SOCIETY FOR INDUSTRIAL ARCHEOLOGY

NEWSLETTER

Volume 43 Spring 2014 Number 2

Nationally Significant Highway Overpass Imperiled by Widening of I-93

The Prowse Memorial Bridge in Londonderry, N.H., one of the most innovative highway bridges on the U.S. Interstate System, faces an uncertain future. The bridge, which carries Ash Street in Londonderry over I-93, is imperiled by the ongoing project to widen the interstate.

Constructed in 1962, the Prowse Memorial Bridge was a groundbreaking structure that spanned both barrels of the highway without a central pier. Robert James Prowse (1906-1969) of what was then the N.H. Department of Public Works & Highways (later the New Hampshire Department of Transportation (NHDOT)) first designed the bridge in 1959 for a competition that was intended to foster imaginative and effective uses of steel for interstate highway overpass bridges. Prowse's design was then adapted from an abstract concept to an actual contract design that proved its effectiveness and economy during construction. It was thought to be the only example of a welded-steel rigid-frame overpass then in use on the Interstate System.

To achieve a 146-ft. clear span with the greatest possible economy of labor and materials, Prowse made use of methods of structural analysis developed throughout the first half of the 20th century and of steel fabrication technology that had been developing since World War II. Noted both for its engineering and its aesthetics, the bridge received a design award from the American Institute of Steel Construction in 1964.

The bridge is composed of five parallel steel rigid frames or bents. Each frame is sculpted through careful cutting and arc welding to constantly varying cross sections that reflect the internal stresses at each point in the bridge and impart a graceful outline to the structure. The bridge is "statically indeterminate," meaning that it is not susceptible to structural analysis by traditional calculations.

(continued on page 2)

James L. Garvin

Robert J. Prowse Memorial Bridge (Ash St. over I-93).

In This Issue:

- SIA 2014 Fall Tour Preview
- Bronx Ferry Bridges
- Gloucester City Shipyard
- "Universal" Power
- *S.S. Badger* Update
- Huber Breaker Lost

Published by the Society for Industrial Archeology
Department of Social Sciences, Michigan Technological University, Houghton, Michigan 49931-1295

HIGHWAY OVERPASS (continued from page 1)

James L. Garvin

Robert J. Prowse Memorial Bridge (Ash St. over I-93).

To understand and accommodate the internal stresses in the structure, Prowse employed one of several "indirect" methods of stress analysis that used a model or profile of the frames that make up the bridge. Prowse tested this model with an instrument called a *deformeter* to measure the deflection of the model under varying conditions of loading and thereby to determine its structural behavior.

By applying sophisticated structural analysis and by employing advanced welding technology with an appropriate steel alloy, Prowse created a bridge that anticipated the statically indeterminate, variable-section, welded, deck girder bridges that have since become commonplace in interstate highway design. Prowse's use of the steel rigid frame with its integral legs, however, was exceptional at the time and remains a rare structural form. Because of its rarity, the Prowse Memorial Bridge was designated in 2006 as one of two resources on the Interstate System in New Hampshire that require detailed review if affected by highway redesign. (The other is the Franconia Notch Parkway.)

The current concept for widening I-93 calls for a much longer overpass at this location. A 2004 agreement requires NHDOT to make a concerted effort to find an adaptive reuse for the bridge and move the structure to a new site if such a use is found. Thus far, NHDOT has not identified a reuse for the bridge, which faces the prospect of demolition as plans for the next phase of widening I-93 continue to develop.

The Ash Street Bridge was named the Robert J. Prowse Memorial Bridge by legislative act in March 1973 to honor the then recently deceased New Hampshire engineer. A monograph detailing Robert J. Prowse's innovative engineering work, including the stabilization of the Old Man of the Mountains, can be found at *www.nh.gov/nhdhr/publications/prowse.htm*. The monograph was researched and written by Patrick Harshbarger and Ingrid Wuebber [both SIA].

James L. Garvin

The *SIA Newsletter* is published quarterly by the Society for Industrial Archeology. It is sent to SIA members, who also receive the Society's journal, *IA*, published biannually. The SIA through its publications, conferences, tours, and projects encourages the study, interpretation, and preservation of historically significant industrial sites, structures, artifacts, and technology. By providing a forum for the discussion and exchange of information, the Society advances an awareness and appreciation of the value of preserving our industrial heritage. Annual membership: individual $50; couple $55; full-time student $20; institutional $50; contributing $100; sustaining $150; corporate $500. For members outside of North America, add $10 surface-mailing fee. Send check or money order payable in U.S. funds to the Society for Industrial Archeology to SIA-HQ, Dept. of Social Sciences, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931-1295; (906) 487-1889; e-mail: *SIA@mtu.edu*; Website: *www.sia-web.org*.

Mailing date for Vol. 43, No. 2 (Spring 2014), June 2014. ISSN 0160-1067. If you have not received an issue, apply to SIA-HQ (address above) for a replacement copy.

The *SIA Newsletter* welcomes material and correspondence from members, especially in the form of copy already digested and written! The usefulness and timeliness of the newsletter depends on you, the reader, as an important source of information and opinion.

TO CONTACT THE EDITOR: Patrick Harshbarger, Editor, SIA Newsletter, 305 Rodman Rd., Wilmington, DE 19809; (302) 764-7464; e-mail: *phsianews@aol.com*.

Southern Indiana
SIA Fall Tour • October 5–8, 2014

The 2014 SIA Fall Tour visits Southern Indiana, Oct. 5-8. As you get out your calendars to save the date, note that this year the Fall Tour is Sunday through Wednesday. This gives SIA a better opportunity to visit operating sites. The base for this year's tour will be the Clifty Inn, located in Clifty Falls State Park about five miles west of Madison, Ind. The inn's dining room overlooks the Ohio River as do many of the guest rooms. Of IA interest, some of the rooms also have a great view of the Clifty Creek Power Plant's stacks.

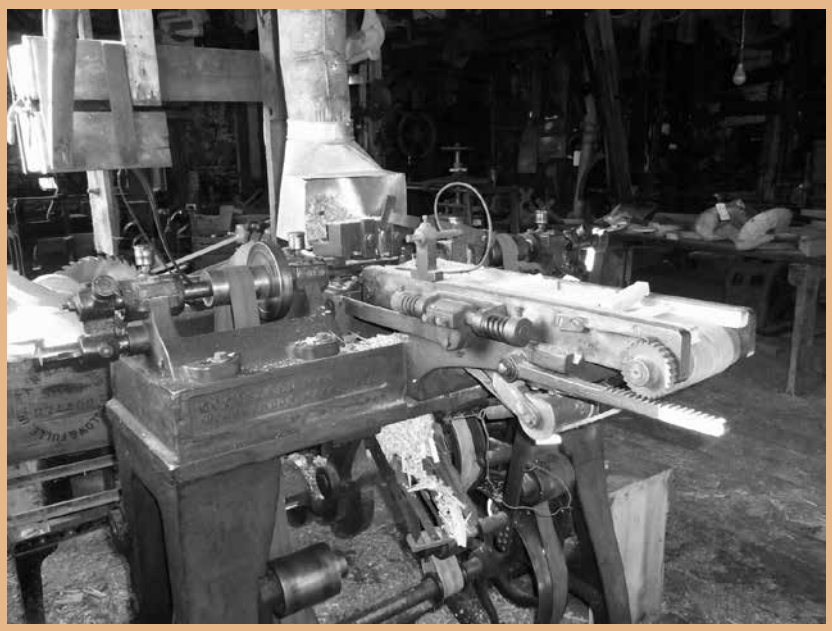
The SIA last visited Madison 20 years ago for its 1994 Fall Tour. While we will have an opportunity to see the amazing progress made in restoring the Schroeder Saddletree Factory, most of the sites will be new to SIA members. Especially exciting will be opportunities to visit Cummins Diesel in Columbus, a world-class producer of diesel engines.

Madison was incorporated in 1809 and sits on the Ohio River. It was one of Indiana's leading manufacturing and commercial centers prior to the Civil War. Its 130-block National Historic Landmark District is one of the best preserved and largest of its kind in the U.S. Downtown is very walkable and contains an amazing collection of architectural gems, including a vibrant Main Street. The Fall Tour's Sunday afternoon opening schedule includes a tour of downtown Madison, a reception at the Shrewsbury-Windle House (an individually listed National Historic Landmark).

Two alternating bus tours will be offered on Monday and Tuesday, so that all participants will have an opportunity to visit the same great sites. One bus tour will visit sites in and around Madison including the award-winning Schroeder Saddletree Factory restoration, the new Madison-Milton Bridge, and other industrial sites in Southeastern Indiana and Northern Kentucky. The second will travel to Columbus and Seymour, north of Madison, for Cummins Diesel and Seymour Manufacturing, the latter a firm that has been making lawn and garden tools since the 1870s.

Registration materials will be sent to all members in late summer. For updates, check the SIA website, *www.sia-web.org*.

Bill McNiece, John Staicer & Rhonda Deeg



Historic Madison, Inc.

Schroeder Saddletree Factory.

Bronx Ferry Bridges Nominated to National Register

On December 5, 2013, the N.Y. State Board for Historic Preservation recommended the 134th Street Ferry Bridges in the Port Morris section of the South Bronx for addition to the National Register of Historic Places. The two maritime structures rise approximately four stories on the shoreline of the East River between East 134th and 135th Sts. They were built at an existing ferry landing when ferry service was reinstated after World War II.

Use of an overhead frame to raise and lower a gangway using cables and pulleys goes back to the early days of ferry operations in New York. Robert Livingston Stevens, whose father operated some of the earliest steam-powered ferries on the Hudson River, is credited with developing this arrangement that allowed the gangway deck to be aligned with the deck of the ferry. In addition to accommodating the rise and fall of the ferry as it floated in the water, the gangway was designed to absorb some of the impact of the ferry coming to rest in the slip. "Ferry transfer bridges" or simply "ferry bridges" came to refer to the gangways used at ferry landings to load passengers and vehicles onto vessels. The terms may have evolved as these structures became more robust to serve increasingly larger ferries. The gangway was quite literally a bridge, commonly using wooden trusses to support the gangway deck, with a hinge or rollers at the inner (landside) end for flexibility, and a pontoon at its outer end to provide buoyancy. To adjust the gangway's height, counterweights were often used and were fastened to the bridge with chain or wire cables carried over sheaves mounted in an overhead frame. At 134th St., the overhead structures added in 1948 housed the operating mechanisms for the new ferry bridges and were sheathed in sheet metal to protect the machinery from the weather.

Ferries were once the only means to cross the numerous waterways that separate the islands that make up New York City. The New York & College Point Ferry Co., started in 1886 or 1887, originally operated a ferry between Manhattan and Queens across the East River. It began with one single-deck boat and two primitive ferry slips at each terminal, one at the foot of E. 99th St. and the other at Third Ave. in College Point in Queens

College Point was established by Conrad Poppenhusen in 1854 to accommodate the workers at his rubber factory. Its breweries, silk mills, and paint works contributed to the area's rapid growth in the 1880s and 1890s and attracted a mostly German population. Its beer halls and amusement parks made it a popular destination.

In 1890, new owners of the New York & College Point Ferry Co. began investing in improvements that included double-decked boats and the addition of an intermediate stop at the popular summer resort of North Beach, Queens on most runs. Recognizing the important role that the Bronx was likely to play in its relation to the East Side of New York after the consolidation of the five boroughs in 1898, the company established a new route between 134th St. in the Bronx and North Beach, building an attractive ferry house at the Bronx end.

The ferry supported Long Island farmers by carrying their produce from College Point to the Harlem Market, which lay between 102nd and 103rd Sts. on the East River in Manhattan. When the market was announced in 1891, it was noted that George Ehret and other large brewers had agreed to start a ferry to various points in Long Island to reduce traffic there and that it would transport passengers as well as produce. Thirty to forty wagonloads a day were being transported to the market by 1904. A market was also established near the ferry terminal in Port Morris in July 1905. There was also easy access to inland transportation via the Metropolitan Ry.'s trolley line and the New York, New Haven & Hartford Ry. By 1906, the company was operating five large double-decked ferryboats on two routes.

Wealthy New Yorker George Ehret, Sr. was the founder of the Hell Gate Brewery at 92nd St. and Second Ave.,

Leah Kozak

134th St. Ferry Bridge.

Historic Districts Council

134th St. Ferry Bridge, looking southwest with East River in the distance.

Manhattan, and was one of the largest brewers in the country. Among other investments, Ehret helped piano maker William Steinway establish the resort at North Beach for workers of the Steinway piano factory. The resort reached its peak between 1895 and 1915 with an abundance of hotels, carousels, restaurants, dance halls, Ferris wheels, etc. Attendance at North Beach fell off when America entered WWI.

