking ahead to spring and several tours, including a glass light bulb plant in northern Rhode Island and a precision machine tool manufacturer in Central Massachusetts (see note elsewhere in this issue). The Chapter co-sponsored the annual Conference on New England Industrial Archeology which was hosted by Central Connecticut State University at New Britain. The day featured a morning of papers (see review elsewhere in this issue) and tours of the University's Robotics Lab and the New Britain Industrial Museum. The SIA thanks CCSU and Dr. Michael Park of their Anthropology Department for welcoming us.

A major new Chapter development is the adoption of insurance coverage. The issue of obtaining insurance coverage for the SNEC for tours and events has been a topic of discussion for the last two years. Initial research indicated that this insurance was specialized and the cost of a $1 million liability policy would be about $500 to $600 per year, prompting the dues increase voted at the October 2000 business meeting. Further research, however, fortunately resulted in a regular $1 million, $0 deductible policy with the Hartford Insurance Company with an annual cost of only $350.00. This policy will cover the Chapter's liability for personal injury and property damage and may help us land more tours of active industrial sites. SNEC Vice-President Greg Galer should be recognized for his tireless efforts in researching and obtaining this insurance policy for the Chapter.

I attended the National SIA's Whither SIA? retreat at Croton-on-Hudson, NY, in February. During two long days, the SIA Board and invited guests listened to presentations on major issues affecting the organization and drew up plans to pursue new initiatives. Participants had been asked ahead of time to work in pairs to answer assigned questions and present on topics including how to grow the membership, attract young people, establish an advocacy role, involve the World Wide Web, and improve our core programming, publications, professional standards, relations with allied organizations, member services, and public visibility. The National Board will review the results and draft a plan for future action.

Matthew A. Kierstead

Northern New England Chapter

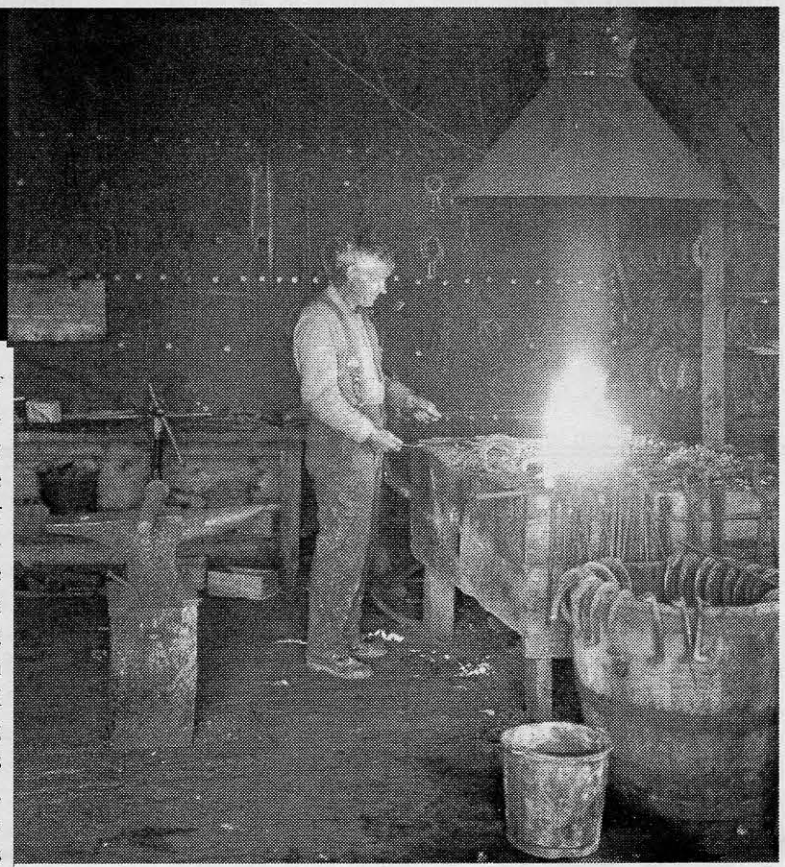
I was elected President of the Northern New England Chapter at the fall 2000 meeting in Portland, Maine, after Krista Butterfield announced that she was stepping down as Chapter President. I want to thank Krista for her years of service as President, and hopefully we will continue to see her at all of our Chapter meetings.

For some of our long-term members, it may be a bit nostalgic to see me as President again, since I served as the first NNEC President in 1980, just prior to becoming Editor of the New England Chapters Newsletter. I managed to get out of the Presidency after just one year -- and many Presidents since then have served for multiple years -- but I've yet to escape from doing the Newsletter. Hopefully this will be just a one-year Presidency once again!

The Northern New England Chapter's Spring Meeting will be held on Saturday, May 12, in Hinsdale, New Hampshire, at the McGoldrick Paper Co. Inc. Dennis Howe has been hard at work making arrangements, and this date has been fixed since last August. I'm mentioning that because many of our readers will note that the National SIA scheduled their Annual Meeting for the same date, and we did not learn that fact until months after our May 12 date was set. Regrettably, it hasn't been possible to change the date of our Chapter meeting, but at least we can guarantee that everyone will have a chance to go to a great meeting that weekend!

David Starbuck
Chestertown, NY

Wooden Forges



This picture was taken at the Cusuptic logging operation in Maine, c. 1920 by Victor Beaudoin, the Brown Company photographer.

In 1998, our research for the reconstruction of a turn of the twentieth century logging camp operation uncovered a photograph of the interior of a Brown Company blacksmith shop taken by Victor Beaudoin in the 1920's. The photograph depicted blacksmith Elmer Page heating large pieces of iron in a roughly constructed wooden forge. Initially, the concept of a three thousand degree fire contained within a wooden box appeared incongruous. Subsequent studies, however, indicated that such wooden forges were in common use throughout North America in the nineteenth and twentieth centuries. Historical evidence, including photographs and texts of the period, supplier's catalogs and several surviving examples of wooden forges, demonstrated that wood box forges were utilized in remote logging operations, rural farms, small villages and urban shops.

In this period several distinct styles of wood forge fabrication emerged, including log box, full box, standing box, inverted pyramid, and tabletop construction. The forge chimneys were made of wood plank, sheet iron, or brick masonry. Operation of the forge required a tuyere, or air pipe, to direct air from a bellows or blower into the fire to generate the high temperatures required for metalworking. Understanding of the tuyere style is still evolving, as the tuyeres are not described in detail and are not easily visible in the photographic record. A survey of the common tuyere options found in period literature and on surviving forges is under way and has revealed approximately a half dozen different possibilities, from ancient style side blast tuyere pipes to fully evolved commercial fireboxes with rotary clinker breakers and bottom ash dumps. The choice of wood to construct the forge appears to have been primarily an economic one, producing a large functional forge, at a minimum cost, with readily available materials.

Because the individuals who constructed these forges often lived below the level of historical examination, there is a paucity of data in the historical record and, consequently, this construction style generally has been overlooked. Archeological investigation of some historic sites has produced a wealth of industrial refuse common to blacksmith shops, yet it has shown no easily identifiable forge footprints, especially within disturbed plow zone excavation. This cost effective construction style, employing an abundant biodegradable resource to produce a functional smith's forge, may explain the scarcity of archaeological evidence of forge foundations within some blacksmith shops, especially in the early settlement period of Colonial America and in later frontier settings.

The approach embraced by this project coalesces historical records, material culture, and the direction and practical knowledge of a skilled traditional craftsman. This interdisciplinary approach provides for a more rounded historical interpretation of the workers' experience. Our ongoing research seeks to document the construction and use of wood box forges in blacksmith shops and to demonstrate the viability of wood as a construction material for metalworking forges in remote locations and in constrained economic circumstances. The project will continue to record this once common, but long forgotten and rarely considered, construction technique that offered a simple and inexpensive alternative to masonry construction. Documentary research may also link this construction style to the lack of physical evidence for forges in the archaeological investigation of some early blacksmith shop sites. This cooperative venture affords the opportunity to read both the physical and documentary evidence and to duplicate the appropriate craft techniques needed to understand the trade and the artifacts produced by that trade, which in turn will enable us to rediscover the daily activity of the blacksmith and interpret more accurately the culture of work in the nineteenth and twentieth century.

Linda Upham Bornstein
Kenneth Schwarz

Lewis Hine Photo Exhibition Explores Child Labor

A compelling new exhibition of early-twentieth-century images by photojournalist Lewis Hine explores the history of child labor in northern New England. *Before Their Time: Child Labor through the Lens of Lewis Hine* will be on view at the Museum of New Hampshire History in Eagle Square in Concord from February 10 through November 4.

The exhibition features 56 original images by Lewis Hine, a talented photojournalist best known for his images of immigrants on Ellis Island and as the official photographer for the construction of the Empire State Building. In the early 1900s, the National Child Labor Committee hired Hine to document child labor conditions around the country. While America enjoyed a period of unprecedented prosperity, many women and children in urban tenements worked 70-hour weeks for $4. The committee aimed to eliminate child labor abuses that excluded children from educational opportunities and often left them maimed and disabled for life.

Hine traveled to Maine, New Hampshire, and Vermont in 1909 and again in 1911-12. His photographs of children at work in mills, mines, quarries, and canneries shocked the nation into action. They were incorporated into posters from the National Child Labor Committee with messages such as "Everybody Pays but few Profit by Child Labor." The exhibition includes re-creations of these posters, allowing viewers to see how the images were used to help shape public opinion. Hine's work was indeed a catalyst for change. In 1911, Progressive Republican Governor Robert P. Bass helped to pass New Hampshire's most sweeping child labor law. By 1914, 35 states had made it illegal to employ children under fourteen years of age. In 1938, federal law followed suit with the passage of the Fair Labor Standards Act.

