

28th Annual New England Conference on Industrial Archeology

Hosted by the Southern New England Chapter of the Society for Industrial Archeology (SNEC-SIA)
 at Alden Laboratories, 30 Shrewsbury Street, Holden, Massachusetts
 Saturday, March 7, 2015

SCHEDULE

8:30-9:25 A.M.	Registration	
9:25-9:30 A.M.	Greetings and Opening Remarks	<u>Marc N. Belanger</u> President, SNEC-SIA
9:30-10:05 A.M.	Industrial Worcester: An Overview of Its Manufacturing Past and Archaeological Present	<u>Susan McDaniel Ceccacci</u> Jefferson, Massachusetts
10:05-10:40 A.M.	Introduction of the Rolled I-beam in the United States in the 1850s	<u>Sara E. Wermiel, PhD</u> Jamaica Plain, Massachusetts
10:40-10:50 A.M.	Break	
10:50-11:25 A.M.	Paul de Mars, Edwin Armstrong and the Yankee Network: a 1941 audio recording of FM radio pioneers broadcasting between Boston, Paxton, MA and Mount Washington, NH	<u>Gilmore Cooke</u> West Yarmouth, Massachusetts
11:25-12:00 P.M.	From Horse to Electric Power at the Metropolitan Railroad Company Site: an Old Collection Provides a New Narrative of Technological Change	<u>Miles Shugar</u> Boston, Massachusetts
12:00-1:30 P.M.	Lunch Break	
1:30-2:05 P.M.	Route 128 – A Network of Artifacts and Milestones	<u>Alan R. Earls</u> Franklin, Massachusetts
2:05-2:40 P.M.	Making Places: An Inventory of Historic Industrial Sites in Connecticut and Pilot Grant Program for Underutilized Mills	<u>Wes Haynes, and Renée Tribert</u> Hamden, Connecticut
2:40-2:50 P.M.	Break	
2:50-3:25 P.M.	The Power of Improvement in Worcester's Metals Industries, 1864-1911	<u>Allison Chisolm</u> Worcester, Massachusetts
3:35-4:00 P.M.	Shoe Buttons, Liberty Laces & Insulated Staples: 153 years of M.M. Rhodes & Sons Company, Taunton, Mass.	<u>Marc N. Belanger</u> Taunton, Massachusetts

Industrial Worcester: An Overview of Its Manufacturing Past and Archaeological Present

This illustrated talk will outline briefly Worcester's early manufacturing development, beginning in the early 19th century. It will identify and map the city's most important manufacturers and industrial sites dating from its late-19th-early-20th-century "Golden Age" of industrial prosperity. It will also take a look at how former factory sites fare today in this city, which is no longer manufacturing-based but is now a center for bio-tech, medicine, and education.

Susan McDaniel Ceccacci is an architectural historian and currently Education Director at Preservation Worcester. Prior to assuming her present position, she served for more than thirty years as a historic preservation consultant, producing National Register nominations, historical/architectural surveys, and consulting services to Massachusetts cities, towns, and historical organizations. She received her M.A. Degree in Historic Preservation Studies from Boston University in 1991 with a thesis entitled *Architectural Terracotta in the United States Before 1870*. Select publications and papers include: *Hillside Stencil Project Report: An Overview of the History of Interior Decorative Painting in Worcester, Massachusetts* (2007), *The Evolution of Historic Structure Reports Prepared by the Society for the Preservation of New England Antiquities: 1962-1992* (1992), and *Living at the City's Green Edge: Bancroft Heights, a Planned Neighborhood in Worcester, Massachusetts* (a book to be published in 2015).

Introduction of the Rolled I-beam in the United States in the 1850s

The I-beam is a metal structural member that, in section, is shaped like a capital I. It is a solid piece (not fabricated from several pieces) with two parallel flanges – at the top and bottom – that are perpendicular to a web between them. While structural metal beams in this shape could be made by casting, this was not done in the United States. Rather, the first I-beams were rolled from wrought iron. And it was only after these rolled beams appeared, in the 1850s, that metal began to be used structurally in American buildings to any extent. While I-beams were used in roofs and (probably) to support bridge decks in the early days, the main expected use of them was as elements in metal frameworks of buildings. The beams were intended for fireproof buildings, which had metal frames.

