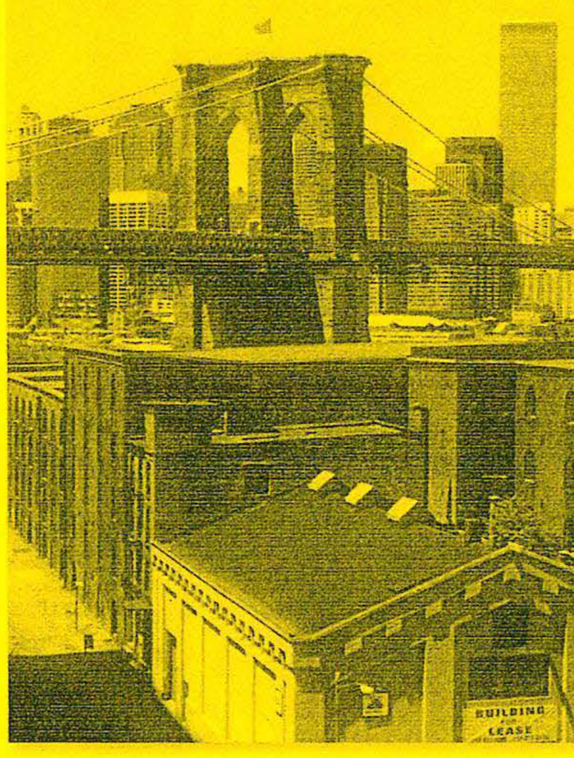
Brooklyn

31ST ANNUAL CONFERENCE 2002

EAST of the RIVER SOUTH of the SOUND



SATURDAY PAPER PROGRAM
June 8, 2002

ROEBLING CHAPTER

SOCIETY FOR INDUSTRIAL ARCHEOLOGY

PAPER SESSION PROGRAM
June 8th, 2002
31st Annual Conference
Society for Industrial Archeology
Dibner Library/Catt Building, Polytechnic University, Brooklyn Campus

We are grateful to Media Support and the Department of Civil Engineering of Polytechnic University, which has graciously donated meeting space and services for our paper sessions

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Session I. 8:15 - 9:45

Panel 1A. *Working with Water* — Catt Auditorium (1st floor)

Chair: Charles Hyde, Wayne State University

Mary Ebeling	Mead & Hunt, Inc.	A Cooperative Endeavor – The Building of the Santee Cooper Hydroelectric Project.
Clifford Zink	C.W. Zink & Associates	Sparkling History, Murky Future: Hackensack Water Company's New Milford Plant in Oradell, NJ.
Edward S. Rutsch	Historic Conservation and Interpretation, Inc.	The Ridgewood Aqueduct, the Major Source of Fresh Water for the City of from 1858 to 1898.

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Panel 1B. *The Restoration of the Ben Schroeder Saddletree Factory: Issues and Challenges in Preserving and Interpreting Industrial Heritage* — LC 102 (1st floor)

Chair: Bode Morin, Detroit Historical Museums, Historic Fort Wayne

John M. Staicer	Historical Madison Foundation, Inc.	An Owner's Perspective in Planning for Preservation and Interpretation of a Historic Industrial Landmark.
John R. Bowie	John Bowie Associates	Coffee Can Construction: Preserving the Historical Character of the Schroeder Factory & Residence Site.
Robert Yuill	Historic Machinery Services Corporation	Of Cardboard Shims and Bits of Wire: The Challenges of Restoring and Operating the Schroeder Machine Collection.

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Panel 1C. *19th Annual Historic Bridge Symposium* — LC 400 (4th floor)

Chair: Eric DeLony, HAER

William Vermes	HNTB	The Development of Continuous Stiffening for American Suspension Bridges.
Dario Gasparini William Vermes	Case Western Reserve University HNTB	C.A.P. Turner and Reinforced Concrete Flat-Slab Bridges
Judith Wang and Dario Gasparini	Case Western Reserve University	Tunneling in New York: The Work of Clifford M. Holland from 1906 to 1919.

Session II. 10:15 - 11:45

Panel 2A. ***The Recordation and Interpretation of the Silk Textile Industry of the Delaware & Lehigh National Heritage Corridor*** **Catt Auditorium (1st floor)**

Chair: Sandra Norman, Florida Atlantic University

Martha Capwell-Fox		The Technology of Silk Textile Manufacturing.
Carol Front	Raymond E. Holland Historical Collection	Photo Documenting Silk Mills and Placing Them in Their Proper Architectural Context.
Lance E. Metz	Hugh Moore Historical Park and Museums	Interpreting the History of the Silk Textile Industry of the Delaware & Lehigh National Heritage Corridor.

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Panel 2B. ***Tailings as Cultural Artifact*** **LC 102 (1st floor)**

Chair: Patrick Malone, Brown University

Paul White	Brown University (PhD Candidate)	The Archeology of Heads, Tails, and Decisions In-Between.
Fredric L. Quivik	Consulting Historian of Technology	From Slimes to Hens Eggs: Visions of Tailings in Idaho's Coeur d'Alene Mining District, 1888-2001.
Kent Alexander Curtis	Second Nature, Inc.	The Invisible Earth: Mining, Nature, and Modern Business Enterprise.

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Panel 2C. ***19th Annual Historic Bridge Symposium*** **LC 400 (4th floor)**

Chair: Beatrice Hunt, Hardesty & Hanover

Bojidar Yanev	NYC Department of Transportation	Managing Brooklyn's Great Bridges.
Jay Shockley	NYC Landmarks Preservation Commission	Steel Arch, Swing Span and Retractile: New York City's Oldest Lesser-Known Bridges.
David W. Moyer	Parsons Transportation Group	History and Rehabilitation of New York's Longest Bridge – the Gowanus Expressway.

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Buffet Lunch in the Courtyard 11:45 - 12:30

Keynote address 12:30 - 1:00 **Catt Auditorium**

Henry Petroski, the Aleksandar S. Vesic Professor of Civil Engineering and a professor of history at Duke University, will speak on *Brooklyn Bridges*.

Annual Business Meeting of the SIA 1:00 - 2:15 **Catt Auditorium**

Session III. 2:15 - 3:45

Panel 3A. ***The Once and Future Port of New York & the Brooklyn Waterfront: Maritime Commerce from the 18th to the 21st Centuries. Part I*** **Catt Auditorium (1st floor)**

Chair and Organizer: Michael S. Raber, Raber Associates

Michael S. Raber	Raber Associates	Deep Water, Mud Flats, Marine Borers, and Congestion: The Port of New York Until the Later 20th Century.
Charles Parrott	Lowell National Historical Park	The Warehouses of the Brooklyn Waterfront.