The Hine photographs in the exhibition, never before exhibited to the public, are on loan to the New Hampshire Historical Society from the University of Maryland, Baltimore County. The display creates a first-ever look at Hine's work in northern New England. Nineteen of the images are in New Hampshire, including photographs taken in Manchester, Suncook, and Dover.

The New Hampshire Historical Society is also publishing this spring a special issue of its journal *Historical New Hampshire* exploring Lewis Hine's work on child labor and the Progressive Movement in New Hampshire. The Society is sending the issue, along with a lesson plan, free of charge to school libraries throughout the state. Schools also can sign up for a special guided lesson at the Museum of New Hampshire History that takes classes through the Hine exhibition and inspires discussion of child labor issues.

The Museum of New Hampshire History is in Eagle Square in Concord. Hours are Tuesday through Saturday, 9:30 a.m. to 5:00 p.m., Thursday evenings to 8:30, and Sundays from noon to 5:00 p.m. Admission is $5 for adults, $4 for seniors, $2.50 for children 6-18, with a family maximum of $15. Admission is free on Thursdays from 5 to 8:30 p.m. Free parking is available in the museum lot off Storrs Street. Get to the museum from Exit 14 on I-93. For further information call 603/226-3189, ext. 200, or visit www.nhhistory.org.

New Book Explores Life of 18th-Century New Hampshire Craftsman

A new book explores the world of a versatile 18th-century New Hampshire shoemaker, tanner, surveyor, and farmer. Samuel Lane faithfully recorded the events of his life in and around Stratham for more than sixty years, spanning much of the eighteenth century. The worries, dilemmas, and day-to-day work Lane detailed present a compelling view of life in colonial New Hampshire. This fascinating tale is the most complete account now available of the life of a colonial New England artisan and tradesman.

Published by the University Press of New England in association with the New Hampshire Historical Society, *The Years of the Life of Samuel Lane, 1718-1806: A New Hampshire Man and his World*, is written by Jerald Brown and edited by Donna-Belle Garvin. Jerald E. Brown currently heads the history department at Bryn Mawr School in Baltimore. He served as editor of the New Hampshire Historical Society's Samuel Lane Papers while earning his Doctor of Philosophy in history from the University of New Hampshire. Donna-Belle Garvin is the editor of the Society's journal *Historical New Hampshire*.

Publication of the book culminates many years of research into the life of Samuel Lane and his family. Brown bases his narrative on careful study of Lane's rich documentary legacy. Through it, he re-creates the life of a true "Renaissance Man." Brown explores the life, career, and motivations of Samuel Lane. Editor D-B Garvin introduces the reader to Lane's world in a preliminary essay. The book is enriched by many illustrations of leatherworking, farming, surveying, buildings, bridges, crops, animals, and gravestones, bringing readers into the complex world that shaped Lane and his family.

"Readers of this skillfully packaged volume will learn more about daily life in early New Hampshire than from any previous publication. They will also learn to appreciate the extraordinary accomplishments of an ordinary man. *The Years of the Life of Samuel Lane* is to New Hampshire what Laurel Ulrich's Pulitzer Prize-winning *Midwife's Tale* is to Maine," said Professor Jere Daniell of Dartmouth College.

The Years of the Life of Samuel Lane is available at the Museum of New Hampshire History store in Concord for $19.95 soft cover (plus $5.20 shipping) or $50.00 hardcover (plus $7.75 shipping). To order, call the Museum Store at 603/226-3189, ext. 225, or purchase on-line at www.nhhistory.org.

Northeast Corridor Improvement Project

The National Railroad Passenger Corporation (Amtrak) has recently published an educational booklet titled Amtrak's High Speed Rail Program, New Haven to Boston, History and Historic Resources. Prepared by PAL (The Public Archaeology Laboratory, Inc.), the booklet was one of the pieces of mitigation required for the construction of the Northeast Corridor Improvement Project Electrifi-cation. It is designed to give readers a context from which to view the significance of the New Haven to Boston section of the railroad as it relates to the history of railroad travel in the Northeast. The extensively illustrated booklet includes a brief history of the line from its roots in the early nineteenth century to the present and descriptions of the numerous extant historic rail-related resources, including railroad stations, maintenance and service facilities, signals and switches, grade crossing eliminations, bridges, and rail related businesses and industries, that are found along its route.

The section of the Northeast Corridor between New Haven and Boston is a descendent of five early railroads – the Boston & Providence; Stonington Road (New York, Providence & Boston); Shoreline (New Haven & New London); New York & New Haven; and New London & Stonington that were constructed between 1833 and 1857. Those lines were consolidated into a single unit in 1893 to become the main line of the New York, New Haven, & Hartford Railroad (NY,NH&H). During the 1960s, passenger railroad service throughout the United States experienced severe financial difficulties. The NY,NH&H was forced into bankruptcy in 1961 and was ultimately merged with the Penn Central Railroad in 1969. In 1970 Congress passed the Rail Passenger Service Act and formed the National Railroad Passenger Corporation (Amtrak), which was charged with the responsibility to keep intercity passenger railroad traffic in the Northeast and Midwest running. In 1971 Amtrak assumed control of the Penn Central's line between Washington, D.C. and Boston, which then became known as the Northeast Corridor.

The completion of the Northeast Corridor Improvement Project made possible the implementation of Amtrak's *Acela* service. *Acela*, a brand name derived from the words excellence and acceleration, is the first of many high speed rail systems that Amtrak plans to implement in its effort to reintroduce Americans to train travel as a viable and attractive alternative to driving or flying. The centerpiece of *Acela* service will be a fleet of ultramodern, high speed electric trains capable of attaining speeds up to 150 miles per hour.

The production of the educational booklet was stipulated in the Memorandum of Agreement (MOA) for the Northeast Corridor Improvement Project – Electrification among the Federal Railroad Administration, National Railroad Passenger Corporation, Connecticut State Historic Preservation Officer (CTSHPO), and Advisory Council on Historic Preservation. The publication is being distributed to libraries, educational institutions, and other repositories in the communities that are located along the route of the Northeast Corridor between New Haven and Boston by the CTSHPO, the State Historic Preservation Offices in Rhode Island and Massachusetts, and Amtrak.

The bulk of the material used to present information about individual resources in the booklet was generated during the cultural resource investigations undertaken by PAL for the electrification project. Among the major tasks completed by PAL were the documentation of 10 historic bridges, eight historic districts, and five railroad stations in Connecticut, Rhode Island, and Massachusetts to HABS/HAER standards; consultation with the State Historic Preservation Officers on the impacts of a variety of undertakings, including the demolition of two historic bridges in Rhode Island, the installation of catenary and barriers on 20 historic bridges, and the construction of pedestrian overpasses at Old Saybrook and New Haven, Connecticut; stabilization of three historic cemeteries, including boundary delineation, gravestone restoration, and the reinterment of one grave; and archaeological survey and construction monitoring at a number of construction sites. The submittal of this announcement for publication in the SIA Newsletter was stipulated in the MOA with the Connecticut State Historic Preservation Officer. It represents the final piece of cultural resources mitigation for the electrification project.

Matthew A. Kierstead

Vernacular Architecture Forum

On April 25th to 29th, 2001, the Vernacular Architecture Forum (VAF) will hold its annual conference, Newport and the Narragansett Basin: the Architecture and Landscapes of the Colonial and early National Periods. Newport's location allows access to one of the greatest concentrations of 18th century buildings, to industrial villages and cities, from 17th and 18th century farmsteads and country seats to late 19th century summer "cottages" of the Gilded Age.

This conference, with presentations, panel discussions, bus and self-guided walking tours, will focus on the architecture and landscapes of Newport and the surrounding Narragansett Bay area during the Colonial and early National Periods. The region, rich in early buildings, was the subject of some of the earliest study by architects and architectural historians at the end of the 19th century. Despite this long tradition of colonial revival interest and study, it has been nearly fifty years since the region's architectural heritage has gotten a new, systematic, evaluation based on fieldwork. The Narragansett Basin is a cultural region with a distinct building tradition that was most vital in the Colonial and antebellum periods, and it is this material that is in greatest need of reinterpretation and reevaluation.

As part of the conference, an Historic Preservation Forum, *History and Historic Preservation Along America's Atlantic Rim: Perspectives for a New Ethos in Old Cities*, will be held on Wednesday, April 25th, and is free and open to the public. This forum will feature speakers and panelists from across the country to assess the interactive relationship between history, historic preservation, and architectural history and how they have shaped our historical understanding and preservation of the nation's earliest seaport towns and cities.

The conference will be based at the Hotel Viking, One Bellevue Avenue in Newport, which is situated within the historic center of Newport and close walking distance of most of the sites that will be visited in Newport.

For further information or to download a registration form, please visit our website at www.VAF2001.org or contact us via email at VAFinfo@aol.com.

SIA Volunteers Needed for National Trust Conference

The National Trust for Historic Preservation is holding their annual conference in Providence, Rhode Island, November 16, 2001. The theme of this conference is Preserving the Spirit of Place. This will be the largest U.S. historic preservation conference of the year, with 2,000-2,500 attendees expected. The conference will include a large area of booths and displays for preservation organizations to meet attendees and spread the word about their mission. This is an excellent opportunity for the Society for Industrial Archeology to increase its visibility and membership. I have discussed this event with the SIA National Board and they are willing to pay for booth space and for shipment of the SIA's folding conference table display. The conference organizers require that all tables be staffed by an organization member during the day. I need volunteers from the Southern and Northern New England Chapters to staff the SIA table during the conference. I will volunteer to monitor it for one day, which leaves five days open. If you would like to volunteer for this opportunity to spread the word about the SIA, please contact me as soon as possible: Matt Kierstead (401) 728-8827.

