On Sunday, March 27, Boston's Metropolitan Waterworks Museum celebrated its grand opening. More than 2,000 visitors braved the windy, cold weather to take a look at the city's newest historical attraction. The opening of the museum culminates an effort begun 20 years ago when a group of local residents joined together in an attempt to persuade the state government to turn the waterworks into a museum rather than tear it down.

Officially known as the Chestnut Hill High-Service Pumping Station (tour site—SIA Annual Conference, 1984), the station is a magnificent cathedral-like Romanesque building built in 1886-87 and expanded in 1897-98 to house the massive engines and pumps that provided the rapidly growing metropolitan Boston region with clean, potable water. The oldest of the three surviving engines is the 1895 triple-expansion, steam-pumping engine designed by Erasmus D. Leavitt (1836-1916) and built by the Quintard Iron Works of New York. The engine, which is well known to historians of steam technology, was designated a National Historic Mechanical Engineering Landmark in 1973. When the station was expanded in 1897-98, another triple-expansion pumping engine was installed, this one built by the E.P. Allis Co. of Milwaukee. A compound Worthington-Snow engine was installed in 1916. The engines remained in use until replaced by steam-turbine driven centrifugal pumps in 1954 and remained serviceable until the station was taken off line in the 1970s.

The Friends of the Waterworks, Inc., was formed in 1991 to advocate the preservation of this former eight-acre Metropolitan Waterworks site and its three historic buildings. The Commonwealth of Massachusetts passed legislation in 2005 authorizing the sale of the site and its buildings for re-development, subject to preservation restrictions. After

(continued on page 2)
many twists and turns, preservationists eventually persevered and in 2009 established the Metropolitan Waterworks Museum Inc. (MWM), a tax-exempt educational organization financed by the Waterworks Preservation Trust.

Financing for the preservation project was achieved in part through a private-public partnership with a private developer undertaking rehabilitation of the site for residential condominiums. The MWM owns the museum building, which also contains four condominiums. The remaining buildings, including the new curved Watermark Building, contain an additional 108 condominiums.

The Waterworks Museum consists of the Great Engines Hall, housing the three pumping engines, and a two-story glass-enclosed pavilion featuring a community meeting room available to area nonprofit community groups. The museum’s exhibits and interpretive programs focus on the historical themes of public health, engineering, architecture and social history. They enable visitors to learn how the pumping station became the hub of an ever-expanding water system that continues to provide the city with abundant, clean water. The monumental building reflected civic pride in the technology that made it possible.

The museum is open from 11 am to 4 pm Thursday through Sunday and until 9 pm on Wednesday. Admission is free, so stop by if you’re in the area. Better yet, rent the place for your next event. (The museum is prohibited from charging general admission, so it needs to be creative about raising operating revenue.) Directions and additional information at: www.waterworksmuseum.org.
This year’s SIA Fall Tour will explore the Quinebaug-Shetucket Rivers Valley. The valley appears dark when viewed at night from aircraft or satellites thus earning it the title as “The Last Green Valley” in the dense urban corridor between Boston and Washington. The valley includes some 1,085 square miles from East Brookfield, Mass. in the north to Norwich, Conn. in the south. On the east it is bound by the Rhode Island state line. The valley is an area of pastures, woodlands, clean streams, small cities, and even smaller towns. Yet, within the bucolic setting, are a number of light and medium industries, architectural sites, and remnants of a once-thriving charcoal industry, old mills, a railroad museum, a textile museum, waterworks, and dams.

The Fall Tour will be based at the Southbridge Hotel & Conference Center, a renovated building built in 1904 as the factory and office of the American Optical Co. The rate for SIA attendees will be $105/night.

Thursday's early-bird tour will focus on Old Sturbridge Village's waterpower and includes behind-the-scenes surveys of a grist mill, sawmill, and carding mill. Attendees will have free time after the mill tour to view exhibits including the blacksmith shop, pottery, glass collection, and other artifacts of early 18th-century life. The opening reception, featuring local food products and a cash bar, will be held at the village's Oliver Wright Tavern and will precede a presentation on the engineering and industrial heritage of the “Last Green Valley”.

The terms of some Friday tours are currently being finalized. On tap are visits to Spirol International, a manufacturer of fastenings; New England Automated Rolls, the baker of all of McDonald's hamburger buns; a candle factory; charcoal kilns; a manufacturer of colognes and personal care products; the Taylor Brooke winery; and Numa Tool, a manufacturer of drill bits. We will tour the Chamberlin sawmill, a small-scale facility dating to the early 20th century. For SIA’s architectural buffs, we will visit Roseland Cottage, a summer home built in 1846 in the Gothic Revival style and visited by several presidents.

Saturday will be devoted to sites in the vicinity of Willimantic and Mansfield, including the New England Railroad Museum, the Windham Textile and History Museum, American Thread, the famous “Frog” bridge, the Willimantic Footbridge, and Gurleyville Grist Mill. In addition we will visit the National Thread Company Mill and the U.S. Army Corps of Engineers Mansfield Hollow Dam, a National Register-listed flood control facility. The banquet will be held at the Sturbridge Conference Center and will feature 19th-century music by Rick Spencer. For additional information visit the web sites of places on the itinerary.

