

SOCIETY FOR INDUSTRIAL ARCHEOLOGY

NEWSLETTER

Volume 29

Fall 2000

Numbers 3-4

THE HUDSON & MANHATTAN RR POWERHOUSE

“It is like some ancient, partly ruined cathedral—a masterpiece of brickwork.”

These words, written by Christopher Gray, the architectural history columnist of the *New York Times*, certainly do not describe any of the new condominium complexes, glass-paneled office towers, or expensive hotels that have risen unevenly on the Jersey City, NJ, waterfront, an area that was, until twenty years ago, a vast kingdom of railyards, train terminals, ferry depots, and wharves. Gray spoke instead of something far grander, of another building that was miraculously overlooked, ignored, untouched by the indifferent bulldozers that erased all vestiges of Jersey City’s industrial past. Somehow the Hudson & Manhattan RR Powerhouse, one of the last great industrial monuments of the New York metropolitan region, was spared.

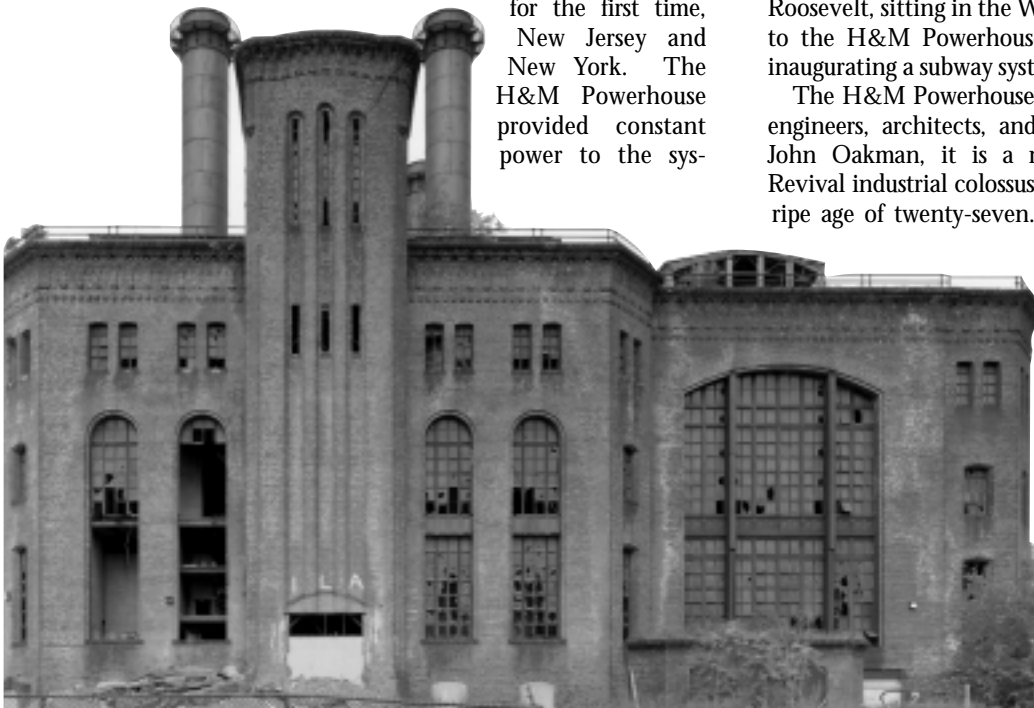
The coal-powered, steam-generating H&M Powerhouse energized the railroad’s Hudson Tunnels, a subway line that in 1908 physically connected, for the first time, New Jersey and New York. The H&M Powerhouse provided constant power to the sys-

tem’s lines, cars, stations, and terminals on both sides of the Hudson River, including the wondrous Hudson Terminal in NY City, then the world’s largest office and train-terminal complex.

The Hudson Tunnels, now part of the Port Authority Trans-Hudson Corporation (PATH) rapid transit system, were actually begun in 1874 when adventurous railroad engineer DeWitt Clinton Haskins, borrowing technology from England’s famed River Thames tunnel, gathered a group of sandhogs and began tunneling toward New York from a shaft at the foot of 15th St. in Jersey City. Over thirty years later, after numerous construction and financial disasters, a young lawyer named William G. McAdoo completed the tunnels and unveiled a state-of-the-art subway that promised to bring both convenience to commuters and economic prosperity to metropolitan area merchants and real estate entrepreneurs. On February 25, 1908, President Theodore Roosevelt, sitting in the White House, sent a ceremonial telegram to the H&M Powerhouse instructing engineers to activate it, inaugurating a subway system that continues in service to this day.

The H&M Powerhouse was the product of a team of visionary engineers, architects, and businessmen. Designed by architect John Oakman, it is a monumental yet elegant Romanesque Revival industrial colossus. Oakman was a master architect at the ripe age of twenty-seven. Newly graduated from the legendary

(continued on page 2)



John Bartelstone photo.

The Hudson & Manhattan RR Powerhouse.

New Volume Numbering

The SIAN is changing its volume numbering to better reflect its production schedule. In past years, the Winter issue has been No. 4, but beginning in 2001 it will become No. 1 of the new volume year. To reflect this transition in volume numbering, the Fall 2000 issue is a double issue Nos. 3-4.

Leon Yost photo



H&M Powerhouse interior steel framework.

École des Beaux Arts in Paris, Oakman was hired immediately by Carrere & Hastings, the renowned NY City architectural firm that recently had designed, among other civic masterpieces, the NY Public Library. However, Oakman's tenure at the firm as a draftsman was brief; he soon departed to start an architectural partnership with a friend, W. Powell Robins. Walter G. Oakman, an elder relative, happened to be president of the H&M RR, which was busy building the Hudson River tunnels. Robins & Oakman was therefore handed the lucrative commission of designing the H&M's stations and industrial buildings, including its powerhouse, which had to be mighty enough to electrify an enormous subway system. Oakman made it more than mighty—he made it as beautiful as any of the handful of neo-classical train terminals dotting the Hudson River Valley.

The H&M Powerhouse was considered one of the country's most technologically advanced powerhouses when construction began in 1906, with gigantic boilers, turbogenerators, and switchboards that collectively created an alternating current of 11,000 volts. Its engineers, who included L. B. Stillwell, were some of the country's finest. A former wunderkind employee of Westinghouse, Stilwell was the genius behind the first Niagara Falls powerplant. His apprentices included John Van Vleck, who designed the steel frame of the H&M Powerhouse; and Hugh Hazleton of Englewood, NJ, who designed the \$3.5 million electrical machinery. The boilers were made by the Bayonne plant of Babcock & Wilcox.

In 1963, the H&M RR went bankrupt. The port authority inherited the subway system and wasted no time demolishing the recently renovated Hudson Terminals to make way for the World Trade Center complex. Many of the H&M's stations underwent modernization as well. A few years after the port authority's takeover, almost nothing of the H&M remained except, of course, the powerhouse, which ultimately was used as a protective shell for a cinderblock-encased sub-station. Throughout the years the H&M Powerhouse's balustraded roof has deteriorated; its windows have been shattered by rock-throwing neighborhood kids; its hulking mechanical and electrical innards, including all boilers, turbines, and dynamos, have been sold for scrap. Vandals have torn out its brass and copper fixtures. Porcelain and marble tiles have been stolen.

Despite this serious neglect, the H&M Powerhouse retains its architectural grace. Local artists, architects, and historians are calling for its restoration. The port authority and the City of Jersey City, while at first announcing plans for a \$20 million demolition, have agreed to explore development potential.



H&M Powerhouse interior view with cranes overhead.

However, a stringent time limit, dictated by an amazingly healthy waterfront real estate market, has also been announced. If no deep-pocketed developer is found soon, the owners will proceed with demolition plans.

The Jersey City Landmarks Conservancy is leading a major preservation campaign to save the H&M Powerhouse. It encourages all concerned individuals and organizations to leave favorable feedback with the port authority and the city. Addresses, phone numbers, and e-mails for these institutions can be found on the conservancy's Web site: www.jerseycityhistory.net.

JG

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 annually. SIA promotes the identification, interpretation, preservation, and re-use of historic industrial and engineering sites, structures, and equipment. Annual membership: individual \$35; couple \$40; full-time student \$20; institutional \$40; contributing \$60; sustaining \$125; corporate \$250. 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; Web site: www.ss.mtu.edu/IA/SIA.html.

Mailing date for Vol. 29,3-4 (Fall 2000), November 2000. 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 Road, Wilmington, DE 19809; (302) 764-7464; e-mail: phsianews@aol.com.

Gerry Weinstein photo

30th Annual SIA Conference

Washington, D. C.

May 10-13, 2001

Join the Montgomery C. Meigs Original Chapter and the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER), National Park Service, for a weekend in Washington celebrating the 30th anniversary of the founding of the SIA

30th Anniversary Pigs! In celebration of the SIA's 30th year, Sloss Furnaces will cast 300 one-pound pigs as a memento of the occasion.

Call for SIA memorabilia, relics, and souvenirs! Special activities and exhibits will mark the 30th anniversary. If you have materials from early SIA conferences and events—photographs, posters, tour books, handouts, site souvenirs, artifacts, etc.—and would be willing either to loan these items or have them scanned, please contact Dean Herrin, 301-624-2773; e-mail: dherrin@fcc.cc.md.us. We are particularly interested in conference posters and photographs of SIA members on tours. Does anyone have film or video footage of early SIA activities? For larger artifacts from tours and other items (including items you might not want to loan but would like to show), we are planning a show-and-tell at the annual banquet. The National Museum of American History, which houses the SIA archives, will also mount a small display during the conference.