Request for Information: Richard Smith, Ironmaster

A man named Richard Smith was active in Connecticut as an important merchant and iron master before and after the American Revolution. He owned Salisbury furnace at Lakeville and built a large forge complex and steel furnace at Robertsville in Colebrook. Despite this, his origins and other activities have remained obscure. Recently, with the help of a professional genealogist in England, we have been able to differentiate this Richard Smith from all the others.

It is now certain that the above Richard Smith was christened on 29 May 1737 in the little town of Cawthorne-by-Barnsley in the so-called black country of South Yorkshire. The area is known for its early manufacture of iron. Richard's parents were William Smith and Janet Woffendin. He was the next-to-youngest of eight children who survived infancy. Both his father and grandfather were reasonably prosperous tanners. When he was about fourteen years old, Richard was apprenticed to an ironmonger, Thomas Walker of Leeds. The Walker family was associated with iron-making.

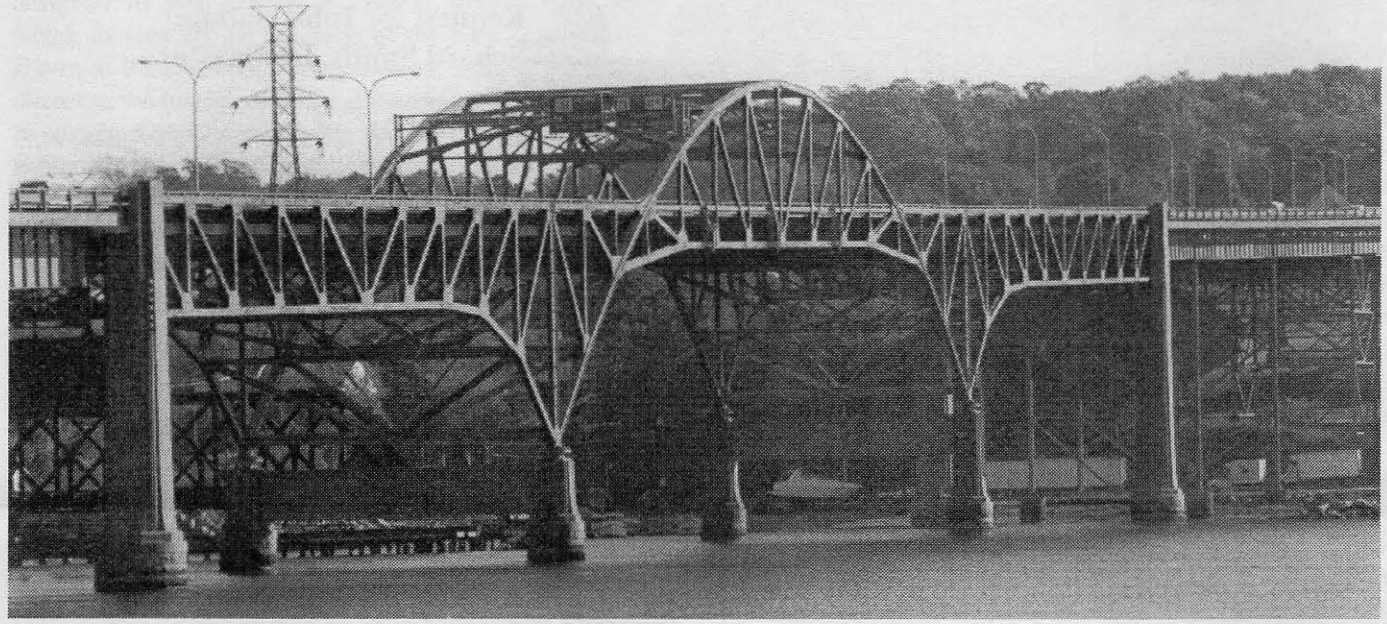
Following his apprenticeship, Smith appears to have gravitated to London where he gained wider experience with a merchant firm. In 1767, he came to Boston and set up business in his own name. He found wholesale customers among Connecticut storekeepers. Two brothers named Caldwell bought goods for their stores on short credit, but by late 1768 it was clear that they were unable to pay. The Caldwells also were the controlling owners of Salisbury Furnace and a forge at Collinsville. Smith agreed to accept part ownership in the iron works in lieu of the money he was owed.

The rest, as they say, is history, but here again efforts are currently under way to learn far more about Smith's Connecticut operations than has been known. Archeological excavations are planned. Walter Landgraf of Pleasant Valley is quarterbacking the effort, and several others are actively involved. I am working at the Boston end and coordinating investigations in England. Raymond Wheeler of Croydon, a city south of London, has proven to be both knowledgeable and imaginative and is now a full-fledged member of the team. If anyone knows of information about Richard Smith in some unusual niche, we would appreciate being advised.

David B. Ingram
Foxborough, MA

Two Landmark Rhode Island Bridges to be Demolished

The Sakonnet River Bridge (1956) from the east shore of Porstmouth. The graceful arch incorporated into the continuous Pratt truss is prominent in this view.



Two of Little Rhody's five biggest bridges, the Jamestown Bridge and the Sakonnet River Bridge, are slated for demolition. Both of these mid-twentieth-century steel truss bridges are the subject of separate documentation projects by PAL, Inc. of Pawtucket, RI.

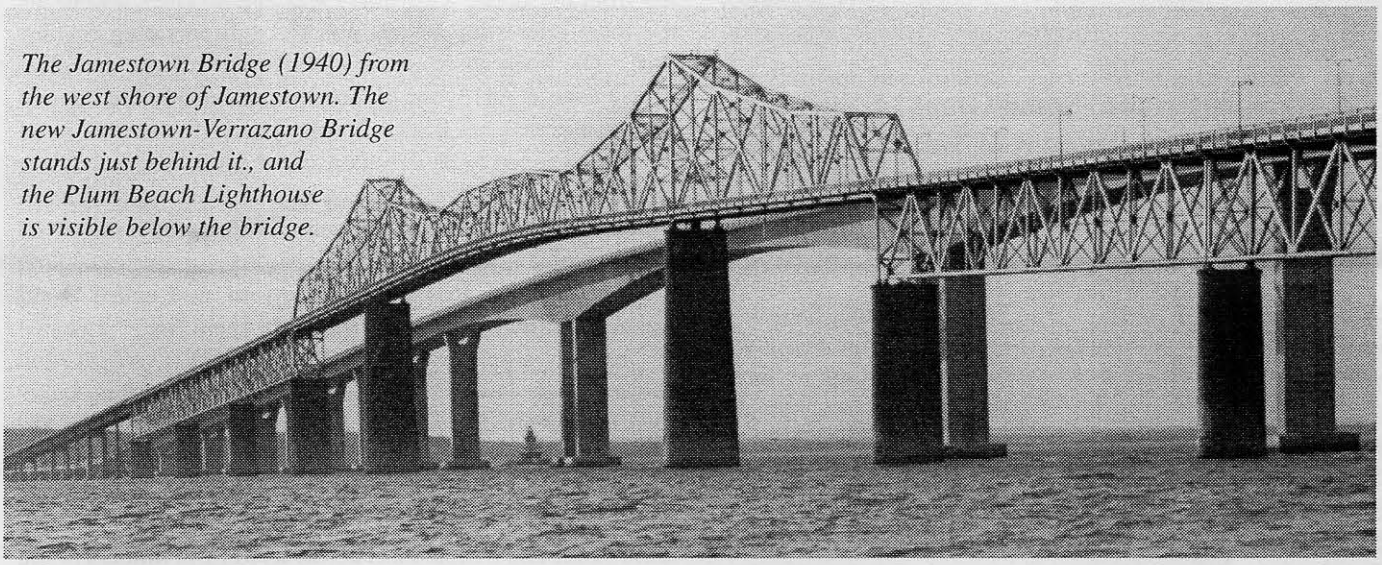
The Jamestown Bridge (RI Bridge No. 400) was completed in 1940 to connect the towns of North Kingstown and the island of Jamestown across the West Passage of Narragansett Bay. At 6,892 ft long it is Rhode Island's second longest bridge. It incorporates 69 spans of varying design including a massive continuous cantilever Warren truss with a 600 ft wide center span 135 ft above the water. Planning for a bridge at this location began as early as 1933 and was spurred by the Hurricane of 1938, which wiped out West Passage ferry service. The noted bridge engineering firm Parsons, Klapp, Brinckerhoff and Douglas won the engineering contract. The plan chosen resembled a similar bridge drawn up in 1920 by Waddell & Hardesty for the Cooper River in Charlestown, SC. The superstructure was fabricated and erected by the Harris Structural Steel company of New York City. The bridge was completed in eighteen months on an accelerated schedule. Traffic on the bridge surpassed all predictions as it served as a link in a shorter route to Cape Cod and spurred early residential growth on Jamestown. The bridge was important during World War II as it was a link between area military bases including the U.S. Naval Training Station Newport and the Quonset Naval Air Station in North Kingstown, as well as several coastal defense batteries. The bridge originally included toll booths on the North Kingstown side, which were removed in 1969. The bridge closed in 1992 when the adjacent Jamestown Verrazano Bridge, approximately 400 ft to the north, opened for traffic. The old Jamestown Bridge has been declared a hazard to navigation by the U.S. Coast Guard, and the Rhode Island Department of Transportation is overseeing the dismantling of the bridge.