Starting with the Staten Island ferry in 1905, New York City began taking over operation of private ferries driven out of business by the expanding infrastructure supporting automobiles and subways. The New York & College Point Ferry Co. followed many others by going out of business in 1918. It might be assumed that the decrease in attendance at the resorts at its Queens terminals combined with the impact of bridges and tunnels brought the company down. However, it appears that the very direct reason for the demise of this ferry company was the federal government's confiscation of George Ehret's assets after America entered WWI. Ehret was in Germany when war broke out and, with a history of very significant financial support to German causes and ties to influential German leaders, he was declared an enemy alien. Although all of his enterprises were allowed to continue to operate and a decision to release the assets back to Ehret was made by the end of the same year, it seems that this was the final blow to the ferry company.

By 1924, New York City initiated condemnation proceedings against the abandoned 134th St. ferry property. After three years of litigation in which the city contended that the ferry structures on the land were worthless, Ehret's estate (Ehret died on Jan. 20, 1927) was awarded $286,384, based on the site being returned to ferry use, although the city said that there was no longer any demand for ferries from this site. Once the court's decision was announced, the city said that the property would be used for ferries to Rikers, Welfare, and other islands where city institutions were located. The judge may have known that the city already had two new ferryboats under construction, designed specifically for these institutional routes.

The city continued to operate ferry service to its East River institutions from 134th St. through the 1930s. Elsewhere in the city, ferry use dropped off dramatically with the Depression, and even more with the continued development of tunnels and bridges. By 1955, the institutional ferry routes were the only remaining municipally operated ones outside of the Whitehall Street-Saint George line to Staten Island.

Use of the island institutions was changing too. Riverside Hospital, the city's infectious disease treatment facility and

(continued on page 21)

Historic Districts Council

134th St. Ferry Bridge.

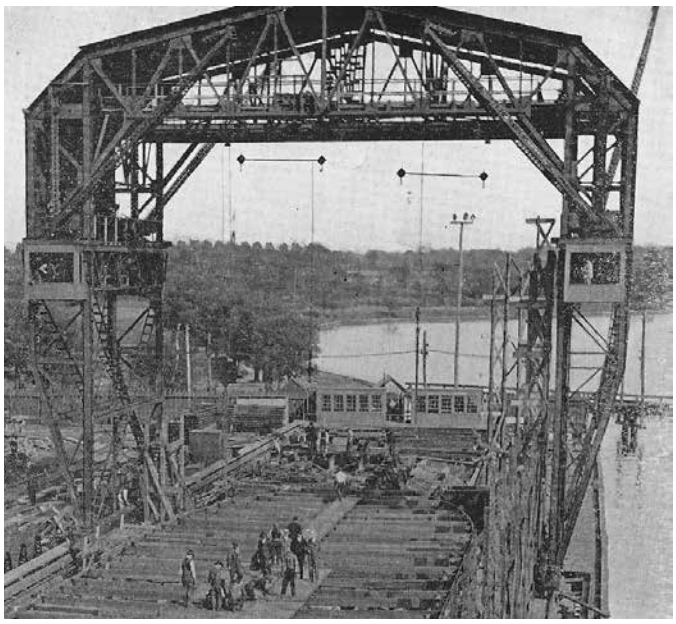
Portion of WWI Shipyard Offered for Sale

The Delaware River in Pennsylvania, New Jersey, and Delaware was the center of American shipbuilding during World War I. Warships, freighters, troop transports, and other vessels were built on more than 90 shipways in this region during the war. In June 1918, the U.S. Shipping Board relocated the offices of the Emergency Fleet Corp. (EFC) from Washington, D.C., to Philadelphia. The EFC was the agency responsible for establishing new shipyards, coordinating the construction of merchant ships and troop ships at all new and existing American shipyards, and assimilating the fleet of requisitioned American vessels and seized enemy vessels already on the water.

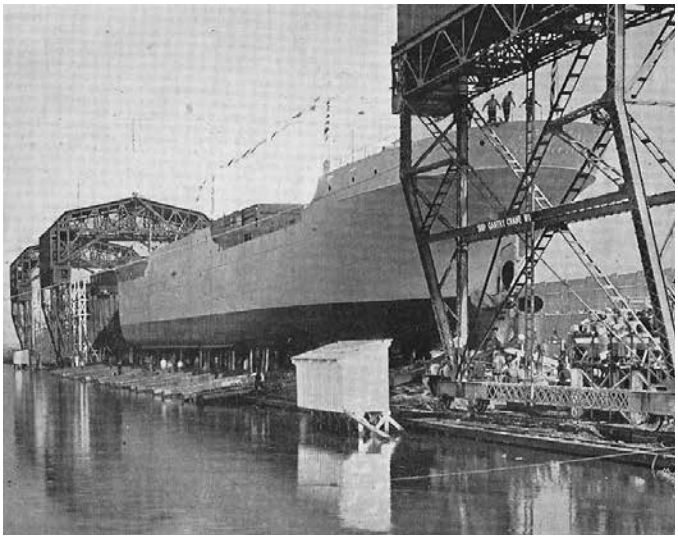
Shipbuilding methods and physical plants on the Delaware River during WWI ranged from the traditional to the innovative. Tradition was best represented by the old established yard of the William Cramp & Sons Ship & Engine Building Co. in Philadelphia (*SIAN*, Winter 2007). Unconventional were the covered shipways and wet basin at the relatively new yard of the New York Shipbuilding Corp. in Camden. Technological innovation was embodied by two shipyards where pre-fabricated freighters of standard designs were assembled: the Merchant Shipbuilding Corp. in Bristol, Pa. (*SIAN*, Winter 2001) and the American International Shipbuilding Corp. (site of the present-day Philadelphia International Airport).

Located in Gloucester City, N.J., were two little-known shipyards. The Pennsylvania Shipbuilding Co. was incorporated on April 27, 1916. The first keel was laid on September 9, 1916; the yard's first ship was launched on August 23, 1917. The contiguous New Jersey Shipbuilding Co. was incorporated on May 3, 1917. The first keel was laid on May 16, 1918; the first ship was launched on September 15, 1918. On August 3, 1917, control of the contracts and physical plants of the two shipbuilding companies was transferred to the EFC. On December 21, 1917, the interests that owned the two yards acquired Pusey & Jones Co. of Wilmington, Del., which owned a shipyard located on the Christina River (a tributary of the Delaware). Thereafter, all three yards were identified with Pusey & Jones.

Unusual aspects of Pusey & Jones' Gloucester City shipyards were the 11 covered gantry cranes and the side-launching of ships. It is unknown whether the idea for the covered gantry cranes was borrowed from the covered shipways at the nearby Camden yard. The shipways at Camden were enclosed on three sides and above, allowing construction to proceed with little interference from wind, rain or sun. The shelter provided by the covered cranes at Gloucester City was largely limited to the overhead exposure, so the advantage against weather would appear to have been slight (assuming weather was the basis for the covers). The side launching at Gloucester City seems to have been unique among Delaware River shipyards. Physiography may account for the sideways building slips, which were located on both sides of two piers and on one wharf. The shipyard land consisted of fill deposited within a timber crib or sheet-pile perimeter. Filling of this enclosure is still incomplete on an aerial photograph dated 1925. Shipways on piers appear to have been a necessity due to scarcity of land area.

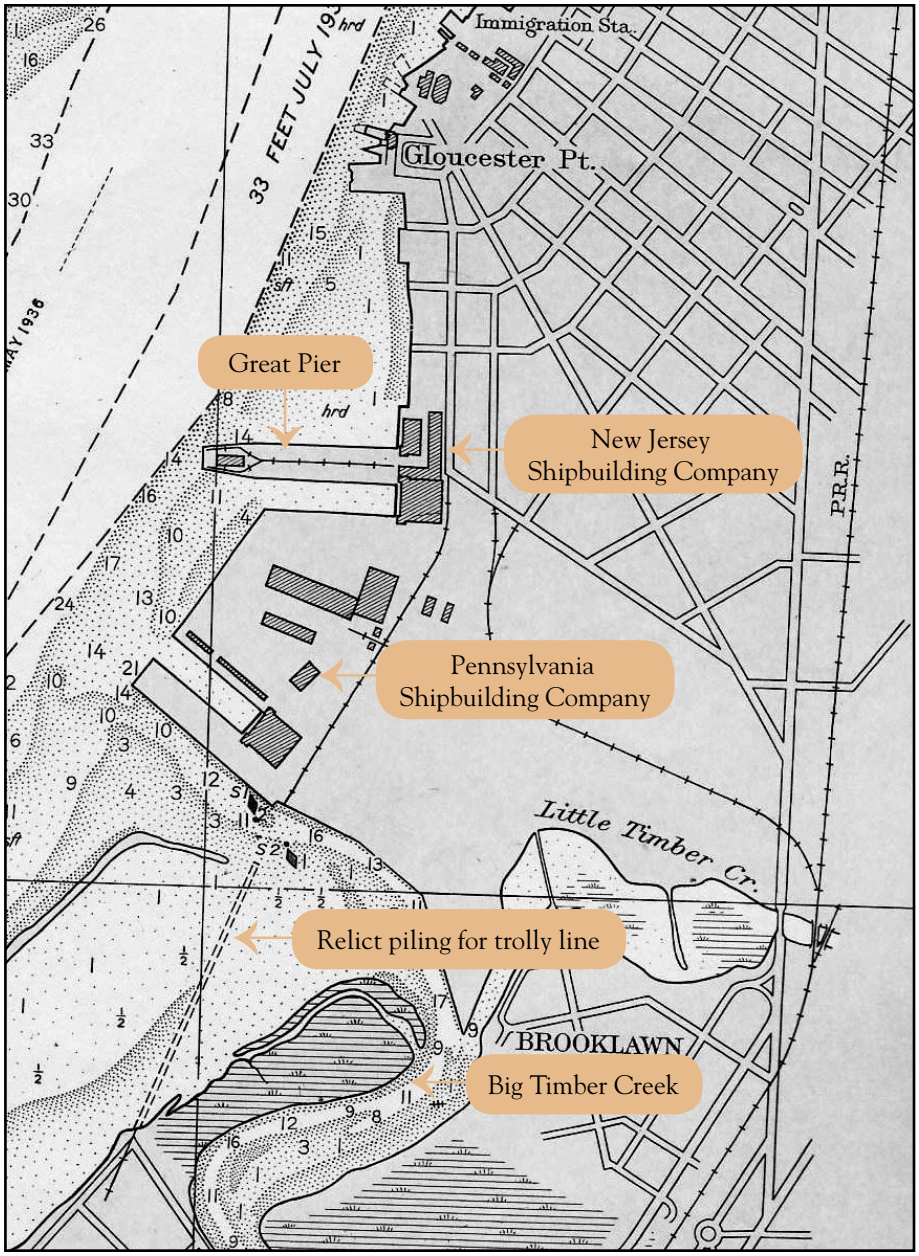


South side of the pier at the Pennsylvania Shipbuilding Co., with Big Timber Creek at the right and in the background. The trestle for the trolley line is just visible at the right. **Shipbuilding Illustrated *(Philadelphia), Vol. 1, No. 3, Feb. 1919.***



Freighter* Castle Point *just prior to launching. Three cranes on a single shipway and a building in the background identifies the shipway as the south side of the Pennsylvania Shipbuilding Co.'s pier at the mouth of Big Timber Creek. **Shipbuilding Illustrated *(Philadelphia), Vol. 1, No. 1, Dec. 20, 1918.***

U.S. Coast and Geodetic Survey, Chart 280,* Philadelphia and Camden Waterfronts, *Oct. 1, 1935 (corrected through Aug. 12, 1936, Hydrographic Office, Navy Dept.).



The 1925 photo's most conspicuous feature is a 1,160-ft. pier extending into the river, distinguished by a slight tapering of the outer 320 ft. with two gantry cranes on each side of the pier. The length of the pier and the lengths of the ships built at the yard imply that at least four ships could have been built simultaneously on the pier's shipways.

The shipyard was served by a pre-existing trolley line. It was abandoned after the war, as evidenced by the notations of "old piles" and "old trolley trestle" on the U.S. Engineer Office's Survey of 1942. The piles are still visible in the water on the Google Earth aerial photograph of 2013.

An unofficial list obtained on the Internet states that 6 tankers, 14 freighters, and 2 mine sweepers were built at Gloucester City. Review of the U.S. Department of Commerce *Merchant Vessels of the United States* (1926, for the year ending June 30, 1925) confirms 5 of the listed tankers, 13 of the listed freighters, and both of the mine sweepers.

The property was used by various industrial companies after the war including the Mathis Yacht Building Co., which had its main yard in Camden. The buildings and rail facilities appear intact on the 1949 edition of the *Philadelphia, PA-NJ*, quadrangle map. The foundations of several of the original manufacturing buildings are visible on the Google Earth aerial photograph of 2013.

On April 15, 2014, the great pier, a small portion of the shipyard land, and a riparian area totaling 10.5 acres (identified as 707 Water St.), were offered at an on-site auction. Although there were several interested parties, the property did not sell.

Hopefully, the skeleton of this forgotten shipyard, long overshadowed by the larger yards in Philadelphia and Camden, will remain and perhaps be restored to use.