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Panel 3B. ***American Icons -- Old and New*** **LC 102(1st floor)**

Chair: Betsy Fahlman, Arizona State University

Chris J. Lewie	City Planner and Author	The Engineering Marvel That Was the Allegheny Portage Railroad.
Roland Miller	Pibloktok Productions	Abandoned In Place: Challenges in Preserving and Presenting Cape Canaveral's Deactivated Space Launch Complexes.
Capt. William McKelvey	Canal Captain's Press	The World Trade Center from Start to Finish.

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Panel 3C. ***Mineral Extraction*** **LC 400 (4th floor)**

Chair: David Simmons, Ohio Historical Society

Gordon Pollard	SUNY - Plattsburgh	Prisoners of Iron: Clinton Prison at Dammemora, NY and 19th Century Charcoal Iron Production
R. Scott Baxter and Rebecca Allen	Past Forward, Inc.	The Solar Salt Facilities of the Baumberg Tract.
Andrew Johnston	UC - Berkeley Dept. of Architecture	Quicksilver Furnaces: Work, Race, and Ethnicity in the Mercury Mining Industry, 1870-1883.

Session IV. 4:00 - 5:30

Panel 4A. ***The Once and Future Port of New York & the Brooklyn Waterfront: Maritime Commerce from the 18th to the 21st Centuries. Part II*** **Catt Auditorium (1st floor)**

Thomas R. Flagg	Photo Recording Associates	Trains on the Tides: Bringing Freight Over the Water in the Carfloating Capital of the World.
Thomas H. Wakeman Andrew Genn	Port Authority of NY & NJ NYC Economic Development Commission	Waterway Development at Port of New York and New Jersey

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Panel 4B. ***Potpourri*** **LC 102 (1st floor)**

Chair: Louise Trottier, Canada Science and Technology Museum

Lee R. Maddex	WV Institute for the History of Technology & Industrial Archeology	The Evolution of Mechanized Nailmaking, 1775-1825: Initial Results of a Cut Nail Machine Patent Study.
Christopher H. Marston	National Park Service HABS/HAER	Stone Bridges and Jersey Barriers: Rusticity and Contradiction on the Bronx River Parkway.
Lyudmila P. Kholodova Eugene Logunov	Ural State Academy of Architecture and Art Institute of History of Material Culture	The Industrial Monuments in the Urals.

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Panel 4C. ***Ethical Responsibilities of Industrial Archeologists to Local Communities*** **LC 400 (4th floor)**

Chair and Organizer: Elizabeth Norris, Michigan Technological University

Alicia B. Valentino	Michigan Technological University	Archeological & Community Interaction in the Preservation of Historical Sites.
Julie A. Kloss	Michigan Technological University	The Preservation of Historic Industries in a Twenty-First Century World.
Sydne B. Marshall Joel I. Klein	Foster Wheeler Environmental Corp. John Milner Associates, Inc.	Responsibility to Communities with Toxic Waste

Panel 1. A: Working with Water

Chair: Charles Hyde, Wayne State University

A Cooperative Endeavor – The Building of the Santee Cooper Hydroelectric Project

Mary Ebeling
Mead & Hunt, Inc.

The dominance of private industry in the production of power began to be challenged in the late 1920s and early 1930s as public agencies entered hydroelectric generation and electric transmission. With the establishment of the New Deal programs, public agencies appealed to the federal government for assistance in constructing their generating plants. The Santee Cooper hydroelectric project was the most prominent of those undertakings in South Carolina and one of the largest New Deal projects in the country. It included the construction of a massive system of dams and dikes; a five-unit powerhouse and related infrastructure; a rural electrification program; and a malaria eradication program. The project, which included the creation of the South Carolina Public Service Authority known as Santee Cooper, marked the beginning of the state of South Carolina's involvement in power production and distribution. It resulted in a virtually unimaginable change to the low-country landscape outside of Charleston. This paper will provide an overview of the history of the project and discussion of the role of Santee Cooper in rural electrification and the development of rural electric cooperatives in South Carolina.

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Sparkling History, Murky Future: The Hackensack Water Company's New Milford Plant in Oradell, NJ

Clifford Zink
C. W. Zink & Associates

The Hackensack Water Company opened its New Milford Pumping Station on Van Buskirk Island in the middle of the Hackensack River in 1882. The site illustrates traditions and innovations in the design and construction of industrial buildings in the late 19th and early 20th centuries. The plant's steam equipment illustrates the shift in the water works industry from vertical triple expansion pumps (a 1911 Allis Chalmers), to piston-driven centrifugal pumps (a 1915 Allis Chalmers), to centrifugal turbines (a 1929 De Laval). The site's most innovative feature is the Filtration Plant designed in 1903 by the New York firm of Hering & Fuller. It survives as the earliest, large-scale example of George Warren Fuller's development of the American system of mechanical filtration that became an industry standard and earned him the designation of "father of sanitary engineering in the United States". Fuller's painstaking experiments in Louisville in 1895 and Cincinnati in 1898 established mechanical filtration as the best way to purify contaminated river waters. Hering & Fuller's innovative design, documented in over 60 surviving original drawings, included chemical and biological laboratories. Working in these laboratories in the late 1920s, company biologist George Spalding, another MIT graduate, developed an activated carbon treatment process to remove tastes and odors from water that became standard in water systems throughout the world.

In 1993 the Company gave the plant to Bergen County, and in 1996 area residents formed the Water Works Conservancy to preserve it, but a preservation plan acceptable to all parties has not yet emerged.

While its future is very much in doubt, Robert Vogel has noted the potential of the New Milford Plant to become "a unique monument to the nation's waterworks industry".

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The Ridgewood Aqueduct, the Major Source of Fresh Water for the City of Brooklyn from 1858 to 1898

Edward S. Rutsch
Historic Conservation and Interpretation, Inc.

Brooklyn developed its fresh water needs in a local and quite disjointed way. By the mid-19th century, the water resources proved inadequate for Brooklyn's ballooning populace. Developers found that it dampened their ability to build and increase industries and population. Fire fighters also were not provided with enough water to extinguish large fires. The solution was to construct the Ridgewood Aqueduct to garner water from the streams along the south shore of Long Island. Water flowed by gravity through the aqueduct, which opened in 1858, to the base of the terminal moraine of the Wisconsin Glacier. There it was pumped to a reservoir at an elevation of 160 feet. A second pump raised part of the water an additional 40 feet to provide a powerful gravity feed to its distribution system. By 1898, Brooklyn, in a development tied closely with it becoming the fifth borough of New York City, was able to tap into water from the Catskills that was carried by New York's New Croton System. Thereafter, the Ridgewood Aqueduct was put on standby and finally abandoned in the 1950s. In the 1980s and 1990s, the system's remains were analyzed and recorded as part of a mitigation procedure brought about by the construction of expanded road facilities on the Nassau Expressway. Illustrations of a sample of the remaining buildings and water-handling facilities will accompany the paper, which will conclude with notes on how the system fell into the schemes of city planner, Robert Moses.