The Sakonnet River Bridge (RI Bridge No. 250) was completed in 1956 to connect the towns of Tiverton and Portsmouth across the Sakonnet River. At 2,982 ft long it is Rhode Island's fifth longest bridge. It incorporates 27 spans of varying design including an unusual modified continuous Pratt arch truss with a 375 ft wide center span 65 ft above the water. The Sakonnet River was originally spanned by the Old Stone Bridge, a double-leaf bascule bridge that was located to the south. By 1945 that bridge was badly deteriorated and planning began for the new bridge. Originally the new bridge was considered as a link in a coastal highway system between Boston and New York, but the route actually chosen (Interstate 95) passed inland through Providence. The Sakonnet River Bridge was designed by the J.E. Greiner

Company of Baltimore, MD, a nationally-prominent transportation engineering firm responsible for many Eisenhower Interstate Highway System roads and bridges on the Eastern Seaboard. Greiner, known for bridges that combined structural efficiency and functionalism with pleasing design, chose the unusual design, which incorporates a prominent arched truss. The superstructure was fabricated and erected by the Harris Structural Steel company of New York City. The bridge was completed in 1956, and supported the residential growth of Portsmouth and Middletown, satellite communities of Newport that were settled by U.S. naval personnel. The bridge carries Route 24, which connects Newport and Fall River, and sees more daily traffic than the Mount Hope and Newport bridges (see below) combined. Poor maintenance has led to the reduction of the section thickness on many non-redundant structural members and the bridge is slated for interim repairs while plans for a replacement are developed.

Narragansett Bay, with its long, convoluted coastline and several large islands includes two other major bridges, both of which are still in use. The 6,000 ft long Mount Hope Bridge was New England's longest suspension bridge and its 1,600 ft wide main span was the eighth longest suspension span in the world when completed in 1929. It won an American Iron and Steel Institute's award in the suspension bridge category in 1930. The 1969 Newport-Jamestown (Senator Claiborne Pell) Bridge, at 2.13 miles long, is the longest bridge in New England, and also has a 1,600 ft wide main span. If you are looking for an exciting and scenic day trip in southern New England, this spring or summer, consider driving a loop around Narragansett Bay and seeing Little Rhody's big bridges before two of them are gone.

Matthew A. Kierstead



The Jamestown Bridge (1940) from the west shore of Jamestown. The new Jamestown-Verrazano Bridge stands just behind it., and the Plum Beach Lighthouse is visible below the bridge.

Great Falls Manufacturing Co. Engineering Archive

I'm spending part of the winter at the Portsmouth Athenaeum compiling a database of some 800 architectural and engineering drawings from the Great Falls Manufacturing Co., Somersworth, NH, that have been deposited there temporarily. The drawings range in date from 1834 into the mid 20th century plus. While there are some blueprints after the 1890s, most are ink on paper or architectural linen, often with color inks and washes.

These include maps, plans and surveys of the company's water (dams, flumes, and canals) along the Salmon Falls River in both Maine and New Hampshire; motive power (waterwheels, turbines, belts and shafting); corporate real estate (plot plans, building designs, infrastructure records); housing (agent's house, tenement houses); and the railroad (depot design, rights of way, etc.). Some building plans from Manchester, NH and Lowell, and Holyoke, MA also survive in this collection (presumably) as models.

The largest number are plans, sections and elevations of original designs for the corporation's several mills, their additions and alterations, many machine layouts in plan and section (with suppliers of equipment often named), and even machine designs. By the late 19th century, suppliers (from Boston, Lowell, and elsewhere -- including Britain) often provided machine drawings for corporate consideration. Together these materials demonstrate changes in technology, capital reinvestment and other aspects of expanded production over most of the 19th and early 20th centuries.

These historic manuscript drawings, some as smaller than 5 x 8 -- others stretching more than 12 feet long -- are still rolled up on numbered wooden rollers and kept in 17 (of originally 18) numbered wooden boxes. Each box is some 3 feet long and just over a foot square. Many also contain later blueprints, tracings, and drawings in other media never rolled up on this system but stored in the same boxes. As an

artifact of industrial management, the content of these hundred of rolls are fascinating.

The whole collection survives because, until the plant recently closed when the most recent company went to Massachusetts, their owner ran the Bleachery and Dye works complex as did his father and grandfather before him. Besides examining the drawings, I have been asked to recommend placement in an appropriate repository which would accept and use this collection for research -- preferably in New Hampshire for access by local historians. As many works on paper have grown brittle, professionals will need to make choices about the level and type of processing to preserve them. A good deal of paper conservation will be needed. I would appreciate hearing from institutions possibly interested in housing this large and important group of drawings.

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A Week in Britain: Some Great IA Sites in Small Amount of Time

Unlike museums, cathedrals, and Harrods, IA sites are rarely conveniently located in big cities or open to the public, which is why SIA-arranged tours are so valuable. I planned to attend a one-day conference in London the first Saturday in March and wanted to spend a few days before and after visiting IA sites. What could I squeeze in, and get to, on a short trip? A lot, it turns out. The Internet greatly facilitates planning.

The high point of my trip was two days in Scotland visiting the mill village of New Lanark. The SIA's 1997 tour of Scotland included New Lanark, where the group found "some of the most sophisticated restoration and interpretation seen on the trip." I've long been a fan of reformer Robert Owen, who began experimenting with ways to improve education and community life at his mill village, New Lanark. Today, the 18th and 19th century cotton mills, tenements, and workshops, picturesquely located in a river valley, have been restored to dazzling effect. To get there from London, I took an overnight sleeper train (ScotRail) to Edinburgh. (Although train service from Glasgow to Lanark is faster and direct, I wanted to spend a morning wandering around Edinburgh.) The trains from Edinburgh to Lanark involve a transfer. At Lanark, I caught a local bus to the village of New Lanark. The village offers several exhibits and a high-tech "ride," which interprets the history of the place. One can also walk around the village and hike a trail to the falls of the Clyde, although this path was off-limits during my stay because of foot & mouth disease.

All this was doable without a car, but my two days visiting woolen mills in the Stroud Valley, a region of Gloucestershire about 100 miles west of London, did require a car. I was fortunate to have a colleague – Mike Williams, a historic buildings surveyor with English Heritage – to show me around. But even without a human guide, you can find mills and other historic textile industry structures in this region using Jennifer Tann's somewhat dated but still comprehensive guidebook, *Gloucestershire Woollen Mills* (1967). Unlike the large, steam-powered cotton mills of Manchester, the industrial-era mills of the Stroud region were relatively small, with a few exceptions, and water-powered (although with supplemental steam power). Textile production for the market began in this area in the late Middle Ages. Many spinning factories were built on the former sites of ancient fulling mills, and physical evidence of the premechanized production survive in clothiers' (merchant-manufacturers) houses and loom-sheds. There are dozens of historic mills and associated buildings to see. All are in private hands, however, so for the most part, you must do your looking from the street. One mill I was able to enter, and to me the most interesting of all, was the still-operating Stanley Mill. The main water-powered mills in this large complex, dating from c. 1813, are fireproof, with remarkable internal iron frames and brick arch floors. I stayed overnight in an old mill, adapted to be a residence and B&B, and had dinner at another recycled mill: Egypt Mill in Nailsworth, part of which dates from the 17th century. It features a preserved waterwheel.

The Chatham Royal Naval Shipyard, now called World Naval Base, was well worth the day I spent there. Located in Chatham, a little over an hour's train ride (Connex) from London, it is about 1-1/2 miles from the train station there. This huge dockyard and naval base was established in the 16th century and closed in 1984; thus, warships were made there from the age of sail to the Cold War. It contains a fascinating collection of buildings (enormous covered slips; masthouses and a mould loft constructed from timbers of old warships), exhibits, and ships to visit. The high point for me was a tour of the submarine "Ocelot," completed in 1964 by workers at Chatham. The operating ropery (built 1729-91) is another spectacular exhibit: a commercial rope-making company uses old machinery to twist rope down the 1/4-mile length of the building. It truly takes the 4-5 hours to see everything at the shipyard. Many buildings have tenants and are not open to the public, but all can be seen from the public ways.

The World Naval Base and New Lanark have websites with hours of operation, accommodations, etc.: http://www.worldnavalbase.org.uk and http://www.newlanark.org. You can get train schedules and travel updates online from Railtrack, http://www.railtrack.co.uk/travel/index.htm. I can also recommend off-season travel to Britain. Although the weather in early March was not the best, airfare and hotel rates were low and there were no crowds.