Tours. Proposed tours will feature examples of Meigs's engineering legacy, including the Washington Aqueduct, the Pension Building, and the U.S. Capitol. We will also investigate several historic buildings in the monumental core of the city, beautiful bridges

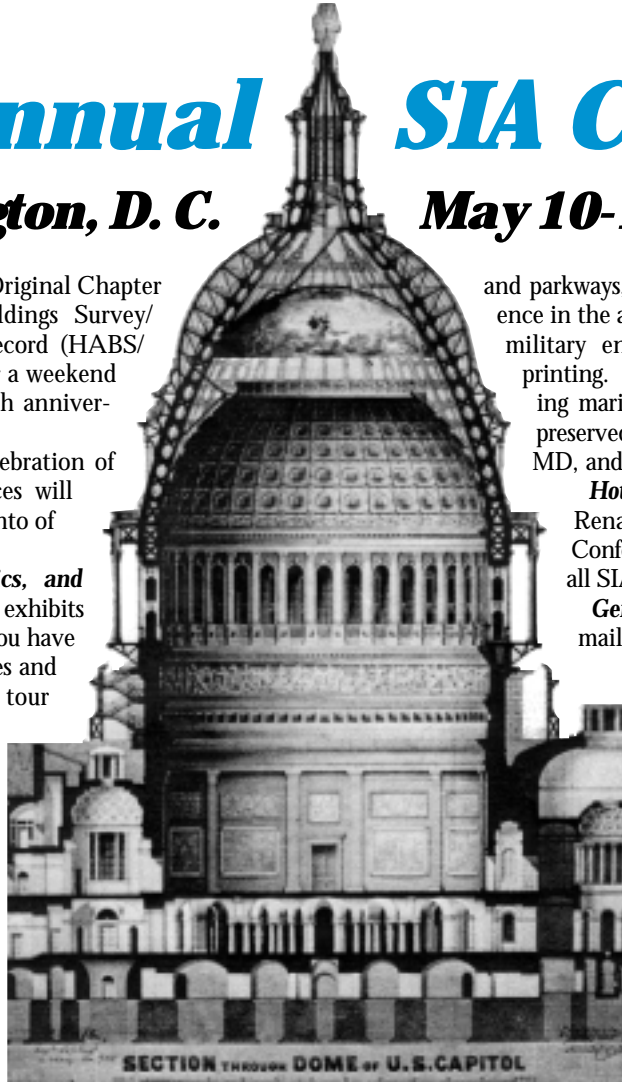
and parkways, and some curious relics of federal influence in the areas of scientific research, transportation, military engineering, espionage, agriculture, and printing. There will also be regional tours examining maritime heritage, railroads, and canals, and preserved remains of early industry in Frederick, MD, and Harpers Ferry and Martinsburg, WV.

Hotel. The conference hotel will be the Renaissance Hotel, 999 9th St., NW. Conference registration materials will be sent to all SIA members in early spring.

General info: Dean Herrin (301) 624-2773; e-mail: dherrin@fcc.cc.md.us; or, Christopher Marston (202) 343-1018; e-mail: christopher_marston@nps.gov.

SHOW & TELL. One of the traditional activities at annual conferences is Show & Tell. This is a free form session, usually scheduled at the end of the first day of tours, in which members can discuss any IA topic that interests them. Subjects have ranged from archeological works-in-progress to reports on ongoing preservation efforts. Members have discussed their careers in mills and factories, displayed historic catalogs, told about useful research sources, and given talks about restoring

waterwheels, mills and other large artifacts. Show & Tell is an activity where nonprofessional archeologists and newcomers are encouraged to report their work to an enthusiastic and congenial group. There is a very strict ten minute limit on presentations. If you have an idea, project, artifact, favorite IA cause, restoration project or shop story that you would like to present, plan on signing up for the Show & Tell Session at the Washington meeting. You can sign up when you register. ■



CALL FOR PAPERS

The SIA invites proposals for papers to be presented at the Annual Conference on Saturday, May 12. Presentations on all topics related to industrial archeology are welcome. The program committee especially encourages papers related to some of the general themes of industry in the Washington area: canal and railroad transportation, urban water supply, construction technology, printing and engraving, and defense and aerospace industries, among others.

Presentation Formats: Proposals may be for individual papers (20 min.), organized panel discussions (90 min., typically three papers, formal commentator optional), reports on works in progress (10 min.), or symposia of related papers.

Proposal Formats: Each paper proposal must include: 1) title; 2) an abstract of not more than 250 words; 3) a one-page résumé for the presenter(s), including postal address, telephone/fax, and e-mail; 4) a list of audio-visual requirements. A panel or symposium organizer should submit all paper proposals as a group, accompanied by a title and a brief description of the

theme or purpose. All proposers must submit four (4) copies of their proposals.

Deadline: December 31, 2000. Send paper copies of proposals to: Richard O'Connor, SIA Program Committee, HABS/HAER, 1849 C St., NW, Room NC300, Washington, DC 20240. Inquiries are welcome at the above address, by phone (202) 343-3901, or e-mail: richard_oconnor@nps.gov.

Student Travel Scholarships: The SIA has limited funds to help full-time students and professionals with less than three years of full-time experience to attend the conference. Those interested should submit a concise letter outlining their demonstrated interest in and commitment industrial archeology or a related field, and one letter of reference. Deadline for submissions is March 15, 2001. Info.: Mary E. McCahon, SIA Scholarships, c/o Lichtenstein Consulting Engineers, One Oxford Valley, Suite 818, Langhorne, PA 19047; (215) 752-2206; fax 752-1539. Notice of awards will be made by April 10. ■



Notes From the President

Whither SIA? Looking at the Big Picture.

Two years ago, the SIA held a conference in Lowell, MA, to examine the present status and the future direction of the field of industrial archeology. "Whither IA?" featured an international roster of speakers and provided much food for thought. The SIA, however, was not on the agenda that weekend, and, as every past president can attest, it is impossible to address big-picture issues at the regular quarterly meetings of the board, which necessarily are concerned with the day-to-day housekeeping issues that keep our organization running smoothly.

That is why the current SIA Board has decided to meet Feb. 16-18 in Croton-on-Hudson, NY, for a combined board meeting and winter retreat. At the retreat, board members and invited guests will consider, in depth, the present status and future direction of the SIA. Past President Fred Quivik has agreed to coordinate the retreat, and together we have crafted a preliminary list of questions to be addressed.

How can we grow our membership? How can we reach young people and attract them to the field of industrial archeology? How can we sustain and improve our core program of conferences, tours, and study tours? How can we improve our publications? How can

we improve member services? How can we establish and build an advocacy role for the SIA? How can we improve our relations with allied organizations, both nationally and internationally? How can we respond to the new realities of the World Wide Web?

How can we move beyond our traditional program? What new initiatives can we take to enlarge our role and presence-to quote from our membership brochure-as "the North American forum for those who share an interest in industrial archeology"? How can we improve our public visibility? How can we improve professional standards? How can we educate amateurs and professionals outside the university? What is our current financial picture and what can we do to ensure the SIA's fiscal health well into the future?

I strongly encourage you to be a part of this watershed event by contributing your ideas and thoughts prior to the retreat. You may respond to the questions posed above or suggest other topics we may have overlooked. We earnestly solicit your input and promise to share every communication we receive with retreat participants. Please write: Carol Poh Miller, 17903 Rosecliff Rd., Cleveland, OH 44119; cpmiller@stratos.net; or Fredric L. Quivik, 2830 Pearl Harbor Rd., Alameda, CA 94501; fquivik@lmi.net. We look forward to hearing from you.

CPM

IA INTERNATIONAL STUDY TOURS, 2001

Germany's Ruhr District, March 2-12. A maximum of 50 members will tour the Route of Industrial Heritage, a system of interconnected sites that range from blast furnaces to working cutlery factories in the Ruhr and Rhein valleys. Participants are expected to book their own travel arrangements to Dusseldorf. The single tour fee will be approximately \$1,250 per person including meals, accommodations (double room), and entrances to sites. See *SIAN* Summer 2000, p. 17, for more details. Pre-registration required with Pat Martin, SIA-HQ, Dept. of Social Sciences, Michigan Tech, 1400 Townsend Dr., Houghton, MI 49931; (906) 487-2070; fax 487-2468; e-mail: pem-194@mtu.edu. Only a few spaces were left on the tour at press time.

Cornwall's Industrial Heritage, Sept. 1-10. A maximum of 30 members will tour Cornwall's impressive legacy of tin and copper mining. A pre-tour is offered to the Great Dorset Steam Fair, Aug. 30-Sept. 1. Academic Travel Abroad (ATA) will be serving as the tour's agent with coordination provided by Bierce Riley of the SIA's board of directors. Anticipated cost including airfare is \$3,175 for the Cornwall Tour and \$775 for the Dorset Steam Fair pre-tour. All hotels will be first-class accommodations and, although packed with adventure, the overall pace will be moderate, with time to soak up the local culture. A mailing will be sent to the membership in early 2001. See *SIAN* Summer 2000, p. 13 for more details. ■

CHAPTER NEWS

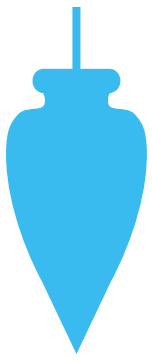
Northern Ohio had a social gathering and picnic at the whistle blow at Bleil Machine Co. in Sept. Members visited the Kent Dam across the Cuyahoga River in Oct. The mid-19th-c. stone dam is threatened with demolition. Chapter members studied the dam's history and learned the status of local efforts to preserve the dam, which Ohio EPA wants to remove for ecological reasons. The chapter will tour the lower deck of the Lorain-Carnegie Bridge in Nov., and on Dec. 3 will hold its first annual meeting at the Wilbur J. & Sara Ruth Watson Bridge Book Collection, Cleveland State University Library.

Oliver Evans (Philadelphia region) held its picnic and annual meeting at the Atwater Kent Museum in Sept. Curator Jeffrey Ray presented a history of the Atwater Kent Manufacturing Co., a pioneer in home radios from 1910 to 1935. The chapter toured the Bethlehem Steel Works, site of the proposed National Museum of Industrial History, and Bethlehem's Moravian industrial community in Nov.

Southern (Greater Birmingham) held its annual meeting at Sloss Furnaces in Sept. Also that month, members attended a presentation and tour of the latest rolling mill excavation at Shelby Ironworks Park. In Oct., the chapter toured the Alabama Copper & Brass Foundry in Birmingham. This long-standing foundry produces a number of specialized castings for the iron and steel industry.

Southern New England toured the Tremont Nail Works in Wareham and Independent Nail in Taunton, MA, in Sept. Tremont Nail makes a variety of specialty square-cut nails using a 150-year-old process. In comparison, Independent Nail makes wire nails using high-speed modern machinery. The chapter held its annual meeting in Oct. at the Original Yankee Steam-up at the

Continued on page 14



2001 GENERAL TOOLS AWARD

Call for Nominations

The General Tools Award Committee invites SIA members to submit nominations for the **2001 Society for Industrial Archeology General Tools Award for Distinguished Service to Industrial Archeology**. The award, presented annually at the SIA annual business meeting, recognizes individuals who have given sustained, distinguished service to the cause of industrial archeology.

Criteria for selection are as follows: (1) The recipient must have given noteworthy, beyond-the-call-of-duty service, over an extended period of time, to the cause of industrial archeology. (2) The type of service for which the recipient is recognized is unspecified, but *must be for other than academic publication*. (3) It is desirable but not required that the recipient be, or previously have been, a member of the SIA. (4) The award may be made only to living individuals. Teams, groups, agencies, firms, or any other collective entities are not eligible.

The nomination, which should not exceed three double-spaced typed pages, should address the specific accomplishments that

qualify the nominee for the award. Supplementary material (the candidate's resume, for example) may be appended to the nomination. Nominations must also include the name, address, and telephone number(s) of the nominator. Nominations may be made by any SIA member in good standing.