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Panel 1. B: The Restoration of the Ben Schroeder Saddletree Factory: Issues and Challenges in Preserving and Interpreting Industrial Heritage

Chair: Bode Morin, Detroit Historical Museums, Historic Fort Wayne

An Owner's Perspective in Planning for the Preservation and Interpretation of a Historic Industrial Landmark

John Staicer, Historic Madison Foundation, Inc.

The Schroeder Saddletree Factory is rare survivor from the once vast and significant horse equipage sector, which included wagon and buggy shops, saddle and harness makers, hame and stirrup manufacturers, whip makers and many allied trades. The issues and challenges of restoring this factory complex and its equipment, while in some ways unique to the Schroeder site, are similar to many industrial preservation projects. The presenters hope their efforts will inspire others to consider industrial restorations of additional worthy sites, so future generations of Americans can see, hear, touch, smell and learn from, the stories these fascinating industrial workplaces have to tell. The presentation will address the significance and the history of the Schroeder Factory and the issues Historic Madison Foundation, Inc. confronted, from an owner's perspective, in planning to restore this historically significant industrial property and its equipment. The Schroeder restoration serves as a case study of one approach to preserving industrial heritage. The decision to preserve and restore the factory, the residence and the site as an operable facility for public visitation is not without its drawbacks, which include: the long term care and conservation of artifacts within the historic structures, use versus non-use of historic machinery, and safely accommodating the public, especially handicapped visitors, within small buildings not designed for public visitation.

Mr. Staicer's presentation will include a discussion of the potential for a reverse engineering or experimental archeology study to further understanding of the saddletree manufacturing process. This process will rely heavily on the extensive collection of Schroeder artifacts, including partially manufactured products, templates, jigs and written records. Also to be discussed are ideas for the development of an innovative, portable, audio/visual guided tour of the factory which may allow visitors on-demand, pre-recorded machinery demonstrations and commentary.

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Coffee Can Construction: Preserving the Historical Character of the Schroeder Factory and Residence Site

John R. Bowie, A.I.A.
John Bowie Associates

The project architect will discuss the building restoration aspects of the project from the architect's viewpoint. The unusually narrow site (which limited the quantity of people the site could accommodate) and the high density of significant historic components (both architectural and machinery-related) within the three buildings necessitated a three-phase project over a three-year time span. The task accomplished in the 1998-99 restoration of the Bench Shop/Blacksmith Shop, the 2000-01 restoration of the woodworking shop and the 2001-2002 restoration of the residence and site will be explained as will how visitor orientation and comfort services, site upgrades and crowd management, and interpretive presentations will take place in the residence and throughout the site.

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Of Cardboard Shims and Bits of Wire: The Challenges of Restoring and Operating the Schroeder Machine Collection

Robert Yuill
Historic Machinery Services Corporation

When first evaluating the machines in the Schroeder Saddletree Factory, it was assumed that the machinery was in a worn condition, requiring repairs, but still functional. As the project proceeded, the extent of the defects and wear encountered were beyond original expectations. The work required to conserve and repair the machines tells an interesting story about the Schroeder family, their use of scrap materials in machinery repair and the conditions this small shop operated under. The process began with an illustrated condition assessment for each of the fourteen machines to be returned to operable condition. Machines were then removed from the factory to a former automobile service station where the machines were disassembled one-by-one for further evaluation and documentation. Repairs were performed, the machines reassembled, tested, adjusted and then reinstalled in the factory. The work took nearly one year to complete. Whether the work was to repair insect damage, worn or missing parts or just cleaning, the challenge was to perform the work without altering the visual or physical elements of each machine.

The discussion will include the general condition of the machines, motors and the overall work required to replace numerous worn bearings, shafts, pulleys, specialty cutters and the effects of termite and powder post beetles on wooden parts; how the new bearings, pulleys and other parts made the machine functional but how this affected the original "operating condition" the Schroeders were familiar with. Original "operating condition" means how the machines, when operated by the Schroeders with bad bearings, worn, out-of-round shafts and pulleys, caused extreme vibration and unsafe operating conditions. It will also address the method of making a saddletree as now understood, using templates to trace the outlines of parts onto lumber and how with further study of the patterns, machines, jigs and saddletree parts, this process may be one day reverse engineered.

Panel 1. C: 19th Annual Historic Bridge Symposium

Chair: Eric DeLony, HAER

The Development of Continuous Stiffening for American Suspension Bridges

William Vermes
HNTB

Continuous stiffening for suspension bridges began in Europe during the 1900s. While continuity was used for self-anchored suspension design, American engineers adapted this innovation to design several continuous stiffening trusses to resist the twisting and bending actions of the decks of traditional, externally anchored suspension bridges. Under the right criteria (main spans under 1,000 feet), these designs were economical, beating competing cantilever truss design bridges. In 1934, David Steinman used continuous stiffening in an ASCE paper as a means to further understanding of Deflection Theory for suspension bridges. In some designs, continuous girders were substituted for stiffening truss counterparts. Despite the low number of suspension bridges constructed with trusses or girders for continuous stiffening, this design represents a significant engineering stepping-stone in the development of suspension bridge technology.

C.A.P. Turner and Reinforced Concrete Flat-Slab Bridges

Dario Gasparini
Case Western Reserve University

William Vermes
HNTB

From 1905 to 1909, the technology of constructing reinforced concrete floors underwent a revolutionary transformation in the United States. This transformation consisted of the introduction and rapid widespread acceptance of C.A.P. Turner's flat-slab "mushroom" system. Turner's design was revolutionary from a technical and materials standpoint because it recognized and exploited the essential monolithic character of concrete. It bared the foolishness of casting floors in imitation of wood and steel framing, which traditionally used one-way decks, beams and girders. Turner's design was revolutionary from a construction and economic viewpoint because it simplified and decreased forming costs, decreased depths of framing, simplified finishing and facilitated lighting. The presentation describes Turner's pioneering adaptations of his mushroom system to bridges from 1908 to 1910. The diffusion and standardization of flat-slab technology in the following decade is discussed. Later examples of flat-slab bridges by several designers are illustrated and a brief assessment of flat-slab bridge technology is given.