This presentation will cover the early history of the rolled I-beam in the U.S. in the 1850s. It will explain the context – the prior introduction of I-beams in France – and when and where I-beam production began in America. This topic has been treated in a few, now classic, texts written by Charles Peterson (1980, 1993), Robert Jewett (1969), and Esmond Shaw (1960). My paper will present a more precise timeline for the introduction of rolled I-beams, from the initial rail-shaped beams to the true symmetrical I-shaped beams. It will conclude with information on buildings in which the early beams were used and extant examples of these buildings in New England.

Sara E. Wermiel is an independent scholar, historic preservation consultant, and teacher. Her research focuses on the history of 19th-century American technology, industrialization, and urbanization. She has written several books and many articles on the main subjects of her research: structural fire protection, and the development of new materials and assemblies for constructing buildings in the 19th and early 20th centuries. Wermiel received a doctorate in urban history and history of technology from the Massachusetts Institute of Technology (1996).

Paul de Mars, Edwin Armstrong and the Yankee Network: a 1941 audio recording of FM radio pioneers broadcasting between Boston, Paxton, MA and Mount Washington, NH

The Yankee Network introduced New England listeners to the most amazing advance in radio reception in 1941. Frequency-modulation (FM) radio programs were transmitted from their landmark station W1XOJ. W1XOJ was located in Paxton MA, near Worcester. Yankee Network's mobile van outfitted with a high quality FM receiver cruised the northeast to demonstrate the better quality sounds available by FM: sounds that were clear and distinct, radio programs that were free from the 'shackles of static'. Those engineers and innovators responsible for launching the FM revolution took part in a live radio relay test on February 14, 1941. Participants included Paul de Mars, Chief Engineer from Belmont and Lawrence, Edwin H. Armstrong, FM inventor, and others in Yankee Network's hi-fi studio in Boston. Voices were transmitted and retransmitted by Yankee's W1XOJ transmitter at Paxton MA. Voice signals were then relayed to W1XER atop Mt.

Washington, back to Paxton, and on to station W1XPW on Meriden Mountain in CT. Finally, down to Armstrong's W2XMN in Alpine, New Jersey. Interestingly, the entire audio or radio 'show' was captured and recorded using high-fidelity equipment. For my presentation, I propose to share this rare audio recording. To my knowledge, it has not been heard in New England since 1941.

Gilmore Cooke is a senior member of the IEEE. He is a member of the Boston Section's Executive Committee and chairs the History and Milestones Committee. A graduate of McGill University, he is a registered professional in Massachusetts and California. He served on the IEEE History Committee. He has spoken numerous times at SIA conferences on the history of power generation, telephone, and other electrical topics. Since retiring, his historical interests include New England's electrical engineering.

From Horse to Electric Power at the Metropolitan Railroad Company Site: an Old Collection Provides a New Narrative of Technological Change

The aim of this paper is to present the findings of a re-examination of the Metropolitan Railroad Company (MRC) Complex Site in Roxbury, Massachusetts. The MRC operated a horse-powered railroad system station at this site between 1860 and 1886. The MRC was conglomerated into the West End Street Railway (WESR) in 1887, which took over the Roxbury Crossing complex and soon after converted the facility and their car lines to operate on the new technology of electric traction. The site was first excavated in the late 1970s by staff of the Museum of African American History. Researchers recovered nearly 20,000 artifacts related to the site's life as a horsecar street railway station and carriage manufactory, its subsequent conversion into an electric street railway until around 1920, when it was converted into an automobile garage.

Using the framework of behavioral archaeology, this project uses GIS-based spatial methods and newly collected documentary evidence to reexamine the site's assemblage of horse accoutrements and carriage manufacturing byproducts. Artifact distribution maps overlaid on detailed historic maps reveal how carriage manufacturing and horse maintenance produced a distinct and spatially focused artifact set generated by specialized craft and maintenance activities. After the WESR reorganized and electrified Boston's transit, the complex was converted into a comparatively inactive station with leather craft persisting to accommodate sleighing and line maintenance. The complex's reorganization and electrification under the West End Street Railway makes it a valuable microcosm of grand technological change. Horse harness craftsmanship continued onsite to serve in new capacities, highlighting nuances in the narrative of technological change onsite.