Sunday will feature do-it-yourself tours. Interested attendees will receive a list of museums and directions to get to them. Possible sites could include Mystic Seaport and the USS Nautilus Submarine Museum at the U.S. Naval Submarine Base in Groton. Fall foliage should be at a peak during the tour and well worth some serious “leaf peeping”.

The Quinebaug Valley is easily accessible from the Massachusetts Turnpike by auto. It is 153 miles from New York, about a three-hour drive. Southbridge is about equidistant, approximately 65 miles from Logan Airport in Boston, Green Airport in Providence, and Bradley Airport at Hartford-Springfield. The nearest Amtrak station is in New London, Conn. Plan on visiting this “quiet corner” of Connecticut during the 2011 SIA Fall Tour.

David A. Poirier and Robert Stewart

The American Optical Company in Southbridge from a publication dated 1907. The building has been renovated and now serves as a conference center and hotel.
Detail from Cooley's 1878 patent # 208,155.

Detail from Herthel's 1867 patent # 71,484.

Johnson's 1873 patent #144,766.

Detail from Johnson’s 1873 patent, showing the connection of the vertical and diagonals to the bottom chord junction box.

Elusive American Truss Bridges: Truss Bridges Using Two-Part Web Members

Builders of 19th-century American truss bridges were aware that as heavy wagons crossed a truss bridge, some members in the truss web underwent stress reversals. These web members needed to be able to accommodate changes from compression to tension or tension to compression. This phenomenon was exacerbated as the live loads imposed by the railroads became increasingly heavier than the dead load of the bridge itself. Engineers thus scrambled to find ways to cope with the issue.

Wood, due to its abundance, was the economical material of choice for early American trusses. But wood, while capable of handling both tension and compression forces, presented difficulties for builders attempting to make a connection capable of transmitting tensile forces. Wrought iron, while excellent for tensile members, was relatively expensive and thus used sparingly, until it became more widely available in the last quarter of the 19th century.

One solution used members composed of two parts, one to resist compressive stresses and the other to resist tensile stresses. George Cooley's timber-truss bridge patent of 1878 (see illustration) is an example of this approach. His patent shows a thin wrought-iron rod (H) parallel to a timber strut (G), with the timber member being held in place by bolts or simply by being compressed (F) between the top (B) and bottom chords of the truss. The threaded end of the tensile rod penetrated the chords and was secured by a washer and a nut (h). The timber member would handle the compression forces, and the wrought-iron rod would deal with the tensile forces, as the situation required.

As the cost of iron became more competitive and thus its use more common for all or most of the members of a truss, engineers experimented with an intriguing approach to dealing with the need to have truss web members capable of alternately resisting compression or tension. A wrought-iron rod was inserted within a cast-iron tube. The cast-iron tube resisted compression forces, the wrought-iron rod tensile forces.

In 1867, George Herthel patented a truss that had a hollow, vertical, metal post (E) with a sculpted end that bore on a metal pin at the truss's panel points. This hollow post contained a wrought-iron rod (G) that penetrated the pin (C) and then was secured by a washer and nut. This design would require an extra-large pin in order to withstand the loss of material due to the holes drilled to accommodate both the inserted vertical rod and the diagonal rods (F). Patent drawings do not provide hints as to how the fabricator should size individual members or parts of the truss. It is not known if any trusses were built using this detail.

A few years later, in 1873, Phelps Johnson proposed a different approach to the problem of connecting a truss member composed of a rod and a tube. His patent shows tubular verticals (b) that extend between a tubular top chord (B) and a junction box (n) secured to a bottom chord (C) that consists of two wrought-iron plates. The inserted tie-rod (f) penetrates the pin (a) in the top chord and is then secured with a nut (s). The lower end of the tie-rod penetrates the junction box and is then secured by a nut (Johnson’s drawings do not show washers).
The upper ends of the pair of crossed diagonals (c) between the web verticals also penetrate the pin (a) and are secured by a nut. Their lower ends are looped to form an eye, which is secured by a bolt (o) in the junction box on each side of the tie rod.

While Johnson may have solved some of the complexity in Herthel’s earlier proposal by not having the diagonals and the verticals intersect at a common point on the bottom chord, he raised a different issue. The plates of his bottom chord are spliced between the verticals, and there are no panel point pins along the bottom chord. Since this created a configuration that could not be accurately analyzed, there may have been a natural reluctance to use it.

In 1879, John Jayne patented a configuration that also used a “hollow post” (F) as a vertical web member, and then inserted a tie-rod (h) from the top through the curved, timber, top chord (C) down to a wooden block (G) that supported a deck beam (B). Again, no records have been discovered indicating whether any bridge was built using this design. The detail, however, appears to be more practical than Herthel’s.

In 1891, William Green patented a truss with a junction box that permitted intersecting tubes containing inserted rods to be connected at panel points in an accessible manner that avoided drilling holes in any of the actual members.

In 1870, J.H. Cofrode & Co. of Philadelphia built a pony-truss variation of a configuration known as a “Post Truss” near Lancaster, Mass. The Atherton Bridge’s mid-span web members consisted of wrought-iron rods inserted within a Phoenix column. The truss’s vertical end consisted of a wrought-iron rod sandwiched between a pair of pipes. Although the end post would not be subject to stress reversals, the tie-rod would have served to stabilize the truss during the assembly process.

Toward the end of the 19th century the introduction of steel, a material essentially equal in its capacity to handle compression and tension, permitted engineers to design individual truss members that could be both easily connected to each other and capable of handling stress reversals. This rendered moot the search for efficient ways to design members composed of two parts, one to handle tension and the other compression.