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Tunneling in New York: The Work of Clifford M. Holland from 1906 to 1919

Judith Wang
Case Western Reserve University

Dario Gasparini
Case Western Reserve University

In 1965, Benita H. Low, daughter of Clifford M. Holland, donated a collection of her father's papers to the Case Institute of Technology Archive for Contemporary Science and Technology. These papers include some of Holland's detailed analyses and designs of tunnels, studies on shields and linings, data on properties and behavior of river sediments and notes on compressed air. His career in tunneling began in 1906 when he joined the Public Service Commission after receiving his BSCE from Harvard. Holland's first assignment was as an assistant engineer on the in-progress Battery-Joralemon St. tunnel. Holland's papers provide a detailed history of this troubled project. Perhaps because of the Battery tunnel experience there was a lull in N.Y. subway tunneling until about 1914. A manuscript in the collection reveals that during this time Holland performed detailed studies of tunneling technologies. Promoted to Division Engineer in 1915, Holland was placed in charge of the construction of four East River tunnels: Old Slip – Clark St., Whitehall St.- Montague St., 14th St., and 60th St. Documents in the collection on these five projects, completed prior to his magnum opus, are presented and discussed.

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Panel 2. A: The Recordation and Interpretation of the Silk Textile Industry of the Delaware & Lehigh National Heritage Corridor

Chair: Sandra Norman, Florida Atlantic University

The Technology of Silk Textile Manufacturing

Martha Capwell-Fox

The manufacture of silk textiles involved many processes such as throwing, warping, weaving, and dyeing. Each of these processes required skilled female workers as well as male mechanics to maintain the machines. Through period images that were taken when her father's mill was still in operation, Ms. Capwell-Fox will explain the step-by-step process through which raw silk is converted into finished products. She will add insights about silk production drawn from experiences at her father's mill and her interviews with former silk workers.

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The Photo Documenting Silk Mills and Placing Them in Their Proper Architectural Context

Carol Front
Raymond E. Holland Historical Collection

At the peak of its prosperity, the silk textile industry of the Lehigh Valley was housed in 358 separate mills built between 1881 and 1931. Some of the mills were truly large with one having 1,000,000 square feet under roof while others were tiny, unpretentious buildings that housed no more than a dozen looms. Silk mills dominated some urban neighborhoods while other sat isolated in small towns and villages. Despite the demolition of over 50 mills and the drastic alteration of many others, many silk mills retain their aesthetic integrity. During 2002, an awareness of the importance of the extant mills was recognized, and over two dozen of them have been placed in the National Register of Historic Places. Ms. Front will present slides from her documentation project.

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The History of the Silk Textile Industry of the Lehigh Valley

Lance Metz
Hugh Moore Historical Park and Museums

In 1881, the operators of Paterson, NJ, silk mills were confronted with increasingly strident labor unrest. Looking for a region where they would not face the same problem, they moved their plants west to Pennsylvania's Lehigh Valley. There they found communities that offered many competitive advantages -- good rail service, cheap energy sources, tax abatements, and, most importantly, a large and docile labor pool composed of the wives, daughters, and sisters of the iron, steel, cement, and slate workers. By 1920, the Lehigh Valley had become the most productive silk textile manufacturing center in America and the largest employer in the region. The importance of the silk textile industry increased as other industries downsized. This made the female workers even more important to the support of the family.

The valley's silk textile industry began to decline in 1937 when it was faced with pressure from unions to organize, which resulted in a long strike. The development of synthetic fibers also depressed the marked as did the cut off of supplies of raw silk from Japan. The industry continued in decline through the 1960s. The last Lehigh Valley silk mill, Catoir Silk, closed in 1989.

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Panel 2. B: Tailings as Cultural Artifact

Chair: Patrick Malone, Brown University

The Archeology of Heads, Tails, and Decisions In-between

Paul White, Ph.D. Candidate
Brown University

Processing wastes are a prevalent feature of historic and present day mining landscapes. Despite their ultimate designation as a non-valuable product, wastes have provided operators with critical assessments of milling performance. Comparisons of mill inputs (head), valued products (concentrate), and discard (tailings) enabled millwrights to calculate the extractive efficiency of a plant, of individual machines, and to make adjustments accordingly. While improvements might entail the addition, elimination, or minor modifications of milling circuits, knowledge of these changes does not always survive in the documentary record.

This paper presents the results of a pilot study testing whether tailings and other milling sediments retain information about their formation history and, by proxy, information on milling techniques. The research site, a small-scale milling facility used for the processing of gold ores from the mid-1930s to early-1940s, was selected for reasons of high physical and documentary preservation. Archeological research involved the surface collection and stratigraphic sampling of mill sediments for chemical analysis. Study results address the utility of seeing industrial wastes as archeological artifacts, and the resultant ramifications for how environmental cleanups are conducted.

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From Slimes to Hens Eggs: Visions of Tailings in Idaho's Coeur d'Alene Mining District, 1888-2001

Fredric L. Quivik
Consulting Historian of Technology

For eighty years, from 1888 to 1968, the mining companies of the Coeur d'Alene mining district dumped the tailings from their lead and zinc concentrators directly into the South Fork Coeur d'Alene River and its tributaries. Over time, the perspective of the mining industry on those tailings changed, due in part to changing technologies and economics of mining and due in part to the ways tailings appeared to farmers along the river downstream of the mining district. Those different and changing views of tailings led the mining industry to engineer various means of handling, discharging, and treating tailings. Even after the mining industry in the Coeur d'Alene basin began impounding all tailings in 1968, the view of tailings continued to evolve, culminating in the Superfund lawsuit tried in federal court in 2001. This paper will present an overview of the ways various groups have viewed tailings in the Coeur d'Alene and will examine in greater detail how those perspectives have shaped the engineering of tailings management. Accompanied by slides, the paper will show how the engineering features have drastically changed the landscape of the Coeur d'Alene basin in stages across more than a hundred years.

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The Invisible Earth: Mining, Nature, and Modern Business Enterprise

Kent Alexander Curtis
Second Nature, Inc.

In 1977, Alfred Chandler published his magnum opus, *The Visible Hand*, in which he argued that modern business institutions had evolved out of the United States economy during the second half of the nineteenth century in response to two key forces: technological change and market growth.