Mike Bernstein

The Four Stages of the 'Universal' Power System

Robert Barnett [SIA] has been giving some thought to the historical development of electrical power transmission systems and the "universal" system of polyphase AC. With this article, he shares some of his insights, which may be of interest to readers, including those with only a passing familiarity with the subject matter.

The entire industrialized world takes electrical power for granted. A worker plugs a hand drill into an outlet with as much confidence that the system will supply power at the correct voltage and frequency as an electrician who hooks up a 50-hp direct-current (DC) motor. No one expects to hook up to a different system for every class of power needed. This is a universal system: one power system to which any user can connect a multitude of different electrical devices regardless of their voltage and frequency requirements. This idea of a universal system was not always the case; it largely originated with early electrical power generation and transmission, and it can be characterized as developing over the course of four overlapping stages from about 1890 to 1910.

Stage 1: Power transmission before the advent of electrical technology. From the middle decades of the 19th century and well into the early 20th, the reciprocating steam engine (also to a lesser extent the hydraulic waterwheel/turbine) was the prime mover for manufacturing machinery. In addition to traditional applications such as locomotives, steam engines were used to power textile mills, metal rolling mills, blast-furnace blowers, and swing bridges, to name just a few applications. For the most part, where significant sustained power was needed, a steam engine was used.

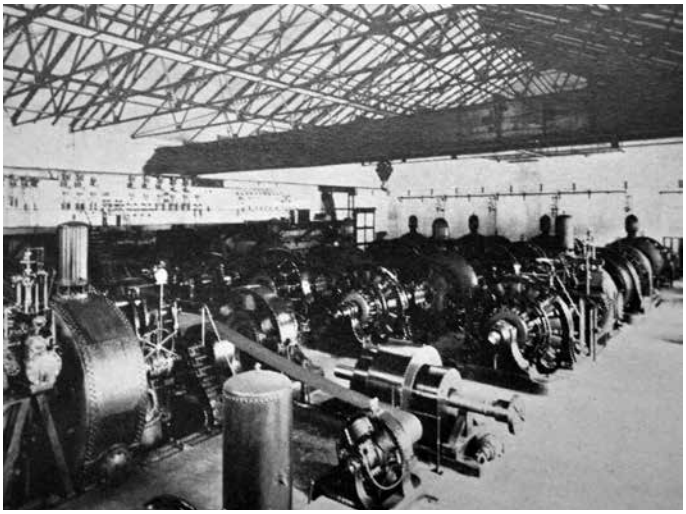
It was not always practical or convenient to site these prime movers near the machines they drove. Steam engines were too large and expensive to be used to drive, say, a single machine tool. Economies of scale dictated that large engines or waterwheels be in a centralized location. Transmission systems often took the form of mechanical line shafts, belts, and pulleys, with a power take-off at the machine itself.

Line shaft transmission for general manufacturing was practical usually only to distances up to 300 ft. Other mechanical means such as compressed air and the pumping of hydraulic fluids were tried, but they were limited to the same order of magnitude as the line shaft. Space and the practicality of maintaining these complicated systems were limiting factors, as were the power losses incurred by bearings, belts, clutches, and fluid turbulence.

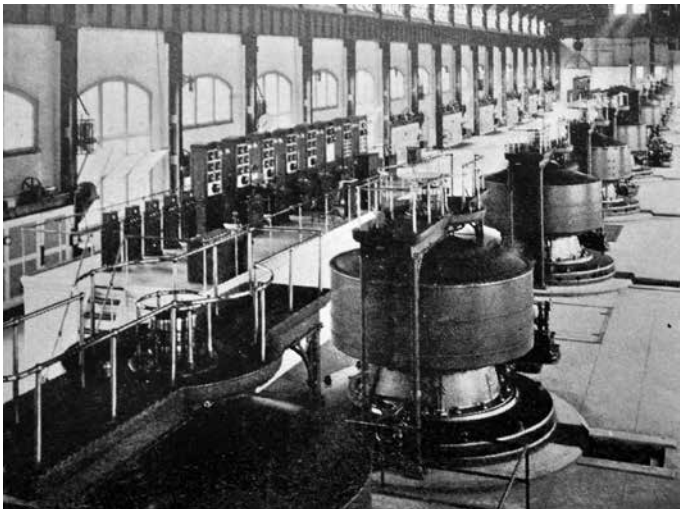
Stage 2: The electrical coupling, the early DC system. Direct current had been in use for most of the 19th century because it could be generated by chemical means. From about 1800, Voltaic pile batteries allowed arc lamps of a very rudimentary nature to provide light for a very limited number of important buildings. By the last quarter of the 19th century, DC generators were being developed to supply arc-lamp systems.

DC motors, along with arc and incandescent lamps, were in widespread use by 1890. A fairly large and well-understood DC power system was becoming entrenched. Small motors of fractional hp could now be easily located at the machines that needed them. DC motors replaced large systems of shafts and pulleys. Power could now be generated in a central station, in many cases not even owned by the manufacturer that owned the motors, and this power could be transmitted over distances of about one mile. These electrical transmission lines were thought of as an electrical "line shaft" linking two mechanical devices: a turbine (driving a generator) at one end and a pump (driven by a motor) at the other connected by conductors.

Stage 3. The need for greater transmission distances, the beginnings of alternating current (AC). The power losses that occurred over long transmission distances are usually mentioned as a reason DC was eventually abandoned in favor of AC for general transmission systems. These losses were, however, not inherent in DC. In fact, DC has less impedance



Interior of Station No. 2, Niagara Falls Power & Manufacturing Co. Note the multiplicity of generators. From* The Niagara Falls Electrical Handbook *(1904).



Interior of Adams Plant No. 1, Niagara Falls Power Co. Compare scale and uniformity with the interior of Station No. 2. From* The Niagara Falls Electrical Handbook *(1904).

and therefore less loss than AC. It was the low voltages of the early DC systems that were the root cause. Low voltages were a result of the physical and electrical restrictions (largely those of flash-over and current density) placed on commutator segments and brushes of DC generators and motors.

Several schemes were tried to increase DC voltage. In some cases, generators were placed in series, but this created other challenges. If for any reason one machine started to generate more power that the others, this machine would eventually try to take over the load, a phenomenon called load sharing. Also there was the challenge of the "Christmas tree light syndrome;" if one machine failed so did the whole series.

By 1890 it was well understood that AC was a solution to the transmission distance problem, although resistance came from those with vested financial interests in DC (notably Edison). The advantage that AC had was a result of the transformer. This device produced high voltage AC for transmission from low voltage AC generation. A practical transformer had been developed in the U.S. (ca. 1885) from European concepts. It was largely used for AC arc-lighting systems where the distances required were in the order of miles.

Understanding transformer operation is critical to explaining how AC produces high-voltage transmission. In 60-Hz AC systems (the frequency most common in North America) the electric current reverses direction 120 times per second. This reversal also causes a transformer's magnetic field to change direction at the same rate, "cutting" the primary (power input) and secondary (power output) windings of the transformer. If there are more turns in the winding on the secondary than in the primary, then the secondary is capable of producing a voltage higher than that of the primary. If, for example, the primary voltage is 2000V then the secondary voltage approximately equals the number of secondary windings divided by the number of primary windings multiplied by the primary voltage. A 10:1 ratio produces 20,000V secondary from a 2,000V primary. No moving electrical parts—commutator, brushes, and rotating field poles—are required to accomplish this.

AC allowed transmission potentials of more than several tens of thousands of volts to be obtained from a relatively low-voltage generator. Higher voltages reduced the amount of current required to transmit a given amount of power. This lower current meant that power could be transmitted greater distances without prohibitive losses. The power lost in any conductor is proportional to the square of the current carried by the conductor.

An important shortcoming of AC was the lack of a reliable self-starting motor. As with the DC system, the AC system could use its generator as a motor. This was in fact done in some installations, notably at Telluride, Colo. But there, the motor was a synchronous machine and, as such, not truly self-starting. A DC pony motor was required to bring the motor up to synchronous speed before it could be loaded. The DC system suffered no such impediment; its motors were self-starting. This seemed an almost insurmountable obstacle for the single-phase AC system. It took considerable courage to break through the technical and financial challenges surrounding the development of a large-scale AC system, but eventually that happened at Niagara Falls.

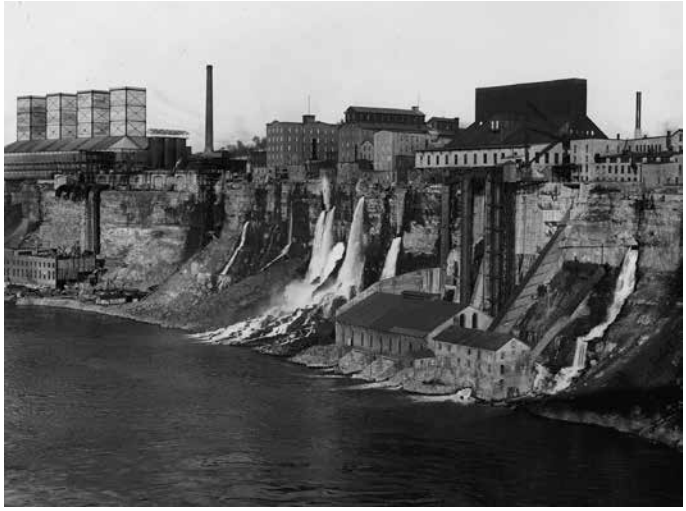
Stage 4: The universal polyphase AC system: the coming of the electrical age. For years the power of the falls at Niagara was known throughout the world, but their location on the border of the Niagara frontier between the U.S. and Canada put them at a great distance from large manufacturing loads. Even at the end of the 19th century, at which time the Great Lakes port city of Buffalo, N.Y., was fast becoming a large manufacturing center, the transmission distance of 18 miles from Niagara Falls was not within the capabilities of any system then in use.

The AC (single phase) system then in use could conceivably be used to transmit power the required distance, but the lack of a self-starting motor made it an unlikely candidate. When the Niagara Power Co. decided to develop the vast potential of Niagara Falls in 1892 and transmit its power to Buffalo, there was no clear-cut system of choice, but many were proposed. In addition to conventional AC and DC proposals, with some not-so-conventional twists, there were odd proposals for shafts and belts, pulleys and ropes, compressed air, hydraulic power and last but not least, the polyphase AC system presented by George Westinghouse and developed by Nicola Tesla.

The power company owners, headed by Edward Dean Adams, began construction on the mechanical equipment for the powerhouse even before the transmission technology was settled. The generation technology was to take the form of ten turbines, each rated at 5,000 hp. These turbines were the largest in their day but required only a scaling-up of conventional practices. What the turbines would be driving remained in doubt. Most experts thought that the turbines would drive electric generators but these same people felt that these generators would be DC—the system of choice at that time.

It must be remembered that the two major electrical loads of the late 19th century were lighting and street railways, the latter being the largest motor loads. These street railways were DC and it was thought inconceivable that any

(continued on page 10)



Detroit Publishing Co./Library of Congress

The Mill District along the Niagara Gorge, c. 1900–1910.

system that was to transmit power for motor use would be anything but DC. Adams was not convinced of the necessity to use DC. After several unsuitable proposals, he made the courageous decision to adopt the Westinghouse/Tesla polyphase system. The catalyst for the coming electrical age had been added to the mix. At the beginning of the last decade of the 19th century, the polyphase AC system, brought by Tesla to Westinghouse in the late 1880s, was poised to enter the scene.

The alternators that Westinghouse built were of an unheard of size—5,000 electrical hp—but they were only vaguely reminiscent of modern hydro alternators. They were two-phase machines that generated 25 Hz with rotating fields and stationary armatures.

Within ten years of first power at the 1895 Adams Plant No.1, a sister station, the Rankine plant of the Canadian Niagara Power Co., was on line and delivering three-phase power. Except for its frequency (25 Hz), this power system was identical to that which North America now uses (60 Hz).

To fully appreciate what this means we need only look at an earlier hydro station that was once located just downriver from the Adams plant. The generating station of the Niagara Falls Hydraulic Power & Manufacturing Co. was, by the beginning of the 20th century, a large plant even by today's standards. It contained a multiplicity of machine types. Some were standard DC of various voltages ranging in power output from a few watts for street lighting to several kilowatts for aluminum refining. Machines for street railways were different in shape, size, and voltage rating from those intended for paper-mill use. Alternating-current machines were also in use. These were single and three-phase with frequencies ranging from 16.7 to 133 Hz. The nature of the loads dictated the wide array of types of generators. In general, each machine served one load or class of loads.

The following table and photographs show a comparison between the equipment in two powerhouses in Niagara Falls, N.Y., at the turn of the 20th century. The Niagara Falls Hydraulic Power & Manufacturing Co. had begun as a supplier of mechanical power. The company added electrical generators to supply load requirements as the need arose. Notice the large number of different ratings to match specific customer needs. Compare this to the machinery installed in Niagara Falls Power Co.'s Adams Plant No. 1. All machines had the same rating. The customer was expected to take power at the voltage and frequency provided by the generating company and transform or otherwise convert it to the voltage and frequency required by the load.