A few patents in addition to those discussed were probably obtained. How many examples of any of the patented concepts were built will never be known, nor how many of the non-patented variations, such as the Lancaster pony truss. However, in both cases the numbers would appear to be small.

The history of truss-bridge design contains numerous examples of rational ideas that were tried, proved cumbersome or impractical, and ultimately abandoned. The use of two-part members to cope with stress reversals is a chapter in this series. The use of a rod-within-a-tube is an interesting dog-leg dead-end in the evolution of the development of the American truss bridge. It provides a small intriguing insight into how builders and engineers approached problem solving.

David Guise
IA Notes—Prison Industries & The Civil War

T

he 150th anniversary of the Civil War begins this year and is motivating a flurry of publications and commemorative events. One historical note that is likely to be largely overlooked is that in the decades leading up to the war, many states, both North and South, had adopted systems to put prisoners to work, often making cheap textiles or shoes, which were sold to Southern slave owners. Prison industries were rather quickly put into service supplying the war effort. Various systems were used to exploit the labor of prisoners including the contract system, in which prisoners made goods or performed services for a private firm using space within the prison; the lease system, in which the security and living arrangements of the inmate were handled by a contractor at a worksite off prison grounds (the state was paid a fee for the use of the inmate); the piece-price system under which contractors supplied the raw materials and paid the state an agreed amount for the work done on each piece or article manufactured by the inmates; and the state-use system, where the goods and services produced by prison inmates could be only for the use of the state government.

The Civil War initially disrupted markets for industrial prison labor and its products. In 1861, the prison systems of Massachusetts, New Jersey, Maryland, and New York all reported difficulty finding markets for their products. The warden of Philadelphia’s Eastern State Penitentiary in his Annual Report of 1861 mentioned that the textile manufacturer for whom the inmates operated the cotton weaving looms went out of business in May of 1861 because of the disruption of cotton supplies; a new contractor could not be found. The report also indicated a steep drop in production of, and profit from, prison-made shoes. Prison industries in the North, however, soon recovered by taking on contracts to produce supplies for the Union forces. Prisons, including those in Massachusetts and Pennsylvania, reported an increase in production by late 1862, as they began manufacturing supplies for contractors to the Union army and navy.

Prison industries in the states that became part of the Confederacy were vital to the war effort, manufacturing weapons, clothing, and field supplies. The workshops of Alabama’s Wetumpka State Prison made caissons and wagon wheels. The textile mill at the Texas State Penitentiary in Huntsville was one of the largest in the South to remain unaffected by Union troops throughout the war. Ironically, the only attack on the mill came from a Confederate cavalry unit that raided the factory in 1863 to try to obtain additional clothing for its men. The Huntsville prison was able to make up to five thousand uniforms a month. The workshops of the Virginia State Penitentiary in Richmond produced goods for the Confederate war effort at least as early as July 1861, and until the Union capture of the Georgia State Penitentiary in Milledgeville, Ga. in 1864, its workshops were used to make arms.

Tyler Turpin

HISTORIC BRIDGE NEWS

Lifespan: The Bayonne Bridge in Transition is an exhibit at the Noble Maritime Collection, Snug Harbor, Staten Island, N.Y. through October 23. The trussed, steel-arch bridge, completed in 1928, is about to undergo renovation with the deck to be raised for clearance of larger container ships. The exhibit is composed largely of contemporary works of art depicting the bridge. Info: (718) 447-6490; www.noblemaritime.org.

The Seven-Arch Stone Bridge in Lockport, Ill. sustained significant damage when portions of its spandrel walls collapsed into Deep Run Creek. The bridge, built in 1868, is among the oldest surviving bridges in the state. Deep Run Creek was originally the course of the Des Plaines River, but when the Chicago Sanitary & Ship Canal was built from 1892 to 1900, this section of the river was rerouted. Engineers are currently reviewing alternatives for rehabilitating the bridge.—Chicago Herald (Mar. 10, 2011)

Bay City Bridges is an exhibit at the Historical Museum of Bay County (Mich.) featuring drawings, photographs, and artifacts from Bay City’s historic bridges including the Belin-da St., Third St., Cass Ave., and 23rd St. bridges across the Saginaw River. The exhibit highlights original architectural drawings on linen sheets, which were rescued from the city’s engineering department several years ago. The majority of bridges featured were movable spans built by the Milwaukee Bridge & Iron Works in the last quarter of the 19th century. The exhibit runs through the end of October.

The National Historic Bridge Preservation Program was one of those eliminated in President Obama’s budget proposal for 2012. The program has provided about $8 million a year in grants to repair or rehabilitate a dozen or so covered bridges each year since first being authorized in FY 2000. Funds have also been used to support research into best-practice methods for rehabilitation and for the historic documentation of covered bridges by the Historic American Engineering Record (HAER). U.S. Department of Transportation officials have said communities will still be able to apply for grants for covered-bridge projects, but they will have to compete with other highway and bridge projects for funds.
**Publications of Interest**

**GENERAL INTEREST**

◆ Paul Bryan. Metric Survey for Preservation Uses: Past, Present, and Future. APT Bulletin, Vol. XLI, No. 4 (2010), pp. 25-29. Provides a comparison of survey techniques, from hand measurement to 3-D laser scanning, discusses the strengths and weaknesses of each, and shows how they can be combined to best meet a project's needs.