An environmental history of mining in Montana's contentious copper district during the last 25 years of the 19th century suggests there may have been other forces at work driving industry toward consolidation. This essay explores the intersection of nature and technology as a copper industry emerged out of the silver industry in the region. It suggests that environmental history offers new insights not only into the history of mining in the region, but into the history of late-19th-century business development in the United States. It will be argued in this paper that environmental history offers insights into the changing business character of late-19th century mining by showing the effect of ore character on business institutional change. Traditional explanations of the rapid industrialization of the Butte region argue that a need to compete with the pure copper being produced on the Keweenaw Peninsula of upper Michigan was the primary cause. My research suggests that while a price war was important, it was not the only cause. The need to manage the invisible and the unknown characteristics of the ore also played a significant role in the shape of business.

The lessons of the silver industry, which most of the major players in the emergent copper industry had experienced, taught the copper mine managers that the surest way to competitive dominance and steady production was an increase in underground extraction combined with an increase in surface processing capacity. In the abstract calculus of economic growth, such expansion is hindered only by the ability of labor/technology to work the ore and markets to absorb the product. In the real world of Butte, Montana, several variables shaped this need. First, multiple displacements in the granite batholith in which Butte's ores had accumulated made ownership over underground ores highly uncertain and contentious, thus a single, or even multiple claims in no way assured the absence of challenges from those holding nearby claims. Second, the ores diminished with depth and lateral scope, forcing the larger companies to seek more ore at a geometric rate merely to maintain a steady production on the surface. And third, the by-product of ore production required increasing land area for disposal of waste. As these limits were reached in the late nineteenth and early twentieth century, the most rational solution became horizontal integration.

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Panel 2. C: 19th Annual Historic Bridge Symposium

Chair: Beatrice Hunt, Hardesty & Hanover

Steel Arch, Swing Span, and Retractile: New York City's Oldest Lesser-Known Bridges

Jay Shockley
New York City Landmarks Preservation Commission

Of the dozens of bridges located within New York City, some (like those over the East River) are quite well known. During the late nineteenth century, however, many significant but lesser-known bridges were constructed in New York and Brooklyn. Jay Shockley will present the history of four of the oldest of the city's bridges that have survived and are designated New York City Landmarks. Washington Bridge over the Harlem River (1886-89), New York City's second oldest extant major bridge after the Brooklyn Bridge, was a significant feat of engineering and is considered one of the finest American nineteenth-century steel arch bridges and one of New York City's most beautiful. It consists of two 510-foot arched spans, composed of six two-hinged, steel-plate arched girders each, with masonry piers and arched approaches. Macomb's Dam Bridge and 155th Street Viaduct (1890-95) is the city's third oldest major bridge and its oldest extant intact metal truss swing-type bridge, a type most often employed in New York along the Harlem River between the 1878 and 1910. The 415-foot steel central swing span was considered at the time to be the world's heaviest moveable mass. The bridge was also noted for its attractive architectural effects. The Bronx side approach viaduct is 1800 feet long, while the 155th Street Viaduct on the Manhattan side is 1600 feet. A difficult municipal undertaking, "the two viaducts and bridge together are one of the greatest engineering operations hitherto carried out by this city," according to *Scientific American* in 1894.

University Heights Bridge (1893-95; 1905-08) over the Harlem Ship Canal Bridge at Broadway was not designed to accommodate a planned subway line, resulting in its being moved and re-used in a new location a decade later. In one of the more intricate bridge flotation operations of its type in the U. S., the central swing and adjacent spans were lifted from their piers, floated by pontoon scow, and placed onto new piers and abutments at 207th Street. In the 1990s, due to heavy traffic usage, the Dept. of Transportation replicated the central swing span at double the width, incorporating original elements. Carroll Street Bridge, over the Gowanus Canal, Brooklyn (1888-89), built by the Brooklyn Dept. of City Works, is the oldest known extant operable American retractile bridge. This unusual moveable bridge functions by rolling back horizontally on wheels set on steel rails, thus providing channel clearance. The superstructure was built by the New Jersey Steel & Iron Co., subsidiary of Cooper, Hewitt & Co.

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Panel 3. A: The Once and Future Port of New York & the Brooklyn Waterfront: Maritime Commerce from the 18th to the 21st Centuries – Part I

Chair and Organizer: Michael S. Raber, Raber Associates

The 2-part panel will summarize the rise and fall of traditional commerce in the Port of New York and New Jersey, outlines the present conditions of the port's still-critical role in the nation's trade, and introduces some of the current solutions proposed to maintain the region's waterway and terminal infrastructure. History continues, but the classic pre-World War II waterfront patterns have not only been transformed several times but will require continuing investment and innovation in a rapidly-changing world.

Deep Water, Mud Flats, Marine Borers, and Congestion: The Port of New York until the Later 20th Century

Michael S. Raber
Raber Associates

The Port of New York, initially centered on lower Manhattan, dominated America's maritime commerce for well over a century following the War of 1812. Export, import, and transhipment of an enormous range of bulk commodities stimulated local industry and led to steady expansion of marine facilities. Canals and railroads feeding the port encouraged new waterfront construction around Upper New York Bay, which was transformed from a barrier between local communities to a great transhipment center. Lighterage, the critical marine transfer of goods in this system, probably reinforced the use of narrow piers for ship-lighter or ship-barge traffic, extending a pattern first seen on lower Manhattan's East River side to other areas. Until about 1840, however, commercial growth did not generate much new waterfront construction, with most development occurring in soft-bottomed, deep-water areas in or near lower Manhattan. High costs of developing shoaled areas, and marine borer threats to pile construction, remained factors until the converging emergence of steamship traffic, rail terminals, and borer-killing pollution. From about 1840 to the Civil War, Hudson River piers increased in lower Manhattan and Jersey City as the new, larger transatlantic packets arrived, beginning nearly a century of waterfront response to longer and longer ships. Facilities in Brooklyn remained limited, with the notable exception of the port's first real terminal at Atlantic Basin.

After the Civil War, there was an extremely dynamic period of over 60 years of construction fueled primarily by railroad and steamship traffic. The narrow slip and pier pattern expanded to virtually all deepwater sections of the port. The port's armada of lighterage vessels tended to discourage warehouse construction at the rail terminals, in favor of rail car movement around the harbor. Increasing waterfront congestion encouraged expansion of warehouse facilities, and eventual construction of large private freight terminals which served steamship lines with both warehouse and lighterage facilities. Brooklyn's large concentration of warehouses and terminals gave it a commanding position in the port. Atlantic Basin's multi-story masonry stores established a pattern which spread along the Brooklyn coast north of Gowanus Bay. The most ambitious projects followed on the tidal flats of Red Hook, where Erie Basin became Brooklyn s largest dredging and breakwater project, with the city s biggest store structure. By 1880, a virtual wall of similar stores arose between Erie Basin and Main Street in Brooklyn, thriving on grain handling, the increased fuel and raw materials brought to the port by the railroads, and the import of foreign bulk products like coffee.

