

SOCIETY FOR INDUSTRIAL ARCHEOLOGY

NEWSLETTER

Volume 30

Winter 2001

Number 1

ONTARIO'S OIL HERITAGE

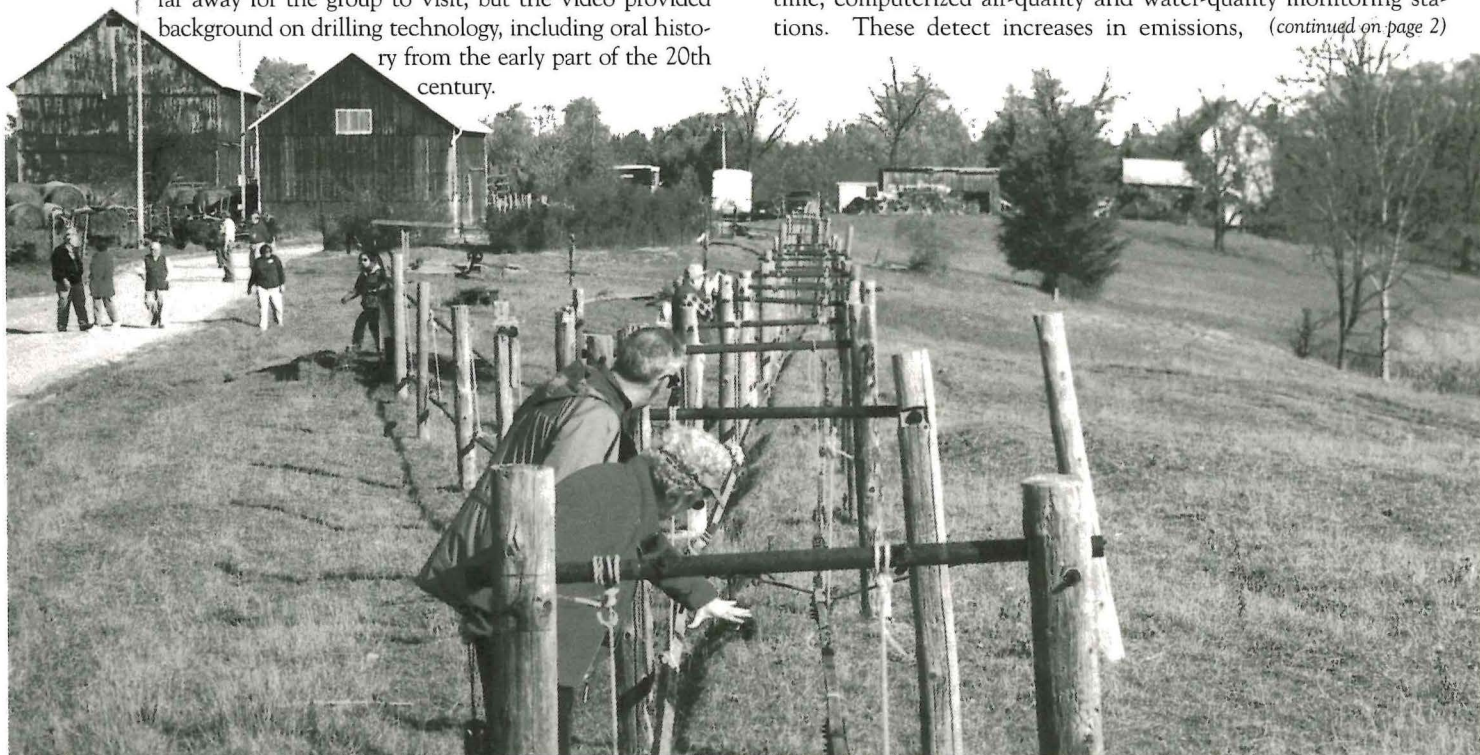
SIA 2000 Fall Tour Review

More than 90 SIA members gathered in Sarnia, Ontario, Oct. 19-22, to explore the birthplace of the Canadian oil industry. From the archeological remains of late 1850s open-pit wells to modern petrochemical complexes, the extraction and processing of crude oil were common themes.

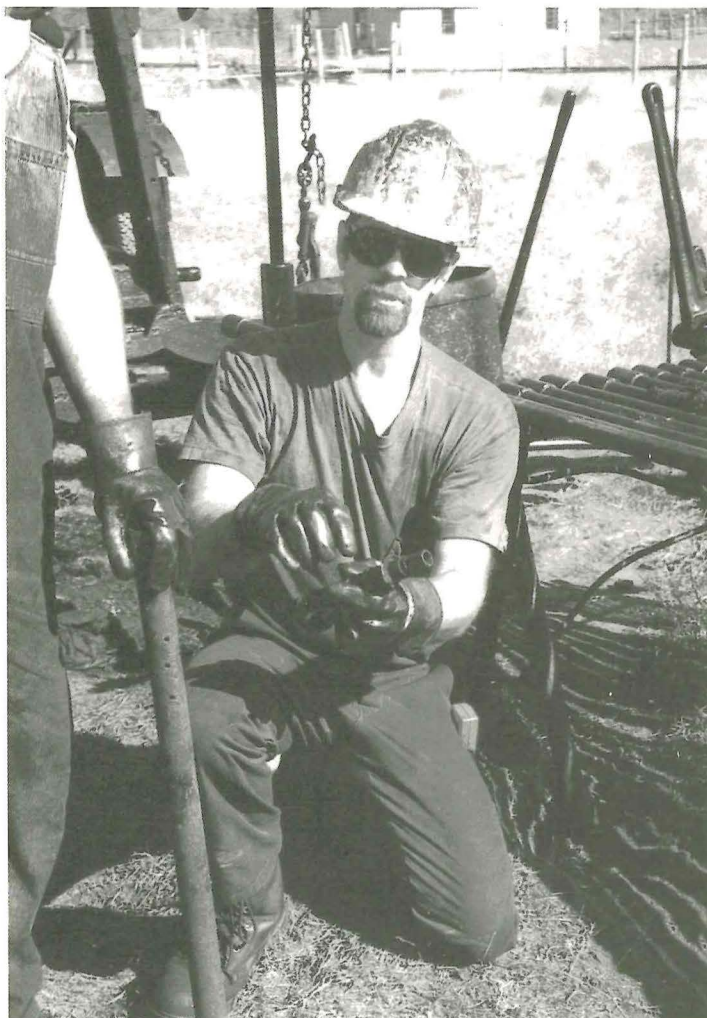
The tour kicked off with a Thursday evening reception at the Stoke's Bay Grill & Bar across from the Harbourfront Inn, the conference hotel on Sarnia's St. Clair River harbor. The setting was grand: Great Lakes boats glided by in the distance and a massive reinforced-concrete grain elevator loomed outside the hotel's door. Tour coordinator Chris Andreae welcomed members and gave a preview of the upcoming days' activities. Following was a video on the preservation of an 1896 Canadian natural gas drilling rig in Rainham Center on the north shore of Lake Erie. The rig, centerpiece of a new museum (www.canadiandrillingrigmuseum.on.ca) was too far away for the group to visit, but the video provided background on drilling technology, including oral history from the early part of the 20th century.

Friday morning brought a pleasant surprise. As we slept, the S.S. Manitoulin of the Canada Steamship Lines docked at the Sarnia Elevator (1927) next to the hotel. First light found many in our group out taking photographs.