◆ Kate Clark. Informed Conservation: The Place of Research and Documentation in Preservation. APT Bulletin, Vol. XLI, No. 4 (2010), pp. 5-10. Using two case studies from her work at Ironbridge Gorge, Clark makes a case for research and documentation to inform decisions about whether to preserve historic sites.


◆ Mireya Navarro. Hoping Gowanus Canal Cleanup Turns Up Old Treasures. NY Times (Mar. 14, 2011). While focusing on the impending cleanup of Brooklyn’s Gowanus Canal, also quotes Prof. Fredric L. Quivik [SIA] in discussing how the U.S. Environmental Protection Agency sometimes can be persuaded to add a preservation component to Superfund projects.

◆ Peter E. Stone. Collecting Tech: Appreciating and Collecting Historical Technology. Astragal Press, 2011. 216 pp., illus. $42.95. Chapters cover specific areas of technology including domestic, steam, nautical, electrical, engineering, surveying, scientific, tool and occupational technology, describing significant developments within each and giving advice on collecting objects with an emphasis on their social and historical contexts.

◆ Louis Uchitelle. When Factories Vanish, So Can Innovators. NY Times (Feb. 13, 2011), Business, p. 5. Closure of the last flatware manufacturer in the U.S. prompts author to analyze how the loss of industry means we are also losing the ability to innovate and the skills to make things.

◆ Daisuke Wakabayashi. Japan’s Belching Smokestacks Draw Industrial-Strength Sightseers. WSJ (Jan. 24, 2011). The newest trend in Japanese tourism is Kojo Moe. It means “Factory Infatuation” and describes tourists who caravan to Japan’s industrial centers to take photographs of power plants, refineries and steel mills.

◆ David Weitzman [SIA]. Skywalkers: Mohawk Ironworkers Build the City. Roaring Brook Press, 2010. 128 pp., illus. $19.99. Aimed at an audience of ages 10 to 14, tells the story of Mohawk ironworkers who risked their lives to build New York’s landmark skyscrapers and bridges. Handsomely illustrated with historical photographs, explores the intersection of modern construction technology and traditional Native American culture in the unlikely environment of high steel. Brings to life the dangers and thrills of working hundreds of feet in the air while riveting, welding, and jumping from beam to beam.

**RAILROADS**

◆ James Barron. A Clock Moves in Grand Central, and Memories Stir. NY Times (Mar. 25, 2011). A large Self Winding clock, once ubiquitous in train stations across the country and essential for the synchronization of train schedules, has been preserved and moved downstairs to the dining concourse in NYC’s Grand Central Terminal. In its heyday, Western Union leased and maintained more than 50,000 Self Winding clocks and telegraphed the time to them from the U.S. Naval Observatory in Washington.


◆ Alexander Craghead. Temples to a Forgotten Religion: The
American Railway Depot. *NRHS Bulletin* (Fall 2010), Vol. 75, pp. 4-43. Photo essay explores the faded glory and neglect of small-town depots, mostly throughout the Midwest and western U.S.

- Anthony Heywood. *Engineer of Revolutionary Russia: Iurli V. Lomonosov (1876-1952) and the Railways*. Ashgate, 2010. 430 pp. $144.95. As well as an innovative engineer who campaigned to enhance the role of science, Lomonosov played a major role in shaping and administering the Russian railways and undertook several diplomatic and scientific missions to the West during the early years of the Revolution. Falling from political favor during an assignment in Germany in 1927, he achieved notoriety in Russia by choosing not to return, thereby escaping probable arrest and execution. This is the first in-depth study of his life and politics.


- Ilene R. Tyler and Ann K. Dilcher. *Sustainable Heritage Conservation: Pere Marquette Railroad Depot in Michigan*. APT Bulletin, Vol. 41, No. 1 (2010), pp. 21-26. Project to restore the Bay City depot, which was near the brink of demolition, focused on ways to retain its original features (e.g., wide, overhanging canopies and numerous large windows) while improving its energy efficiency.


**AERONAUTICS**


**WATER TRANSPORTATION**


- John H. White, Jr. *Hudson River Steamboats*. 1877 (Winter 2011), pp. 30-39. How the Hudson was a hotbed of innovation and competition for the world’s fastest vessels in the 1840s.

**AGRICULTURE & FOOD PROCESSING**


- Margaret Foster. *Dogfish Head Brewery Revives Delaware Cannery, Town*. Preservation Online (Jan. 13, 2011); www.preservationnation.org. The successful micro-brewer, located in Milton, Del., has expanded into the former, and until recently abandoned, warehouse of the Draper-King Cole cannery.


21, 2011). Whitesbog, N.J., celebrates its blueberry industry and preserves worker housing, a general store, pay office, and processing and packing plants.

**COMMUNICATIONS**

- Christophe Lecuyer and David C. Brock. *Makers of the Microchip: A Documentary History of Fairchild Semiconductor*. MIT Pr., 2010. 368 pp., illus. $24.95. History of the early years of Fairchild (est.1957). The company became the model for the Silicon Valley start-up. Features a collection of facsimiles of documents including the company's first prospectus; ideas, sketches, and plans; and a notebook kept by cofounder Jay Last.