More broadly, this research offers the opportunity to recognize human and animal contributions to increasing the efficiency of transportation infrastructure between the economic core of Boston and its growing suburbs during the latter half of the 19th century.

Miles Shugar attended Millersville University of Pennsylvania after obtaining early volunteer experience in archaeology. There, after conducting fieldwork on colonial sites in Lancaster County, PA, and Bermuda, he obtained his Bachelor's Degree in both history and anthropology, with a concentration in archaeology. After spending a few years in the professional realm, Shugar re-entered academia at the University of Massachusetts, Boston and obtained his Masters in Historical Archaeology. His work there explored the collections of the Metropolitan Horse Railroad Complex Site in Roxbury, Massachusetts. In addition, Shugar is the head of the GIS department at the Massachusetts Historical Commission, where he maintains digital geographic data on the Massachusetts' above ground and archaeological historic resources.

Route 128 – A Network of Artifacts and Milestones

Route 128, completed in the early 1950s, was the first superhighway beltway built around an American City. It also quickly became a nexus for economic development, particularly the new companies that later became known as the high tech industry. In a slide show I will trace the early history and construction of Route 128, as well as some of the historic features still visible along the roadway – those related to the highway itself and those related to the institutions that grew up around it. I will also provide a general overview of the foundational inventions, discoveries, and breakthroughs made in this region that undergird today's global economy.

Alan R. Earls is the author of several relevant books published by Arcadia Press, including *Route 128 and the Birth of the Age of High Tech* (2002), *Digital Equipment Corporation* (2004), *Polaroid* (2005), *U.S. Army Natick Laboratories* (2005), *Raytheon Company: The first 60 years* (2005) and *Watertown Arsenal* (2007). He has covered high tech as a journalist for more than 25 years and is a former editor of *Mass High Tech* newspaper and *Industry Magazine* (published by Associated Industries of Massachusetts). For the past 20 years, he has been a self-employed freelance journalist. He was also guest curator of a 2006 exhibit at the Charles River Museum of Industry in Waltham, Mass., entitled *The Widgets of Route 128*.

Making Places: An Inventory of Historic Industrial Sites in Connecticut and Pilot Grant Program for Underutilized Mills

The Connecticut Trust for Historic Preservation is in the second year of a two year pilot program, made possible by funding from the State Historic Preservation Office, Department of Economic and Community Development of the State of Connecticut, to document the state's extensive historic industrial resources, raise the level of awareness of potential alternatives to the neglect such buildings experience, and stimulate reinvestment in them. Our purpose in presenting at the conference is to spread the word about Making Places, and to stimulate an exchange of information about mill sites in Connecticut.

The historic resource inventory (HRI) builds upon Matthew Roth's 1981 *Connecticut: An Inventory of Historic Engineering and Industrial Sites*, and seeks to be as comprehensive as possible in identifying the breadth of factories built prior to 1965 in terms of construction, location, production, associated environment. The HRI will be a database searchable by town, industry and other variables. For the more notable facilities, researched entries will be completed. Our presentation will include a very brief discussion of methodology and examples of the variety of facilities identified to date.

To raise awareness and stimulate re-investment, Making Places provides demonstration grants to support strategic planning and pre-development surveys as seed money to invigorate reuse projects for mill properties that have lain fallow or only partially used. We will present information on the broad scope of issues associated with these properties and grant-funded activities ranging from preservation planning to market feasibility to environmental and zoning studies. We will also show excerpts of our "Got Mill" presentation of case studies of completed adaptive use projects in Connecticut.

Wes Haynes, Making Places Project Director and Circuit Rider, has extensive experience in historic preservation, including tenures at the New York Landmarks Conservancy, Preservation League of New York State, New Jersey Historic Trust, and in private practice at The Ehrenkantz Group and John G. Waite Associates.

Renée Tribert, Making Places Project Manager, has recently returned to the field after a sixteen year hiatus spent in environmental consulting. She has an MS in Historic Preservation from the University of Pennsylvania and has been curator/collections manager at the Harriet Beecher Stowe House and the New Britain Museum of American Art.