The General Tools Award was established in 1992 through the generosity of Gerald Weinstein [SIA], chairman of the board of General Tools Manufacturing, Inc. of New York City, and the Abraham and Lillian Rosenberg Foundation. The Rosenbergs founded General Hardware, the predecessor to General Tools. The award consists of a citation, a commissioned sculpture, and a \$1,000 cash award. Previous recipients are Emory Kemp (1993), Robert Vogel (1994), Edward Rutsch (1995), Patrick Malone (1996), Margot Gayle (1997), Helena Wright (1998), Vance Packard (1999), and Eric DeLony (2000).

Nominations, *which must be received on or before April 1, 2001*, should be submitted to: David Simmons, Chair, SIA General Tools Award Committee, P. O. Box 356, Galena, OH 43021; (614) 297-2365; e-mail: dsimmons@ohiohistory.org. ■

CALL FOR NOMINATIONS—SIA OFFICERS

For those willing to commit their time and skills to direct the SIA, there are four openings to be filled in 2001: two directors, one member of the nominations committee, and one TICCIH representative. *Please note, all candidates must give their consent to be considered for nomination and must be members in good standing.*

Directors (3-year term), two of seven directors on the Board of Directors, which meets quarterly, including during the annual conference. Directors govern official business of the SIA and chair committees that oversee society operations, such as publications, tours and conferences, and local chapters.

Nominations Committee (3-year term) serves as one of three elected members who oversee the annual nominations and elections. The newly elected member chairs the committee during the final year of his/her term.

TICCIH Representative (3-year term) serves as the SIA's representative to the International Committee for the Conservation of the Industrial Heritage (TICCIH), the world organization for promoting conservation, research, recording, and education in all aspects of industrial history.

Nominations from the membership are requested by the Nominations Committee, which will then offer a slate of candidates to the membership. The committee welcomes your suggestions, including offering yourself as a candidate.

Please submit nominations by December 31, 2000, by mail to:

**David Shayt,
Div. of Community Life—MRC 616
National Museum of American History
Smithsonian Institution
Washington, DC 20560-0612; (202) 357-4414.**

Include the name, address, telephone and e-mail address of the person nominated, and the position. Be certain that the person has given his/her consent to be nominated.

Once the slate is selected, the SIA Nominations Committee will request a biographical statement (not to exceed 150 words) and a photograph from each nominee.

Editor's Note: The Board of Directors requested that this year's call for nominations appear in the newsletter to save the society the considerable cost of a separate mailing. The bylaws state that the Nominations Committee shall request suggested nominations by the members by means of a printed announcement at least thirty (30) days prior to selection by the Nominations Committee, Section 2.05 (a). This is that printed announcement.

SIA Officers and Directors, 2000-2001

Carol Poh Miller, President (2000-2002)
Vance Packard, Vice President (2000-2002)
Richard K. Anderson, Jr., Secretary (2000-2003)
Nanci K. Batchelor, Treasurer (2000-2003)
Sandy Norman, Past President (2000-2002)
Gray Fitzsimons, Director (1998-2001)
Mary Habstritt, Director (2000-2003)
Lance Metz, Director (1999-2002)
Richard O'Connor, Director (1999-2002)
Bierce Riley, Director (1998-2001)
Robert Stewart, Director (2000-2003)
Louise Trottier, Director (1999-2002)
Patrick E. Martin, Executive Secretary and Editor IA
Patrick Harshbarger, Editor SIAN

Nominations Committee

David Shayt, Chair (1998-2001)
Patrick Harshbarger (1999-2002)
Robert Frame (2000-2003)
Sandy Norman, ex officio (2000-2002)

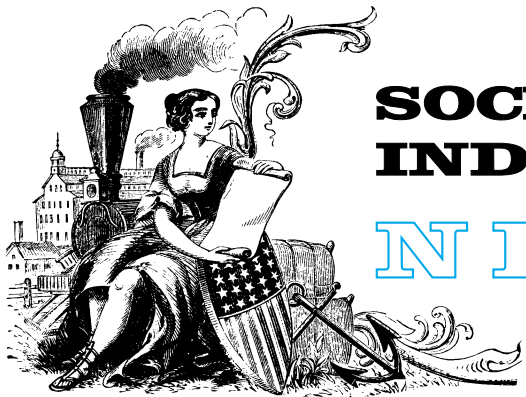
Mine Tours

Thanks to the National Mining Association's magazine, *Mining Voice*, for granting permission to the SIAN to reprint this list of sites that offer mine tours to the public. The list appeared in its

July/Aug. 2000 issue and is courtesy of P&H Mining Equipment, Milwaukee, WI. [Note: *The list is by no means meant to be a complete representation of mine tours available in the U. S.*]

	Hours & Admission Fees*	Information
Asarco Mineral Discovery Center Sahuarita, AZ Interstate 19 at Exit 80, Pima Mine Road—15 miles south of downtown Tucson.	Open pit mine & mill tour rates: Adults \$6; Children \$4. No charge to the Mineral Discovery Center exhibits & theater. Call 520/625-7513	Open-pit mine & mill tours available—exhibits on geology, mining & uses of minerals; historic & present-day mining equipment, videos, gift shop.
Barrick Goldstrike Mines Elko, NV Guests will be picked up at the Northeastern Nevada Museum & transported to the property.	7 days a week—depart 8 a.m. and 1 p.m.—reservations required 48 hours in advance. Call 775/778-1220	Visitors will see the prolific Betze-Post open pit, the analytical lab and the new \$330 million roaster and tour the visitor's center
Elkview Coal Corp. Sparwood, BC, Canada	Advance reservations, call 250/425-2423	Tours depart daily from the Infocentre
Estevan Mine Saskatchewan, Canada	Free Admission	The Shand Power Plant provides a free guided mine and power plant tour.
Kennecott's Bingham Canyon Mine Visitors Center Bingham Canyon, UT	Daily from 8:00 a.m.—8:00 p.m. weather permitting Entrance Fees: Carload \$3	Visitors Center stands inside the mine itself and features exhibits and displays of artifacts & memorabilia, combined with interactive exhibits.
Kentucky Coal Mining Museum Benham, KY & Lynch, KY	Mon–Sat 10 a.m.–5 p.m.; Sundays 1–4 p.m. Adults \$4; Children \$1.50 606-848-1530	Guided or self-guided tours available; you'll get a feel for what it was like to live, work and play at these unique camps in Benham and Lynch.
McCaw School of Mines Henderson, NV	702-558-8501 for more information	4,500 sq. ft. structure portrays the history & importance of mining in Nevada. Includes a simulated tunnel connecting 4 interior alcoves that depict: historical mining, mining in Nevada, geology & minerals and modern-day mining
"The Mining Museum" 405 E. Main Platteville, WI	Daily from 9:00 a.m.–5 p.m. Tour of museum, the mine & train ride takes 1.5 hours. Adults \$6; Children 5–15 \$2.50 608-348-3301	Traces the development of lead and zinc mining in the Upper Mississippi Valley through models, dioramas, artifacts & photographs.
Newmont Gold Co., NV	Second Tuesday of the month—depart 9 a.m. from museum; returns to museum at noon	Reservations required 24 hours in advance—Call 775-778-4068
Queen Mine Underground Tour 118 Arizona St., Bisbee, AZ Located immediately south of Old Bisbee's Business district.	Daily at 9:00 a.m., 10:30 a.m., 12:00 noon, 2:00 p.m., 3:30 p.m. Adults \$8; ages 7–11 \$3.50; ages 3–6 \$2; under 3 free	Explore one of the oldest copper mines in Arizona. Former miners show how turn-of-the-century mines were operated. Avg. temperature in mine 47 degrees
Queen Mine Tours—Historic District & Surface Mine 118 Arizona St., Bisbee, AZ Located immediately south of Old Bisbee's business district.	Daily at 10:30 a.m., 12 noon, 2:00 p.m., 3:30 p.m. Tour Price \$7 Children under 3 are free	This is a narrated van tour that takes you to the leaching plant, mine shafts, atop dumps, around the perimeter of the pit, and the city's turn-of-the-century architecture.
Sierra Silver Mine Underground Tour— Wallace, ID 420—5th St. Easy access off I-90, Exits 61 & 62.	Daily every 30 minutes; 9:00 a.m.–4 p.m. (July & August until 6 p.m.); (no children under 4) 1 hour 15 minutes 208-752-5151	Trolley takes you to the minesite. An experienced miner guides you as you witness exhibits, methods & techniques for hard-rock silver mining.
Taconite Mine Tours Hibbing Taconite is located near Chisholm on Minnesota's Mesabi Iron Range.	Wednesdays & Thursdays 12 noon Advance reservations are encouraged—contact Ironworld Discovery Center at 218-254-3321. Children must be 10 or older and accompanied by an adult—\$6 per person	You'll visit the mine, the concentrator & the agglomerator. Slacks & comfortable shoes are recommended. Hard hats, safety glasses and earplugs will be furnished.

* Subject to change. Always verify hours of operation before traveling.



SOCIETY FOR INDUSTRIAL ARCHEOLOGY NEWSLETTER

PUBLICATIONS OF INTEREST

A Supplement to Vol. 29, Nos. 3-4

Fall 2000

COMPILED BY

Mary Habstritt, New York, NY; and Patrick Harshbarger, SIAN editor.