- *Technology & Culture*, Vol. 51, No. 4 (October 2010) features a series of articles on early radio and telephony: Gabriele Bulbi, *Radio before Radio: Araldo Telefonico and the Invention of Italian Broadcasting* (distribution of news and entertainment programming via telephone lines and house-based phones); Noah Arceneaux, *Wanamaker's Department Store and the Origins of Electronic Media*, 1910-1922 (Philadelphia department store featured its own storefront radio stations to advertise and sell radios); Priya Satia, *War, Wireless, and Empire: Marconi and the British Welfare State, 1896-1903* (Marconi's use of media to foster the reputation and commercial prospects of radio, particularly playing on radio's ability to tie together the far-flung British empire); and Christopher Beauchamp, *Who Invented the Telephone? Lawyers, Patents, and the Judgments of History* (focus on the army of lawyers who shaped the ownership and control of the telephone patents, and in the course of their legal arguments also popularized a unified but inaccurate history of its invention).

- Tom Wheeler. *Lincoln's t-Mails* (*I&T* (Winter 2011), pp. 22-29. How the President used the new technology of telegraphy to communicate with his generals in the field.

**BRIDGES**

- Ben Barr. *Conway and Britannia Tubular Bridges: Stephenson's Team*. *EHH*, Vol. 163, Issue EH1, pp. 51-60. Describes sequence of model tests and the methods used to overcome the problems of buckling identified in the experimental work undertaken in the late 1840s and early 1850s by Stephenson prior to construction of the landmark bridges.

**CONTRIBUTORS TO THIS ISSUE**


With Thanks.

**Covered Bridge Topics**, Vol. 68, No. 4 (Fall 2010) includes Lola Bennett, *William Henry Gorrill and the Pacific Bridge Company* (prominent California bridge builder); *The Delaware Giants* (historic photo essay of covered bridges over the Delaware River); Gerald Arbour, *Chronicles of Old Quebec*, *The First Thiffault Crossings and Its Neighbor* (construction of bridges at La Bostonnais in 1945-46); *Some Twin Covered Bridges from Vermont* (photo essay on bridges that are so close that one can be seen from the other). Vol. 69, No. 1 (Winter 2011) includes *A Look into Stereo* (the Ellsworth Collection of stereographs at the NSPCB archives); *1828 Bridge Timber Used in Central Maine Barn* (1828 truss timbers found re-used in barn in Leeds); and T. Willis Pratt and *His Plank Warren Truss* (a patented truss design of 1873). Avail. with membership in the National Society for the Preservation of Covered Bridges, www.coveredbridgesociety.com.


- Andrew Grossman. *Finding a Fix for the Tappan Zee*. *WSJ* (Feb. 15, 2011). The NY State Thruway Authority's Tappan Zee Bridge, opened in 1955 and carrying increasing traffic loads under deteriorating conditions, is presented as an example of how government agencies are considering public-private partnerships to fund infrastructure repairs.


**BUILDINGS & STRUCTURES**


computer-aided drafting, to proving the continued relevance of hand measurement in a digital era.


Water Control & Reclamation

◆ Manny Fernandez. For Water Tunnels, Age Is Just a Number. NY Times (Jan. 16, 2011), p. MB8. Describes construction of a new water tunnel for New York City’s new Croton filtration plant; “the 1800s meet the 2000s” at an intersection between new and old aqueducts.

◆ Manny Fernandez. Miles of Sewer Lines, and He Knows Them Well. NY Times (Feb. 16, 2011). Luis Baerga, New York City’s longest-serving sewer inspector, recounts his experiences with French film crews, debunks the alligator myth, and explains why live rats are better than dead ones.

Chapter News

Oliver Evans (Greater Philadelphia). On March 14, over twenty members and friends of the chapter had an opportunity to examine at the American Philosophical Society a patent dated 1808 for an automated flour mill invented by the namesake of their chapter. Roy Goodman, Asst. Librarian and Curator of Printed Materials, explained that the document was part of the Warren S. McCulloch Papers, recently acquired by the Society. Anyone interested in viewing the patent may contact Charles Greifenstein, manuscripts librarian (cgreifenstein@amphilsoc.org). On May 16, historian and author Regina Blaszczyk made a presentation to the chapter on the history of Plexiglas as part of her research for the centennial of Philadelphia’s Rohm & Haas Co. (now part of Dow Chemical), which was instrumental in transferring methacrylate technology from Europe and adapting it for use in airplane windows in the 1930s.

Roebling (Greater N.Y.-N.J.) members were treated to a special tour of the Vertical Urban Factory exhibit at the Skyscraper Museum (SIAN, Winter 2011) on March 5. The tour was led by curator Nina Rappaport. SIA Past-President Mary Habstritt, who served as an advisor on the exhibit, gave a talk on New York’s industrial heritage at the museum on Feb. 23. Chapter members toured the Modern Art Foundry (www.modernartfoundry.com) in Astoria, Queens, on March 20. The foundry, which specializes in casting sculptures and conservation work, has been in operation since 1932 and at the same location since 1944.