Sara Wermiel

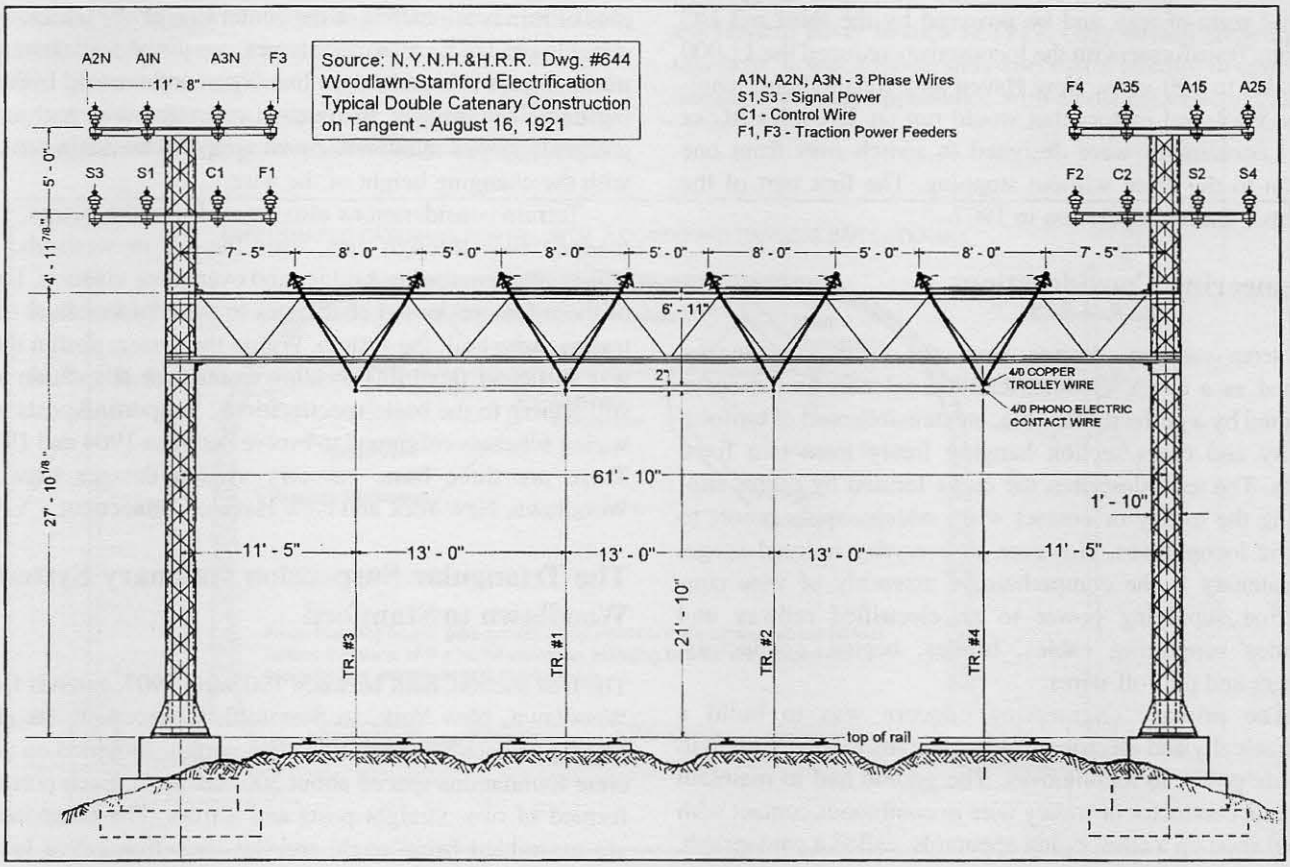
The Catenary System
of the New York, New Haven & Hartford

With the initiation of high-speed train service between Boston and Washington, much of the catenary that provided power to New York, New Haven & Hartford trains running between New Haven and New York is scheduled to be replaced with a modern system. As mitigation for the replacement of an historic engineering feature, the extant catenary system was documented by Historical Technologies.

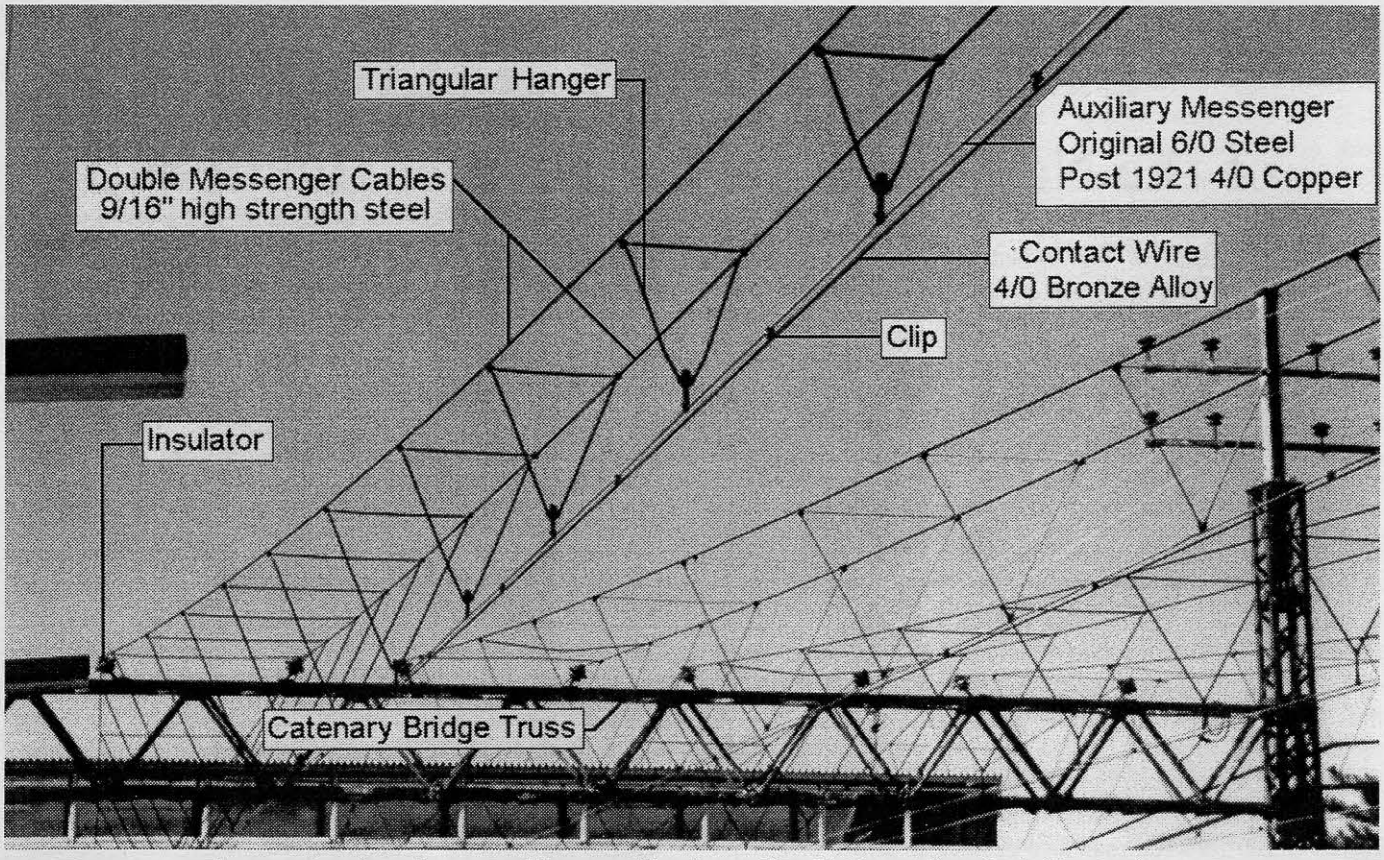
During the first decade of the twentieth century, accidents and demands to reduce pollution led to the prohibition of steam locomotives from New York City. As an alternative to steam, the New York Central Railroad selected electricity for powering its trains into Manhattan. The Central plan called for steam power to Croton-on-Hudson, just north of the city. At this junction, trains would be switched over to electric locomotives that picked up 600 volt direct current power from a third rail.

To power its trains into Manhattan, the New York, New Haven & Hartford Railroad also decided to utilize electricity. The New Haven's approach to electrification was a departure from the accepted standards and proven components of the period. Rather than an electrified section to bring trains the last few miles into the city, the railroad envisioned a completely electrified operation running from New York to Boston. Its core was an 11,000 volt, 25 cycle alternating-current system developed by the Westinghouse Manufacturing Company. Instead of picking up power from a third rail, power would be transmitted to locomotives over an overhead wiring system called a catenary. City streetcar systems had used overhead DC trolley wiring for power transmission starting with the system installed in Richmond, Virginia, in 1888. However, these light duty, relatively low voltage, direct current systems could not withstand the rigors of high speed, main line railroad operation. Consequently, New Haven engineers, led by William S. Murray, Chief Electrical Engineer of the New Haven, developed overhead power transmission technology attuned to the railroad's requirements.

The New Haven technology also had to integrate with New York Central's. For the last twelve miles into Grand



Typical straight post portal or bridge used on NYNH&H RR Woodlawn to Stamford.



A catenary wire scheme used between Woodlawn, New York, and Stamford, Connecticut

Central Terminal, New Haven trains had to run over a Central right-of-way and be powered by the third rail DC system. Transformers on the locomotives reduced the 11,000 volts AC to 600 volts. New Haven and Westinghouse engineers developed motors that would run on 25 cycles AC or DC. Locomotives were designed to switch over from one system to the other without stopping. The first part of the system went into operation in 1907.

Engineering Considerations

The term catenary derives from the Latin - *catenaria*, defined as a chain. Geometrically, a catenary is the curve assumed by a perfectly flexible, inextensible cord of uniform density and cross section hanging freely from two fixed points. The term describes the curve formed by cables supporting the trolley or contact wires which supply power to electric locomotives. However, in everyday railroad usage, the catenary is the comprehensive assembly of wire construction supplying power to an electrified railway and includes supporting cables, bridles, beams, conductors, hangers and pull-off wires.

The primary engineering concern was to build a mechanically and electrically reliable transmission system to provide power to locomotives. The system had to maintain the main conductor or trolley wire in continuous contact with a steel shoe on a telescoping apparatus, called a pantograph, mounted on the locomotive. This wire had to be held within plus or minus ten inches of the center line of the tracks. The wire also had to be mounted about twenty-two feet above the tracks except at road bridges passing over the track. In passing under the bridges, the contact or trolley wire had to be gradually sloped to allow the pantograph to maintain contact with the changing height of the wire.