Friday's activities began in downtown Sarnia at the offices of the Sarnia-Lambton Environmental Assn., an organization begun in 1952 when three local chemical companies pooled resources to study the impacts they were having on the environment. Sarnia had horrible air and water; eyes burned, paint peeled off buildings in no time at all, and the St. Clair River was dead in spots. The companies, in a farsighted move, realized that their own economic health and well-being were tied to monitoring and improving the environment. From initial efforts, the group has expanded to include 16 local industries that share information and resources. The association is proud of its environmental record, which includes establishing Canada's first real-time, computerized air-quality and water-quality monitoring stations. These detect increases in emissions, (continued on page 2)



SIAers examine jerker-lines at the Fairbank Oil Properties.



Patrick Harshbarger

A Fairbank Oil Properties employee explains the technique of "pulling" a well for repair and cleaning.

like benzene, well before they reach hazardous levels determined by the government. Automatic systems alert the companies to check or correct their operations before they would need to be shut down. The association warmly welcomed the SIA to Sarnia, helping arrange the process tours, and hosting the Saturday night banquet in its splendid harborfront board room.

After the association's presentation, the group divided in two for Friday's site tours. One group visited Bayer and Sun Oil, while the other visited Imperial Oil and Safety-Kleen. Both groups visited the St. Clair Tunnel and a drilling rig.

South of Sarnia stretching 18 miles along the east bank of the St. Clair River is an area known as the Chemical Valley, lined with refineries and chemical plants. The granddaddy of the petrochemical facilities is **Imperial Oil**, in operation in Sarnia for more than 100 years. Imperial is the Canadian division of Esso. Established in 1880, Imperial traces its origins to Ontario's oil heyday when refiners consolidated their operations to fight overproduction and falling prices. John D. Rockefeller's Standard Oil acquired a majority of Imperial stock in 1897, but Imperial remained the name for Standard Oil's Canadian operations. Imperial moved its operations from Petrolia, the town in the oil field about ten miles east of Sarnia, to Sarnia proper in 1899, after



J.J. Reap

Carter Litchfield views a wooden tank wagon once used for transporting crude oil, Oil Museum of Canada.

buying a property on the St. Clair River that afforded better access to water transport. Imperial's Sarnia refinery has been in continuous operation ever since.

Today, Imperial Oil is a thoroughly modern facility producing dozens of petrochemical products. Millions of barrels of crude oil arrive at the refinery annually, piped or shipped in from points all over the globe, though most of the crude comes from western Canada. A few thousand barrels still arrive by truck from the nearby Petrolia field each month, but that field reached its peak production in 1907 and now is a very minor producer (about 30,000 barrels per year). Although Imperial has a venerable history, the employee who gave us a bus tour around the refinery could point out only a handful of brick buildings that predate the 1940s, and these had been gutted for modern uses. The petrochemical industry has seen many technological changes to improve efficiency and increase capacity. In the late 19th century-

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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. 30,1 (Winter 2001), February 2001. 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.

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Patrick Harshbarger



The group gets a close-up look at a Canadian drilling rig that has just finished exploring an 1,800-ft.-deep well that turned up dry.



Patrick Harshbarger

S.S. Mantoulin stole up in the night at the Sarnia Grain Elevator next to the conference hotel.

ry, when the primary product was kerosene, nearly 40 percent of the crude went to waste, but today nearly every drop finds a practical use. We also toured Imperial's state-of-the-art engine lab, where technicians develop different grades of lubricating oil to the exacting specifications of engine manufacturers and then test them under extreme conditions of cold and heat.

Other major refiners followed Imperial to Sarnia. **Sun Oil** (Sunoco) established a refinery in the Chemical Valley in 1953, coinciding with the construction of a pipe line to bring crude oil from western Canada directly to Sarnia without transfer to lake boats. After orientation in Sun Oil's offices, SIAers walked down the company's "Main Street" past units that process 75,000 barrels per day of "sweet" crude oil piped from Saskatchewan. The primary products are gasoline, jet fuel, diesel fuel, and aromatic (benzene-related) compounds. Heat and pressure form the heavier fractions into the desired products in the presence of a catalyst (mostly platinum in a matrix of ceramic beads about the size of chopped vermicelli). The cracking process takes place in a large vessel, with a vertical flow induced by a steam jet in the base. After reaching the top of the reactor, the beads cycle downward to a regenerator or kiln, where accumulated coke deposits burn off. The beads last about three years if not "poisoned" by contact with sulfur. They are not recycled, but disposed of as hazardous waste, much of it sent to Safety-Kleen, another site on the SIA's itinerary. The refinery ships most of its production east by barge, while trucks deliver the smaller volume of aromatics for further processing into paint solvents and similar products. Like Imperial, Sun Oil has replaced or modified most of the original vessels and piping as later processes were added, so there was little historic fabric to observe. The company removed the electro-mechanical instrumentation in the control room, one of the last vestiges of the original plant, about five years ago.

Polymer Corp. established a synthetic rubber plant next to the refineries in 1942. The plant's original purpose was to relieve wartime shortages of natural rubber, which Japan's army cut off from the Allies. **Bayer Chemical Co.** acquired the plant about ten years ago. Much of the site, viewed from the bus, consisted of

the usual tanks, vessels, and piping. However, we could get out of the bus and tour the later stages of synthetic rubber manufacture that takes place inside buildings. The Imperial refinery pipes feedstocks of butadiene and acrylonitrile to the rubber plant. Bayer combines these as an emulsion, or latex; gases produced from the reaction expand the product as a foam, which is repeatedly dried over vacuum screens into crumbs, then baled into 70-lb. cakes for shipment. The crumbs have an odd acrid odor, and they fly around everywhere. The makers originally hoped that butadiene nitrile rubber would be suitable for the most conspicuous wartime need, tires, but it proved too hard. Principal endproducts are power transmission belting, moldings (e.g., engine mounts), and sealing products (o-rings), which take advantage of its high strength and oil-resistant qualities. Quite a bit of the original Polymer Corp. plant remains, but Bayer's employees say that it has reached the end-of-life stage. A ring of concrete columns supported most of the hortonspheres (spherical gas tanks that distribute pressure equally to all points), where one would expect steel. The suspicion was that they made the substitution to conserve steel for the war effort. The tanks are an illustration on the former \$10 Canadian bill.

Next to Imperial's refinery is the east portal of the **St. Clair River Tunnel**. The Canadian National Railway granted SIA permission to hike, under an escort of railroad police, about a half mile along the tracks to the tunnel's cut-stone portal. Opened in 1891, the St. Clair Tunnel is a marvel of engineering. It brought together for the first time the three principal methods of subaqueous tunneling: the shield method of excavating, cast-iron lining (curved cast-iron liner segments, assembled by bolting the flanged edges together), and excavation in a compressed-air environment. Charles Hyde, who has documented the tunnel for HAER, was on hand to summarize its history and answer questions. The Grand Trunk Rwy. built the tunnel to replace St. Clair River car ferries and form a more efficient link between its Canadian and Michigan lines. The tunnel served for 96 years, but went out of service in 1995 when a new parallel tunnel was opened. The new tunnel is about 9-ft. larger in diameter and can accommodate

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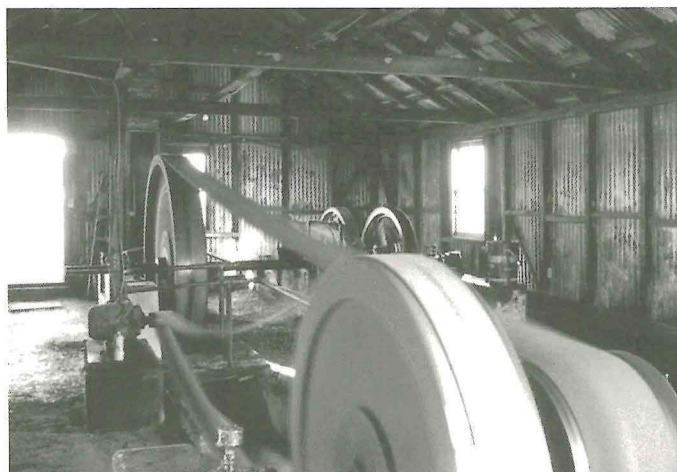
Patrick Harshbarger

SIA Fall Tour group at the St. Clair Tunnel portal.

stacked intermodal containers and auto-parts boxcars. The old bore, although no longer used by trains, provides maintenance access to the new tunnel and a conduit for pipes to pump out water seepage and runoff from the approach grades. A portable generator and lights illuminated the tunnel for the first SIA group, however, the generator voltage regulator broke and melted the lights before the second group could peer into the tunnel. The portals have massive steel gates to prevent unwanted immigrants passing through the tunnel.