This was a precursor to the universal grid of today where all alternators are of one type—three-phase, 60 Hz (in North America) with internal rotating fields. Moreover, this grid feeds all classes of AC loads: single phase, two-phase, three-phase, six-phase, and of any frequency, plus DC loads. The user simply connects to the grid at some convenient point with an interface device (transformer, rectifier, motor-generator set, etc.) that will supply the power at the voltage, phase, and frequency needed.

This is a truly universal system and represents one of the first examples of open architecture, familiar to most people today in the form of computers accepting of a large manner of digital devices such as cameras, printers, scanners, phones, etc. It is no exaggeration to say that the system developed by the Niagara Falls Power Co. in the two decades spanning the turn of the 20th century set the stage for the electrical age.

Robert D. Barnett

Niagara Falls Hydraulic Power & Manufacturing Co.

POWER HOUSE NO. 2

Qty	*Turbine*	*Attached Generator*
1	250 Hp—600 RPM	150 kW, 125 volts DC
1	550 Hp—475 RPM	400 KW, 550 volts DC
3	1650 Hp—250 RPM	3560 kW, 300 volts DC
1	1900 Hp—300 RPM	2560 kW, 550 volts DC 200 kW, 135 volt DC 110Hp booster
2	2300 Hp—250 RPM	750 kW, 300 volts DC 750 kW, 300 volts DC
1	2800 Hp—257 RPM	875 kW, 175 volts DC 1000 kW, 11,000 volts AC, 3 phase
1	2900 Hp—250 RPM	875 kW, 175 volt DC 1000 kW, 325 volt DC
1	2900 Hp—250 RPM	1000 kW, 325 volt DC 1000 kW, 325 volt DC
4	2900 Hp—250 RPM	750 kW, 300 volts DC 750 kW, 300 volts DC
1	2900 Hp—250 RPM	1000 kW, 11,000 volts AC, 3 phase 700 kW, 2,200 volts AC, 1 phase

Niagara Falls Power Co.

ADAMS PLANT NO. 1

Qty	*Turbine*	*Attached Generator*
10	5000 Hp—250 RPM	3300 kW, 2,200 Volts AC, 2 phase

Comparison of Equipment in Two Niagara Falls Power Plants, 1906. **Information for this table was taken from Captain Charles W. Kutz. *Existing Water-Power Situation at Niagara Falls so Far as Concerns the Diversion of Water on the American Side.* (Washington: Government Printing Office, 1906).**

SOCIETY FOR INDUSTRIAL ARCHEOLOGY NEWSLETTER

Publications of Interest

Vol. 43, No. 2 Spring 2014

COMPILED BY

Mary Habstritt, New York, NY., Justin M. Spivey, East Windsor, N.J., and Patrick Harshbarger, SIAN *editor, Wilmington, Del.*

General Interest

- Catherine W. Bishir. **Crafting Lives: African American Artisans in New Bern, North Carolina, 1770-1900**. Univ. of N.C. Pr., 2013. 392 pp., illus. $30. From the colonial period onward, black artisans in the South—thousands of free and enslaved carpenters, coopers, dressmakers, blacksmiths, saddlers, shoemakers, bricklayers, shipwrights, cabinetmakers, tailors, and others—played vital roles in their communities. This book offers an in-depth portrayal of urban African American artisans in the small port city of New Bern.
- **Engineering Heritage Australia Magazine** is a new on-line magazine published by Engineering Heritage Australia (*www.engineersaustralia.org.au/engineering-heritage-australia/activities-publications*). Vol. 1, No. 1 (Dec. 2013) is a meaty issue that includes articles on the Barton White & Col Power Station, built in 1888 and the first commercial electric supply in Queensland; preservation of the *City of Adelaide*, a composite clipper ship (timber planking applied over an iron frame) built in 1864 and the oldest surviving example in the world; the National Steam Centre, a huge collection of steam and internal-combustion machinery assembled by the Melbourne Steam Traction Engine Club; the Ord River Diversion Dam, built in 1963; the Overland Telegraph, established in 1872; the Phoenix Foundry in Ballarat; the Julius Tote, a 100-year-old mechanical tote board at the Eagle Farm Racecourse in Brisbane; the Royal Engineers Building, Hobart; and the hammerhead (Titan) crane at Garden Island, Sydney Harbour.
- **Industrial Archaeology News**, the bulletin published by the Assn. for Industrial Archaeology (U.K.), is a quarterly round-up of IA in Britain and beyond. No. 165 (Summer 2013) includes I.J. Brown, *The Preservation of St. Aidans Dragline and Its Friends* (Bucyrus Erie 1150B dragline); Tony Crosby, *Malthouse Features Revealed* (an 1840s malthouse in Bishop's Stortford, Hertfordshire); George C. Dickinson, *The Markham Grange Steam Museum*; and Nanci Rosenberg, *An Eighteenth-Century Timber Waggonway* (at William Hawks' Gateshead Iron Works, short section of single track, 4 ft.-3 in. gauge). No. 166 (Autumn 2013) includes Bill Barksfield, *'Roaming Round the Ruhr'* (review of AIA Spring Tour 2013) and Nigel Grizzard, *Our Northern Mills* (economic recession has brought many textile mill rehabilitation projects to a stop and an uncertain future). No. 167 (Winter 2013) includes *AIA 2013 Dundee Conference* (review of the annual meeting) and Robert Carr, *The Hampton & Kempton Waterworks Railway—Hanworth Loop* (narrow-gauge steam railway in operation from 1916 to 1946). No. 168 (Spring 2014) includes Paul Saulter *E FAITH in Switzerland* (review of 7th European Industrial and Technical Heritage Weekend) and Stuart B. Smith, *Japan's Meiji Industrial Revolution* (the Japanese government ohas put forward a UNESCO World Heritage Site nomination for a collection of industrial sites related to Japan's rapid industrialization (1868-1912). This is a first for Japan, and possibly for Asia, as the nomination includes sites that are still operational). *IA News* is available to members of the AIA. Info: *www.industrial-archaeology.org*.
- Barrie Trinder. **Britain's Industrial Revolution: The Making of a Manufacturing People, 1700-1870**. Carnegie, 2013. 676 pp., illus. Richly illustrated with several hundred photographs, drawings, and maps, offers a comprehensive treatment of the dramatic expansion of British industry with a focus on the people who created, innovated, labored, prospered, and suffered as a result of industrialization. Rev: *IA News* (Autumn 2013), p. 19.
- Paige Williams. **Drop Dead, Detroit!** *The New Yorker* (Jan. 27, 2014), pp. 32-39. Located just across Eight Mile Road from the city of Detroit, Oakland County has been governed by chief executive L. Brooks Patterson since 1992. While Oakland's AAA bond rating, three-year rolling budgets, and economic development initiatives have won national accolades, there are concerns that its success has come at the expense of Detroit's further decline.

Automobiles & Highways

- Antonio Amado Lorenzo. **Voiture Minimum: Le Corbusier and the Automobile**. MIT Pr., 2011. 350 pp. $49.95. Explores the origins of a myth, fostered by the architect Le Corbusier, that his design for the *voiture minimum* (an automobile cheap enough for the masses) inspired the design of the Volkswagen Beetle and the Citroën 2CV. Rev.: *T&C* (Jan. 2012), pp. 215-16.
- Burkhard Bilger. **Auto Correct: Has the Self-Driving Car at Last Arrived?** *The New Yorker* (Nov. 25, 2013), pp. 96-109. While chronicling the latest step in the evolution of self-driving cars at Google X, the company's division for experimental technology, Bilger also provides historical perspective on their previous development, from the 1939 World's Fair to the first DARPA Grand Challenge in 2004.

- Mary M. Chapman. **Your Earrings Remind Me of Grandma's Gran Torino.** *NYT* (Aug. 25, 2013). Jewelry is being made with "fordite," also known as Detroit agate. The material is enamel slag built up from layers of paint in the ovens once used to harden car paint under high heat.
- Christopher Nelson. **Frederick Douglass Patterson, Black Manufacturing Pioneer**. *Timeline*, Vol. 31, No. 2 (Apr./June 2014), pp. 50-55. Patterson of Greenfield, Ohio, successfully transitioned a family-owned firm from making carriages to automobiles, trucks, and buses in the early years of the 20th century.
- Bill Vlasic. **100 Years Down the Line**. *NYT* (Oct. 29, 2013). Retrospective on the history and impact of the Ford Model T assembly line on its 100th anniversary. Quotes Bob Casey [SIA].
- Bill Vlasic. **Derelict in Detroit, and Hard to Sell.** *NYT* (Nov. 22, 2013). Recent efforts to redevelop the massive abandoned Packard Motor Car plant have come to naught.
- Jason Vuic. **The Yugo: The Rise and Fall of the Worst Car in History**. Hill and Wang, 2011. 262 pp. $19. Based on the Fiat 127, the Yugo was manufactured at Yugoslavia's Crevena Zastava (Red Flag) factory. Nothing was "inherently wrong with the design … it was the execution that led to its dismal reputation. The Serbian factory in which it was made looked like something out of the early Industrial Revolution. Overstaffed, filthy, and dimly lit …." Rev.: *T&C* (Oct. 2011), pp. 854-55.

Aeronautics & Aerospace

- Johannes R. Allert. **Northwest Airlines' Modification Center in World War II**. *Minnesota History* 63:8 (Winter 2013-2014), pp. 324-333. To speed production, military aircraft manufacture was separated from alterations made to prepare planes for particular climates or roles, such as photo reconnaissance. During WWII, Northwest modified B-24 Liberators at its facility at St. Paul's Holman Field. Over 5,000 workers customized one-third of the aircraft produced at Detroit's Willow Run plant.
- Phil W. Hudson. **Delta to Fly DC-9 One Last Time**. *Atlanta Business Chronicle* (Dec. 24, 2013). On Jan. 6, 2014, Delta retired its last remaining DC-9, following Flight 2014 from Minneapolis-St. Paul to Atlanta. This was the last scheduled commercial flight of a DC-9 by a major U.S. airline. Delta flew its first DC-9 in 1965.
- David Meerman Scott and Richard Jurek. **Marketing the Moon: The Selling of the Apollo Lunar Program**. MIT Pr., 2014. 176 pp., illus. $39.95. Describes the sophisticated efforts by NASA and its contractors to prime the American public to support the Apollo program, opening up a world of science and technology, even science fiction, that had long been mainly of interest to scientists and engineers.
- Laura Williams. **Bainbridge to Dedicate World War II Hangar**. *Albany (Ga.) Herald* (Apr. 1, 2014). Hangar, built in 1942 by the Army Air Force as part of the Bainbridge basic air-training school, has been preserved from destruction by local volunteers. It is now located in an industrial park.

Power Generation

- Donald W. Linebaugh [SIA]. **The Springfield Gas Machine: Illuminating Industry and Leisure, 1860s-1920s**. Univ. of Tenn. Pr., 2011. 368 pp., photos, tables. $49.95. The machine's maker, the Gilbert & Barker Mfg. Co., paved the way for other gas-powered appliances by converting gasoline from an oft-discarded byproduct of crude oil to a viable fuel source. The Springfield Gas Machine was a gas-lighting system marketed for use in homes and businesses beyond a city's gas works. The self-contained unit was suited to American families looking for simplicity in the countryside without losing any modern comforts of the city. Industries, too, were looking for a means to operate more efficiently and implement longer work hours. Owners of a Springfield system could retain control of their light production during a time when corporations were reaping large benefits from a monopolistic hold over municipal gas works. The author inventories preserved Springfield systems across the country, and uses newspapers and magazine articles, advertisements, patents, and mail-order catalogs to tell the story of this one-of-a-kind unit. By capturing the pre-automobile market for gasoline, Gilbert & Barker attracted the attention of Standard Oil, presaging the oil-industry dominance over gasoline production that continues today. The story ends in the early 20th century as the advent of electricity proved more available to the masses at considerably less expense.
- Steven Mufson. **Tennessee Valley Authority to Close 8 Coal-fired Power Plants**. *Washington Post* (Nov. 14, 2013). Prompted by a combination of environmental requirements, the age of the plants, competition from natural gas, and declining electricity consumption, the TVA will close six units at Colbert and Widows Creek, Ala., and two at Paradise, Ky.
- Vaclav Smil. **Prime Movers of Globalization: The History and Impact of Diesel Engines and Gas Turbines.** MIT Pr., 2013. 261 pp. $15.95. Detailed historical accounts of the invention and improvement of diesel engines and gas turbines, and an argument that they were the prime enabling technologies leading to the development of a worldwide economy. Rev.: *T&C* (Oct. 2011), pp. 852-53.
- **Windmillers' Gazette**, Vol. 32 No. 3 (Summer 2013) includes T. Lindsay Baker, *Miniature Windmills of Cape Cod* (fanciful toy windmills sold to tourists for their yards) and *Summer Picnics for Windmill Company Workers*, and Christopher Gillis, *A Father's Influence: The Story of Roberts Pump & Supply Company* (story of Glenn LaVerne Roberts, a top Aeromotor windmill salesman in Nebraska starting in the 1950s). Vol. 32, No. 4 (Autumn 2013) includes T. Lindsay Baker, *Evolution of Section-wheel Windmills in America, Part One*, and *Remembering "Rawhided" Windmills* (practice of repairing weathered wooden windmills by wrapping in strips of rawhide), and Christopher Gillis, *Women Windmillers: Climbing the Tower*. Avail.: P.O. Box 507, Rio Vista, TX 76093; quarterly, $20/yr. Back issues $5.