Southern New England has a new website that is up and running. Editors William Burt and Craig Austin encourage members to communicate with them through the website and to send in news, notices of events, items of interest, etc. The new SNEC website is being hosted on the SIA website: www.sia-web.org/chapters/snecc/sneccindex.html.
The **Sparrows Point steel mill** (tour site—1995 SIA Annual Conference, Baltimore), which has been closed since July 2010, is set to restart. The announcement was made by New York-based RG Steel, which closed a deal to purchase the plant from Severstal, the Russian-based steelmaker. Severstal had purchased Sparrows Point from the financial wreck of Bethlehem Steel in 2008. RG Steel hopes to rehire nearly 1,000 workers who were laid off and bring the mill into full production as soon as possible. It is anticipated that the blast furnace will become operational in May. As part of the deal, RG Steel also acquired mills in Warren, Ohio and Wheeling, W.Va.—*Baltimore Sun* (Mar. 17 and Mar. 31, 2011)

Baltimore’s next big rehab of an IA white elephant will be **Mount Vernon Mill No. 1** in Jones Falls Valley, south of the folkloric neighborhood of Hampden. The multi-story brick mill was started in 1845 by the same investors who in 1842 had built the Woodberry Factory (a 2010 casualty to fire). Mount Vernon No. 1 grew to remarkable length and overran the site of the older Laurel Flour Mill. During the expansion of 1873, it suffered a fire but was rebuilt. Some of the 1840s fabric still stands. The works converted to synthetic textiles in 1948, then closed up in 1972 and sent its activities to the South. The vast space later housed smaller enterprises including Rockland Mills, Inc., which made medical gauze. David Tufaro is the developer of the rehab, which aims to convert the vast spaces into condos, apartments, and two restaurants. Oddly enough, the great Kremlinesque bell that summoned the workers each day was known as “Big David,” for the formidable manager and major investor David Carroll.—*John McGrain* (SIA)

The **Robert Julian Roundhouse and Turntable** was named an American Society of Mechanical Engineers historic landmark at a ceremony in March. The 37-bay roundhouse, built in 1924 and one of the largest ever constructed, is located at the Spencer Shops of the former Southern Ry., which now house the North Carolina Transportation Museum in Rowan, N.C.—*Salisbury Post* (Mar. 20, 2011)

The U.S. Coast Guard honored the **Smilax** as the Queen of the Fleet at a ceremony at its home port of Fort Macon in Atlantic Beach, N.C. The Smilax is a 100-ft.-long construction tender and the oldest operating cutter in the fleet. It was built by the Dubuque Boat & Boiler Works in 1944.—*Charlotte Observer* (Apr. 14, 2011)

The **WSM radio tower** south of Nashville, Tenn., is under study for addition to the National Register. The 808-ft.-tall steel tower, built in 1932, has been used to broadcast the legendary Grand Ole Opry country music show that popularized country music and spread it beyond the South.—*The Tennessean* (Jan. 20, 2011)

The **S.S. United States**, the down-on-its-luck luxury ocean liner that has been rusting away at a pier in Philadelphia since 1996, gained a new lease on life earlier this year when it was acquired by the S.S. United States Conservancy. Built in 1952, she still holds the record for the fastest crossing of the Atlantic Ocean in either direction by a regularly scheduled passenger liner. The conservancy was able to raise $3 million to buy her from NCL Group, the operator of Norwegian Cruise Lines. NCL had acquired the liner about ten years ago with plans to rehabilitate her for use cruising the Hawaiian Islands, but those plans never came to realization. NCL was taking bids from scrapyards when the conservancy was able at the last minute to raise funds to match the ship’s scrap value. The conservancy’s goal is a public-private partnership to permanently dock the ship and fill it with hotel rooms, restaurants, classrooms, and offices.—*Wall Street Journal* (Feb. 1, 2011)

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**Digital SIAN Reminder**

SIA members now have the option of downloading the SIAN as a digital download at the time of publication, which is typically three to four weeks before the printed version arrives in your mailbox. You will still receive the printed copy unless you opt out, but now you can read the electronic version sooner.

Members who have signed-up to receive the SIA’s e-news will receive notification when the paperless version of each issue becomes available. If you haven’t been receiving e-news, please make sure we have a good email address for you. Members can sign up for e-news at the SIA website (www.siahq.org). The e-news message will direct you to an unpublicized part of the SIA website where you may view and download the issue. You are encouraged to share the electronic SIAN with your colleagues and friends as a membership recruitment tool.

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Fire insurance maps are an esteemed source of information for the study of historic industrial establishments and a tool commonly used by industrial archeologists.* They are especially valuable to the environmental assessor, since the fire insurance companies were concerned with many of the structures, operations, and hazardous substances that are relevant to a Phase I Environmental Assessment.

Associated Factory Mutual Fire Insurance Companies of Norwood, Mass., prepared excellent site-specific fire insurance maps of industrial facilities. Other companies published coverage of cities, such as Ernest Hexamer & Son’s mapping of Philadelphia. But for nationwide coverage and ready availability, the fire insurance maps prepared and published by Sanborn Map Company of Pelham, N.Y., are the essential reference. Fire insurance maps are so important to the environmental assessor that Sanborn was acquired by Environmental Data Resources, Inc. (EDR) of Milford, Conn. EDR is a vendor of environmental regulatory agency databases, and acquired Sanborn after fire insurance maps became a standard research tool for every Phase I Environmental Assessment per the American Society for Testing Materials (ASTM) standard E 1527-05. EDR provides electronic black-and-white reductions of Sanborn maps. Many environmental assessors—including some with years of experience—have never seen an original Sanborn atlas and don’t know that the maps are usually large and colorful.