GENERAL INTEREST

- Frederick Allen. **Technology at the End of the Century.** *I&T* (Winter 2000), pp. 10-16. Compares 1899 with 1999 to draw lessons about technological change, and to refute common perception that the "information age" is more chaotic than the "industrial age."
- Torsten Berg and Peter Berg, eds. **R. R. Angerstein's Illustrated Travel Diary, 1753-1755: Industry in England and Wales from a Swedish Perspective.** National Museum of Science and Industry (Avail: Gazelle Book Services, Falcon House, Queen Sq., Lancaster, LA1 1RN, U.K.; www.gazellebooks.co.uk), 2000. 43 pp., illus., £34.95. Angerstein was an industrial spy who traveled through Europe in the 1750s supported by the Swedish government, gathering information about trades and emerging technology. The diary of his trip to Britain is extraordinary for its quality of observation and insight, its comparative nature, and the large number of detailed illustrations. Coal, tin and copper mines, porcelain factories, iron foundries, smithies and workshops, rolling and slitting mills, chemical factories, waterworks, etc. This is the first published English-language translation.
- R. John Brockman. **From Millwrights to Shipwrights to the Twenty-First Century.** Hampton Press, 1998. 464 pp., illus. Eclectic exploration of how technical manuals and communication, from Oliver Evans' automated flour mill to modern computer technology, have changed over time. Rev: *T&C* (Oct. 1999), p. 879.
- **Copperopolis: Landscapes of the Early Industrial Period in Swansea.** Royal Commission on the Ancient and Historical Monuments of Wales (Plas Crug, Aberystwyth, Ceredigion, Wales SY23 1NJ, UK), 2000. 400 pp., illus., £32. Swansea was the first major industrial region in Wales, and its preeminence as an international center of copper smelting at the end of the 18th c. earned it the title of Copperopolis.
- Neil Cossons, ed. **Perspectives on Industrial Archaeology.** National Museum of Science and Industry (Avail: Gazelle Book Services, Falcon House, Queen Sq., Lancaster, LA1 1RN, U.K.; www.gazellebooks.co.uk), 2000. 176 pp., illus., £19.95. Essays on the development of industrial archeology in Great Britain since the 1950s. Publication coincides with the 2000 TICCIIH conference.
- Eric DeLony. **Bibliographic Essay, 30 Years Documenting Engineering & Industrial Heritage through HAER Publications.** *IP* v.3 (2000), pp. 29-34.
- Robert Gordon and Michael Raber. **Industrial Heritage in Northwest Connecticut: A Guide to History and Archaeology.** Connecticut Academy of Arts and Sciences (Box 208211, New Haven, CT 06520; (202) 432-3113; www.yale.edu/caas/), 2000. 220 pp., \$39. Six tour routes and detailed maps.
- Mary Mills. **Greenwich Marsh: The 300 Years Before the Dome.** 2000. 240 pp., illus., maps. Industrial and natural history of the Greenwich, England, peninsula includes iron & steel, ships, gunpowder, tide mill, steam engines, largest gasholder in the world. Avail: M. Wright, 24 Humber Rd., London, SE3 7LT, U.K.
- **The Public Historian: Special Issue on New Perspectives on Industrial History Museums.** v. 22, 3 (2000). Nine essays, several delivered at a 1998 Lehigh Univ. conference. Avail: Univ. of California Press, (510) 642-6188.
- **Ruins of Detroit.** Web site has information on Detroit IA sites. www.bhere.com/ruins/toc.htm#industrial.
- **Science and Technology Museums in Central Europe.** *T&C* v. 41,3 (July 2000), pp. 516-536. A review of museums and exhibits in Munich, Berlin, Vienna, Prague, and places in-between.

CHEMICALS

- **The DuPonts in Delaware: 200 Years.** *Wilmington (DE) News Journal*, June 18-19, 2000. Two 8-page, pull-out sections celebrate the history of the family that established the famous blackpowder works on the Brandywine River (now Hagley Museum & Library) and went on to be leaders of the chemical industry.
- Robert Fox and Agusti Nieto-Galan, eds. **Natural Dyestuffs and Industrial Culture in Europe, 1750-1880.** Watson Pub., 1999. 354 pp., illus. \$49.95. Papers from 1996 conference on The Evolution of Chemistry in Europe explore chemistry, geography, manufacturing, and use of dyestuffs. Rev: *T&C* (Apr. 2000), p. 360.
- Anne Cooper Funderburg. **Making Teflon Stick.** *I&T* (Summer 2000), pp. 10-20. General Motors researchers discovered Teflon by accident and teamed with DuPont to develop it in the 1930s. Significant obstacles had to be overcome to produce and market Teflon successfully.
- Dorothy Hosler, Sandra L. Burkett, and Michael J. Tarkanian. **Prehistoric Polymers: Rubber Processing in Ancient Mesoamerica.** *Science* (June 18, 1999), v. 284, pp. 1988-

1990. Ancient peoples harvested latex, processed it using liquid extracted from a species of morning glory vine, and fashioned rubber balls, figurines, and other artifacts.

- Arnold Thackray and Minor Myers, Jr. **Arnold O. Beckman: One Hundred Years of Excellence.** Chemical Heritage Foundation (1-888-224-6006, ext. 2222), 2000. 379 pp., illus., \$65 includes CD-ROM video. The blacksmith's son who played a pivotal role in the development of scientific instruments for the chemical and biomedical industries. In 1934, he created the first of his inventions, the pH meter.

MISC. INDUSTRIES

- Frederick Allen. **The Oldest Business in America.** *I&T* (Winter 2000), p. 6. Avedis Zildjian Co. of Norwell, MA. Cymbal maker traces origins to 17th c. Turkey.
- Christina Bates. **Wearing Two Hats: An Interdisciplinary Approach to the Millinery Trade in Ontario, 1850-1930.** *MHR* 51 (Spring 2000), pp. 16-25. A collection of 500 hats from a Sarnia millinery shop provides documentation for the industry in the 1920s and 1930s.
- Regina L. Blaszczyk. **Imagining Consumers: Design and Innovation from Wedgwood to Corning.** Johns Hopkins Univ. Pr., 2000. 368 pp., illus. \$39.95. Trials and tribulations of china and glassware producers in their contest for the hearts of working- and middle-class women, who made up more than 80 percent of those buying mass-produced goods by the 1920s.
- Bruce Epperson. **Failed Colossus: Strategic Error at the Pope Manufacturing Co., 1878-1900.** *T&C*, v. 41,2 (April 2000), pp. 300-320. Early bicycle manufacturer rode the wave of success with innovative armory production technology and aggressive patent and market strategies, then founded when bicycle mfr. was standardized and failed upon entering the automobile market.
- David Gwyn. **Power Systems in Four Gwynedd Slate Quarries.** *IAR* 21,2 (1999), pp. 83-100. Slate industry of NW Wales dominated world production of roofing slates in the 19th c. Power sources were a blend of water and steam.
- Robert H. Lochte. **Going Wireless in 1880.** *I&T* (Summer 2000), pp. 28-35. Alexander Graham Bell's attempts to develop a photophone, a wireless telephone that used sound to modulate a beam of light.
- Michael Trueman. **Lime Kilns—Modelling Their Technological Development.** *IA News* (Spring 2000), pp. 4-5. A typology for lime kilns based on mixed-feed, separate feed, intermittent, and continuous processes.
- Curt Wohleber. **The Can Opener.** *I&T* (Summer 2000), pp. 6-7. Technological evolution of the can opener.
- Andrew Dow. **Norfolk & Western Coal Cars, 1881-1998.** TLC Press (Lynchburg, VA), 1998. 248 pp., illus. Study of the evolution of coal-car technology on a premiere coal-hauling railroad. Rev: *RH* (Autumn 1999), p. 142.
- Keith Falconer. **Swindon's Head of Steam: The Regeneration of the GWR's Works.** *IP* v.3 (2000), pp. 21-28. Opening a new railway museum at Great Western Railway former main engineering works at Swindon, U.K.
- Jim Harter. **American Railroads of the 19th Century: A Pictorial History in Victorian Wood Engravings.** Texas Tech Univ. Pr., 1998. 320 pp. Sourcebook for images of railroads before the time that photographs could be readily reproduced in publications. Rev: *RH* (Autumn 1999), p. 139.
- Edward S. Kaminski. **American Car & Foundry Co., 1899-1999.** Signature Pr. (Wilton, CA), 1999. 362 pp., photos. Photo album celebrates the company's centenary. Introductory essays trace the evolution of car-building technology. Rev: *RH* (Spring 2000), p. 117.
- Robert A. Le Massena. **Design-It-Yourself Locomotive.** *RH* (Spring 2000), pp. 22-57. illus. Railroad companies avoided standardization of the 4-8-4 locomotive, resulting in an extraordinary number of variations in the first half of the 20th c.
- Larry Lowenthal. **Titanic Railroad: The Southern New England.** Marker Press (Brimfield, MA), 1998. 254 pp., photos, maps. Documents railroad grade and solitary bridge abutments of the Southern New England RR from Palmer, MA, to Providence, RI. Construction began in 1912 but stopped shortly after Charles Hays, the railroad's champion, died on the *Titanic*. Places the line, never completed, in political and economic context of the time. Rev: *RH* (Spring 2000), p. 107.
- Scott R. Nelson. **Iron Confederacies: Southern Railways, Klan Violence, and Reconstruction.** UNC Press, 1999. 257 pp. Rebuilding, financing, and managing the South's railroads after the Civil War includes some surprising conclusions about deals made with Klansmen and former Confederates. Rev: *RH* (Spring 2000), p. 97.
- Edward J. Pershey and Christopher J. Dawson. **Fast Train Through the Cornbelt.** *Timeline* (Sept./Oct. 2000), pp. 48-53. NY Central mounts jet engine on railroad locomotive to set an American speed record of 183.85 mph in 1966.
- David A. Pfeiffer. **Commuter & Light Rail Station Photographs.** *R&LHSN* v. 20,3 (Summer 2000), pp. 10-11. Info on a National Archives collection of 3,500 images taken by USDOT in 1979 to document handicapped accessibility at metropolitan stations. Includes uncommon interior views of ticket windows, restrooms, waiting areas, stairs, and exits.
- J. W. Swanberg. **Vanishing Triangles.** *RH* (Spring 2000), pp. 84-87. illus. Triangular-shaped catenary (electrified wires) over four-track main line of New Haven RR near Stamford, CT. Placed in 1908, it may be the oldest high-voltage catenary still in existence from the early period of railroad electrification in the Northeast. It is scheduled for replacement, but the railroad is being encouraged to preserve a representative segment.
- Wilma Ruth Taylor and Norman Thomas Taylor. **This Train Is Bound for Glory: The Story of America's Chapel Cars.** Judson Pr. (Valley Forge, PA), 1999. 382 pp. Church missions on rails. Authors are restoring the last Baptist chapel car.

RAILROADS

- Michael M. Bartels. **Rock Island Town.** South Platte Pr. (David City, NE), 1999. 80 pp. Fairbury, NE, headquarters of the Rock Island RR's Western Division. Chronicles slow decline to final abandonment. Recent efforts to restore the passenger station as a museum and community center. Rev: *RH* (Spring 2000), p. 105.

- Bob Withers. **When the B&O Ruled Wheeling.** *Classic Trains* (Fall 2000), pp. 23-31. Passenger service to a WV city in the 1950s.