Safety-Kleen, a waste-disposal corporation with sites across North America, runs a hazardous waste landfill in Moore Twp. east of the Chemical Valley. It receives much of the heavy waste from the refineries, as well as other waste from the U.S. Much of this part of western Ontario has an approximately 50-ft. thick surface layer of clay that is impermeable to water and thus an ideal lining for the landfill. We drove around the rim of the landfill watching the heavy equipment dump and cover waste in contiguous "cells," inspected the operator's room of the incinerator, and toured the lab where materials proposed for disposal are first tested. Safety-Kleen has elaborate controls to identify and keep track of each load of waste that enters the site. Technicians use robotic arms to sample the trucks and ensure that the waste is what the shipper says it is. If shippers try to sneak in unauthorized waste (which apparently happens sometimes), they can be fined or the truck turned away.

The last site Friday was southeast of Sarnia, out toward oil-field country. We arrived just in time to look over a cable-tool drilling rig that was being readied to abandon a dry hole in an unsuccessful effort to find natural gas. The cable-tool percussion rig is still in use here because it works faster than a rotary-table rig at moderate depths where the rock fractures easily. As we arrived, **Hughes-Baker**, a contractor, was surveying the well's geologic features. They had backed a shiny ten-wheeler equipped with a laboratory up to the drill rig platform, and a winch on the truck's deck was pulling an instrumentation cable out of the well collar. The cable connected to a device that measured the propagation rate of atomic particles through the



J. J. Reap

Interior of a pumphouse at the Fairbank Oil Properties. Thirty-odd pumps are driven by a 3-hp electric motor via belting and reduction gears.

surrounding rock. They graph the rate on a chart for a detailed record of the geologic formations through which the 1,800-ft.-deep well passed. Had we come the next day, the crew probably would have been dismantling the rig for shipment to another site.

The focus on Saturday was Canada's oil heritage in Oil Springs and Petrolia, where oil was first discovered and continues to be pumped in small quantities. First on the agenda was the **Oil Museum of Canada** in Oil Springs. The museum is found on (or near, depending on the source) the site of North America's first commercial oil well. The earliest evidence of petroleum in the area was the presence of black, gooey gum beds where the oil seeped out of fissures. The gum oil, which killed vegetation, was a nuisance to early settlers until they discovered they could sell it for medicinal purposes, and then later for kerosene. Historians credit James M. Williams with bringing the first oil well into commercial production in 1858, the year before Drake's famous well in Pennsylvania. In the early 1860s, oil men drilled the first large-production wells (including a few gushers) and an oil boom followed, but ultimately the reserves were too small for Canada's needs. Ontario's riggers, however, were among the first men to

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CONTRIBUTORS TO THIS ISSUE

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With Thanks.

gain the knowledge and practical experience of exploring for oil. They traveled to western North America, the Middle East and Asia spreading the oil industry. Trinkets and souvenirs that the oil men sent back to their families in Canada from far-off lands fill the museum's collections.

Our next site, **The Petrolia Discovery**, is an outdoor museum a dozen or so miles north of Oil Springs in Petrolia. Oil explorers discovered the Petrolia field in 1865 and ultimately determined it to be about 12 times the productive area of the Oil Springs field. Both The Petrolia Discovery and the Oil Museum of Canada have many outdoor exhibits and impressive collections of oil drilling and pumping machinery that show the evolution of the technologies.

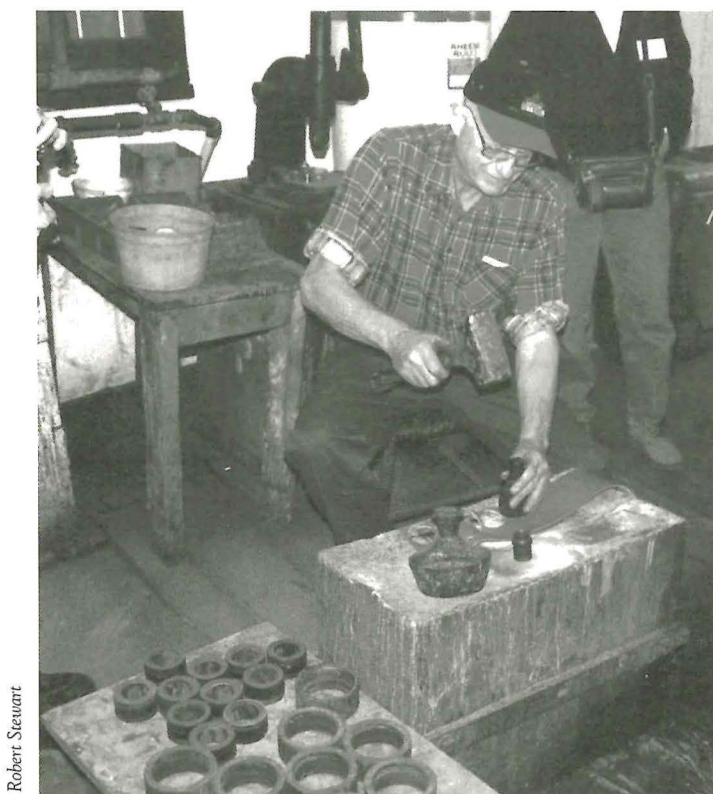
At The Petrolia Discovery, we had lunch and listened to a lecture on the storage of petroleum products in subterranean salt formations. In a process developed during the 1950s, water is injected into the salt beds to dissolve a cavern, which is then partially pumped out and refilled with a liquid hydrocarbon, such as propane or butane. Forcing more saturated brine into the cavern displaces the hydrocarbon, permitting withdrawal. The brine is degassed and stored in a reservoir until needed again.

Fine examples of Victorian brick churches, banks, stores, and public buildings grace downtown Petrolia and speak to the prosperity wrought by the oil boom in the 1870s and 1880s. An amazing survival is the **Baines Machine & Repair Works** in operation since 1914. In two small frame buildings, Albert Baines performs basic machine shop services and makes replacement parts for the oil drilling, pumping, and pulling machinery still in use at some of

the old oil wells in the area. The shop's complement consists of general-purpose machine tools, many manufactured in England or by English firms in Montreal or Toronto. In the rear shed was an amazing set of machines used to make pump valve cups, which are shaped and edged from sheet leather. The cup leathers, a little better than an inch in diameter, are found in the surprisingly small piston pumps installed in well bottoms. To our delight, Baines was on hand to demonstrate how the cups are made.