Terrain considerations also entered into the design. The roadbed runs through cuts, over the fill in wetlands, on embankments, trestles, bridges and over stone viaducts. Each of these features posed challenges to the engineers and contractors who built the system. Within the system design there was sufficient flexibility to allow vernacular adaptation and still adhere to the basic specifications. Supporting posts and wiring schemes continued to evolve between 1904 and 1914. There are three basic catenary system designs between Woodlawn, New York and New Haven, Connecticut.

The Triangular Suspension Catenary System - Woodlawn to Stamford

The first section, built between 1905 and 1907, extends from Woodlawn, New York, to Stamford, Connecticut. Its supporting bridges are fabricated steel portals mounted on concrete foundations spaced about 300 feet apart. Each portal is formed of two straight posts and a truss. The components are assembled from angle and flat strap iron called lattice

bars, to form the structures which support the wire construction. The angles and straps are fastened together with rivets. Subsequent sections feature the same type of construction and materials. However, configurations are significantly different.

The wire component is defined as a double-catenary or twin messenger type. It is characterized by triangular hangers, spaced at ten foot intervals, separating three supporting wires running roughly parallel to the track. The top or base of the triangle is horizontal and the inverted vertex suspends the third wire. The two upper supporting wires, called messenger cables, are 9/16- inch, seven strand, extra high-strength steel which are attached to the portal bridges with insulators. The triangular hangers decrease in length toward the center of the span between two bridges and thus form a series of triangles of decreasing size.

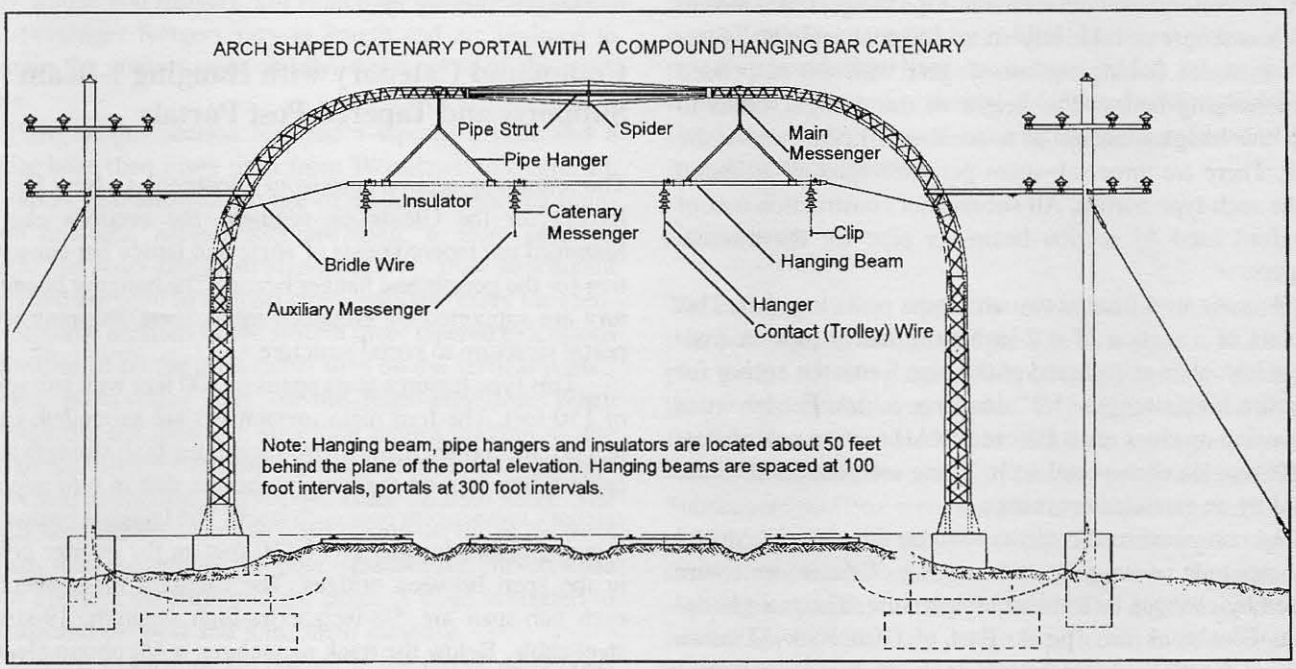
This system provided a rigid support for the contact wire. Within a few months, experience proved that rigidity was not advantageous. Excessive wear was noted at the points where the triangular hangers held the contact wire. In addition, the steel was subject to corrosion. The suspension was modified by installing clips to hold a new contact or trolley wire made of 4/0 bronze phono-electric wire, an alloy specifically developed for this use, below the original wire. The clips were installed between the hangers. With one exception, an experimental section where a heavy bronze 4/0 wire was installed as a prototype contact wire, all future main line designs featured the auxiliary and contact wires connected by clips. The original contact wire was then renamed the Auxiliary messenger wire. The clips were installed between the vertices of each triangular hanger, midway between the hangers, to provide maximum flexibility. This gave the contact wire more flexibility and retained the triangular aspect of the suspension.

This system required many small components, and its installation required considerable labor to install and maintain. The triangular design readily maintained the contact wire over the center of the track on tangent (straight) sections. However, on curves, single posts located between the portals on the outside of the curve served as anchor points for bridle wires connected to the messenger cables. These "pull-off" poles maintain the contact wire in a series of short chords within the limits of a curved track centerline.

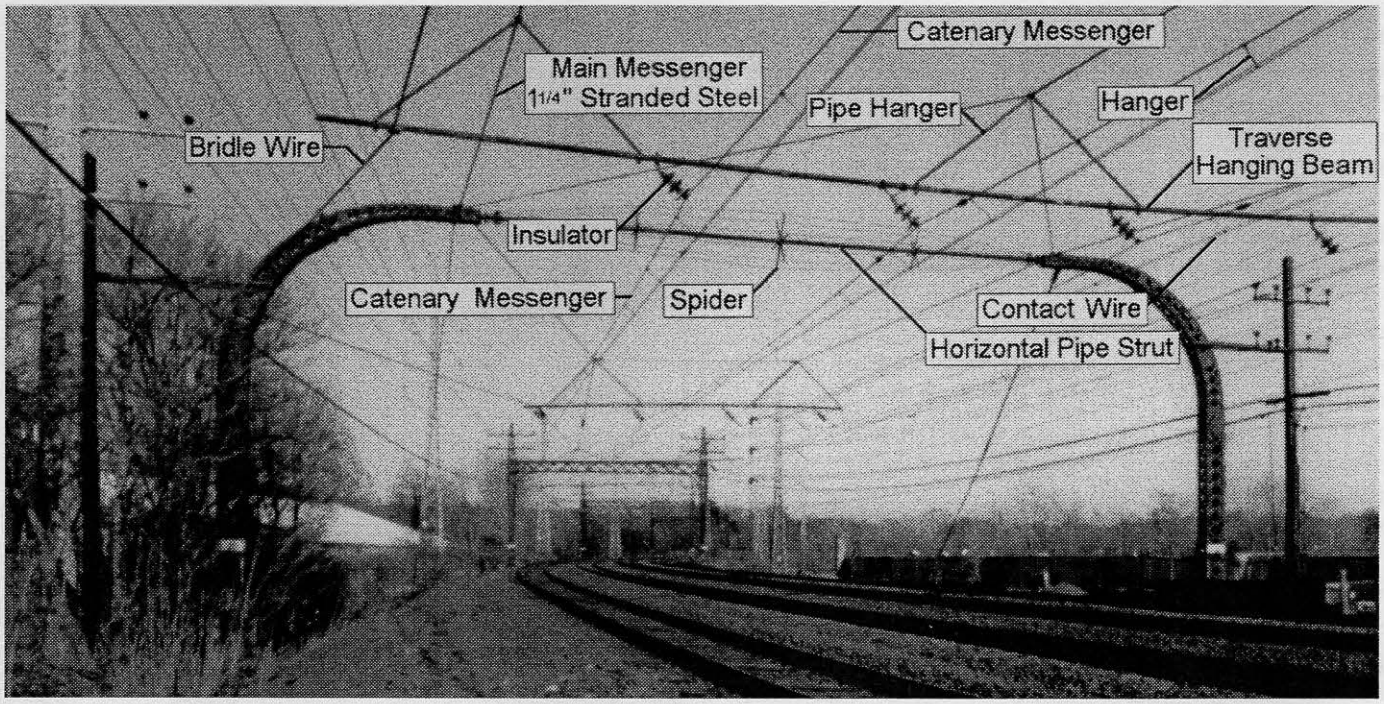
An interesting story about the early catenary design concerns the invention of a popular toy. Alfred Carleton Gilbert was traveling to New York on the New Haven Railroad while the catenary was being built. He was fascinated by the steel bents and bridges being erected to carry power lines and conceived the idea of assembling similar beams on a smaller scale. By 1913, A.C. Gilbert was displaying his first Erector sets at the New York Toy Fair. They were immediately popular, and Gilbert was on his way to toy making fame.