AUTOMOBILES & HIGHWAYS

- Kevin Borg. **The "Chauffeur Problem" in the Early Auto Era.** *T&C* (Oct. 1999), pp. 797-832. New technology gasoline and steam-powered touring cars created problems for wealthy motorists whose chauffeurs exhibited brazen disregard for social decorum, borrowed cars for joyrides, and extorted commissions and kickbacks from garage owners, 1903-1912.
- Robert W. Hadlow. **The Columbia River Highway: America's First Scenic Road.** *SCA Journal* (Spring 2000), pp. 14-25.
- David A. Kirsch. **The Electric Vehicle and the Burden of History.** Rutgers Univ. Pr., 2000. Historical development of electric vehicles with relevance to today's efforts to revive the technology.
- Jill Livingston, et. al. **That Ribbon of Highway: Highway 99.** Living Gold Press (Klamath, CA), 1999. 2 vols., illus., maps, biblio. Guide to history and sights of US 99 in California, Oregon, and Washington. Rev: *SCA Journal* (Spring 2000), p. 34.
- Christian W. Overland. **Celebrating Detroit: Assembling an Automobile National Heritage Area.** *SCA Journal* (Fall 1999), pp. 10-17. Up to \$1 million per year for ten years is available in federal matching funds to interpret and preserve automobile-related heritage in southern Michigan.
- Leonard S. Reich. **The Dawn of the Truck.** *I&T* (Fall 2000), pp. 18-25. Trucks caught on much more slowly than cars, partly because of the expense, partly because horses did a good job, and partly because people had to figure out what trucks could do.
- Steven L. Thompson. **The Arts of the Motorcycle.** *T&C* (Jan. 2000), pp. 99-115. Review essay of 1998 Guggenheim Museum exhibit that displayed over 100 motorcycles as *objets d'art*. Offers reasons to examine the role of art and aesthetics in technology.
- Zachary M. Schrag. **"The Bus Is Young and Honest": Transportation Politics, Technical Choice, and the Motorization of Manhattan Surface Transit, 1919-1936.** *T&C* (Jan. 2000), pp. 51-79. Street railways replaced by buses not for technological advantages but a desire to escape tradition, custom, and regulation fettering the street railways.

JOB ANNOUNCEMENTS

HAER 2001 Summer Employment. The Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER), a division of the National Park Service, seeks applications from qualified individuals for summer employment documenting historic sites and structures of architectural and technological significance. Duties involve on-site field work and preparation of historical reports and measured and interpretive drawings for the HABS/HAER Collection at the Prints and Photographs Division of the Library of Congress. Projects last twelve weeks, beginning in May or June. Salaries range from entry level positions at \$4,500 to more senior positions at approximately \$8,500 for the summer, depending on job responsibility, location of the project, and level of experience. Applicants for positions as architects, landscape architects, historians, engineers, illustrators, industrial designers, and industrial archeologists must submit the following:

- A résumé and/or U.S. Government Standard Form OF-612 (You DO NOT have to specify whether you wish to work for HABS or HAER.)
- Supplemental Qualifications Statement (OPM Form 1170) or college transcript
- Letter of recommendation from a faculty member or employer familiar with your work
- Appropriate work samples (copies of portfolios, articles, class papers, etc.)
- CAD Background and Experience Inquiry Form (for Architects and Architecture Technicians to be considered for CAD-based projects)

Applicants who have worked for HABS/HAER since Summer 1995 need submit only complete, current forms OF-612, OPM-1170, or current resume, and SF-50 (Notification of Personnel Action). Forms OF-612 and OPM-1170 are available at Federal

office buildings, many employment agencies, campus job placement centers, and from HABS/HAER at the following address. *Submit application materials to:* Summer Program Administrator, National Park Service, HABS/HAER Division, 1849 "C" St., N.W., Room NC300, Washington, DC 20240.

For more information: (202) 343-9626/9618; e-mail: robbyn_brooks@nps.gov. Applications must be postmarked by February 15, 2001. Positions are open only to U.S. citizens. Successful candidates will be notified by telephone between late April and early May 2001. Please provide a telephone number and, if possible, e-mail address, for that time period. For more information and to download application forms, visit the HABS/HAER Web site: www.cr.nps.gov/habshaer/joco/summer-jobs.htm.

Michigan Technological University invites applications for a tenure-track assistant or associate professor in industrial or historical archeology. Appointment begins August 2001. Includes teaching at the undergraduate level and in the masters program in industrial archeology. The masters program emphasizes field-based learning and archeological science in the comparative study of 19th- and 20th-century industrial sites and communities. Upper Michigan's historic mining locations and extractive industries provide a rich base for local resources and research. Candidate should demonstrate an active research record combined with excellent teaching skills; geographical area(s) of specialty open. Ph.D. required; competitive salary and benefits. Review of applications begins on Dec. 15, 2000 and will continue until the position is filled. Send letter of application, c.v., and sample of scholarly work, and letters from three references to Dr. S. R. Martin, Chair, IA Search Committee, Dept. of Social Sciences, MTU, Houghton, MI 49931. Program description at www.social.mtu.edu/IA/iahm.html. MTU is an Equal Opportunity Educational Institution/Equal Opportunity Employer. ■

AVIATION

- **American Aviation, the Early Years** is a theme issue of *CRM: Cultural Resource Management*, v. 23,2 (2000), published by the National Park Service. Included are Jody Cook and Ann Deines, *Cultural Resources, People, and Places of Aviation's Early Years*; Tom D. Crouch, *Flight in America, 1784-1919*; Darrell Collins and Ann Deines, *Counting Down to the Centennial of Flight*; Marla McEnany, *From Pasture to Runway, Managing the Huffman Prairie Flying Field*; Tom D. Crouch, *Octave Chanute, Aeronautical Pioneer*; Jeanne Palermo, *Restoration, Preservation, and Conservation of the 1905 Wright Flyer III*; Paul R. Green, *Preserving Aviation Heritage Resources in the U.S. Air Force*; Jody Cook, *A Place Called Langley Field: National Significance in American Military and Civil Aviation*; Suzanne P. Allan, *Rehabilitating Building 661 at Langley Air Force Base*.
- Howard A. Mansfield. **Becoming a Birdman: The Wright School of Aviation.** *Timeline* (July/Aug. 2000), pp. 2-13. The Wright brothers teach aspiring aviators at their Dayton school beginning in 1910.
- Dennis Parks. **Early Douglas Aircraft Drawings at the Museum of Flight.** *Annotation* (March 2000), pp. 7,11. Recently discovered 1920s design drawings by Donald Douglas at the Museum of Flight, Seattle.

POWER GENERATION

- T. Lindsay Baker, ed. **Windmillers' Gazette.** Quarterly. Avail. Box 507, Rio Vista, TX 76093. Dedicated to the preservation of America's wind-power history and heritage. Vol. 19, 1 (Winter 2000) includes *The Stars Still Shine: The Legal Battle over the Star Windmill Trademark and A Product History of the Red Star and Red Cross Windmills*. Vol. 19, 3 (Summer 2000) includes *Hard Times and Hard Feelings: The Untold Story of the Early Eclipse Windmills*.

BRIDGES

- Eric DeLony. **Tom Paine's Bridge.** *I&T* (Spring 2000), pp. 38-45. In addition to his famous political writings, Tom Paine designed, patented, and modeled a long-span iron bridge. Although his engineering was doubtful, he spread the word about an engineering revolution in the making.
- Emory Kemp. **The Wheeling Suspension Bridge, the 150th Anniversary.** *IP* v.3 (2000), pp. 67-70.

BUILDINGS & STRUCTURES

- John S. Allen. **A History of Horseley, Tipton: 200 Years of Engineering Progress.** Landmark Publishing (Waterloo House, 12 Compton, Ashbourne, Derbyshire DE6 1DA, U.K.; landmark@clara.net), 2000. 176 pp. £17.95. Commencing coal mining at Tipton at the end of the 18th c., the Horseley Co. developed into an important engineering and structural iron-work company, whose output included cast-iron bridges and buildings, locomotives, steamboats, steel pipes, and gasholders.
- Betsy Hunter Bradley. **The Works: The Industrial Architecture of the U.S.** Oxford Univ. Pr., 1999. 347 pp., illus. Development of factory architecture and engineering from 1840 to 1940. Covers, in detail, such topics as factory roofs, walls, windows. Rev: *T&C* (July 2000), pp. 591-3.

- Nathan Caldwell and Nancy Thomas. **Volunteers Re-Light Kilauea Point Lighthouse.** *CRM*, v. 22, 9 (1999), pp. 7-8. Efforts to preserve the 1913 lighthouse on Hawaii's Kauai.
- Candace Clifford. **Moving Lighthouses.** *CRM*, v. 22,9 (1999), pp. 36-40. Lighthouses have a long history of being moved culminating in the recent attention given to the Cape Hatteras project.
- Fitzgerald & Halliday, Inc. and Historical Perspectives, Inc. **Fort Trumbull: Ramparts, Subs and Sonar.** New London Development Corp. (Avail: Connecticut Historical Commission, 59 S. Prospect St., Hartford, CT 06106; 806-555-3005; davepoirier@gyral.com), 2000. Fort Trumbull guarded Connecticut's Thames River from the American Revolution to the Cold War. The fort housed the U. S. Navy's underwater sound lab.
- Linda E. Smeins. **Building an American Identity: Pattern Book Homes & Communities.** Altamira Press, 1999. 355 pp. biblio., \$24.95. Pattern book homes appeared in hundreds of Victorian-era journals and influenced the development of suburbs. Rev: *VAN* (Fall 2000), pp. 31-34.
- Ronald Stenvert. **Textile Mills for Twente: The Case of Beltman versus Stott.** *IAR* 21,2 (1999), pp. 101-116. Influence of Lancashire, England, textile mill architects on Dutch mill architecture. ■

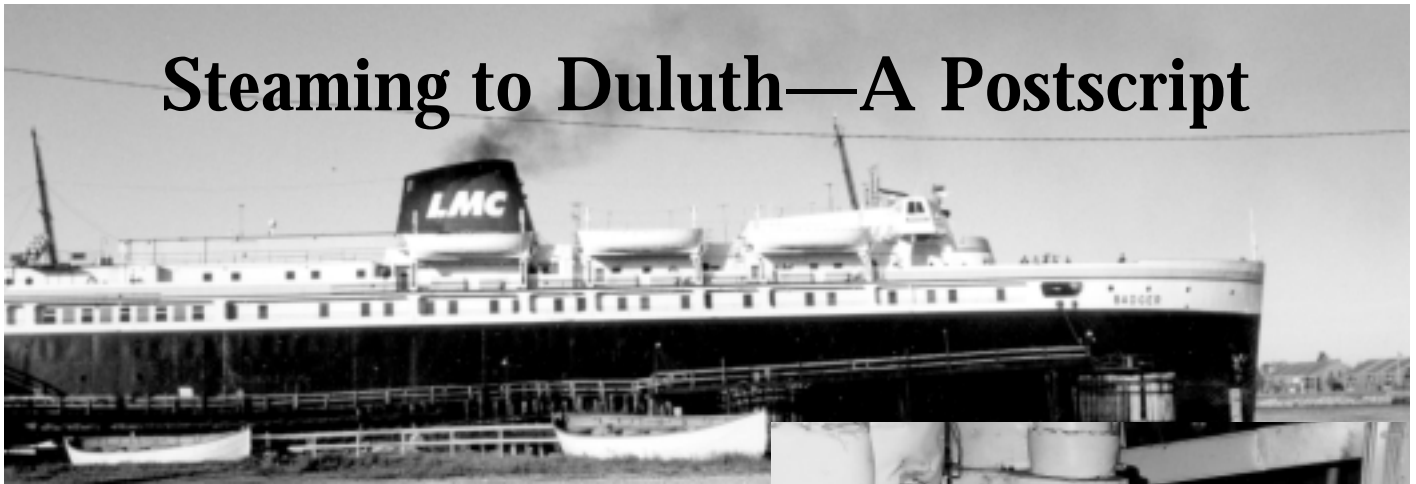
ABBREVIATIONS:

CRM	= Cultural Resources Management, published by the National Park Service
IA News	= Industrial Archaeology News (UK)
IAR	= Industrial Archaeology Review (UK)
I&T	= American Heritage of Invention & Technology
IP	= Industrial Patrimony (FRA), Journal of the Int'l Committee for the Conservation of the Industrial Heritage (TICCIH)
MHR	= Material History Review (CAN)
R&LHSN	= Railway & Locomotive Historical Society Newsletter
RH	= Railroad History
SCA	= Society for Commercial Archeology Journal
T&C	= Technology & Culture: Quarterly of the Society for the History of Technology
VAN	= Vernacular Architecture Newsletter

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 the **SIA Newsletter**, 305 Rodman Road, Wilmington, DE 19809.