The Power of Improvement in Worcester's Metals Industries, 1864-1911

Post-Civil War Worcester was a city fueled by innovation and enterprise, and one of its leading industries was wire manufacture. At Washburn & Moen, founded by Ichabod Washburn in 1831, a new way of manufacturing wire from rods, produced using a rolling mill design imported from England in the late 1860s, vastly increased production and quality of wire. Used in a host of products, including pianos, hoop skirts, telegraph and telephone systems, and by the mid-1870s,

barbed wire, the wire produced in Worcester helped to fence in the expanding Western settlements and extend communications systems to the new frontier towns. Supervising the manufacturing works at Washburn & Moen from 1864-1887, Charles Hill Morgan brought his new ideas to the manufacturing process and patented a hydraulic elevator to serve the needs of the expanding factory on Grove Street and its second location in South Worcester. During that period, the enterprise grew to more than 3,000 employees. In 1888, he founded Morgan Construction Company, which built rolling mills with his patented designs for wire manufacturers across the country. Morgan also served as an early trustee of Worcester Polytechnic Institute and guided that institution established with the founding principles of theory and practice for its engineering students. Many of its graduates would go on to work with Worcester's industrial companies.

This paper will address Morgan's lifetime of ideas and continued improvements to existing rod rolling manufacturing as contributing factors in the economic growth experienced in Worcester throughout this period, and well past his death in 1911, relying on research completed for his recently published biography, *The Inventive Life of Charles Hill Morgan: The Power of Improvement in Industry, Education and Civic Life*.

Allison Chisolm has been a freelance writer and marketing consultant for academic, healthcare and business clients since founding Choice Words/Chisolm & Co. in Worcester in 1996. Her work has appeared in local and international publications. She has also been a writer and editor for UMass Medical Center, Harvard University, and Ogilvy Adams & Rinehart in New York and London. A Princeton University graduate, Chisolm published *The Inventive Life of Charles Hill Morgan: The Power of Improvement in Industry, Education and Civic Life* with TidePool Press in October 2014.

Shoe Buttons, Liberty Laces & Insulated Staples: 153 years of M.M. Rhodes & Sons Company, Taunton, Mass.

An overview of ongoing efforts to document and preserve the remarkable M.M. Rhodes & Sons Company complex in Taunton, Massachusetts, which closed in 2014 after 153 years of operation by the Rhodes family. The company was founded in 1861 by Marcus Morton Rhodes, in the rented space of a former umbrella factory. He initially produced small metal items such as carriage lining nails, carpet tacks, hoop skirt trimmings and tufting buttons. In the early 1870s, joined by his two sons, Rhodes developed the machinery and process for the production of papier-mâché shoe buttons, which became the company's primary product for several decades. By 1893, Rhodes employed about thirty people and produced six million buttons per day to supply the burgeoning shoe industry. In 1897, they also developed a process for finishing shoe hooks, sold under the "Rhodite" trademark.

However, by the time of Rhodes' passing in 1916, the industry had changed, and shoe buttons were no longer en vogue. The company attempted to diversify with other products, including a short-lived venture to manufacture shoe laces, sold under the "Liberty Laces" trademark. In 1922 the family began producing insulated nails, staples and other types of fasteners for the wiring industry. This business ultimately was a success, and would carry the company for more than ninety years until it ceased in 2014.

The small factory complex is a rare survivor, containing an array of belt-driven machinery operated by antique electric motors. The company's office appears much like it did a century ago, with its original tin ceiling and woodwork, along with an extensive collection of product samples and company records. Together, these elements provide great insight on how the company grew and adapted over the years. Particular focus will be on the site's most unique building, the wooden japanning house / paint shop that contains several steam-heated ovens and a system of tracks and trolleys used in the finishing process to provide the buttons with a hard, durable finish. The ovens had also been used until recently to dry the company's painted products. The presentation will conclude with an update of the ongoing efforts to document and preserve the site, equipment and archives for the benefit of future generations, and the anticipated adaptive reuse of the property.

Marc N. Belanger is a licensed civil engineer from Taunton, Massachusetts with a longtime interest in the history and geography of New England. Since 2001, he has photographed and studied dozens of industrial sites throughout the region, with particular focus on the textile industry in his hometown of Fall River. In 2013 he wrote and published *A Guide to Fall River's Mills and other Industrial Sites*, and presented a paper entitled *Industrialization of the Lower Quequechan Valley (1813-1850)*, as part of the Fall River Historical Society's summer lecture series. He is the current president of the Southern New England Chapter – Society for Industrial Archeology.