Iron & Steel

- Simone de Bruxelles. **Ukrainian City Puts Its Welsh Founder on His Pedestal**. *The Times (U.K.)* (Nov. 16, 2013). Welshman John Hughes was invited by the Russian government to set up a steel works in Donetsk, Ukraine in 1870. His wife and 100 Welsh steel workers and miners accompanied him and, despite many hardships, they were successful in building a settlement based on a Welsh valley town. After the Russian Revolution, the town was renamed Stalino because its foreign connections were anathema to the Communists. Hughes's sons, who were running the works, were forced to leave. Now, a statue of Hughes has been

erected at Donetsk Technical University and the Ukrainian government plans to honor Hughes with a postage stamp. For photos of the statue and the steelworks, see "God Save the Queen—And Donesk, Too?" at *www.npr.org*.

- Lisa Selin Davis. **Industrial Strength: Cold Spring, N.Y.** *Preservation* (Apr. 1, 2014) (*www.preservationnation.org*, search on Cold Spring). Short article discusses challenges of interpreting the West Point Foundry archeological site. MTU's IA program field school excavated the site, recovering some 145,000 foundry-related artifacts.
- Chris Evans and Alun Withey. **An Enlightenment in Steel? Innovation in the Steel Trades of Eighteenth-Century Britain**. *T&C*, Vol. 53, No. 3 (July 2012), pp. 533-560. Argues that consumer demands, not Enlightenment science, led to innovation in England's steel manufacturing capacity, particularly the transition from blister steel to crucible steel.
- Dennis Hockman. **Itinerary: Bethlehem, Pa.: A Pennsylvania Town Builds on Colonial History and Industrial Heritage**. *Preservation* (Oct. 1, 2013) (*www.preservationnation.org*). Promotes industrial heritage tourism, with info on where to stay and eat, and recommends visits to the National Canal Museum, the D&L Trail towpath, and Steel Stacks, an arts and community center located near the five abandoned blast furnaces of Bethlehem Steel.
- Ian Johnson. **In the Air: Discontent Grows in China's Most Polluted Cities.** *The New Yorker* (Dec. 2, 2013), pp. 32-37. Focusing on the Hansteel works established in 1958 in Handan, Johnson describes the increasing public concern about industrial pollution in China. The Hansteel plant, now part of the Heibei Steel conglomerate, pays residents of neighboring communities a "pollution fee."
- Ben Miller. **Scottish Industrial History Could Have Sparked Prehistoric Economy, Say Archaeologists**. *Culture 24* (Jan. 15, 2014); *www.culture24.org.uk*. An East Lothian archeological site, dating to 490 B.C., has yielded high-carbon steel remains, which had been heated and quenched in water. The presence of steel suggests the existence of specialist metalworkers and an advanced state of technology.
- Kirthana Ramisetti. **Old Foundry's Historic Ruins Get New Life.** *WSJ* (Oct. 23, 2013). Report on the official opening of the West Point Foundry Preserve in Cold Spring, N.Y., summarizes environmental cleanup, archeological study, landscape renovation, and interpretive installations completed since Scenic Hudson's purchase of the site in 1996.
- Geoff Weisenberger. **Keep on Rolling**. *MSC* (Feb. 2014), pp. 44-51. Illustrated with photos, provides an in-depth virtual tour of the Nucor-Yamato Steel (NYS) mill in Blytheville, Ark. The mill opened in 1988 and converts scrap to structural shapes using two electric-arc furnaces and two rolling mills. NYS is currently enlarging the furnaces to reduce the number of charges per heat from two to one.

Lumber & Paper

- Ralph W. Andrews. **This Was Sawmilling: Sawdust Sagas of the Western Mills**. Schiffer Pub., 2007. 176 pp. $15.99. Numerous photographs illustrate lumbering and sawmill operations. Rev: *Old Mill News* (Spring 2013), pp. 25-6.
- Moira F. Harris. **Legacies of Logging in Minnesota**. *Minnesota History*, 63:5 (Spring 2013), pp. 203-212. A look at the cultural legacy inspired by Minnesota's white pine logging, one of the state's two main industries in the 19th century (the other flour milling). After a quick review of other works, such as murals created under the 1930s WPA program, the focus is on Paul Bunyan's many appearances in literature, film and, particularly, roadside sculpture.
- Gordon Jackson. **Paper Mill Popular Among Filmmakers**. *New Brunswick (Ga.) News* (Apr. 8, 2014). The old Gilman Paper Co. site in St. Mary's is considered a thing of beauty by filmmakers due to its "million different looks." It has been used as a set for a half-dozen movies.
- Mike Riley. **The Cat Tail Company: Montezuma Fibre**. *New York History Blog* (Oct. 17, 2013); *www.newyorkhistoryblog.org*. History of the Montezuma Fibre Co. of Syracuse, N.Y., and founder Eugene Kimmey, who in 1906 came up with a process to use flag (what we now call cat tails) as the main ingredient in making a heavyweight cardboard-like paper. In competition with the Solvay Process Co., which had devised a similar method, it set off a land rush to purchase thousands of acres of marshland on which the cat tail grew. Declining flag supplies, coupled with poor management, led to Montezuma's filing for bankruptcy in 1917.
- Katherine Rosman. **In Digital Era, Paper Makers Manage to Fight, Not Fold**. *WSJ* (Mar. 8-9, 2014), p. A1. Using Mohawk Fine Papers as an example, analyzes how large paper manufacturers have shifted focus to survive as electronic publishing has meant less information is recorded in paper form.

Textiles

- Tony Adams. **Swift Spinning Transitions to Employee-owned Textile Company**. *Columbus (Ga.) Ledger-Enquirer* (Nov. 15, 2013). Swift Spinning, established in 1906, produces ring-spun cotton yarns for the hosiery, knitted apparel, and specialty weaving sectors, and has about 300

CONTRIBUTORS TO THIS ISSUE

Susan Appel, Champaign, Ill.; Sigrid Arnott, Minneapolis, Minn.; Nancy Banks, New York, N.Y.; Robert D. Barnett, St. Catharines, Ont.; Alicia Batko, Montague, N.J.; Marc N. Belanger, Taunton, Mass.; Mike Bernstein, Chalfont, Pa.; James Bouchard, Montreal, Que.; Brian Bowen, Atlanta, Ga.; Stephen Buonopane, Lewisburg, Pa.; Arlene Collins, Houghton, Mich.; Gary Coppock, State College, Pa.; Rhonda Deeg, Madison, Ind.; Katie Duffy, Boston, Mass.; Don Durfee, Houghton, Mich.; Betsy Fahlman, Tempe, Az.; Dennis Furbush, Jackson Heights, N.Y.; James L. Garvin, Pembroke, N.H.; Mary Habstritt, New York, N.Y.; Neill Herring, Jesup, Ga.; John Johnson, Marshfield, Vt.; Scott Klipper, Poulsboro, Wash.; Donald Linebaugh, College Park, Md.; Carol Lockman, Wilmington, Del.; Bill McNiece, Indianapolis, Ind.; Cydney Millstein, Kansas City, Mo.; Bode Morin, Mountain Top, Pa.; Steve Muller, Troy, N.Y.; Lynn Rakos, Brooklyn, N.Y.; John M. Rossi, Boston, Mass.; Joe Seely, Chicago, Ill.; William Seiner, Niagara Falls, N.Y.; Brian Shovers, Helena, Mont.; Joel Shprentz, Reston, Va.; Justin M. Spivey, East Windsor, N.J.; Amy Squitieri, Madison, Wis.; John Staicer, Madison, Ind.; Darwin Stapleton, Boston, Mass.; Lloyd Tepper, Villanova, Pa.; Tyler Turpin, Richmond, Va.; Robert M. Vogel, Washington, D.C.

With Thanks.

workers. All shares have been sold to an Employee Stock Ownership Plan in an attempt to stay open and competitive.

- Stephanie Clifford. **That 'Made in U.S.A.' Premium.** *NYT* (Dec. 1, 2013). Examines the cost of making clothing in America. Some manufacturers have found a niche with luxury labels but others have gone bankrupt trying to compete with factories in countries with lower labor costs. Most consumers are not willing to pay a higher price for U.S.-made goods.
- Susan McCord. **Historic Augusta Mills Might Become GRU Campus Expansion**. *Augusta (Ga.) Chronicle* (Mar. 27, 2013). Georgia Regents University is considering expansion into the historic Sibley and King mills for classroom and housing space.
- Natalie Sherman. **Terra Nova Ventures' $19 Million Clipper Mill Road Project Moves Forward**. *Baltimore Sun* (Dec. 6, 2013). Following a $45 million rehabilitation of Whitehall Cotton Mill No. 1 overlooking the Jones Falls, now being leased for apartments and offices, David Tufaro is moving on to another former mill nearby.

Misc. Industries

- Jack Ewing. **The Royal Family Business.** *NYT* (Dec. 4, 2013). Faber-Castell, the largest wood-encased pencil maker in the world, is run by Count Anton-Wolfgang von Faber-Castell, the 8th generation to run the company begun in 1761. Places company in context of successful mid-size German manufacturers that have contributed to the country's trade surplus. *NYT* website includes a 3-min. video of production at the plant, narrated by the County.
- Tony Hadland and Hans-Erhard Lessing. **Bicycle Design: An Illustrated History**. MIT Pr., 2014. 528 pp., illus. $34.95. Sets out to provide an "authoritative and comprehensive account" of the technological evolution of the bicycle from the earliest velocipedes to modern racing bikes. Amply illustrated.
- Thomas A. Kinney. **High Gloss, Sherwin-Williams and the Birth of Modern Paint**. *Timeline*, Vol. 31, No. 1 (Jan./Mar. 2014), pp. 18-31. The story of entrepreneur Henry Sherwin, who founded a paint company in 1866 and then revolutionized the industry through the development of ready-mixed paints sold in cans.

Water Control & Reclamation

- Sigrid Arnott [SIA], Douglas A. Birk, and David Maki. **Evaluating Minnesota's Historic Dams: A Framework for Management**. Archeo-Physics, Dec. 2013. Avail: *www.osa.admin.state.mn.us/resource.html?id=33715*. This thorough report provides a contextual framework for evaluating the historical significance of the state's dams. Includes an extensive discussion of historic typology and construction technologies, and use of LIDAR and existing dam-safety databases to identify and classify dam sites. Also provided are recommended registration requirements for National Register listing.
- Sheila Bonde and Clarke Maines. **The Technology of Medieval Water Management at the Charterhouse of Bourgfontaine**. *T&C*, Vol. 53, No. 3 (July 2012), pp. 625-670. Archeological investigations of a former Carthusian monastery in France uncovers an exceptionally sophisticated system for water supply and waste removal.
- Ashley Halsey III. **Meet Lady Bird, a Massive Machine Digging Out a Solution to D.C. Wastewater Woes**. *Washington Post* (Feb. 15, 2014). Named after the First Lady whose environmental concern eventually led to the creation of the EPA, a tunnel-boring machine is excavating a 13-mile-long, 23-ft.-diameter tunnel to address combined sewer overflows in the nation's capital.
- Katherine Wentworth Rinne. **The Waters of Rome: Aqueducts, Fountains, and the Birth of the Baroque City**. Yale Univ. Pr., 2011. 262 pp., illus. $65. Development of the city's water system from 1560 to 1630. Rev.: *T&C* (July 2012), pp. 698-700.
- David Soll. **Empire of Water: An Environmental and Political History of the New York City Water Supply**. Cornell Univ. Pr., 2013. The task of providing water to New Yorkers transformed the natural and built environment of the city, its suburbs, and distant rural watersheds. This history of the nation's largest municipal water system focuses on the geographical, environmental, and political repercussions.