In the South Brooklyn shoals beginning in 1895, Irving Bush saw an opportunity to create an antidote to the port's increasing congestion. He developed a 200-acre terminal by 1912 with pier sheds on seven solid-fill piers fronting warehouses, industrial space, and rail connections by land and water to anywhere in the port. This was the largest, most successful of the marine terminals devoted to traditional freight handling, and a model for later public developments to the north and south. New York City, inspired in part by such private efforts, invested heavily in construction of seawall, piers, steamship and freight terminals between about 1870 and 1935 to maintain the port's competitive edge. The growth of public and private waterfront transportation facilities restricted most other industrial waterfront users in the port to firms processing bulk raw materials, petroleum oil, and chemicals, plus building-supply yards and a number of shipyards. By 1930, about 150 miles of the port's 750 miles of waterfront had become over 550 miles of wharfage, primarily in the upper bay. More remote shoaled areas such as Newark bay remained undeveloped.

Congestion, unfavorable railroad rates imposed by the federal government, and the limited amount of newer construction for larger vessels and better material handling, contributed to a marked decline in the port's world trade share beginning after World War I. Very little of the older waterfront has been converted to container handling since the 1960s. New construction has focused on the most difficult natural areas, shoals left aside by earlier developers. Projects by the Port Authority of New York and New Jersey, and the military, account for most post-Depression construction. Brooklyn's waterfront declined dramatically shortly after World War II. Despite attempts by the Port Authority to revive the area with traditional cargo handling and small container facilities, the borough's road and rail limitations have so far stymied any renewal of a once commanding position in maritime commerce.

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The Warehouses of the Brooklyn Waterfront

Charles Parrott
Lowell National Historical Park

The emergence of New York as the center of American import trade during the early 19th century, coupled with the explosive growth in commodity exports following the opening of the Erie Canal, quickly rendered the old system of maritime storage obsolete. Developers soon turned to Brooklyn's relatively empty East River waterfront to provide the wharfage and buildings required for the long-term storage that the often speculative trade in commodities demanded. Beginning in the 1840s and continuing for the next 80 years, meeting these storage-space demands translated into a Brooklyn-centered warehousing system that visually commanded much of the eight miles of marginal upland from the Brooklyn Bridge to the Bay Ridge bluffs. The physical presence of these brick warehouses exemplified greater New York's commercial hegemony through establishment of a new kind of functionally deterministic building dedicated completely to commodity storage at a scale not previously attempted. This development of these Brooklyn warehouses will be traced, from their probable first appearance at the Atlantic Basin to their last significant construction as part of the Bush Terminal after the turn of the 20th century. The replacement of this building form and functional system by some important early examples of the reinforced concrete warehouse, culminating in the WWI-era Brooklyn Army Supply Base, will also be explored, and both types will be assessed to consider their place in the functional tradition of American industrial architecture.

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Panel 3. B. American Icons – Old and New

Chair: Betsy Fahlman, Arizona State University

The Engineering Marvel that was the Allegheny Portage Railroad

Chris J. Lewie
City Planner and Author

During the mid-1820s the Commonwealth of Pennsylvania had an ambitious plan to build a 400-mile canal and rail system to link the tidewater at Philadelphia to Pittsburgh and the Ohio River in the west. This great engineering endeavor was accomplished by the construction and operation of the 36-mile railroad "link" over the eastern continental divide at Allegheny Mountain. By using a series of 10 inclines and levels the Allegheny Portage Railroad was built where no person thought that a railroad could go in 1834 - up and over a mountain. The mountain railroad opened a pathway to the west for trade and commerce, and helped to start the great industrial and transportation age in America. It may have also been the first mountain railroad in the world.

The Portage Railroad was also the location of the first practical use of spun steel wire, developed by engineer John Roebling. The spun wire used on the inclines in 1845 was a forerunner of the wire used in the Brooklyn Bridge in New York City over 30 years later. In my opinion, the Allegheny Portage Railroad with all of its "firsts" in engineering and technology was one of the greatest engineering marvels of the first half of the 19th century.

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Abandoned In Place: Challenges In Preserving and Presenting Cape Canaveral's Deactivated Space Launch Complexes

Roland Miller
Pibloktok Productions

The deactivated launch facilities at Cape Canaveral Air Force Station pose several unique preservation concerns. Along with the typical concerns of restoration, funding, and political support, weather is also a critical factor. They are located in one of the most caustic environments on earth, and there is always the possibility of hurricane damage. Many of the already dismantled deactivated facilities had sustained such damage. The Cape is one of the best locations for rocket launching, so there is a strong drive to repurpose these sites for a new generation of launch vehicles. This study pursues one option for preservation; photodocumentation. Public access to the Cape Canaveral facility is limited. The possibility of wide public access rests partly with development of a second-generation of reusable space plane that would result in lower usage demand at the Cape, but that concept is not being advanced. Record photographs are what, indirectly, preserves the historic Cape Canaveral launch facilities and are all that is available until new technology allows further on-site restoration and access. My project, *Abandoned In Place,* is accessible on-line and is being exhibited nationally. This provides wide public access and ability to examine these historic launch facilities.

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The World Trade Center from Start to Finish

William McKelvey
Canal Captain's Press

Bill McKelvey took advantage of the view from his office to chronicle the history of the World Trade Center. He will use his photographs, memorabilia, and artifacts to tell the story of its construction, it heyday as the premier office space in Lower Manhattan, the 1993 bombings, and its destruction.

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Panel 3. C: Mineral Extraction

Chair: David Simmons, Ohio Historical Society

Prisoners of Iron: Clinton Prison at Dannemora, N.Y. and 19th Century Charcoal Iron Production

Gordon Pollard
State University of New York, Plattsburgh

The maximum-security prison presently called Clinton Correctional facility was founded "in the wilderness" in 1844 for the purpose of employing convicts in the mining and manufacture of iron within prison walls. That legislative directive was pursued until 1877. Fraught with recurring debates over its political, economic, and penal efficacy, the venture ended in failure, and the prison then shifted convict labor to other activities. Subsequent enlargement and modification of the prison has obliterated all signs of its original mandate. For the iron-related decades of the prison's history, documents and photographs provide an unusual perspective on a unique experiment in penal involvement with an industry that flourished in the Adirondacks of upstate New York. This paper highlights some of this evidence, including the physical layout and facilities, relations to other local iron operations, and the human correlates of this undertaking.