We endeavor to make citations as complete as possible, but they are from a variety of sources, and are sometimes incomplete. If a date, publisher, price, or other statistic is missing, it simply means that it was unavailable, and, unfortunately, we do not have the time to track down these missing bits. The SIA, unless otherwise noted, is not a source for any of the cited works. Readers are encouraged to use their library, bookstore, computer, or school for assistance with locating books or articles.

Steaming to Duluth—A Postscript



The S.S. Badger about to depart Ludington for Manitowoc. June 1999.

How do you drive from Washington to Duluth to attend the SIA Annual Conference by the route that is simultaneously the shortest and, from the IA standpoint, the most interesting? We would insult the reader's intelligence if we pointed out that, obviously, you would cut across Lake Michigan's middle. But sixty miles across and no bridge! Well then, how about the car ferry S.S. *Badger*, operating between Ludington, Michigan, and Manitowoc, Wisconsin? Of course! Please to note the "S.S.," for the *Badger* is a steamship (boat, really, as everything on the lakes is a "boat," regardless of size), the last steam ferry on the lakes, and probably in the U.S., reason enough to say a few words about this extraordinary vessel.

She was built in Sturgeon Bay, Wisconsin, in 1953 for the Chesapeake & Ohio RR as a twin-screw railroad-car ferry, powered by a pair of Skinner four-cylinder steeple-compound uniflow engines of 3,500 hp each. Four Foster-Wheeler marine-type boilers supplied the steam. These were (and are) coal-fired (by stoker) in view of the C&O's heavy coal traffic. Hopper cars on the rail deck simply dumped directly into the boat's bunkers below. Today, coaling is by dump trucks. At 410 feet, she is the largest lake car ferry.

In 1990 the C&O abandoned the service as no longer economical and the *Badger* and her sister, the S.S. *Spartan*, were laid up. By 1992 a new corporation, Lake Michigan Carferry, had purchased both boats. While the *Spartan* lies moribund at Ludington and probably will never sail again, the *Badger* underwent a considerable refitting—principally the paving over of the tracks (they won't be subjugated—they can be seen poking through the asphalt), installation of an intermediate deck in the forepart of the (RR) car deck, and introduction of additional cabins and other amenities for passengers. Withal, the power plant was essentially untouched. The



Midsection of the Badger's port engine, between the (upper) high-pressure cylinders and (lower) low-pressure cylinders, showing the bell cranks that operate the steam valves.

Badger now embarked on a new career, as a cross-lake automobile and truck ferry. In this she thrives, between mid-May and late-October, in summer making two daily trips each way; spring and fall, one. Passage takes four hours. LMC has provided for all comforts, including a fine small museum on the history of Lake Michigan ferry service and containing the American Society of Mechanical Engineers bronze plaque designating the *Badger* a Historic Mechanical Engineering Landmark, live entertainment, bingo, appropriate amusements for the kiddies, and deck chairs. (If you squint your eyes you could be aboard the *United States* without 11:00 AM bouillon). And best of all, like the late, great ocean greyhounds, there is no annoying thrum and vibration from the diesels below—only the occasional health-giving whiff of bituminous coal smoke. Try it, you're bound to like it. *Brochure available from LMC, Box 708, Ludington, MI 49431. 1-888-562-7245 or 227-7447.*

RMV

Neal FitzSimons, 1928–2000

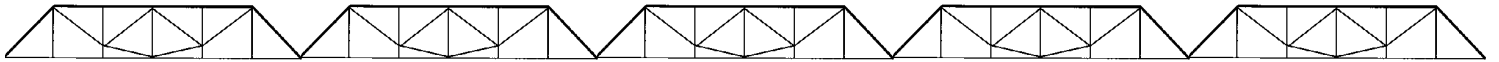
Neal FitzSimons, a long-time SIA member and well-known civil engineer and historian of the civil engineering profession, died suddenly last spring at his home in Kensington, MD. His wide-ranging work as a civil engineer in many ways reflected the endeavors of many of the 19th-century American engineers that Neal enthusiastically wrote about and celebrated. I dare say, he rarely met a civil engineer he didn't like.

After graduating from Cornell in 1950, he was called into military service in Germany, where his duties included engineering intelligence work for the 7th Army. Subsequently, he worked for many years in the Department of Defense, designing and testing bomb shelters. In private practice after 1976, Neal specialized in structural failures and the structural rehabilitation of historic buildings and bridges. This work included the rehabilitation of

Cabin John Aqueduct.

An active member of the American Society of Civil Engineers, Neal was perhaps best known within IA circles for founding the ASCE's History & Heritage program, which resulted in the landmark status for dozens of notable civil engineering works. He published numerous articles on civil engineers, edited the first volume of ASCE's biographies of civil engineers, and edited the writings of civil engineer John B. Jervis. He, Robert Vogel, Emory Kemp, and a number of other stalwarts helped found the Historic American Engineering Record in 1969. Neal leaves his wife Rebecca and their two children, and three sons by his first wife, Mayvis. He will be sorely missed my family and friends of SIA.

GF



Elusive American Truss Bridges

David Guise [SIA] is researching the evolution of the 19th-century American truss bridge for an upcoming book. His goal is to demonstrate why a large variety of truss designs were developed and examine how the introduction of new materials, progress in construction techniques, and expansion of theoretical knowledge, combined to cause a particular truss type to be superseded by a different, "better," configuration. In the second installment in a series to appear in SIAN, he shares his research to date on the Greiner truss [See Winter 1999 for the Kellogg truss and Spring 2000 for the Stearns truss]. Articles on other elusive truss configurations will appear in subsequent newsletters. The series is intended to serve as a catalyst to elicit additional information, especially the location of historic photos, plans, descriptions or surviving examples.

Greiner Truss—a bridge of old rails

In 1908, John Greiner (1859-1942) founded the well-known Baltimore engineering firm that still carries his name (URS Greiner Woodward Clyde). Prior to establishing his independent consulting practice, Greiner spent 21 years as an engineer with the Baltimore & Ohio RR, apprenticing

under such legendary bridge men as Pegram and Lindenthal.

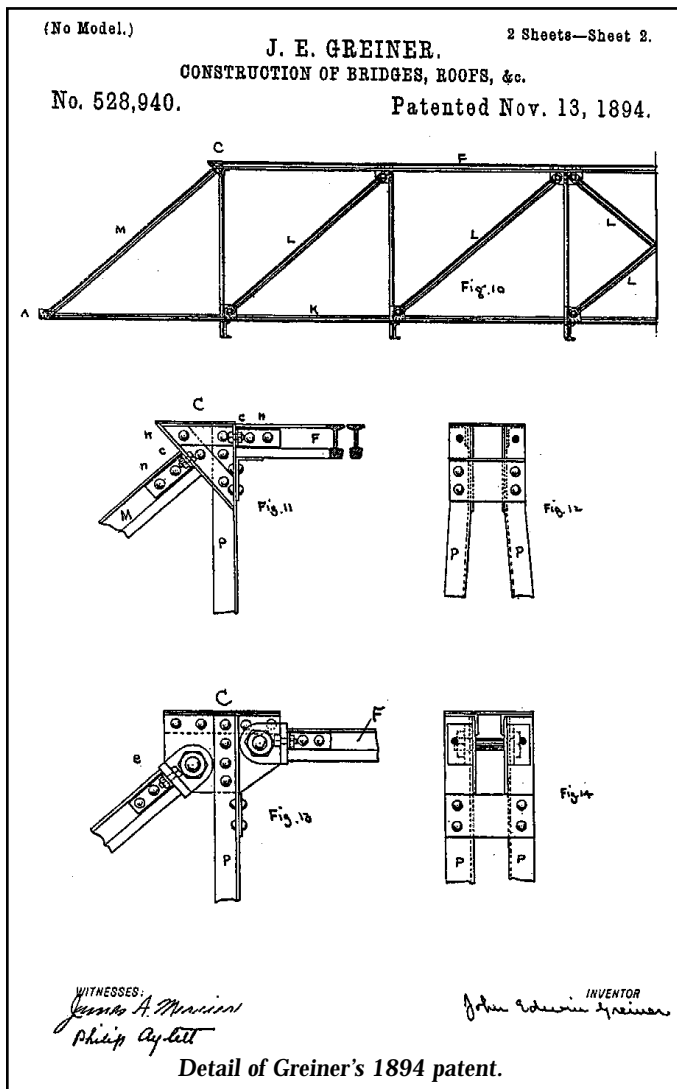
In 1894, while with the B&O, he obtained a patent for a truss design. Greiner's proposal was for a short-span bridge to be constructed almost entirely with sections of used railroad rails. Its principal use was to be for replacing the deteriorating wooden highway bridges crossing over the B&O lines. By using readily available, salvaged rails, he believed his bridge would be less costly to erect than a timber-truss alternative, and it had an additional inherent advantage of not being flammable, an important consideration for overhead railroad crossings at a time of spark-spewing locomotives.

Due to the generally unglamorous nature of these short-span highway bridges—compared to the dramatic long-span crossings of the Ohio and Mississippi rivers then being built—and the current absence of remaining examples, Greiner's "old-rail" bridges have not received much attention from either engineers or historians of technology.

Greiner, in his patent, based his claim of originality on his method of connecting truss parts, not on a new truss configuration. The configuration submitted as part of his patent application is an unadulterated Howe truss. He showed two variations of the Howe, one with parallel chords for bridges, the other with inclined, or sloping top chords, which he proposed as a way of building roof trusses. As a railroad man, he was seeking ways to make constructive use of discarded material.