Saturday's final stop was the place where it all came together. **Fairbank Oil Properties**, near Oil City, clearly ranks in the top tier of historic industrial sites in North America. It is complete, still working, and at the historic foundation of the petrochemical industry that has had such a profound impact on our world's patterns of energy consumption. Owner Charlie Fairbank graciously welcomed the SIA and gave us the grand tour, complete with horse-drawn wagon rides to the back lots where we saw some archeological remains of early, wood-cribbed open-pit wells. Fairbank has 350 working wells, most operated by the jerker-line pumping method devised by his great-grandfather in the 1860s and still a viable means of extracting oil after 130 years. Each well produces about three-quarters of a barrel of oil per day. Although extremely low-volume by modern standards, the field covers expenses and will still be producing a comfortable income for future generations of the Fairbank family. The jerker-line system operates many walking-beam pumps from a single power source—a steam engine in the early days but now electric motors. One would think that jerker-lines required a good-sized motor, but the pumping motions are balanced to reduce resistance, so *three hp* suffices to run more than thirty pumps! Wooden rods or stringers are connected end-to-end, suspended off the ground by iron links hung from A- or H-frames. By giving the rods a reciprocating motion, power is transmitted at little loss and the pumps are set to a slow motion that matches the slow underground flow of oil in the old oil pool. Bellcranks redirect movement around corners and transfer a vertical motion to the walking beams. The oil is pumped to skimming troughs to separate it from the water, stored in pits or tanks, then collected and transported to refineries in Sarnia. Emory Kemp of West Virginia Univ. has had a team at

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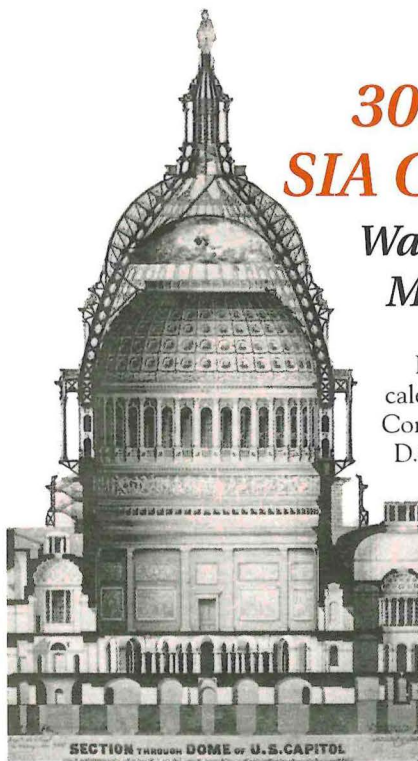
Robert Stewart

Albert Baines punches out a pump-valve cup at the Baines Machine & Repair Works. The Baines shop has been manufacturing and repairing pumps used in Petrolia's oil wells since 1914. Most of the shop's belt-driven equipment dates to its founding.



Patrick Harshbarger

John Light, a tour organizer, explains how a piston pump works at the Baines Machine & Repair Works, Petrolia.



30th Annual SIA Conference

Washington, D. C.
May 10-13, 2001

Don't forget to mark your calendar for the SIA Annual Conference in Washington, D.C. Registration materials will soon be in the mail to all members. We will be celebrating the SIA's 30th anniversary with special activities. Tours will investigate Montgomery C. Meigs's engineering legacy, bridges and parkways, railroads, canals, and government research

facilities. The conference hotel is the Renaissance Hotel, 999 9th St., NW. Paper sessions will be held on Saturday, May 12. Info: Christopher Marston, HABS/HAER, (202) 343-1018; christopher_marston@nps.gov; or Dean Herrin, (301) 624-2773; dherin@fcc.cc.md.us. ■

ONTARIO (continued from page 5)

Fairbank recording the jerker-line system, and he and some of his students were on hand to interpret the site. As an aside, the jerker-line system has a symbiotic relationship with sheep ranching: the grazing sheep keep the jerker-lines free of entangling vegetation, and the mutton provides extra cash.

If the tour of the Fairbank property were not enough, Charlie Fairbank also arranged for some demonstrations. A local smith who specializes in decorative ironwork treated us to forge-welding in the old blacksmith shop. A crew was also on hand to pull a well, giving us a good idea of what is going on out of sight underground. Pulling is done with a rig that lifts out the segmental pipe and pump from a well for cleaning and maintenance.

After returning to the hotel for a short break, the group reconvened in the board room of the Sarnia-Lambton Environmental Assn. for the traditional banquet. Charlie Fairbank even provided fresh roast lamb! Emory Kemp gave the evening's keynote address offering a wide ranging overview of the development of industrial archeology in the U.S. and Canada. He noted that while we have come far, especially developing standards for documentation, we still have a long way to go in convincing other academic disciplines of the importance of IA.

Sunday, the tour concluded with a detailed exploration of the **Blue Water Bridge**. The high-level cantilever truss highway bridge opened in 1938 to replace the car ferry between Sarnia and Port Huron, MI. Consulting engineers Modjeski & Masters of Harrisburg, PA, and Monsarrat & Pratney of Montreal designed it. The bridge proved adequate until the early 1990s when a joint Canadian/U.S. task force determined the need for an additional crossing. A second bridge, a tied arch, opened in 1997. Dan

Elash, general manager of the bridge authority, gave a thorough and engaging overview of the history, construction, and operation of the spans, which, in 1999, carried 5.5 million cars, trucks, and buses. His assistant, Dan Daamen, then provided a tour of the twin bridges and a behind-the-scenes look at the customs plaza on the Canadian side. Following the bridge tour, we paid a visit to the Sarnia train station where cast-iron segments of the St. Clair Tunnel are on exhibit on the lawn.

Chris Andreae, Robert Cochrane, Charles Fairbank, and John Light did a fantastic job of organizing the fall tour. Chris Andreae wrote a fine illustrated guidebook, *Lambton's Industrial Heritage*, while many other people, organizations, and companies contributed to the success of the event. The SIA's thanks go to each and all.

JR & JPH

Proposed Slate 2001 SIA Election

The SIA Nominations Committee is pleased to present the following slate of candidates for the 2001 elections of Directors and Officers:

Director

(3-year term): Elect Two

Betsy Fahlman
Rick Greenwood
Robert Kapsch
Matt Kierstead

Nominations Committee:

(3-year term): Elect One

Mike Raber
Ann Steele

TICCIH Representative:

(3-year term): Elect One

Patrick Martin
Louise Trottier

SIA by-laws state that the Nominations Committee shall notify the membership of the proposed slate. This is that written notice, **it is not a ballot**. Additional nominations can be made in writing over the signatures of no fewer than twelve (12) members in good standing (dues paid for 2001) and delivered to the chair of the Nominations Committee at the address below by March 23, 2001. Candidates must have given their consent to be nominated and must also be members in good standing. Ballots with a biographical sketch and photograph of each candidate will be mailed to members for a vote in April.

The 2001 Nominations Committee is David Shayt (chair), Patrick Harshbarger, Robert Frame, and Sandy Norman (ex officio). Reply to: SIA Nominations Committee c/o David Shayt, Div. of Community Life-MRC 616, National Museum of American History, Smithsonian Institution, Washington, DC 20560-0612; (212) 357-4414.