The author’s library includes a Sanborn atlas for a portion of Boston (Vol. 5; Breed’s Island, East Boston, and Charlestown), published in 1927. The last hand-pasted revisions were attached on Sept. 19, 1932. A diversity of industrial establishments is depicted, including the Hodge Boiler Works at 99 Sumner Street; Middlebrook Wool Combing Co. at 308-314 Border Street; General Electric Co.’s East Boston Lamp Works at 156-200 Porter Street; East Boston Potteries at 146 Condor Street; and Gibby Foundry Co. at 96 Condor Street. Various other establishments and features of potential environmental concern are also depicted.

Not surprisingly, “G.T.” (gasoline tank) is an immediate concern. Underground storage tanks are usually depicted as circles on Sanborn maps, less commonly as rectangles. The collection of soil and groundwater samples from borings is usually preceded by a geophysical survey (magnetometer and ground-penetrating radar) to delineate the tank. Nonetheless, the indication of a tank’s dimensions and alignment by its depiction as a rectangle is obviously more useful than a circle.

Transformer vaults are another feature of interest to the environmental assessor. Because of the dangers of shrapnel and scalding hot oil associated with a transformer explosion, liquid-cooled transformers were often located in concrete vaults. Other discrete rooms depicted include those for the storage of solvents and paints.

Sanborn maps differentiate among the various types of laundry establishments, labeling them as steam laundry, Chinese laundry, wet wash laundry, etc. The differentiation was likely due, at least in part, to the dangers associated with a boiler explosion. Of immediate concern to the enviro-

(continued on page 13)

All maps Boston, Mass., Vol. 5; Breed’s Island, East Boston, and Charlestown, Sanborn Map Co. 1927, rev. 1932.

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The environmental assessor’s perfect storm: an automobile (“A”) repair shop adjoining a dry cleaner, adjoining a gasoline underground storage tank, 1214-1220 Bennington St. “S” is a store. The black circle labeled “U.B.” represents an upright boiler, probably to generate steam for the cleaner’s garment presses. A separate heater (“H’TR”) for space heating of the building is indicated in another room.

Four transformer vaults in the Edison Electric Illuminating Co. substation at 171-177 Border St.
ronmental assessor is a dry cleaner, the use of chlorinated solvents (trichloroethylene and perchloroethylene) by dry cleaners dates to at least as early as the 1920s.

Like any map, a fire insurance map depicts only the features and operations identified by the field personnel and included by the mapmaker. In rare instances, “Admittance refused” is noted with regard to a particular establishment, in which case the physical plant is depicted on the basis of public records. Whatever their limitations may be, fire insurance maps are an invaluable tool to the industrial archeologist and environmental assessor alike. When maps concur with information contained in other sources (especially city directories), the investigator is reasonably assured that the information is sound and conclusions can be developed.

Michael Bernstein


**IA ON THE WEB**

Detroit 1906 ([www.merit.edu/~jimmoran/detphot/detroit.html](http://www.merit.edu/~jimmoran/detphot/detroit.html) or search for “Detroit 1906”). This site is built around a detailed analysis of a panoramic photo of the Campus Martius public square. Discusses streetcars, street patterns, air quality, and commercial architecture. Also The Ruins of Detroit ([www.steidlville.com/books/1050-The-Ruins-of-Detroit-English-Edition.html](http://www.steidlville.com/books/1050-The-Ruins-of-Detroit-English-Edition.html)). Although this site is primarily the publisher’s publicity for the book of the same name, it includes an extensive gallery of Detroit industrial-site photos.

Domino Sugar Refinery ([www.thedominoeffectmovie.com](http://www.thedominoeffectmovie.com)). The 9-min. trailer for The Domino Effect, a new documentary on the redevelopment of the Domino Sugar site in Williamsburg, Brooklyn (tour site—SIA Annual Conference 2002) and the larger impact of rezoning on this neighborhood, which formerly was working-class and industrial. The filmmakers are raising money toward releasing it.

Langhorne Carpet Co. ([www.newsworks.org/index.php/art-entertainment-sports/item/11972-27pcarpet](http://www.newsworks.org/index.php/art-entertainment-sports/item/11972-27pcarpet)). Short video shows operations of one of the last manufacturers of woven carpets. Most carpet now is made by computerized “tufting”—a row of needles knitting carpets to a backing material and binding them with glue. The company in Bucks County, Pa. uses mechanical looms that haven’t changed much in over 100 years.


Society for Historical Archaeology Publications ([www.sha.org/publications/](http://www.sha.org/publications/)). The SHA’s “publications explorer” contains all major SHA publications from 1967 to the present, including a large number of articles and technical briefs related to industrial topics. While most publications are free, some might need to be purchased.

(continued on page 14)
The Steam Locomotive (www.liveleak.com/view?i=816_1298931726). An 18-min. film documenting operations on the NY Central in 1938. Also on Liveleak (browse “locomotive”), several other old documentaries on railroad operations, mostly from Britain.

Triangle Shirtwaist Factory Fire Centennial Project (http://rememberthetrianglafire.org/open-archive). The Triangle Fire Open Archive is an online, participatory archive of community-contributed stories, images and documents. Each of these objects tell a piece of the history and impact of the infamous New York City Triangle factory fire of 1911 and its critical relevance for today’s pressing questions about labor rights and safety, from New York City to Wisconsin to Bangladesh.