After first constructing the Howe truss configuration shown in his patent drawings, Greiner derived several very differently configured "old-rail" trusses for the B&O. While none of these other shapes, including the one most often associated with his name, bears much of a visual resemblance to a Howe truss, all of Greiner's trusses shared a fundamental characteristic: all were assembled from railroad rails, rather than from plates, channels, angles, and I-beams. None of these various truss configurations, including the one now commonly known as a Greiner truss, was ever patented.

Engineering Logic: Standard design procedure normally starts with a specific span and load requirement. This information is then used to determine the required sizes for the chord and web members of the selected truss pattern. Since Greiner's concept was based on using a standard-sized railroad rail, he had to reverse the design process.



Detail of Greiner's 1894 patent.

The size of Greiner's chord and web members were his starting points. Then, knowing their stress limits, he could calculate the maximum span and load carrying capacity of his trusses. The Howe truss configuration initially selected by Greiner subjects its horizontal chords to a typical parallel-chord stress distribution pattern. That is, the stress in the chords increases in each successive panel, as the panels approach the center of the span. Parallel chord trusses, therefore, usually have progressively stronger (larger-sized) chord sections in each successive panel. But Greiner could not do this since he was fabricating the truss with a standard, uniform-size rail.

After building several successful Howe-type rail-truss bridges, he continued to seek ways to improve his rail-truss by exploring alternative configurations. His initial improvement consisted of inserting a bowstring truss in a Howe truss. His next solution inserted an inverted bowstring truss in the center of a Pratt truss. This latter composite shape is the one shown on the widely disseminated truss poster published by the Historic American Engineering Record, and it has become commonly known as the Greiner truss.

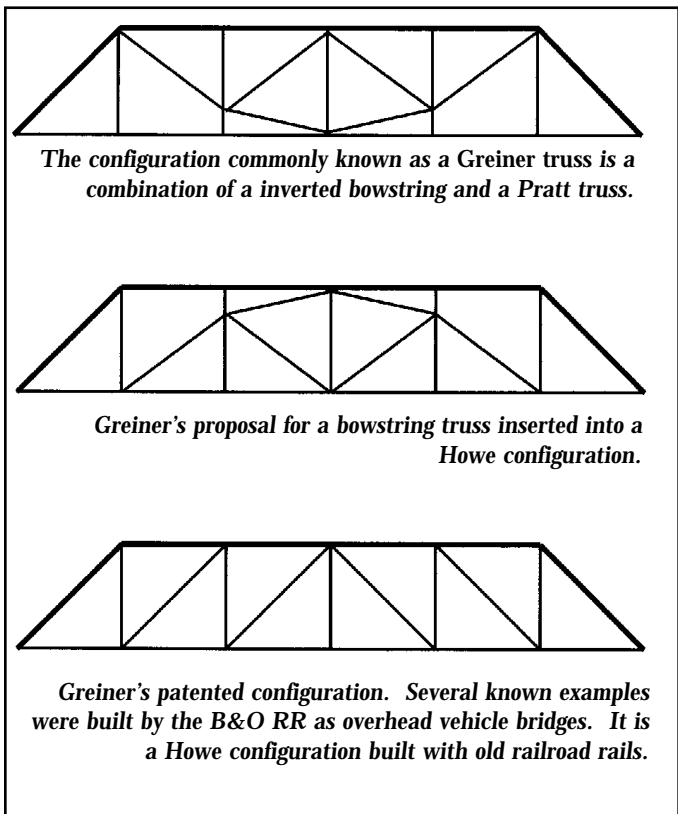
An examination of the stress distribution in the Greiner truss reveals a great deal of ambiguity. Since the diagonal bracing pattern of the underlying Pratt truss does not continue across the center of the span, where it is replaced by the bowstring, both systems had to be analyzed separately. Then, the effect of the bowstring members when the Pratt segment was not symmetrically loaded had to be determined. No wonder Greiner's composite shape did not become popular with engineers seeking a simple truss type for their short-span bridges!

The logic behind what at first might seem an irrational configuration is that the tensile stresses induced on the horizontal top chord by the bowstring tend to balance the compression stresses induced by the Pratt configuration. The result is that the stress values in the horizontal chords becomes more uniform over the entire span length. Because these short-span trusses were used for rural highway bridges, the asymmetrical stresses induced by a moving load were minimal, and the old-rail chords were adequate to the task.

Greiner was not alone in adopting old rails for use in truss bridges. The Lane Bridge Co., based in Painted Post, NY, also obtained a patent for a truss fabricated, in part, from used railroad rails. The Lane truss is essentially a Howe truss configuration with rail sections used for the chords and compression web diagonals, and rods for the verticals. A scattered few remain standing, including an 1896 example in McDowell, VA.

The difficulty in fabricating joints, the complexities and uncertainties of stress analysis, as well as concern about the questionable condition of old rails, conspired to prevent a fascinating concept from becoming a popular solution. The Pratt pony truss, simpler to fabricate and more readily understood, remained the light-load, short-span, metal truss of choice.

Greiner's concept of balancing chord forces in a truss by superimposing opposing forms is an interesting chapter in engineering thinking. However, the enduring significance of his design may lie



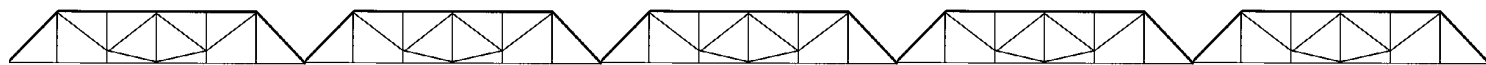
not in its unusual configuration, but its use of recycled material. Greiner sought ways to make effective use of discarded material, anticipating by over a century our own current emphasis on recycling to conserve resources and protect the environment.

Info: David Guise, Box 132, Georgetown, ME 04548; phone/fax (207) 371-2651. ■

CONTRIBUTORS TO THIS ISSUE

Franziska Blome, Boston, MA; Don Durfee, Houghton, MI; Betsy Fahlman, Tempe, AZ; Gray Fitzsimons, Lowell, MA; John Gomez, Jersey City, NJ; David Guise, Georgetown, ME; Mary Habstritt, New York, NY; Dean Herrin, Frederick, MD; Arlene Johnson, Houghton, MI; Zahir Khalid, Islamabad, Pakistan; Christopher Marston, Washington, DC; Pat Martin, Houghton, MI; Sue Martin, Houghton, MI; Carol Poh Miller, Cleveland, OH; Paula Mohr, Alexandria, VA; Richard O'Connor, Washington, DC; David Poirier, Hartford, CT; Fred Quivik, Alameda, CA; David Shayt, Washington, DC; David Simmons, Columbus, OH; Robert Stewart, W. Suffield, CT; Robert Vogel, Washington, DC.

With Thanks



Dual Honors For Last Bollman Truss

On Sept. 16th the sole surviving Bollman truss bridge, spanning the Little Patuxent River in the hamlet of Savage, Howard County, Maryland, was declared a National Historic Landmark, joining the pantheon of such luminous structures as the Brooklyn Bridge, the Folsom (hydroelectric) Power House, the Liberty Ship *Jeremiah O'Brien* (one of two remaining), the St Louis Union Station, and the Eads Bridge. In a joint ceremony, the little two-span composite cast- and wrought-iron bridge, built in 1869 by the Baltimore & Ohio RR, also was rededicated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers. This unusual event was largely a consequence of the fact that the ASCE had in fact *dedicated* the bridge a Landmark 34 years earlier, in Sept. of 1966—the first of their extensive inventory of Civil Engineering Landmarks. That, too, was a joint celebration, occurring simultaneously with the B&O's donation of the bridge to the County of Howard. Problem was, the Society's handsome bronze plaque declaring the span's eminence, was (not very artfully) welded to one of its posts, and was filched very shortly thereafter leaving the relic without its rightful pedigree. But . . . problem solved. By curious happenstance the errant plaque turned up quite recently, even more curiously in one of the county's maintenance sheds.

Thus it was fitting that a limestone boulder was the present ceremony's centerpiece, in which was set the National Historic Landmark plaque, the prodigal ASCE plaque, and one dedicated to civil engineer Neal FitzSimons (see article elsewhere in this issue), father of the ASCE's Landmark program and a speaker at the 1966 ceremony. Eric N. DeLony [SIA], Chief of the Historic American Engineering Record, formally presented the NHL plaque and Herbert H. Harwood [SIA], distinguished historian of the B&O and other Maryland railroads, spoke of the bridge's significance, observing that the bridge-truss system invented in 1850 by self-taught Baltimore civil engineer Wendel Bollman, B&O Master-of-Road, was the first of iron to be consistently adopted by an American railroad. Harwood noted that this example survives only because in the 1880s, when it had become too light for continued mainline service, it was readily dismantled and re-erected on the light industrial spur where it has reposed these 115 or-so



The reverence with which the bridge is held in Savage has inspired the renaming of the local school: Bollman Bridge Elementary—with sweatshirts to carry the message. Could this be the only school in the U.S. named for a bridge?



Robert Vogel photos

Harwood and DeLony (both at far right) and assembled ASCE and County dignitaries in the shadow of the Bollman Bridge.

years, there never being any reason to remove it. In conclusion he mentioned a mystery frustrating to railroad and bridge historians: it is not known, and probably never will be, where on the extensive B&O system this celebrated little span originally served!

RMV

CHAPTER NEWS

Continued from page 4

New England Museum of Wireless and Steam in East Greenwich, RI. The steam-up features a large number of operating steam engines, gas engines, and antique motor vehicles. A topic of discussion at the annual meeting was sustaining and expanding activities of the chapter, including tours and advocacy for threatened industrial sites.

Roebling (NY-NJ) held its 20th Annual Drew Symposium on Industrial Archeology in the New York-New Jersey area on Oct.