Remember: SIA membership dues were mailed in late December. Only members who have paid their dues will be allowed to vote. The membership period is the calendar year. ■



SOCIETY FOR INDUSTRIAL ARCHEOLOGY NEWSLETTER

PUBLICATIONS OF INTEREST

A Supplement to Vol. 30, No.1

Winter 2001

COMPILED BY

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

GENERAL INTEREST

- Robert Carr. **Industrial Archaeology and Conservation of London.** *TICCIH Bulletin* (Summer 2000), pp. 3-4. Brief review of sites of interest.
- Henry Glassie. **Material Culture.** Indiana Univ. Pr, 1999. 413 pp., illus. \$29.95. Distinguished folklorist explores technology in broad cultural context with series of essays. Case studies of pottery, carpet repair, and vernacular building technology. Rev: *T&C* (Oct. 2000), p. 791.
- Vicki Goldberg. **Lewis W. Hine: Children at Work.** Prestel, 1999. 104 pp., photos. \$39.95. As an investigative photographer for the National Child Labor Committee, Lewis Hine documented children working in mines, mills, fish canneries, factories, and on the streets from 1906 to 1918. His purpose was to use his photos to create social change. This book contains over 90 of his finest works.
- Richard Hayman, Wendy Horton, and Shelly White. **Archaeology and Conservation in Ironbridge.** Council for British Archaeology (Bowes Morrell House, 111 Walmgate, York, YO1 9WA, U.K.; www.britarch.ac.uk), 2000. 220 pp., illus. £24. Recent repair projects at the Ironbridge Gorge, site of first coke smelting of iron ore in 1709, and first significant cast-iron bridge in 1779. Attempts to understand and reassess the individual sites within the gorge as integrated elements of a historically complex industrial landscape.
- Antonella Marciano. **International Meeting on Industrial Heritage: Preservation and Development.** *TICCIH Bulletin* (Summer 2000), pp. 5-6. Report on Apr. 2000 meeting in Naples, Italy.
- Robina McNeil and Michael Nevell. **A Guide to the Industrial Archaeology of Greater Manchester.** Assn. for Industrial Archaeology (Aval: AIA Office, c/o School of Archaeological Studies, University of Leicester, LE1 7RH, U.K.). 72 pp., illus., maps. Gazetteer of museums and industrial sites published to mark AIA's 2000 conference.
- David Poirier and Kenneth L. Feder, eds. **Dangerous Places: Health, Safety, and Archaeology.** Greenwood Pr. (1-800-225-5800), 2000. 264 pp. \$65. Hazards of field work at sites with possible industrial, chemical, and biological threats. Case studies and reasonable precautions. Includes: John F. Konefes and Michael K. McGee, *America's Colonial and Industrial Legacy: Old Cemeteries, Arsenic, and Health Safety*; Allen W. Hatheway, *Former Manufactured Gas Plants and Other Coal-Tar Industrial Sites*; Michael Roberts, *Beneath City Streets: Brief Observations on the Urban Landscape*; Dana Linck and Joe W. Van III, *Dig Fast and Die Young: Unexploded Ordnance and Archaeology*; Cece Saunders and Susan R. Chandler, *Get the Lead Out*; Ronald L. Reno, Stephen R. Boyd, and Donald L. Hardesty, *Chemical Soup: Archaeological Hazards at Western Ore Processing Sites*.
- Michael B. Schiffer and Andrea R. Miller. **The Material Life of Human Beings: Artifacts, Behavior, and Communication.** Routledge, 1999. 158 pp. \$19.99 paper. Theorizes that human beings are fundamentally object-based, not language-based, creatures and that the archeology of daily life is the key to the study of human behavior. Rev: *T&C* (Oct. 2000), p. 793.
- R. B. Scholfield. **Benjamin Outram, 1764-1805: An Engineering Biography.** Merton Priory Pr. (67 Merthyr Rd., Whitechurch, Cardiff CF14 1DD, U.K.), 2000. 352 pp., illus. £24.95. A leading figure in the development of civil engineering in Great Britain, Outram designed numerous canals and horse-drawn railways, and established an iron company at Butterly, alongside the Cromford Canal.

MINES & MINING

- David Bick. **Evolution of the Pre-Cornish Beam Engine House.** *IAR* 21,2 (1999), pp. 117-135. Inventory and analysis of surviving British engine houses built before widespread acceptance of the Cornish beam engine (pre-1830).
- James Ferguson. **Expectations of Modernity: Myths and Meanings of Urban Life on the Zambian Copperbelt.** Univ. of Calif. Pr., 1999. 326 pp., bibliog. \$17.95. Modern miners struggle to get on with their lives after decades of economic decline following the industrialization of northern Zambia's copperbelt in the 1920s and 30s.
- Andrew Fielding. **The Lion Salt Works.** *IA News* (Winter 1999), pp. 4-5. Northwich, England, salt works is now a museum. Open-pan saltmaking by evaporating brine in a 19th-c. factory.
- **Helping to Save the Machetanz Film Collection in Alaska.** *Annotation* (Sept. 1999), pp. 16-19. Hallie Cordle, an equipment salesman, filmed gold-mining operations in the 1930s. Part of the diverse collection of the Alaska Film Archives in the Alaska and Polar Regions Dept., Univ. of Alaska Fairbanks.
- Timothy J. LeCain. **The Biggest Mine.** *I&T* (Winter 2001), pp. 10-19. Utah's Bingham copper mine.
- Susan R. Martin. **Wonderful Power: The Story of Ancient Copper Working in the Lake Superior Basin.** Wayne State

Univ. Pr., 1999. 286 pp., bibliog. \$24.95. Prehistoric copper mining and use around Lake Superior and, through trade, in parts of the eastern U.S.

- Robert McIntosh. **Boys in the Pits: Child Labour in Coal Mines.** McGill-Queen's Univ. Pr., 2000.
- Rosemary Preece. **The Museum of the English Coalfields.** *IA News* (Spring 2000), pp. 2-3. National Coal Mining Museum near Wakefield, West Yorkshire, U.K.
- T. H. Watkins. **Hard Rock Legacy.** *National Geographic*, March 2000, pp. 76-95. With an emphasis on the environmental problems left behind, a review of mining in the western U.S. since the General Mining Law of 1872. Includes a map of major mines of the West, color-coded by mineral, and related Superfund sites.
- Tom Zoellner. **Oil and Water.** *I&T* (Fall 2000), pp. 44-52. History of offshore drilling beginning in the 1940s.

IRON & STEEL

- Robert S. Davis, Jr. **Cotton, Fire, and Dreams: The Robert Findlay Iron Works and Heavy Industry in Macon, Georgia, 1839-1912.** Mercer Univ. Pr., 1998. 198 pp., illus. Business history of manufacturer of variety of machinery and stationary engines for local grist, saw, and textile mills. Rev: *T&C* (Jan. 2000), p. 143.
- Gerald G. Eggert. **Making Iron on the Bald Eagle: Roland Curtin's Ironworks and Workers' Community.** Penn State Univ. Pr., 1999. 189 pp., illus. \$22.50. Central PA ironworks from 1810 to 1922. Rev: *T&C* (Jan. 2000), p. 798.
- John Ferguson. **Forged and Founded in Cornwall.** Cornish Hillside Pub., 2000. 194 pp., illus. £13.99. Cornish iron industry. Rev: *IAR* (Nov. 2000), p. 147.
- Matthew Kierstead. **W(h)ither the Stone Ironworks Building?** *NECN* 19 2 (1999), pp. 4-6. Pre-Civil War stone-walled ironworks buildings are endangered.
- Edward M. Kirby. **Echoes of Iron in Connecticut's Northwest Corner.** Sharon Historical Society (18 Main St., Sharon, CT 06069), 1998. 135 pp., illus. \$18 ppd. History of the Salisbury Iron District. Includes 23 p. "drive-and-hike" guide. Rev: *NECN* 19,2 (1999), p. 11.
- Colleen E. Kriger. **Pride of Men: Ironworking in Nineteenth Century West Central Africa.** Greenwood Pr., 1999. 261 pp., illus. \$24.95 paper. Iron currencies, tools, weapons manufactured by African smiths. Analysis of artifacts. Rev: *T&C* (Oct. 2000), p. 797.
- Calvin Lieberman. **Creative Destruction.** *I&T* (Fall 2000), pp. 54-63. History of specialized machinery to reclaim steel from junk cars.