Welland Canal (http://mistermerritstditch.ca/). Features history and postcard views of the canal (tour site—SIA Fall Tour, Niagara Falls, 1984) and canal-side industries. Many of the bridges have long since been removed, as have the enormous concrete utility poles designed to allow clearance for the high-masted ships still common on the second Welland Canal of 1888. The Burgoyne Bridge, a high-level truss built in 1915, is under threat of replacement.

“IA on the Web” is compiled from sites brought to the editor’s attention by members, who are encouraged to submit their IA Web finds: phsianews@aol.com.
Designing Tomorrow: America’s World Fairs of the 1930s will be on display at the National Building Museum in Washington, D.C. through July 10. Between 1933 and 1940 tens of millions of Americans visited world’s fairs in cities across the nation. Designing Tomorrow explores the modernist spectacles of architecture and design they witnessed—visions of a brighter future during the worst economic crisis the U.S. had known. The fairs popularized modern design for the American public and promoted the idea of science and consumerism as salvation from the Great Depression. Info: www.nbm.org.

Harnessing the Hudson is an exhibit through September 25 at the Chapman Historical Museum (Glens Falls, N.Y.) exploring the history of waterpower in upstate New York from colonial sawmills to modern generating stations. The exhibit features photographs and archival materials from the museum’s Spier Falls collection. In 1898, the Mechanicville hydroelectric plant began producing electricity for Glens Falls and surrounding communities, as well as the large General Electric Plant in Schenectady, 50 miles away. Info: www.chapmanmuseum.org.

Jolan Gross-Bettelheim: An American Printmaker in an Age of Progress features rare prints by the Hungarian-American artist (1900-1972), a pioneering modernist woman printmaker who excelled in creating prints of industrial scenes, machinery, and technology. Her compositions celebrated the modernist geometric imagery that prevailed during America’s machine age. The prints are comparable to those of leading American printmakers, although her work is not widely known. On display at the Jane Voorhess Zimmerli Art Museum at Rutgers University, New Brunswick, N.J. through July 31.

Railroad Communications and Signaling will be on exhibit at the RR Museum of Pennsylvania in Strasburg through Dec. 31. From solitary signals to centralized-traffic-control centers, learn about the history of railroad technical operations and try to run a simulated rail traffic operation in this exhibit. Photographs, artifacts, and video from the museum’s rich collections round out the fascinating story of rail communication. Info: www.rrmuseum.org.

The B&O RR Museum (tour site—1995 Annual Conference, Baltimore) is marking the 150th anniversary of the Civil War with a special exhibit The War Came by Train open through May 2015. The Civil War was the first major conflict where railroads played a prominent role, and the B&O was a major line that straddled the divided country. Between April 19, 1861 (the Baltimore Riot) and April 21, 1865 (Lincoln’s Funeral Train), the B&O stood witness and participant to the war that changed the course of American history. The exhibit features photographs, broadsides, interpretive signage, video presentations, life-size dioramas, artifacts related to the B&O’s operations, and the largest assemblage of Civil War railroad equipment in the world including eight locomotives and cars that served during the war. Locomotives to be presented include The William Mason (1858), The Thatcher Perkins (1863), The Atlantic (1832), The Memnon (1848), The John Hancock (1835), and the Pioneer (1851) on loan from the Smithsonian Institution. Kid-friendly interactive exhibits will engage children in learning about Civil War railroads.—B&O RR Museum Train Mail (Mar. 2011)

Reading Artifacts Summer Institute. The Canada Science & Technology Museum in Ottawa offers a week-long workshop, Aug. 15-19. It will be held in the museum’s storage facility in the midst of Canada’s largest collection in science, medicine, and technology. With sessions led by material culture scholars and open to students, faculty, scholars, and professionals, the institute will challenge participants to think beyond traditional accounts of science and technology and gain a renewed appreciation for artifacts and the multiple, unpredictable stories they tell. Info: www.sciencetech.museums.ca/English/whatson/2010-reading-artifacts.cfm.

Call for Papers: The Pioneer America Society: Assn. for the Preservation of Artifacts & Landscapes (PAS: APAL) will hold its 43rd annual conference at the Indian River State College and Marriott Courtyard in Stuart, Florida, on Oct. 12-15. The conference theme is Boom and Bust: Landscapes of Economic and Cultural Transition. The emphasis is to document the boom and bust cycles in Florida and show how these cycles affected real estate, architecture, transportation, coastal development, cultural diversity, agricultural landscapes and shifting land use, environmental issues, and what the future holds for the Treasure Coast. Presentations will be limited to 20 minutes. Abstracts must be no longer than 300 words, including the author’s name, affiliation, and title. Deadline: Aug. 27. Abstracts should be sent directly to: Marshall E. Bowen, 2011 PAS: APAL Conference, 1007 Cadmus Dr., Fredericksburg, VA 22401; mbowen@umw.edu. Info: www.pioneeramerica.org.

CALENDAR

2011


Sept. 5-8: Rustbuckets or Floating Heritage?—Corrosion of Historic Ships Conference, Stockholm, Sweden. Info: rustbuckets2011@maritima.se.


Oct. 6-7: First Annual Natural Gas History Symposium, Titusville, Pa. Sponsored by the Oil Region Alliance on the campus of the University of Pittsburgh at Titusville. Info: www.oil150.com/calendar/details/?id=291.


2012