Bridges

- Kate Ascher. **Going Up! A Bridge Makes Way for Bigger Ships**. *NYT* (Mar. 21, 2014). Background on the Bayonne Bridge project, which will raise the roadway by 64 ft. When it opened in 1931, the Bayonne Bridge was the longest steel-arch bridge in the world. The roadway, although currently 151 ft. above the Kill Van Kull between Bayonne, N.J. and Staten Island, N.Y., is no longer high enough for the largest container ships calling on the Port of Newark. Includes diagrams explaining how the deck will be raised using mobile cranes.
- Rebecca Burrow, Chris Bell, and Chris Leedham. **2013, Oregon's Historic Bridge Field Guide**. Oregon DOT, 2013 (*www.oregon.gov*). Volume marks the culmination of two years of work identifying and researching the historic highway bridges of Oregon, resulting in a list of 334 bridges that ODOT considers to be historic. Includes brief historic context, glossary of bridge types, preservation methods, and methodology, plus a bridge-by-bridge inventory, organized by county.
- Frank Griggs, Jr. **Union Bridge**. *Structure* (Feb. 2014), pp. 22-24. With four spans of combined arch-trusses attributed to Theodore Burr, the Union Bridge across the Hudson River at Waterford, N.Y., was one of the world's longest when completed in 1804 and carried increasingly heavy loads, including streetcars, ungil its destruction by fire in 1909.
- Terry E. Miller and Ronald G. Knapp. **America's Covered Bridges: Practical Crossings—Nostalgic Icons**. Tuttle Pub., 2014. 272 pp., illus. $39.95. Illustrated with some 550 historical and contemporary photos, paintings, and technical drawings of nearly 400 different covered bridges. Five chapters on the history, design, and fate of America's covered bridges, plus related bridges in Canada. The "Permanent Bridge" in Philadelphia figures prominently, as well as outstanding bridges designed by Timothy Palmer, Theodore Burr, and Lewis Wernwag.
- Jim Talbot. **Philadelphia Falls**. *MSC* (Mar. 2014), pp. 32-34. The Falls Bridge over the Schuylkill River, completed in 1895, was designed as a double-deck bridge but only the lower roadway was ever installed. Dramatic lighting of the bridge, with a blue accent light over each panel point in the Petit truss spans, was completed in 2008.

(continued on page 19)

Historic *S.S. Badger* Gets New Lease on Life

The installation of the first phase of a multi-million-dollar coal ash retention system aboard the *S.S. Badger* was completed before the start of the ferry's 2014 sailing season in Lake Michigan on May 16th. The dumping of ash is an environmental concern that had threatened the continued operation of the historic steam ferry. The 410-ft. *S.S. Badger* entered service in 1953, built primarily to transport freight cars for the Chesapeake & Ohio RR. She is the largest car ferry ever to sail Lake Michigan and the only coal-fired steamship in operation in the U.S. The railroad mothballed the *S.S. Badger* in 1990; however, entrepreneur Charles Conrad committed his own financial resources to resurrect her for the passage between Manitowoc, Wis. and Ludington, Mich. The ferry is now operated by Lake Michigan Carferry, which offers daily passenger service from mid-May through mid-October.

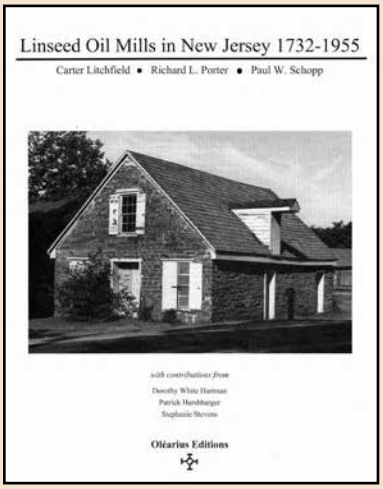
The *S.S. Badger* underwent major changes including the installation of a new combustion control system during the off-season in compliance with a consent decree that will ultimately end the discharge of ash by the start of the 2015 sailing season. The second phase will be completed during the winter of 2014-15. Chuck Leonard, the company's vice president of navigation says, "This technology has never been executed on a coal-fired steamship. The new combustion system will allow the ship to be more efficient—burning less coal and generating less ash." Chief engineer Charles Cart states, "Researching, designing and implementing new combustion controls is an involved process. Removing the old equipment and installing the new in the course of our brief off-season while continuing the cycle of maintenance to the machinery, hull, and appearance of a ship is a major challenge. Accomplishing all of this over an unusually hard winter demonstrates the high level of personal dedication and community involvement typical of our crew and supporting contractors here in Ludington." Info: *www.ssbadger.com*.

Patrick Harshbarger

S.S. Badger, 2013.

Available from SIA: *Linseed Oil Mills in New Jersey 1732–1955*

This gazetteer provides historic background on the linseed oil industry and detailed histories of over 70 mills in the Garden State, which was a center of production during the 19th century. Many of these mills were "combination" mills, manufacturing not just linseed oil but a variety of other products by waterpower, so the book will also be of interest to fans of gristmills, tanbark mills, and the like. Well illustrated. Hardcover, 223 pp. Written by Carter Litchfield, Richard L. Porter, and Paul W. Schopp [all SIA], with contributions from Dorothy White Hartman, Patrick Harshbarger [SIA], and Stephanie Stevens. Published posthumously by Litchfield's Olearius Press, all proceeds have been generously donated by the Litchfield estate to the SIA. SIA 2014 U.S. Member Price: $30 ($25 plus shipping of $5.00). Members outside of U.S. please email *sia@mtu.edu* for additional shipping charges. Limit one book per year. You must be a current member to buy this book. Offer expires Dec. 31, 2014. Info: *www.sia-web.org*, click on publications. *[Correction: a prior listing for this book failed to identify co-author Paul Schopp as an SIA member. Our apologies!]*



Huber Breaker Demolished for Scrap

As reported in a prior *SIAN* (Fall 2013), the feared demolition of the Huber Breaker in Ashley, Pa., just outside of Wilkes-Barre, has become a reality. As of April 2014 the breaker had been demolished and sold for scrap by Paselo Logistics, a recycling company that purchased the breaker in October 2013. This sad event brought to an end a two-decade effort to preserve the breaker, led by the Huber Breaker Preservation Society and numerous individuals who had lobbied on behalf of this iconic structure of Pennsylvania's anthracite coal era. The only other historic breaker in the region is the St. Nicholas in Shenandoah. This sole survivor has been partially demolished, although its main structure remains intact.

John M. Rossi, a preservation architect who was active in preservation efforts at the Huber Breaker and who alerted *SIAN* that demolition had finally occurred, writes passionately: "It is with deep sadness that I convey this story of the enduring human condition and one of place. Being of immigrant descent whose grandfather toiled and died from working in Scranton coal mines, this story is personal and shared by many American families whose families lived, worked, and learned in Northeastern Pennsylvania." The Huber Breaker's towering steel-clad structure coupled with its brick power station and smokestack were considered by many to be a cultural symbol of the dignity and sacrifice of mine workers.

The breaker was used to process coal brought from underground to be washed, broken, and sized prior to shipping to market. Before child-labor laws, the massive multi-story breakers often employed young boys or former miners too old or crippled to work underground. Constructed in the 1930s, the Huber Breaker was one of the largest and last of its kind ever built by the anthracite industry.

Rossi and architect collaborator John Gianacopoulos had prepared a feasibility study for the preservation and re-use of the Huber Breaker. In 2000, this report was contracted by the Earth Conservancy and the National Park Service's Delaware & Lehigh National Heritage Corridor. It described the potential for the breaker to become a museum and park. The $10 million plan outlined how an investment in preservation could eventually pay for itself through contributions to Pennsylvania's growing heritage

(continued on page 17)

SITES & STRUCTURES

The Montague Historical Society has successfully listed the **Millville Historic and Archaeological District Boundary Increase** on the New Jersey and National Registers of Historic Places. The boundary increase encompasses properties that relate to the development of the northwestern New Jersey mill hamlet during its 18th- and 19th-century period of significance. Of particular interest is the upper impoundment dam for the hamlet's gristmill. An SIA Industrial Heritage Preservation Grant supported the preparation of the nomination (*SIAN*, Spring 2006).

Marcy Dam on Marcy Brook in the High Peaks Wilderness of the Adirondack Mountains is slated for removal by the N.Y. Dept. of Environmental Conservation (DEC). The lake formed by the dam was once an iconic stop on the shortest hiking trail to New York State's highest point, Mt. Marcy. The original dam at this location was built by logging companies in the early 20th century, was later replaced as a Civilian Conservation Corps project, and was replaced again in the 1960s. In 2011, floodwaters triggered by Hurricane Irene washed away the dam's sluice gate, leaving a sluggish stream winding through a mudflat. Rather than repairing the sluice, DEC has decided to dismantle the dam in stages, allowing the mudflats to stabilize.—*The Adirondack Almanack (Jan. 13, 2014)*

The N.Y. State Board for Historic Preservation has recommended the addition of three industrial sties in Buffalo to the

(continued on page 17)

Alicia Batko

Upper Impoundment Dam, Millville Historic District, Montague, N.J.

Huber Breaker, interior, 2012.

Patrick Harshbarger

Huber Breaker, 2012.

tourism industry, which in 1997 contributed $1.34 billion to the state's economy and today has surged to contributing an estimated $2.9 billion annually. The Huber Breaker preservation plan was created with extensive citizen involvement and community outreach, and close cooperation with Al Roman, #1 Contracting Corporation, property owner at the time; the Huber Breaker Preservation Society; Pennsylvania Historical and Museum Commission; Luzern County Community College; and state elected officials. The preservation plan can be viewed at *http://www.oldforgecoalmine.com/Huber%20Breaker%20Report%202000.pdf*.

After 14 years of grass-roots advocacy, all hopes for financing the Huber's preservation fell short in U.S. Bankruptcy Court. The new owner sold the Huber Breaker's 900 tons of steel for an estimated scrap value of $85,000.

Ray Clark, Chairman of the Huber Breaker Preservation Society and lifetime Ashley resident, is leading efforts to build a historic marker creatively designed from structural and mechanical elements salvaged from the Huber Breaker. The marker will incorporate the names of former workers and an engraved image of the Huber Breaker in granite and red-brick pavers. Clark's plan envisions an interpretive educational center with a theater to show historic films of the Huber Breaker and a mining history exhibit. Clark, together with Rossi, is also working with Jessica Lynne Swida, a graduate student at Rhode Island School of Design (RISD), on interpreting the Huber Breaker's history. Swida grew up within miles of the Huber Breaker and is completing her thesis with special emphasis on adaptive reuse and historic preservation. Her understanding of the Huber's history and significance to the region draws attention to the importance of documenting and saving historical sites and landmark architecture. Rossi stated, "Mentoring young professionals and engaging community residents of all ages in preservation planning topics and activism around building restoration empowers progressive-minded citizens to be more fully aware and engaged as contextual integrators of what is and already exists."

Bode Morin

Huber Breaker, demolition nearly complete, Apr. 2014.

Site & Structures *(continued from page 16)*

State and National Registers of Historic Places. The **Sibley & Holmwood Candy Factory** was constructed in 1896. S&H employed 300 operatives and was generally considered one of the best confectionary producers in the nation. The **Witkop & Holmes Headquarters** was constructed in 1901 for a chain of grocery stores. It is noteworthy as an example of the work of architects Bethune, Bethune & Fuchs. Louise Bethune was the first woman in the U.S. to be officially recognized as a professional architect. **Taylor Signal Co./General Railway Signal Co.**, built in 1902, is an early example of a concrete-framed factory designed for the mass production of electric railway signals. The complete text of the nominations is available as pdf. Google the company names and look for the nysparks.com URL. ■

The Belger Arts Center (Kansas City, Mo.) joined with architectural historian Cydney Millstein [SIA] and photographer Richard Welnowski for a special industrial history exhibit that was on display from Feb. to May 2014. ***Velocity of Change: The Evolution of Albert Kahn's Pratt & Whitney Plant in Kansas City*** documents a 3,000,000-sq.-ft. manufacturing plant originally built in 1943 in less than nine months. The aircraft-engine plant was made possible by Kahn's "Warspeed" concept using concrete arches. The Pratt & Whitney complex was specifically planned to assist in U.S. wartime efforts by designing, manufacturing, and testing air-cooled Double Wasp engines. At the height of its activity, the plant employed 21,000 workers. As part of the exhibit, Welnowski's contemporary photos were paired with historical images. The contemporary, large-format photos, along with the history of the plant, were prepared for the Historic American Engineering Record (HAER). Millstein's firm, Architectural & Historical Research, LLC, was hired in 2009 to research and document the site per federal stipulations. The plant most likely will be demolished. Local reviews of the exhibit can be found at *www.pitch.com* (search on 'Belger', and click on the Apr. 8, 2014 article) and at *www.kansascity.com* (search on 'Airplanes and Architects' and click on the Apr. 19, 2014 article).

Albert Kahn Associates, Inc.

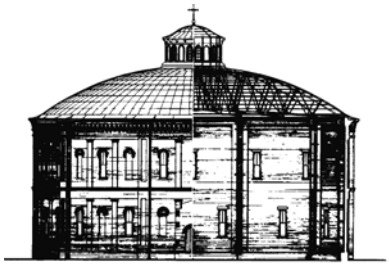
Pratt & Whitney Plant under construction in 1943.

Richard Welnowski

Test Cells (July 2011).

Palaces for the People: Guastavino and the Art of Structural Tile will be on display at the Museum of the City of New York through Sept. 7, 2014. The exhibit explores the lives of Spanish immigrants Rafael Guastavino, Sr. (1842-1908) and his son, Rafael, Jr. (1872-1950), who developed a system of structural tile vaults. The Guastavino Fireproof Construction Co. (1889-1962) installed hundreds of the vaults known for their low maintenance and capacity to support significant loads. The exhibit was originally in the National Building Museum (Washington, D.C.) and is updated to feature some 20 Gaustavino vaults in the New York City area. Info: *www.mcny.org*.