Arch Shaped Catenary Portals and Compound Catenary

A developmental section of an unconventional catenary system design was installed near Glenbrook, east and west of Courtland Avenue, near the Stamford-Darien border in 1909. It was the prototype for the compound catenary construction used on the New York, Westchester & Boston Railroad and the Harlem River Branch in 1912. Only fifteen arched portals exist. It was a moderately successful attempt to combine attractive esthetic appearance with a cost-effective engineer



Elevation of an Arch-Shaped Portal with Compound Catenary System



View of an Arch-shaped portal at Glenbrook. This portal demarcates the transition from arched portals to tapered posts.

ing design. The design contributed to the evolution of even more efficient systems. This portion of the system is characterized by arch-shaped portals of angle iron and lattice bars bolted to concrete foundations spaced about 300 feet apart. A horizontal pipe strut connects the arched posts. Contact wires are suspended from insulators on a compound hanging-bar catenary. Two grounded, stranded steel, 1 1/4 -inch diameter, main messenger cables suspended between the catenary portals provide the main support for a transverse hanging bar or beam which in turn supports insulators holding the auxiliary and contact wires. Pipe hangers attached to each messenger at relatively short 100-foot intervals form two triangles linking the messengers with the suspended beam hanging below. The height of the triangle varies to keep the hanging beams at a consistent height above the track. There are three sub-spans per main span as delimited by the arch-type portals. All subsequent construction east of Stamford used AI section beams or pipe for the traverse hangers.

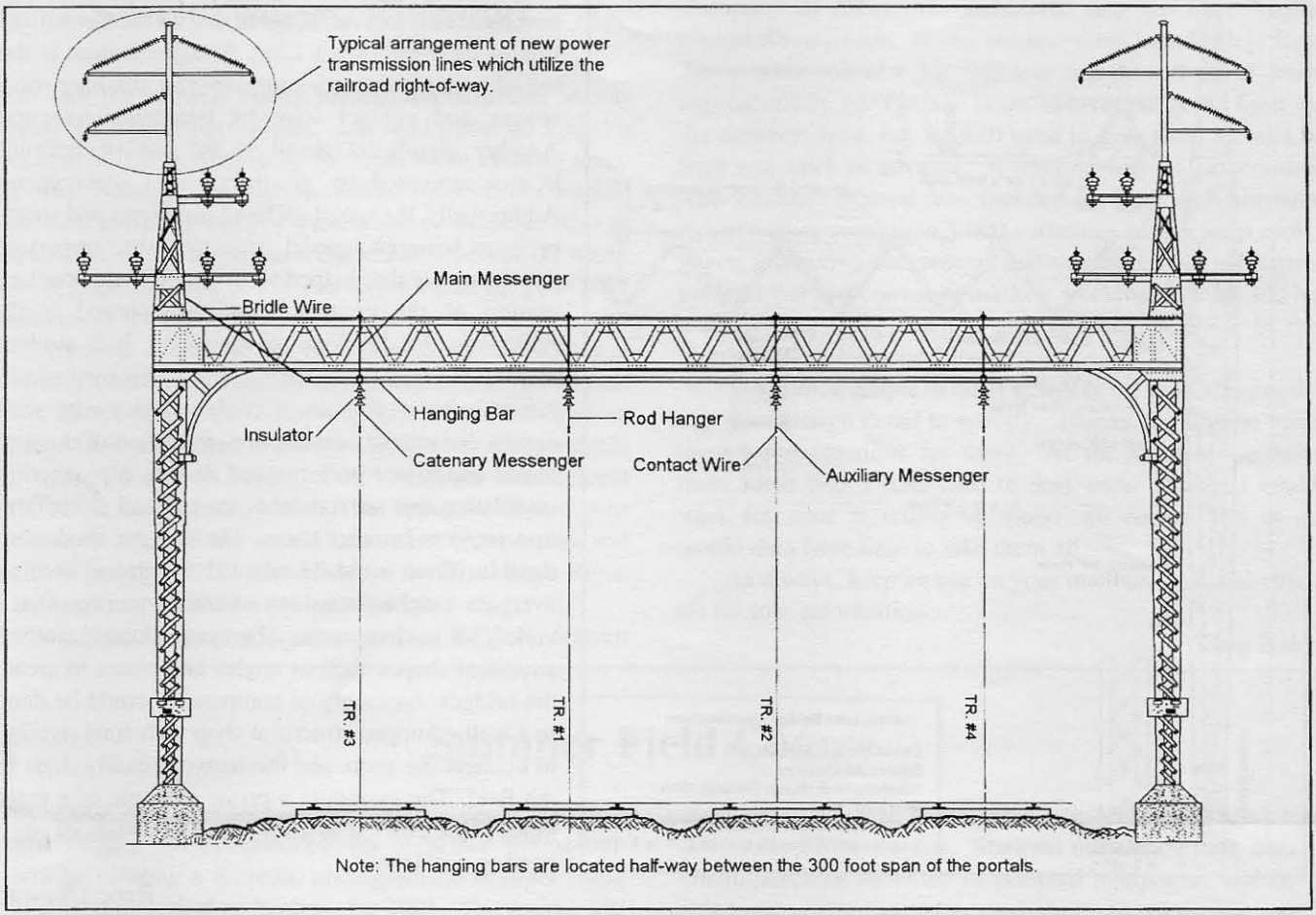
A cross strut fastens two arch-type posts together. This consists of a section of 4 2-inch extra heavy pipe. A malleable iron plate at each end of the pipe forms the anchor for six extra high strength 5/8" diameter cables. Feeder wires are carried on cross arms fastened to AH section poles located 10' outside each portal arch. These are connected to the portal by an extended cross arm.

As compared to the earlier system, this design reduced the amplitude of hogging and sagging of the contact wire caused by changes in ambient temperature. The main hangers at Glenbrook are pipes. East of Glenbrook AI beam replaced the pipes. A secondary, single messenger cable for the contact wire is suspended from the hanger beam by an insulator. Rod hangers at ten foot intervals connect the single messenger to the contact wire. By varying the length of the inclined hangers between the messenger and the contact wire, the contact wire is conformed to closely follow the arc of the track and maintains a position essentially parallel to the rails. Bridle wires attached to the hanging beams center the insulators and catenary messengers over the track. The system is designed to allow the contact wire to follow the curve of the track below more closely than did the double messenger catenary system.

Compound Catenary with Hanging I-Beam Supports and Tapered Post Portals

The remaining section runs from Glenbrook to New Haven. Except for the Glenbrook segment, the sections east of Stamford use tapered posts of angle and lattice bar construction for the portals and hanger beams. The hanging beams in turn are supported by grounded messengers spanning from portal structure to portal structure.

This type features main spans of 300 feet with sub spans of 150 feet. The four main messengers are grounded, carry no current, and are made of 7/8-inch extra-high strength steel cable. They support the hanging beams that in turn support catenary messengers over each track. The hanging beams are 3-inch I-beams located every 150 feet, at the quarter points in the span between bridges. The catenary messengers in each sub-span are 5/8-inch extra-high strength, 19-strand steel cable. Below the track messenger, a 4/0 phono-electric



Elevation of a tapered post portal. Except for the fifteen arch-type portals used in Glenbrook, and several modified posts at Jenkins Curve in Bridgeport, these were the standard catenary supports between Stamford and New Haven.

contact wire and a 4/0 auxiliary messenger wire is supported by simple rod hangers. On curves the contact and auxiliary messenger hangers vary in length and are inclined to maintain the contact wire closely to the curve of the track below.

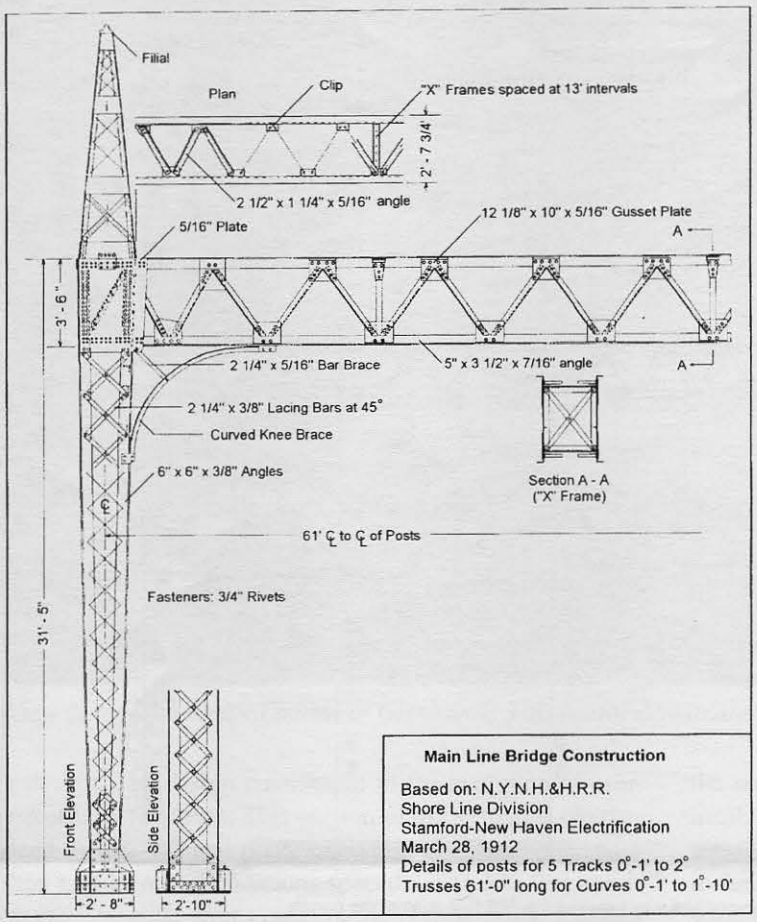
Posts in this section featured a tapered profile and a smaller base than posts used from Woodlawn to Stamford. The tapers also allowed the use of a smaller concrete foundation and are, aesthetically speaking, a more pleasing design. The posts also taper above the cross truss attachment points and are used to support cross arms that carry the feeders. On some sections of the system these tapered extensions are positioned on the truss rather than on the vertical posts.