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The Solar Salt Facilities of the Baumberg Tract

R. Scott Baxter and Rebecca Allen
Past Forward, Inc.

With the beginning of the Gold Rush in California, salt became an important, scarce, and expensive commodity. Entrepreneurs were quick to discover that the unique environment of San Francisco Bay provided ideal conditions under which to convert sea water to salt. A solar salt industry was quickly established and rapidly expanded to include much of the south and eastern shores of the bay. One such location is a region known as the Baumberg tract. Over the last 150 years this area has been extensively developed into salt producing facilities, housing for workers, and shipping points from which to ship their product. In 2001 the California Department of Transportation's need to bank wetlands along the eastern shores of San Francisco Bay led to the historical and archeological study of this area. This research revealed a complex and surprisingly well intact industrial landscape.

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Quicksilver Furnaces: Work, Race and Ethnicity in the Mercury Mining Industry 1870-1883

Andrew Johnston
University of California-Berkeley Department of Architecture

This paper argues that the design, and particularly the method of operation, of quicksilver reduction

furnaces can inform us, as scholars of the industrial, about the changing nature of work, and the changing nature of race relations, within the mercury mining industry. While technological advances were common during the industrialization of the 1870s, my research tells a different story than the familiar one of increased efficiency and decreased need for skilled workers. The Chinese workforce that became the mainstay of the mercury mining workforce during these years actually became internally stratified, encompassing a range from common laborer to highly skilled engineer. The technological advances of quicksilver furnaces, together with the changing ethnicity of the workforce, created a situation where the often maligned Chinese worker rose to a new, higher status in the industry.

As a part of my dissertation on the mercury mining industry in California I detail the major technological development of the quicksilver reduction furnace. The major advance was from a non-continuous feed (Bustamante) furnace to a continuous feed (Scott or Knox-Osborne) furnace. These advances occurred during the Quicksilver Boom (1870-1878), when worldwide market prices for mercury soared and production in California reached unprecedented peaks. These years also witnessed a major structural shift in the industry from smaller-scale local owners to national and international corporate ownership of mines. Arguably, however, the major structural shift in the mercury mining industry during these years was the creation of an economic dependency on Chinese labor. It is the interplay of these structural shifts in technology, ownership, and ethnicity that is the subject of this paper.

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Panel 4. A: The Once and Future Port of New York & the Brooklyn Waterfront: Maritime Commerce from the 18th to the 21st Centuries , Part II

Chair and Organizer: Michael S. Raber, Raber Associates

Evolution of the Transfer Bridge at the Port of New York

Thomas R. Flagg
Photo Recording Associates

During the first half of the 20th century, the railroads reaching the Port of New York floated 3000 to 5000 railroad cars on the waters of the harbor every day. Carfloating was essential in serving the collection of islands, peninsulas and bays that made up the nation's busiest port and largest manufacturing district. The technology of carfloating presented only one real engineering challenge; the design of the "transfer" or "float" bridge, the structure by which the cars were moved from stable land to a floating vessel. The huge volume of carfloating insured that the evolution of this most sophisticated of all movable bridges would occur under forced draft, primarily in the years from 1888 to 1911. This paper will summarize the evolution and will conclude with a look at two surviving transfer bridges. One represents the earliest stage of development, though built in 1954. The other was the first example of the final climactic design (1911). There is a possible revival of carfloating, a system for moving freight across the region that some argue has never been equaled for efficiency and low environmental impact.

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Waterway Development at Port of New York and New Jersey

Thomas H. Wakeman
Port Authority of NY and NJ

Andrew Genn
New York City Economic Development Commission

The continued growth and prosperity of the United States is dependent on global, national, and local business enterprises and their employees having access to modern transportation infrastructure. The United States economy is increasingly dependent on international trade such that it now represents about one-fifth of the nation s Gross Domestic Product. Between 1990 and 1997, the Nation's foreign trade grew approximately 38 percent by tonnage and 35 percent by value. This expansion is intensifying the demand for new multi-modal transportation infrastructure and services, particularly for freight but also for passengers. Any interruptions or delays to the rapid movement of products or commodities between global trading partners impairs economic competitiveness and creates inefficiencies in the marketplace.

Shippers worldwide will seek new routes to their customers if they experience inefficiencies and higher costs in their current routes versus another gateway. Waterway access provides mobility for cargo and passengers typically in an unconstrained fashion compared to road or rail moves. However without adequate water depth, the world's ocean carriers will not be able to fully utilize their new post-Panamax fleets (i.e., vessels capable of transporting 6000 plus containers). Because the draft requirements of this generation of container vessels (15 to 15.5 meters), the Corps of Engineers conducted a study for a new 15.2-meter or greater deep port at the New York/New Jersey harbor. The Feasibility Report for the New York and New Jersey Harbor Navigation Study, and its associated Environmental Impact Statement, were completed in December 1999, and the project was authorized in the Water Resources Development Act of 2000. The project provides for the deepening of all the major channels in the harbor serving marine terminals in New York and New Jersey to 15.2 meters. These channels include Ambrose, Anchorage, Port Jersey, Kill Van Kull/Newark Bay, Arthur Kill, and Bay Ridge at a total cost approaches $2.0 billion. With its completion, the Harbor Navigation Improvement Project will provide the Port with the waterways needed for 21st century navigational mobility.

To succeed in this century, ports must develop the modern waterway and terminal infrastructure needed to enhance their connectivity to the ocean and to local, regional and national transportation systems. Furthermore, security requirements, environmental concerns, and technology advantages must be identified and addressed to successfully complete development projects. The stakeholders in the Port of New York and New Jersey are working together to meet these waterway development and terminal infrastructure requirements.

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Panel 4. B: Potpourri

Chair: Louise Trottier, Canada Science and Technology Museum

The Evolution of Mechanized Nailmaking, 1775-1825: Initial Results of a Cut Nail Machine Patent Study

Lee R. Maddex
West Virginia Institute for the History of Technology and Industrial Archeology

In the history of technology there have been few inventions which have profoundly effected American society as that of the cut nail. Prior to the advent of the cut nail, all nails were handmade. The mass production of cut nails and the invention of western framing converged in the early 1830s to revolutionize the building trades. Western framing was rapidly adopted anywhere that dimensional lumber and cut nails could be delivered; towns virtually developed overnight, thereby enabling the expansion and settlement of the American West. Slides of various patent drawings and other illustrations gleaned from my research will be used to describe the evolution of nailmaking machinery from its genesis in 1775 to its maturation in 1825.