TEXTILES

- **Nomination of New Lanark for Inscription in the World Heritage List.** Historic Scotland, 2000. 127 pp. £12.50. (Avail: Mark Watson, Historic Scotland, Longmore House, Salisbury Place, Edinburgh EH9 1SH, U.K. Please make out checks or bank transfers in pounds sterling payable to Historic Scotland.) Famous cotton spinning mills and village (ca. 1786-1820s) in Lanarkshire, founded by David Dale and Richard Arkwright. Dale's humane philosophy was later expanded by Robert Owen.

- **Run of the Mill.** *Preservation* (Nov./Dec. 1999), pp. 79-81. Saving the Dan River textile mill complex, Danville, VA.
- **Textiles: Threads Through Time** is a theme issue of the *ALHFAM Bulletin* 30,3 (Fall 2000) devoted to period clothing and textiles. Includes: Tom Shaw, *Researching Common Clothing*; Charles LeCount, *The Linen "Market" Wallet*; Karen Mullian, *Shift to Chemise; or a Tempest in a Teapot*; Nancy Webster, *"Gather Up the Fragments": Some Examples of Virginia Slave Clothing Textiles*; *Flax Break—A Must Have*; Lynne Z. Bassett, *Laura Ingalls Wilder, A Resource for Clothing Historians*; Todd Stockwell, *Burton Cotton Gin*; Debra Reid, *Comforters in Cotton Country*.

AGRICULTURE & FOOD PROCESSING

- **Art of the Draw—Advertising Posters from the McCormick-International Harvester Collection.** On-line version of Wisconsin State Historical Museum exhibit. Evolution of agricultural machinery with colorful and sometimes fanciful advertising art from the museum's collection of more than 200,000 photos and 3,000 posters. www.shsw.wisc.edu/artofthedraw.
- Dmitry Babalis. **Conservation and Development of Industrial Sites in Lucca, the Full Integration of the Royal Tobacco Manufacture within the Planning Process.** *IP* v.3 (2000), pp. 37-40. Origin and growth of cigar and cigarette plant in Tuscany, Italy, during 19th and early 20th c. Plant will close in two years, and efforts are under way to find alternative use.
- Steve Barry. **Something Big on the Horizon: The Wooden Elevators of Saskatchewan Are Coming Down.** *Railfan & Railroad*, Jan. 2001, pp. 32-39. If you want to visit the wooden grain elevators of western Canada, you can't leave soon enough. The elevators are coming down rapidly as operations are consolidated at high-throughput elevators, massive concrete structures holding ten times the grain of local elevators.
- Dan Baum. **Citizen Coors: An American Dynasty.** William Morrow, 2000. 352 pp. \$27. Tells how each generation of the Coors family mismanaged the company. Rev: *The New York Times* (July 9, 2000) Sec. BU, p. 5.
- Piotr Gerber and Agnieszka Gryglewska. **The Demolition of the Historical Slaughter House in Wroclaw: The Main Issues Concerning the Industrial Heritage in Poland.** *IP* v.3 (2000), pp. 9-14. Documents massive 19th-c. slaughterhouse and cattle market complex.
- Moira F. Harris. **Louise's Legacy: Hamm Family Stories.** Pogo Press (4 Cardinal Lane, St. Paul, MN 55127; 651-483-4692), 1999. 160 pp., photos, bibliog. \$15.95. Pogo's fourth book to focus on the Hamms, Minnesota's great brewing family, offers photos and a selection of newspaper accounts of the early days of the brewery. Based on the recollections of Louise Muller, the granddaughter of Theodore and Louise Hamm, who made many of the company's business decisions.
- Steven J. Keillor. **Cooperative Commonwealth: Co-ops in Rural Minnesota, 1859-1939.** Minnesota Historical Society Pr., 2000. 500 pp. \$35. Multidimensional history gives special attention to political movements, including the Grange and the Farmer-Labor Party, that spawned or influenced cooperatives. The role of ethnicity, religion, and technology are considered in shaping the character of the cooperative movement in one of the most cooperative-minded states in the Union, where there existed 600 cooperative creameries, 270 farmers' elevators, and hundreds of rural telephone associations. Compares the economic model of

the cooperative, based on grassroots democracy, to that of the corporation, based on the power of accumulated wealth. Rev: MH 57 (Fall 2000), pp. 155-156.

- W. Duncan MacMillan, with Patricia Condon Johnson. **MacMillan: The American Grain Family: An Illustrated Biography.** Afton Historical Society Pr. (Box 100, Afton, MN 55001; www.aftonpress.com), 1998. 350 pp., illus. \$30. The MacMillans, who, with their Cargill cousins, are owners of Cargill, Inc., reputedly the largest privately held company in the world.
- Cheri Register. **Packinghouse Daughter: A Memoir.** Minnesota Historical Society Pr., 2000. 288 pp. \$24.95. Family loyalty, small-town life, and working-class values in the face of a violent labor strike in 1959.
- John B. Rehder. **Delta Sugar: Louisiana's Vanishing Plantation Landscapes.** Johns Hopkins Univ. Pr., 1999. Photos, maps. \$45. History and function of buildings on a typical sugar plantation. Five case studies: Armant, Cedar Grove, Whitney, Ashland, and Oakland plantations. Rev: VAN (Winter 2001), p. 21.
- Wilson J. Warren. **Struggling With "Iowa's Pride": Labor Relations, Unionism, and Politics in the Rural Midwest Since 1877.** Univ. of Iowa Pr., 2000. 185 pp. \$34.95. A long-term view of Ottumwa, IA, home of the John Morrell pork processing plant. Industrial relations evolved from paternalism to welfare capitalism, reinforced by ethnic and racial homogeneity, to unionization, marked by massive strikes, to the erosion of union power and the ultimate loss of safe, secure, well-paying jobs in an era of frequent mergers and plant closings. Rev: MH 57 (Fall 2000), pp. 157-158.
- Alison Watts. **The Technology that Launched a City: Scientific and Technological Innovations in Flour Milling during the 1870s in Minneapolis.** MH 57 (Summer 2000), pp. 86-97. Written by the first student winner of a special history-day award that allows the student to publish in *Minnesota History* and participate in the publication process. Article summarizes the technological solutions developed by Minneapolis millers to mill the hard red spring wheat that grew so well in Minnesota's climate but made poor flour when milled using old grist mill methods. These innovations made the city the milling capital of the world.

LOGGING & LUMBERING

- Mary T. Bell. **Cutting Across Time: Logging, Rafting, and Milling the Forests of Lake Superior.** Nodin Pr. (525 N. 3rd St., Minneapolis MN 55401), 1999. 96 pp., illus., maps. \$29.95. History of the John Schroeder Lumber Co., which logged along the North Shore of Lake Superior and the Apostle Islands from 1872 to 1939. The many kinds of workers and skills needed to run a logging operation, camp life, log rafting, and the milling process. Illustrated with period and contemporary photos, maps, and watercolors, some in color.
- Paul Fahlstrom. **A Short History of Old Cloquet: White Pine Capital of the World.** Carlton County Historical Society (406 Cloquet Ave., Cloquet, MN 55720; (218) 879-1938; cchs@cpinternet.com), 1997. 170 pp., photos, index. \$15.00. The city, rebuilt after the great forest fire of 1918, was a Weyerhaeuser enclave and is still an important wood products center, home of Diamond Brands and Potlatch [SIA 2000 Annual Conference].