The **Maritime & Seafood Industry Museum** in Biloxi, Miss., will hold a grand re-opening on July 18-20. The museum, established in 1986, has been closed for almost nine years since being destroyed by Hurricane Katrina. In addition to two operating 65-ft., two-masted Biloxi schooners, the museum's exhibits will feature shrimping, oystering, recreational fishing, marine blacksmithing, netmaking, a shrimp-peeling machine, and numerous historic photographs and objects. Info: *www.maritimemuseum.org*. ■



Publications of Interest (continued from page 14)

Buildings & Structures

- Glenn R. Bell. **Frank Heger**. *Structure* (Feb. 2014), pp. 36-37. One of the three founding partners of today's firm Simpson, Gumpertz & Heger, Inc. (SGH), structural engineer Frank Heger designed a number of unusual and innovative structures such as the Disney/Monsanto House of the Future and the geodesic dome for the U.S. pavilion at Expo '67 in Montreal.
- Catherine A. Cardno. **Safe Passage**. *CE* (Feb. 2014), pp. 60-65. Supplementing two parallel tunnels opened in 1937, and a third bore opened in 1964, the recently completed fourth bore of California's Caldecott Tunnel is 3,399-ft. long, excavated using the New Austrian Tunneling Method. Before the fourth bore opened in Nov. 2013, Caltrans had to switch the direction of reversible lanes as many as six times per day on weekends to handle traffic flows. Also see *www.caldecott-tunnel.org*.
- **APT Bulletin**, Vol. 44, No. 4 (2013) is a theme issue based on presentations from the 2011 Symposium on the Restoration of Historic Cast and Wrought Iron. Includes: Carol Gayle and John G. Waite, *Margot Gayle: Passionate Crusader for Cast-Iron Architecture*, pp. 5-6 (this profile of Margot Gayle acknowledges her receipt of SIA's General Tools Award in 1997); Richard Pieper, *A Checklist for the Restoration of Architectural Cast Iron in the U.S.*, pp. 7-11 (Reviews nine "technical questions that have been posed but not definitively answered in the last 40 years of restoration of architectural cast iron," some of which stem from the unique characteristics of this manufactured product.); J. Scott Howell, *The Patternmaker's Art: Innovation within a Traditional Craft*, pp. 13-16 (While covering the traditional basics of molding and casting, Howell also discusses more recent innovations such as laser scanning and the "three-dimensional router," i.e., CNC milling.); Conrad Paulson, *Modern Strength Assessment of Historical Structural Metals*, pp. 18-29 (Although this article focuses on sampling and testing protocols for current structural engineering practice, it also provides a capsule history of materials testing in the U.S.); Edmund P. Meade, *Structural Aspects of Documenting Cast-Iron Buildings*, pp. 31-37 (Using two case studies from New York City, illustrates the range of applications for architectural cast iron, from integral part of the lateral load-resisting system to cladding on an otherwise self-supporting building,); Robert C. Bates, *Restoration of an Artist's Cast-Iron Loft Building in SoHo in New York City*, pp. 39-43 (Erected in 1870, the cast-iron building at 101 Spring St. housed various clothing manufacturers until 1968, when it became the home and studio of artist Donald Judd. Following a comprehensive restoration of the building's facade, the Judd Foundation opened it as a museum in 2013.); and Doug McLean, *Repair versus Replacement: A Craftsman's Perspective on Ironwork*, pp. 45-53 (Galveston's Strand District (NHL) contains a number of cast iron-clad buildings built from the 1850s to the 1890s, which are endangered by the lasting effects of hurricane flooding, neglect, and inappropriate repairs. McLean discusses two examples where artful compromises promoted the economic feasibility of restoration.).

Agriculture & Food Processing

- **Brewery History**, No. 155 (Winter 2013). This issues of the journal of the Brewery History Society (U.K.) is titled *Approaches to the History of American Brewery Architecture* and is guest edited by Susan Appel [SIA]. This is the first issue of the journal to be devoted to American breweries. Articles included: Greg Brick, *Stahlmann's Cellars: A Large American Lagering Cave from the Nineteenth Century*; Craig Williams, *An Examination of the Lemp Brewery Cave* [St. Louis]; Susan Appel, *Edmund Jungenfeld of St. Louis and His Impact on 19th-Century American Brewery Architecture*; Rich Wagner [SIA], *Ott C. Wolf: Brewery Architect and Engineer, Philadelphia, PA*; Doug Hoverson, *Brewery Returns to 'Good Old Potosi': A Restoration Success Story*. The volume's introduction by Susan Appel has been posted for free access: *http://www.breweryhistory.com/journal/archive/155/index.html*.
- Christopher Leonard. **The Meat Racket: The Secret Takeover of America's Food Business**. Simon & Schuster, 2014. 370 pp. $28. Insider's report on Big Meat, from the tragedies of small producers who lose their farms to the omnipotence of Tyson Foods. Rev.: *NYT Book Review* (Mar. 2, 2014).
- Maureen Ogle. **In Meat We Trust: An Unexpected History of Carnivore America**. Houghton Mifflin Harcourt. 368 pp. $28. A cultural history of meat consumption from the Revolution to the present, treating industrial production as a response to consumer demand. Examines motivations of the leading industrialists and impact of industrialization on local slaughterhouses. Rev.: *NYT Book Review* (Mar. 2, 2014).
- Brian Trompeter. **Restoration Project to Bring Colvin Run Mill to Its Former Glory**. *Sun Gazette Newspapers (Northern Va.)* (Feb. 27, 2014) (*www.insidenova.com*, search on Colvin Run Mill). Work is underway on a project to place a second grindstone in operation at the c.1811 brick mill in Great Falls. Scheduled to be completed in Nov., the project includes renovating and strengthening two floors of the mill, replacing a warped countershaft in the pit, and creating a new rolling screen in the attic.

Railroads

- John Gruber, ed. **Railroaders: Jack Delano's Homefront Photography**. The Center for Railroad Photography (*www.railphoto-art.org/railroaders-catalog/*), 2014. 200 pp., illus. $60. Features 108 photos, including 73 of Jack Delano's 1942–1943 views of Midwestern railroads and their workers, reproduced in full color with rich quadtones for the black-and-whites. Contemporary photographs by Jack's son, Pablo Delano, and the Center's John Gruber and Scott Lothes complement the catalog. There are essays by Pablo Delano, Gruber, and University of Texas professor Jeremi Suri. Biographical essays tell the life stories of 49 railroaders featured in the photos. There is a show on the same subject at the Chicago History Museum through Aug. 10, 2015 (*www.chicagohistory.org/pla-navisit/exhibitions/railroaders*).
- Gregory L. Schneider. **Rock Island Requiem: The Collapse of a Mighty Fine Line**. Univ. Pr. of Kansas, 2013. 380 pp. $37.50. Details the backstabbing, greed, meddling, and incompetence that led to the downfall of the Rock Island after more than 100 years in business. Rev.: *WSJ* (Jan. 13, 2014), p. A13.
- Michael Tomberlin. **I Believe in Birmingham Prepares to Fight Alagasco's Demolition of Historic Train Depot**.

(continued on page 23)

IA ON THE WEB

Brooklyn Industry Photos (*www.brooklynhistory.org*, select Library & Collections, then Search, then Online Image Gallery). The Brooklyn Historical Society has an ever-growing digital image collection with loads of IA-related content. A recent "photo of the week" featured construction of the Brooklyn sewer system.

Cross Ties Production (*www.youtube.com*, search on 'Stamp of Character'). This 23-min. video, produced by the Missouri Dept. of Conservation, features marvelous archival footage of the last railroad tie drive made on the Black River by the T.J. Moss Tie Co. of St. Louis in the 1920s. Includes scenes of hewing ties by hand, sawmill operations, and creosoting.

Engineering Map of America (*www.pbs.org/wgbh/AmericanExperience/features/interactive-map/penn-engineering/*). PBS's American Experience series is developing an online interactive map listing hundreds of historic American engineering sites linked to archival images, documents, and videos. SIA members and institutions are invited to consider becoming partners to this effort. The initial set-up requires participants to contact Katie Duffy (*Katherine_Duffy@wgbh.org*) and providing your e-mail account name, a password, a logo (72 dpi, under 1MB and 300x300 pixels), your organization's name, and a website URL. As soon as PBS accepts this information and creates a profile, the participant will be provided with a "pinning guide" explaining the process of adding material to the map. Users do not have to be contributing partners to view the map.

IA in University of Vermont's Historic Preservation Program (*www.uvm.edu/~hp206/2013/*). The rich and diverse industrial heritage of Burlington and Winooski, Vt. is now available online. In Fall 2013 Professor Thomas Visser's graduate students in historic preservation created a website of local industrial sites. The page *Mills and Factories* incorporates postcard images and measured drawings, archival and current photos, city and Sanborn maps, as well as historical narratives with footnotes, for ten manufacturing and industrial neighborhoods. Interesting chapters include "Flynn Avenue Factories: From Film to Chocolate", "From Cereal to Can Openers: Historic Industries Along Pine Street" and "Carriages, Sugar and Old-Fashioned Crackers". In the mid-19th century Burlington became a major international inland port and industrial center. The students have developed an excellent web-based model of how to relate industrial history to neighborhood history.

Iron in Central Pennsylvania (*www.centrehistory.org/exhibits/building-on-the-past/*). The Centre County Historical Society (State College, Pa.) has created a webpage on the Valentine Iron Ore Washing Plant, which operated from 1887 to 1898. It includes links to a full 2-volume report (as a pdf download), as well as links to eight Public Education Poster Boards from an archaeological investigation by Heberling Associates, Inc. prior to construction of a new industrial park on the site. The website and report include information on iron-ore processing and the iron history of Central Pennsylvania, as well as several generations of the Valentine and Thomas families. These families were Quaker ironmasters and influential businessmen, promoting railroads, canals, and the founding of Penn State University. In 1842, Abraham S. Valentine invented an iron-ore washing machine known as the log washer, which was used throughout the U.S. and Europe. It revolutionized the process by separating from clay small pieces of iron ore previously discarded as waste.

National Park Service History (*www.NPSHistory.com*). This new electronic library is a portal to thousands of publications covering the history of the parks, monuments, and historic sites of the National Park System.

The Story of Stone (*www.youtube.com*, search on 'Paci Story of Stone'). This 6-min. video introduces Adrian Paci's film, "The Column." The film follows a piece of marble carved from a quarry in China, brought onto a boat, and then carved into a Classical column during its voyage to Europe. The film was shown at the Montreal Museum of Contemporary Art (*www.macm.org/en/expositions/Adrian-pace-2/*).

"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. ■

New Look SIA Website Up and Running

Earlier this year, SIA quietly unveiled its redesigned website (*www.sia-web.org*), for a cleaner, easier-to-use look. The homepage now prominently features recent and upcoming events, activities, and publications. There are links to our social media pages, as well as information on how to join, make a donation, and access our publications. There is also a news page for SIA activities, including those of our local chapters. So, if you haven't checked it out recently, take some time to visit our website and add it to your browser's "favorites."

Bronx Ferry Bridges (continued from page 5)

Historic Districts Council

134th St. Ferry Bridge, view looking east into the East River.

quarantine site, had operated on North Brother Island since 1886. Notoriously, "Typhoid Mary" Mallon was confined there. New York City's Department of Hospitals closed the facility after decades of financial strain in 1944. A proposal to use the old hospital facility to house returning veterans was pitched by the New York County American Legion after the end of WWII. Thousands of returning veterans were enrolling in New York colleges and universities under the G.I. Bill, causing a crisis in affordable housing.

Riverside Emergency Housing opened on North Brother Island in 1948, accommodating 1,500 veterans and their families. With so many new residents to be transported back and forth, the city upgraded the existing ferry facilities at E. 134th St. Although the *New York Times* reported that new ferry slips were constructed at the time, it seems more likely that improvements consisted primarily of the two new ferry bridges to facilitate loading of automobiles. A ferry bridge still stands on North Brother Island mirroring those at 134th St. but is not included in the National Register listing.

Municipal ferry service continued from the 134th St. terminal into the 1960s. As housing pressures diminished, the student-veteran housing program was discontinued in 1952. The ferry was still utilized to access the former hospital, which was used as a treatment center for juvenile drug addicts until 1963. North Brother Island has remained abandoned since. Ferry services to Rikers Island continued until at least 1966, when a bridge to the island opened. Ferries to both islands may have continued from 134th St. until as late as 1969. In 2001, New York City placed North Brother Island under the jurisdiction of its Parks & Recreation department and the island is now protected as a bird sanctuary.

The city has retained ownership of the property since the discontinuation of ferry service at the East 134th St. terminal. It was used as a marina by the New York City Police Department in the 1970s, when the turn-of-the-century ferry building was demolished, but it has not been used in recent memory. The rusty ferry bridges await re-use as plans for a waterfront park are developed.