Jeremiah Wilkerson, a Cumberland, Rhode Island, blacksmith, is credited with the invention of the cut nail. In 1775 he cut iron slivers with shears and then headed them with a hammer, making tacks. In the decades that followed American (and British) inventors endeavored to mechanize the nailmaking process. After 1790, many of these early nail machines were patented, but none were very practical. Numerous other nail machine designs followed, including Jacob Perkins' 1799 nail machine, perhaps the first successful one-operation nail machine (one which could cut and head nails in a combined operation) capable of cutting a wide range of sizes. Despite the success of Pierson and Perkins' machines, inventors continued to perfect the one-operation nail machine. Jesse Reed, a Massachusetts inventor patented his first commercially successful single operation nail machine in 1807. It was, however, his second machine, patented in 1825, which truly revolutionized the burgeoning American nailmaking industry. Significantly, the 1825 Reed machine came to dominate the industry in the 1830s. The two surviving American cut nail factories–Wheeling-La Belle Nail Company at Wheeling, West Virginia, and the Tremont Nail Company at Wareham, Massachusetts–still employ batteries of the1825 Reed nail machine.

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Stone Bridges and Jersey Barriers: Rusticity and Contradiction on the Bronx River Parkway

Christopher H. Marston
National Park Service-HABS/HAER

The Bronx River Parkway of Westchester County, New York, was one of the most important landscape designs of the 20th century. Recently named to the National Register of Historic Places, it was documented by the Historic American Engineering Record in 2001.

The story of the development of the parkway is an intriguing one, from the vision of the commissioners who oversaw it, to the engineers, landscape architects and architects who executed it. Beginning as an effort to clean up the polluted Bronx River in 1906, the project became a huge landscape construction effort, by dredging the river, treating thousands of trees, and planting many more thousands of new shrubs and trees. The parkway also influenced modern highway design with features such as wide right-of-way and medians, separated motorways, and grade separation structures featuring the revolutionary reinforced concrete rigid frame bridges, which was faced in a variety of rustic stone patterns to help blend the roadway into the idealized landscape.

However, the parkway was a victim of its own success, almost from the start. As the parkway became overcrowded with faster automobile traffic, the county straightened out many curves and widened the lower portion, diminishing much of its scenic beauty. Nonetheless, the parkway continues to survive into the 21st century. This presentation will examine the factors that led to the creation of this significant "park with a road through it," as well as the many pressures that threaten its integrity.

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The Industrial Monuments in the Urals: Toward XII TICCIH Congress in Russia

Eugene V. Logunov
Institute of History of Material Culture

Lyudmila P. Kholodova
Ural State Academy of Architecture and Art

The goal of this paper is to introduce SIA members to the most important industrial monuments and sites in the Urals. Some will be visited during the XII TICCIH Congress in July 2003 in Russia. The Urals occupy a special place in the history of Russia, and not just because they divide Europe and Asia. Since the time of Peter the Great, the Urals have been the principal mining and metallurgical center of Russia. By the middle of the 18th Century, this area rich in iron ore was the world's leader in the production of ferrous metals. In 1900, more than 250 works functioned here, and some were among the largest industrial enterprises of their day. Few of these monuments are museums. Rather, these historic industrial artifacts survive as non-operating features of still-operating industry.

The Goroblagodatsky iron quarry has been in operation for 260 years, and the once 1,000 m high pile is now a huge crater 1,000 m deep. A blast furnace shop at the Seversky works is considered a real pearl of industrial architecture. It survives with its bloomer shops, casting yard and a Martin shop. In Solinkamsk there is wood industrial architecture and a salt works founded in 1878. The distinctive feature of the site is the good preservation of all of the objects being exploited within a century. This has no analogues in Russia. And undoubtedly one of the most impressive monuments of industrial culture in the Urals is the metallurgical works in Nizhny Tagil. Founded in 1725, it is a model of metallurgical enterprise of the transition type that had features of both proto-industrial and industrial periods. It is now a museum-works.

Panel 4. C: Ethical Responsibilities of Industrial Archaeologists to Local Communities

Chair and Organizer: Elizabeth Norris, Michigan Technological University

Although industrial sites have an intrinsic historical value to archaeologists, they often hold different meanings for members of the site's surrounding community, such as economic change or toxic pollution. As industrial archeologists, we have an ethical responsibility to the communities that surround the research projects we help to investigate. This panel examines several case studies from the Midwest, Germany, New England, and Middle Atlantic that illustrate successful interactions between academic and contract industrial archaeologists and communities. A discussion will follow the presentation of the three papers.

Archeological & Community Interaction in the Preservation of Historical Sites

Alicia B. Valentino
Michigan Technological University

The preservation and documentation of industrial sites is important for future generations, as well as present day communities. The determinations of archaeologists upon starting work on a site should not overshadow the wishes and desires of the surrounding community who lived through its history and live among it today. The responsibility of archaeologists is not simply to record and safeguard sites, archaeologists should work with the community so that the archaeologist's goals and the community's desires can come to fruition. A case study of Electric Park on Michigan's Keweenaw Peninsula is especially applicable since people who once used the park still reside in the area. Proper interaction between these two parties can yield gratifying results in the preservation of the area's industrial heritage.

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The Preservation of Historic Industries in a Twenty-First Century World

Julie A. Kloss
Michigan Technological University

Museums and interpretive sites are a wonderful method of preserving industrial history, but this is not possible in every situation. Industrial archaeologists should play a role in preservation methods that fall outside of straightforward interpretation. The adaptive reuse of industrial sites involves a sense of industrial heritage as well as keen knowledge of the needs of surrounding communities. This paper will discuss places like the Saint Anthony Milling District in Minneapolis, Minnesota, and Route Industriekultur, in Germany's Ruhr Valley, which have been successful in re-adapting historic industrial areas while maintaining the integrity of the historic flavor.

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Responsibility to Communities with Toxic Waste

Joel I. Klein, Ph.D., RPA
John Milner Associates, Inc.

Sydne B. Marshall, Ph.D., RPA
Foster Wheeler Environmental Corp.

Even areas contaminated with toxic wastes can hold appeal to communities as sites of historical significance. Industrial sites, sometimes the source of these wastes, may be the centerpieces of communities especially when towns were created by industrialists to provide housing for workers at a complex industrial facility, e.g., the veritable company town. In contrast, the most bucolic (and non-industrial) of locals may be affected by a toxic waste stream thus also affecting archeological resources of concern to stakeholders. Archeologists evaluating the potential impacts of remedial investigations and cleanups can and should work with regulators, environmental scientists, and community members to balance the need for environmental stabilization/restoration with the desires of communities to maintain continuity with their past, present, and future. This paper examines several examples of this kind of interaction in locations in New England and the Middle Atlantic, and looks at the kinds of success that can be achieved when interested parties work together toward a common goal.