28. The event was co-sponsored by the Drew University Anthropology Dept. and the NJ Historic Preservation Office. Illustrated presentations included Tom Flagg, *From Rails to Rubber: Pioneering Highways in the NY-NJ Region*; Conrad Milster, *Powering Production: Industrial Uses of Steam*; Ed Saliklis, *Hershey Ice Arena: Largest Monolithic Thin-Shelled Concrete Structure in North America*; Charles Lawesson, *Floating Dry Docks of New York Harbor, 1827-1860*; Frank Vopasek, *A Quarter Century in the Steam Racket*; and Gerry Weinstein, *Twenty Years Behind the Ground Glass: Documenting IA with the View Camera*. ■

NOTES & QUERIES

John Joseph Earley: Expanding the Art and Science of Concrete is the topic of the Fourth Biennial Symposium on the Historic Development of Metropolitan Washington, DC, organized by the Latrobe Chapter of the Society of Architectural Historians and presented at the School of Architecture, University of MD, College Park, Mar. 31-Apr. 1. The symposium will examine the life and work of Earley (1881-1945) who developed a "polychrome" process of concrete slab construction and ornamentation. In the Washington metropolitan area, his products graced a variety of buildings—all formed by his staff of the Earley Studio in Rosslyn, VA. His unique polychrome houses in Silver Spring, MD, are outstanding among prefabricated houses in the country for their Art Deco ornament and superb craftsmanship. Sessions will include papers on the development of concrete as a material, Earley's life and work, his refinement of the medium of exposed aggregate concrete, and his use of patterns. A number of preservation case studies will also be presented including Meridian Hill Park (Washington), Polychrome Houses (Silver Spring), The Fountain of Time (Chicago), and Bahai Temple (Wilmette, IL). Sunday's session will be devoted to a bus tour of Earley's work in the Washington area. Info: Jere Gibber, Conference Coordinator, (703) 768-6987; e-mail: jgibber@aol.com; Web site: www.artnouveau.org/latrobe/.

The **Historic Windsor (VT) Preservation Institute** is offering its 17th series of preservation skills workshops. Upcoming workshops include historic plaster repair, wooden window repair, moldings, architectural woodworking, ornamental plaster, decorative finishes (graining and marbling), the business side of preservation, learning to write about historic properties, and generating publicity for design-related businesses. Historic Windsor is a non-profit organization working to conserve North America's architectural heritage by preserving Windsor House, participating in historic preservation projects, and teaching preservation skills. Info: Box 1777, Windsor, VT 05089-0021; (802) 674-6752. The complete course catalog is available at www.historicwindsor.com.

The **Pennsylvania Historical and Museum Commission** invites applications for its 2001-2002 Scholars in Residence Program and its recently inaugurated Collaborative Residency Program. The scholars program provides support for full-time research and study in the manuscript and artifact collections at any PHMC facility, including the state archives, state museum, and 26 historic sites and museums around the state. The residency program funds original research that relates to the interpretive mission of PHMC sites and museums, and advances a specific programmatic goal of the host site or museum. Proposals for residency are to be filed jointly by the scholar and host institution. Both programs are open to all who are conducting research on Pennsylvania history. Residencies are available for 4 to 12 weeks for the year beginning May 1, 2001, at the rate of \$1,500 per month. Application deadline: Jan. 12, 2001. Info and application materials: Linda Shopes, Div. of History, PHMC, Box 1026, Harrisburg, PA 17109; (717) 787-3034; e-mail: lshopes@phmc.state.pa.us.

National Preservation Institute is a nonprofit organization that provides professional training for the management, development, and preservation of historic, cultural, and environmental resources. NPI offers a wide range of seminars and workshops, many dealing with specific government regulations and guidelines that impact historic sites. A calendar and catalogue are available: NPI, Box 1702, Alexandria, VA 22313; (703) 765-0100; Web site: www.npi.org.

Grain Elevators, Slaughterhouses, and Reapers. The PBS history series *American Experience* is seeking sites and settings for use in a three-hour film on Chicago's pre-1893 history. They are interested in illustrating the industries that fueled the city's meteoric growth. One of the scenes they wish to film is an operational **grain elevator** with some similarity to those on the Chicago River in the 1860s and 1870s. Although they realize that no operating elevators of this era survive, they are looking for an existing elevator that might be filmed in ways that suggest an early grain elevator process. The producers are also seeking a **slaughterhouse and stockyard** with no electric tools and a pig-wheel (a wheel with chains for attaching the hogs). Finally, they are looking for locations that would help recreate the story of the **McCormick reaper**. The producers would like an interior setting that could stand as the McCormick reaper factory, basically a large blacksmith shop. They are also planning to film an early operational reaper if one can be located. Assistance with identifying possible locations or experts would be appreciated. Info: Franziska Blome, Associate Producer, Chicago Project, WGBH TV, Boston, MA; (617) 300-3635; e-mail: franziska_blome@wgbh.org.

Zahir Khalid, owner of the **C&H Refinery** in Lusk, Wyoming (*SIAN*, Winter 1999), writes that the refinery has been accepted to the National Register of Historic Places. Additionally, the Guinness Book of World Records has certified the C&H as the smallest oil refinery in the world.

IA was the theme of **West Virginia Archeology Month**, October 2000, sponsored by the WV Division of Culture & History, the WV State Historic Preservation Office, and the Institute for the History of Technology & Industrial Archeology at WV University. The program included an impressive series of tours, presentations, and other programs at historic sites and museums, raising the public awareness of the Mountain State's industrial heritage. . An *Illustrated Guide* contains details about the industrial images on the WV Archeological Month poster, as well as a list of sites and events. Copies of the poster and the guide are obtainable (while supplies last) Call (304) 558-0220; Web site: www.wvculture.com. Additional resources on IA in WV are available at www.as.wvu.edu/ihitia.

The **Lemelson Center Fellows Program** supports projects that present creative approaches to the study of invention and innovation in American society. These include, but are not limited to, historical research and documentation projects, exhibitions, conferences, multimedia products, and educational initiatives for the fellow's home or other institution or in conjunction with the center. The center offers fellowships to scholars and professionals who are pre- or post-doctoral candidates or who have completed advanced professional training. Fellowships are awarded for a maximum of ten weeks and carry a stipend. Fellows are expected to reside in the Washington, DC, area, to participate in the center's activities, and to make presentations on their work to colleagues at the museum. The Lemelson Center was established at the National Museum of American History, Smithsonian Institution, in 1995 to document, interpret, and disseminate information about invention and innovation, to encourage inventive creativity in young people, and to foster an appreciation for the central role of invention and innovation play in the history of the U.S. Info: Smithsonian Institution, NMAH, The Lemelson Center, Fellows Program, Washington, D.C. 20560-0604; (202) 357-2096; e-mail: lemcen@nmah.si.edu. ■

CALENDAR

2001

Jan. 10-13: Society for Historical Archaeology Conference, Long Beach, CA. "Archeology & Education." Held aboard the Queen Mary. Papers, workshops, tours, book displays. Info: 2001 SHA Conference, Box 2667, Long Beach, CA 90801; (562) 290-0064; Web site: www.sha.org.

Mar. 2-12: SIA Study Tour to the Ruhr, Germany. See article in this issue. Info: Patrick Martin, SIA-HQ, Dept. of Social Sciences, Michigan Tech Univ., 1400 Townsend Dr., Houghton, MI 49931; (906) 487-2070; fax 487-2468; pem-194@mtu.edu.

Mar. 17: 20th Annual Canal History & Technology Symposium, Lafayette College, Easton, PA. Info: National Canal Museum, 30 Centre Square, Easton, PA 18042; (610) 559-6626.

Mar. 31-Apr. 1: Fourth Biennial Symposium, Latrobe Chapter of the Society of Architectural Historians, School of Architecture, University of Maryland, College Park, MD. Topic: John Joseph Earley: Expanding the Art & Science of Concrete. See article elsewhere in this issue. Info: Jere Gibber, Conference Coordinator; (703) 768-6987; jgibber@aol.com; Web site: www.artnouveau.org/latrobe.

Apr. 20-22: Annual Meeting of the Business History Conference, Miami, FL. Info: Roger Horowitz, BHC, Box 3630, Wilmington, DE 19807; (302) 658-2400; Web site: www.eh.net/bhc.

Apr. 25-29: Vernacular Architecture Forum, Newport, RI. Focus on colonial and early national period architecture. Tours include early textile factories and mill villages in the Blackstone Valley. Web site: www.vernaculararchitecture.org.

Apr. 28-30: Ironmasters Conference, Hugh Moore Historical Park & Museums, Easton, PA. Paper proposals requested. Info: Lance Metz, National Canal Museum, 30 Centre Square, Easton, PA 18042; (610) 559-6626.

May 10-13: SIA 30th Annual Conference, Washington, DC. Hosted by the Montgomery C. Meigs Original Chapter. **Deadline for paper proposals is Dec. 31, 2000.** See article elsewhere in this issue. Info: Christopher Marston, HABS/HAER, (202) 343-

1018; christopher_marston@nps.gov; or Dean Herrin, (301) 624-2773; dherrin@fcc.cc.md.us.

June 1-3: Railway & Locomotive Historical Society Annual Meeting, Jacksonville, FL. Info: Box 997, Sacramento, CA 95812; Web site: www.rlhs.org.

June 10-14: Assoc. for Living History, Farm & Agricultural Museums, Annual Conference, Williamsburg, VA. "Looking Back, Going Forward: The Future of Living History." Info: ALH-FAM 2001, Colonial Williamsburg, Box 1776, Williamsburg, VA 23187; alhfam2001@cwf.org.

June 11-14: 2nd Annual Meeting of the Mining Section of the International Conference on the Conservation of Industrial Heritage (TICCIH), Butte, MT. Planned in conjunction with the annual meeting of the Mining History Assoc. (see below). Info: Richard Williams, TICCIH Mining Section, Industrial Heritage Consultancy, Poldark House, Poldark, Wendron Cornwall TR13 OER, UK; phone +44 1326 573173; heritage@eurobell.co.uk.

June 14-17: Annual Meeting of the Mining History Association, Butte, MT. Info: MHA, Box 150300, Denver, CO 80215. Web site: www.lib.mtu.edu/mha/mha.htm.

Sept. 1-10: SIA Study Tour to Cornwall, England. Optional pre-excursion to the Great Dorset Steam Fair, Aug. 30- Sept. 2. Information will be mailed to members early in 2001. See article in this issue. Info: Bierce Riley, 19 Budd St., Morristown, NJ 07960; (973) 455-0491; bierce.riley@worldnet.att.net.

Sept. 19-22: 7th Historic Bridges Conference, Cleveland, OH. Sponsored by the Wilbur J. and Sara Ruth Watson Bridge Book Collection, Cleveland State Univ. Library. Field demonstrations, paper sessions, and tours. Info: Bill Barrow, Special Collections Librarian, CSU, 1860 E. 22nd St., Cleveland, OH 44114; (216) 687-6998; w.barrow@csuohio.edu; Web site: <http://web.ulib.csuohio.edu/7hbc/>.

Oct. 22-25: First Flight Centennial Commission Symposium, NC State Univ., Raleigh, NC. Paper sessions, entertainment, and tours commemorate the centenary of Wright Bros. flight. Info: 4635 Mail Service Center, Raleigh, NC 27699; (919) 733-2003. ■

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

**SOCIETY FOR
INDUSTRIAL
ARCHEOLOGY**

Return and Forwarding Postage Guaranteed
Address Service Requested

Presorted Standard Mail
U.S. POSTAGE
PAID
Permit No. 110
Hopkins, MN