- Ronald Jager. **Tool and Symbol: The Success of the Double-Bitted Axe in North America.** T&C (Oct. 1999), pp. 833-860. Careful analysis of the tool that came as a small revolution in timber-harvesting technology over 100 years ago.

RAILROADS

- Richard C. Barrett and Joseph Gross. **The Illustrated Encyclopedia of Railroad Lighting, Vol. II: The Railroad Signal Lamp.** RR Research Pub. (3400 Ridge Rd. W., Ste. 5, Rochester, NY 14626), 1999. 368 pp. \$69.95. 300 pp. devoted to images of signal lamps culled from company catalogs "manages to create an intriguing picture of the problems associated with railroad signaling." Rev: RH (Autumn 2000), p. 121.
- James B. Cabellero. **Semaphore Blades by Night.** RH (Autumn 2000), pp. 62-81. Different 19th-c. attempts to make semaphore signals visible in the dark. Illustrates and describes a variety of blades illuminated by reflected or transmitted light, or illuminated by lamps, lights, or tubes on the blades.
- Geoffrey H. Doughty. **New York Central's Stations and Terminals.** TLC Pub. (1387 Winding Creek Lane, Lynchburg, VA 24503), 1999. 168 pp., photos. \$28.95. Surveys many lesser-known stations. Rev: RH (Autumn 2000), p. 132.
- Ken Fitzgerald. **Southern Pacific 1744 Steams Again.** *Railfan & Railroad*, Jan. 2001, pp. 40-41. A 1901 Baldwin locomotive recently restored and pulling passengers in New Orleans.
- Thomas Flagg. **New York Harbor Railroads in Color, Vol. 1.** Morning Sun Books (9 Pheasant Lane, Scotch Plains, NJ 07076; 908-755-5454), 2000. Harbor operations, mostly from the 1950s and 60s. Different types of marine operations at the port; illustrations from nine Class One railroads with fleets and three Brooklyn terminal railroads.
- Vernon J. Glover. **C&TSRR Report September 2000.** *R&LSN* (Autumn 2000), pp. 5-6. Historic Cumbres & Toltec Scenic RR (NM-CO) receives new management and attention to deferred maintenance.
- **Historic Railroads: A Living Legacy** is a theme issue of CRM, v. 22,10 (1999). Includes: Susan Kraft and Gordon Chappel, *Historic Railroads in the National Park Service and Beyond*; Colin Divall, *Railroads as World Heritage Sites*; Kenneth and Lisa Kraft, *19th- and 20th-C. Potawatomi Culture and the Railroad*; Adrienne Anderson and Rick Wilson, *The Unheralded Resources of Golden Spike National Historic Site*; Gordon Chappell, *A Grand Canyon Railway: Project for a New Century, the 20th*; Susan Kraft, *Through the Greatest Gateway to the Greatest Park*; Dudes on the Rails to Yellowstone; Dale Martin, *Livingston: A Railroad Town and Its Depot*; Robert C. Hoyle, *To the Tetons by Train*; Paul Shea, *Union Pacific Dining Lodges and Cafeterias for the National Parks*; Terry E. Maze, *Petrified Wood and Railroads*; Lautie Slawson, *Copper Mining, Railroads, and the "Hellhole of Arizona"*; Geoffrey Bleakley, *The Copper River and Northwestern: Alaska's Bonanza Railway*; Ann Kain, *Frontiers in Transportation: Denali and the Alaska Railroad*; Frank Norris, *Alaska Tourism, Skagway, and the White Pass and Yukon Route*; Gordon Chappell, *The Curious Case of the Buried Locomotives, or Railroad Archeology with a Vengeance*; Diane M. Garcia and Nancy L. Smith, *Allegheny Portage Railroad: New Support for Old Arches*; R. Patrick

- McKnight, *Paint and Park: The Lehigh & New England Railroad Caboose 583*; R. Patrick McKnight and R. Jay Conant, *The Rutland Railroad's Caboose No. 28*; Gordon Chappell, *The Sacramento Locomotive Works of the Central Pacific and Southern Pacific Railroads, 1864-1999*; Sam Tamburro, *The Valley Railway: A Tale of Two Landscapes*; Deloris Jungert Davisson, *On Track Through a Beautiful Country*.
- Aaron Isaacs. **Wisconsin Sampler.** *RMQ* (Fall 2000), pp. 5-10. Review of railroad museums: Appleton Trolley Museum; East Troy Electric RR; Spooner; Mid-Continent Rwy. Museum; and other Wisconsin odds and ends.
 - Andres Jenks. **A Metro on the Mount: The Underground as a Church of Soviet Civilization.** *T&C* (Oct. 2000), pp. 697-724. Moscow underground of the 1930s as an instrument of civil and social engineering.
 - Malcolm Jones. **The Most Beautiful Trains in the World.** *Preservation* (Nov./Dec. 1999), pp. 30-37. Photographer O. Winston Link captured a time and a place that changed forever with the last steam engines - Norfolk & Western, 1950s-60s.
 - Graydon M. Meints. **Race to Chicago.** *RH* (Autumn 2000), pp. 6-29. The mad scramble to connect Chicago to the east by rail, ca. 1835-1850s.
 - William D. Middleton. **Landmarks on the Iron Road: Two Centuries of North American Railroad Engineering.** Indiana Univ. Pr., 1999. 216 pp. illus. \$39.95. Bridges, tunnels, freight terminals. Rev: *RH* (Autumn 2000), p. 115.
 - **Railroad Heritage** is the quarterly magazine of the Center for Railroad Photography and Art (Box 259330, Madison, WI 53725-9930; www.railphoto-art.org). No. 2, 2000 includes *Barriger's Unique Visual Record* (50,000 historic railroad photos in the Barriger Library, St. Louis); *Starlight's Images Shine* (review of collection of classic nighttime railroad photos); *Bennett Builds Railroad's Image* (H. H. Bennett, Milwaukee Rd. photographer in the 1880s); *Miner's Railroad Art Collection* (paintings in the W. H. Miner, Inc. collection); *Roy Emerson Stryker and the Elusive* (Farm Security Administration photographer); *Libsohn Views Southern Changes* (photos of Southern Rwy. in 1947); *Bonds to Past, Hidden From View* (collecting engraved bond and stock certificates as works of art).
 - Clifford Schoff. **Baldwins in Brazil or Journey with Maria Fumaca.** *R&LHSN*, (Autumn 2000), pp. 3-4. Narrow-gauge 1912-vintage Baldwin locomotives still at work in Sao Joao del Rei, central Brazil.
 - Thomas T. Taber and Mark Reutter. **Century Gone.** *RH* (Autumn 2000), pp. 30-52. Summary of railroading troubles and accomplishments of the 20th c.
 - Augustus J. Veenendaal Jr. **The Saint Paul and Pacific Railroad: An Empire in the Making, 1862-1879.** Northern Illinois Univ. Pr. (DeKalb), 1999. 178 pp. \$49.95. The role of Dutch investors in the early financing of the company. Details the operations, management, and equipment. Rev: *MH* 57 (Summer 2000), pp. 101-2.
 - Jeff Wilson. **Great Northern Railway in the Pacific Northwest.** Kalmbach, 2000. 128 pp., photos, illus. maps. \$19.95. Glossy photo book includes track maps and history.