The posts taper only on the front elevation. When viewed from the side, the structural angles making up the post are parallel. Extensions for supporting cross-arms that are located at the top of the post, taper on both faces. The truss is fastened between two posts so that the top of the truss is flush with the top of the post. Decorative curved knee braces connect the truss and the posts. A plate is riveted to the truss and the post and joins them securely.

Tapered extensions are riveted to the top of most posts to support feeder and ground wires. The angle iron extensions are held together with laced bar stock and taper to form a small platform topped by a filial. In recent years utility power transmission lines have been added to the posts. Compared to the earlier design, the tapered posts reduced the stress due to the moment introduced by lateral load at the truss to post connection.

Summary

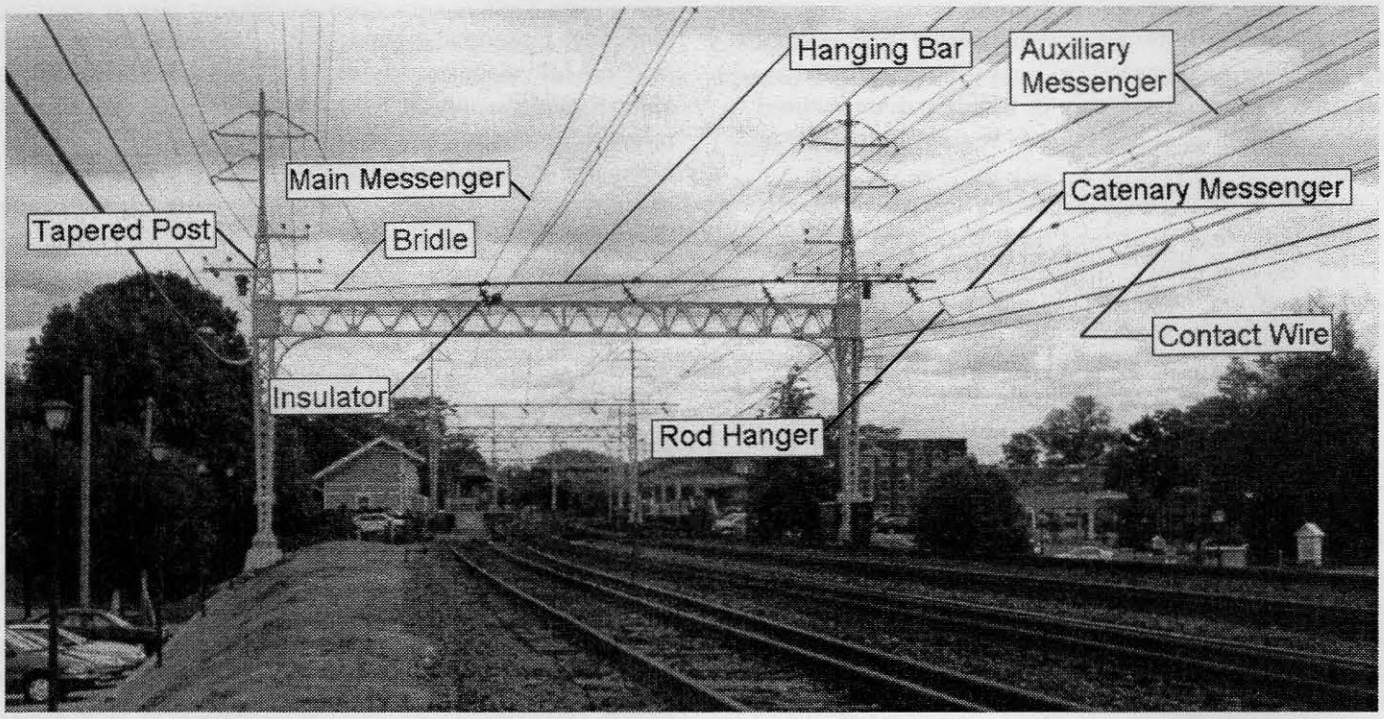
The catenary system shows the evolution of a railroad traction power transmission design. The first section is a complex design requiring many components. Engineers assumed that a rigid system was needed. Experience showed that a flexible system reduced wear. Further, a simpler system would be as effective and cost less to install and maintain. Subsequent sections were simpler in design, arguably more esthetically pleasing and less costly. The catenary is significant as an example of railroad traction power transmission showing its progressive development. The experience gained in New Haven's catenary design is reflected in other railroad electrification projects throughout the United States.



An unnumbered blueprint dated March 28, 1912 which details the specifications for the tapered posts used from Stamford to New Haven.

Several important techniques for catenary construction were developed and tested during the electrification of the New Haven Line. A major feature is the use of twin messengers supporting an auxiliary messenger and contact wire by triangular hangers. Another significant detail is the use of hanging beams supported by grounded main messengers. Additionally, the use of inclined insulators and shorter spans between support structures were important developments that helped to maintain better conformation of the contact wire over curved track. Following the development time-line, it is evident that the engineers continually looked for methods to insure better conformance of the contact wire with curves, lower cost construction, reduction of maintenance and better performance. It was a pioneering installation that set standards for railroad electrification projects in other areas. The designs used were flexible. They could be adapted to terrain, varying overpass heights, numbers of tracks, curves and a variety of environments. The system used standard structural shapes such as angles and plates to create the bridges. Assembly of components could be done in a well-equipped structural shop with final riveting to connect the posts and the trusses, readily done in the field. The system is a prime example of a technology that evolved as a solution to a variety of engineering problems.

Robert Stewart
West Suffield, CT



View east near Milford Station showing catenary construction

SNEC Tours Planned

Now that the snow is nearly melted, unpredictable storms largely gone until next winter, and road travel no longer a concern, SNEC is gearing up for some more exciting tours. As usual, numbers are often limited by the facilities we will tour, so if a mailing catches your interest call early. Also as usual, tours with limited numbers will be reserved for members in good standing (i.e. if you haven't paid up your 2001 dues now is the time to do so!).

Although details are not yet available, we are looking at mid-May (tentatively June 2) for a group of tours in Central Falls, Rhode Island. The morning will feature a tour of an OSRAM Sylvania facility. This is a glass plant that produces tubing for fluorescent lamps, various bulbs for incandescent light bulbs, and giftware glass. After lunch we hope to tour a former textile mill site turned into an interpretive park and see (and perhaps ride) a canal boat on the Blackstone River. It is shaping up to be an exciting afternoon.

We have had many requests to tour the L.S. Starrett Company in Athol, Massachusetts, and we have finally pinned down a tour. If you are interested note Friday, June 22, in your calendar for this tour which will occur from approximately 10:00 am to noon. There will be no limit on the numbers here, but we will need to give them a count at least one week in advance. A mailing will be forthcoming with details. Starrett was founded in 1880 and currently manufactures more than 5,000 variations of precision tools, gages, measuring instruments and saw blades for industrial, professional and consumer markets worldwide. It should be a fascinating tour, which is also open to members of the Northern New England Chapter.

There are a couple of other things in the works, but nothing with enough detail to specify. Thanks for all who have provided suggestions for tours. At the moment we have more ideas than I have time to deal with. If only I could work full time at setting up tours! Of course, few of us would then have time to take them all.

As always, keep an eye on your mailbox (real and virtual) for tour information.

Greg Galer

Summer Field Course

The Department of Anthropology at SUNY Plattsburgh will be offering a 6 credit, undergraduate summer field course in historical archeology for 2001. The course will run from July 9 through August 9, 8 a.m. to 4 p.m., Monday through Thursday. The site is the ruins of the 19th-century Clintonville iron works in the Adirondacks, about 30 minutes south of Plattsburgh. This will be the fourth field season of research at this important industrial site.

We shall be doing excavations within the remains of the large bloomery forge building that operated here between 1836 and 1890. The site lies in a beautiful wooded area beside the Ausable River. Transportation will be provided daily to and from the site. Students must bring their own lunch, purchase short list of personal equipment, and be able to cope with mosquitoes, proximity to poison ivy, and minimal facilities in the field. Please contact the instructor for further information before enrolling for the course: Dr. Gordon Pollard, Chair, Department of Anthropology, SUNY College, Plattsburgh, New York 12901. Phone (518) 564-4005, or email gordon.pollard@plattsburgh.edu. Enrollment is through the Registrar's Office: 1 (800) 570-1634 or through the Center for Lifelong Learning: 1 (800) 388-6437. Students needing dorm accommodations should contact Cathy Moulton at the SUNY Plattsburgh Campus Housing Office: 1 (800) 569-5716.

Membership Application Form

The Society for Industrial Archeology promotes the identification, interpretation, preservation, and modern utilization of historic industrial and engineering sites, structures and equipment.

Northern New England Chapter
Maine, New Hampshire, Vermont, Northeastern New York.
❒ Regular $10.00
❒ Student $5.00
❒ Lifetime $100.00
Make check payable to NNEC-SIA and mail to:
Herman C. Beown
Traeasurer, NNEC-SIA
250 West Shore Road
Grand Isle, VT 05458-2104

Southern New England Chapter
Massachusetts, Rhode Island, Conncticut
❒ Regular $15.00
❒ Student $10.00
❒ Lifetime $150.00
Make check payable to SNEC-SIA and mail to:
Robert C. Stewart
1230 Copper Hill Road
West Suffield, CT 06093

Chapter members are encouraged to join the national **Society for Industrial Archeology**
❒ Regular $35.00
❒ Student $20.00
Make check payable to SIA and mail to:
SIA-HQ
Dept. Socieal Studies
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931-1295

Name: _____ e-mail: _____

Address: _____

_____

Phone: _____

Chapter dues do not include membership to national SIA.