Mary Habstritt

CHAPTER NEWS

Oliver Evans (Greater Philadelphia) enjoyed a behind-the-scenes tour of the Historic Textile and Fashion Collection at the Design Center of Philadelphia University on Feb. 20. The center possesses over 200,000 items, including many fabric swatches produced by Philadelphia manufacturers from the 1880s to the 1910s. Curator Sarah Moore led the tour.

Roebling (Greater N.Y.-N.J.) held its annual meeting at the Rogers Building in Paterson, N.J. on Jan. 18. After electing officers, chapter members participated in a show-and-tell. On Mar. 29, chapter members hiked the remains of Oreland, N.J., an early 20th-c. mining boomtown on a branch of the Wharton & Northern RR. Two weeks later, on Apr. 12, the chapter had a walking tour of the Farny Highlands in Rockaway Twp., N.J., also an area once served by the W&N and known for its bloomery forges and charcoal pits. Both tours were led by Joe Macasek and Bierce Riley.

Southern New England toured Joseph Abboud Mfg. Co. in New Bedford, Mass., on Apr. 11. The company is a maker of high-quality men's suits, located in the historic 1910 Nashawena Mills weave shed. The tour also included a visit to the nearby Nashawena office building and attached power plant. On May 3, the chapter hosted a joint tour with the **Northern New England Chapter** and the Middlesex Canal Association at the Middlesex Canal Museum in North Billerica, Mass. The tour included a bus ride with stops at various points along the historical canal route that once provided an important transportation corridor between Boston and New Hampshire during the first half of the 19th century.

***Support Your Local Chapter**. For info on a chapter near you or to start one, contact Ingrid Wuebber, SIA Director, Local Chapter Chair* (Ingrid_Wuebber@urs.corp.com) *or check out the local chapters section of the SIA website* (www.sia-web.org). ■

TowerPower is a research initiative of the Massachusetts Institute of Technology, School of Architecture and Planning, Special Interest Group in Urban Settlement (SIGUS). The group proposes turning abandoned industrial chimneys and smokestacks into "solar chimneys" by installing standard wind turbines at the base of the stacks where the draft can be used to generate power. A glass apron at the base of the chimney and a translucent trombe wall surrounding the chimney capture solar energy, thereby heating the air and increasing airflow through the main chimney. According to the SIGUS website, "these largely abandoned chimneys [of New England's past industrial era] are relatively difficult and expensive to remove, and their reuse is a win-win opportunity for energy generation. The chimney network from former factories could provide the backbone for a low-cost, quick entry power generation for the cities that developed around the previous industrial corridor." A poster illustrating a proposed chimney turbine installation is available from the website, *www.sigus.scripts.mit.edu*.

General Tools Acquired. High Road Capital Partners acquired General Tools & Instruments, LLC in a deal that was completed earlier this year. General Tools is a leading designer and developer of precision specialty hand tools and handheld test instruments (*www.generaltools.com*). The SIA's General Tools Award for Distinguished Service to Industrial Archaeology was established in 1992 through the generosity of Gerald Weinstein [SIA], chairman of the board of General Tools, and the Abraham and Lillian Rosenberg Foundation. The Rosenbergs founded General Hardware, the predecessor to General Tools, in 1922.

Z. Taylor Vinson Collection of Transportation Ephemera. Hagley Museum & Library (Wilmington, Del.) has recently opened this collection of 1,300 linear ft. of materials to researchers. The collection focuses primarily on automobile history, but also documents other forms of transportation. It includes trade catalogs, books, magazines, and artifacts in addition to materials relating to Vinson's career at the National Highway Traffic Safety Administration. A finding aid is available through the library's on-line catalogue. A small portion of the collection—mostly related to automobile advertising—is available through Hagley's digital collection. Info: *http://findingaids.hagley.org*. ■

Can you identify this metal object? The current owner is stumped and would appreciate any leads. The highlighter and tape measure are for scale. Info: Scott Klipper, 13027 Bolin Point Pl. NE, Paulsboro, WA 98370; (360) 779-5441; srklipper@gmail.com.

PUBLICATIONS OF INTEREST *(continued from page 19)*

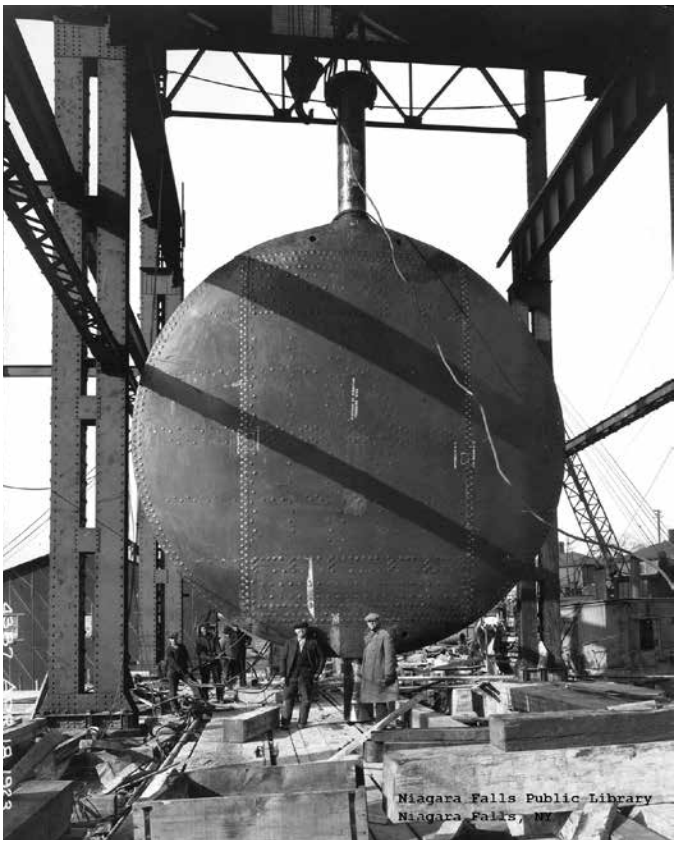
Birmingham (Ala.) News (Jan. 27, 2014) and **Time's Up? Alagasco Says New Alternative Plan to Save Birmingham Historic Train Depot Is Too Late** (Mar. 27, 2014). Also, John Reed, **I Believe in Birmingham Holds Protest Against Planned Demolition of Old Downtown Train Depot**. *Birmingham News* (Apr. 10, 2014). Efforts to preserve the former Birmingham Southern RR Freight Depot (1928) and the Tennessee Coal, Iron & RR Co. warehouse (*c.* 1902).

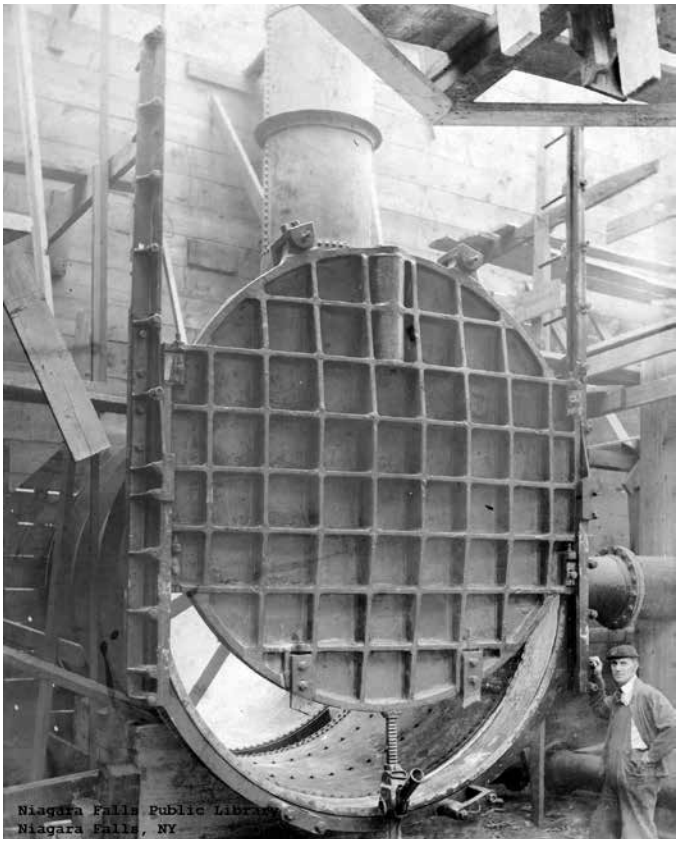
◆ Tom Zoellner. **TRAIN: Riding the Rails that Created the Modern World—from the Trans-Siberian to the Southwest Chief**. Viking, 2014. Light and entertaining history of the world's railways organized around a round-the-world rail journey by the author.

ABBREVIATIONS:

B&L	= *Buildings & Landscapes: Journal of the Vernacular Architecture Forum*
APT	= Association for Preservation Technology International
CE	= *Civil Engineering*
IA News	= *Industrial Archaeology News*, published by the Assn. for Industrial Archaeology (U.K.)
MSC	= *Modern Steel Construction*, published by the American Institute of Steel Construction
NYT	= *New York Times*
T&C	= *Technology & Culture*, published by the Society for the History of Technology (SHOT)
Timeline	= published by the Ohio Historical Society, $40/yr. Info: (614) 297-2315
WSJ	= *Wall Street Journal*

Publications of Interest *is compiled from books and articles brought to our attention by you, the reader. SIA members are encouraged to send citations of new and recent books and articles, especially those in their own areas of interest and those obscure titles that may not be known to other SIA members. Publications of Interest, c/o* **SIA Newsletter,** *305 Rodman Road, Wilmington, DE 19809;* phsianews@aol.com.





The Niagara Falls (N.Y.) Public Library is seeking assistance dating and identifying the technological features and perhaps some of the individuals depicted by this set of four photos, part of a much larger collection held by the library. The massive riveted control valve (disc) is thought to be a headgate for the penstock on the Upper Niagara River above the Schoellkopf Generating Station. Info: William H. Seiner, whseiner@gmail.com, (716) 876-7340.

SOCIETY FOR INDUSTRIAL ARCHEOLOGY

Department of Social Sciences
Michigan Technological University
1400 Townsend Drive
Houghton MI 49931-1295

Non-Profit Organization
U.S. POSTAGE
PAID
Permit No. 11
Houghton, MI 49931

CALENDAR

2014

***Sept. 3-6:* 12th International Conference on Urban History, Lisbon, Portugal**. Theme: Before the Assembly Lines: Materiality, Home and the Urban Consumer in 19th-Century Europe and Beyond. Info: *www.eauh2014.fcsh.unl.pt*.

***Sept. 5-10:* Assn. for Industrial Archaeology Annual Conference, Chester, U.K.** Two days of paper sessions followed by visits to IA sites. Info: *http://industrial-archaeology.org/aconf.htm*.

***Sept. 17-21:* National Maritime Historical Society, 10th Maritime Heritage Conference, Norfolk, Va.** Info: *www.seahistory.org*, search "Latest News/Blog.".

***Sept. 26-28:* Ninth Biennial Preserving the Historic Road Conference, Savannah, Ga.** Info: *http://historicroads.org*.

***Oct. 5-8:* SIA FALL TOUR, SOUTHEASTERN INDIANA.** See article in this issue. Info: *www.sia-web.org*. [Note the Sun.-Wed. schedule to take advantage of process tours, many in Columbus, including Cummins Diesel.]

***Oct. 23-24:* National Workshop on Large Landscape Conservation, Washington, D.C.** Info: *www.largelandscapenetwork.org/2014-national-workshop/*.

***Oct. 23-26:* Society for the Preservation of Old Mills Annual Conference, Rochester, Mich.** Info: *www.spoom.org*.

***Oct. 26-30:* Assn. for Preservation Technology International Annual Conference, Quebec City, Que.** Info: *www.apti.org*.

***Oct. 30-31:* Green Capitalism? Exploring the Crossroads of Environmental and Business History, Wilmington, Del.** Hagley Museum & Library. Info: *clockman@hagley.org*.

***Nov. 6-9:* Society for the History of Technology Annual Meeting, Dearborn, Mich.** Info: *www.historyoftechnology.org*.

***Nov. 12-14:* Construction History Society of America, Biennial Meeting, Minneapolis. Minn.** Info: *www.constructionhistorysociety.org*.

***Nov. 10-14:* National Trust for Historic Preservation Annual Conference, Savannah, Ga.** Info: *www.preservationnation.org*.

2015

***Jan. 6-11:* Society for Historical Archaeology Annual Meeting, Seattle, Wash.** Info: *www.sha.org*.

***Apr. 15-18:* National Council on Public History Conference, Nashville, Tenn.** Info: *www.ncph.org*.

***Apr. 15-19:* Society of Architectural Historians Annual Conference, Chicago, Ill.** Info: *www.sah.org*.

***June 3-7:* 5th International Congress on Construction History, Chicago, Ill.** Info: *http://5icch.org*.

***June 4-7:* SIA ANNUAL CONFERENCE, SCHENECTADY, N.Y.** Watch the SIA website for updates: *www.sia-web.org*.

***Sept. 6-11:* 16th International TICCIH Congress, Lille, France.** Info: *www.ticcih.org*. ■