WATER TRANSPORTATION

- Kevin J. Crisman. **Horse Power at the Chilo.** *Timeline* (Nov./Dec. 2000), pp. 38-41. Treadmill ferry on the Ohio R. (Chilo, OH-Bradford, KY), ca. 1870-1900.
- Jonathan Gill. **Lock and Dam Number 7 on the Monongahela River.** *IAR* 22,2 (Nov. 2000), pp. 115-132. Based on 1994 HAER study.
- John C. Gribar and Jaime A. Bocanegra. **Passage to 2000.** *Civil Engineering* 69 (Dec. 1999), pp. 48-53. \$1-billion dollar modernization and rehabilitation program intended to increase the Panama Canal's operating capacity by 20 percent. Widening and straightening of the Gaillard Cut, replacing ten miles of locomotive track, and installing hydraulic cylinder arms for operating the lock gates.
- Emory Kemp. **The Great Kanawha Navigation.** Univ. of Pittsburgh Pr. and Inst. for the History of Tech. and IA (Avail: Box 6305, 1535 Mileground Rd., Morgantown, WV 26506), 2000. 300 pp., illus. \$45. The Kanawha R. bisects the rugged terrain of southern WV. The river was a logical choice for a great east-west canal in the early 19th c., but to no avail. Efforts to build the James & Kanawha R. Canal, and later the Great American Central Water Line were aborted. In 1879, the U.S. Army Corps of Engineers began a 23-yr. construction effort that completely canalized the Kanawha and allowed year-round barge traffic.
- Colin Richardson, et al. **On the New Waterfront.** *Civil Engineering* 70 (Feb. 2000), pp. 60-63. First phase of a project to renew the 1903 Hoboken South Waterfront in NJ, including re-building Pier A and putting a park on it.

AUTOMOBILES & HIGHWAYS

- Max J. Skidmore. **The Theodore Roosevelt International Highway.** *SCA Journal* (Spring 1999), pp. 14-21. Tourist trail association marks and describes transcontinental route, Portland, ME to Portland, OR, 1919-1922.

BRIDGES

- Bashar Altabba. **Re-Creating the Rainbow Bridge.** *Civil Engineering* 70 (May 2000), pp. 32-37. Replica of the Rainbow Bridge in Jinze, China, using 12th-century construction methods. The project was initiated by WGBH-TV for an episode in the NOVA series, "Secrets of the Lost Empires."
- Bruce Clouette. **Reconstruction of a Brick-Arch Railroad Bridge.** *NECN* 19,2 (1999), pp. 6-8. Connecticut DOT rehabilitates 1885 bridge of the Danbury & Norwalk RR. Also, **Bridges and the Suburb Beautiful**, pp. 10-11. Restoration of stone-faced reinforced-concrete arch bridge from 1929 in Darien, CT.
- Eric DeLony. **Bridging the Past for the Future.** *Pennsylvania Heritage* (Winter 2000), pp. 8-17. Pennsylvania's bridge history and recent documentation and preservation efforts.
- **Michigan Historic Bridges.** Web site has a list and photos of Michigan's historic highway bridges. www.mdot.state.mi.us/environmental/historicbridges.
- Tom Ryan, comp. **The Art and History of the Bow Bridge.** 2000. 96 pp., illus. \$23.45 ppd. Avail. Box 70, Corinth, NY 12822. Imaginative effort to bring recognition to endangered 1888 lenticular truss bridge in Hadley, NY. Over 90 works of

original art by 65 artists including children. Paintings, drawings, poems, photos, wood blocks, and sculpture inspired by the bridge. Includes HAER documentation, historic photos, postcards. Proceeds go to a special Bow Bridge Preservation Account, established by the Hadley-Luzerne Historical Society.

BUILDINGS & STRUCTURES

- Ben Brown. **Monumental Ordeal.** *Preservation* (Nov./Dec. 1999), pp. 48-51. Raising the Washington Monument was a struggle.
- Neil Harris. **Building Lives: Constructing Rites and Passages.** Yale Univ. Pr, 1999. 208 pp., illus. \$40. Non-traditional architectural history examines buildings as cultural artifacts that are born, live their lives, and die, just as do humans. Rev: VAN (Winter 2001), p. 11.
- Kimberly Hinder. **Florida's Early Tourist Towers.** *SCA Journal* (Spring 1999), pp. 14-21. Observation towers from the 1920s to 1960s, built to attract tourists and showcase views of the landscape. Maple Groves Observation Tower, Winter Haven; Citrus Tower, Clermont; Placid Tower, Lake Placid; Bazaar International and Bazaar Trylon Tower, Riviera Beach.
- Rowland J. Mainstone. **Structure in Architecture: History, Design and Innovation.** Ashgate, 2000. 436 pp., illus. \$135.95. Innovation in pre-19th-c. structures possible without benefits of modern engineering theory.

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. 19,4 (Autumn 2000) includes *Prefabricated Windmill Towers from the Challenge Company* and *The Windmill Collection at the Fred Turner Museum, Loeriesfontein, South Africa.*
- Alan Crocker. **The Rolt Memorial Lecture 1999: Early Water Turbines in the British Isles.** *IAR* 22,2 (Nov. 2000), pp. 83-102. Examples of extant turbines made in Great Britain, ca. 1850-1875.

ELECTRONICS & ELECTRICAL ENGINEERING

- K. G. Beauchamp. **A History of Telegraphy: Its Technology and Application.** Inst. of Electrical Engineers (1-888-438-2517), 2001. 408 pp. \$95. Comprehensive survey of telegraphy over two centuries.
- Yakup Bektas. **The Sultan's Messenger: Cultural Construction of Ottoman Telegraphy, 1847-1880.** *T&C* (Oct. 2000), pp. 669-696. In 1877 the Ottoman Empire possessed the world's 8th largest telegraph network, extending over more than 17,000 miles.
- Russel Burns. **The Life and Times of A. D. Blumlein.** Inst. of Electrical Engineers (1-888-438-2517), 1999. 560 pp., illus. \$95. Blumlein (1904-42) played an important role in fundamental innovations in radar, electronics, and sound recording, including stereo sound.
- Gillian Cookson and Colin Hempstead. **A Victorian Scientist and Engineer: Fleeming Jenkin and the Birth of Electrical Engineering.** Ashgate, 2000. 280 pp. \$78.95. Pioneer in British electrical engineering known for his work on intercontinental submarine telegraphy, 1850-1885.

- Donland F. McLean. **Restoring Baird's Image.** Inst. of Electrical Engineers (1-888-438-2517), 2000. 292 pp., illus. \$55. In the late 1920s, John Logie Baird, considered to be the inventor of television, was experimenting with "photovision" in which he attempted to record television signals on gramophone discs. His attempts were largely unsuccessful and this technology forgotten until the 1980s, when the author began restoring the discs with modern computer-based techniques. Helps explain a poorly understood period of television history before official TV services started.

MISC. INDUSTRIES

- N. A. Cavanagh. **The Thornton Archive and the Production of Sawpierced Silverware in Sheffield.** *IAR* 22,2 (Nov. 2000), pp. 103-114. Analysis of documents and artifacts to understand sawpiercing, the technique of decorating silver tableware by cutting away areas of metal with fine-bladed saws.
- **Flesh and Stone: Stony Creek and the Age of Granite.** Stony Creek Workers Celebration (Box 3047, Stony Creek, CT 06405), 2000. 216 pp., photos. \$50. Evolution of granite quarries and immigrant communities in the Branford, Stony Creek, and Guilford areas of Connecticut. Web site: www.quarrycelebration.org. ■

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)
MH	= Minnesota History
MHR	= Material History Review (CAN)
NECN	= SIA New England Chapters Newsletter
R&LHSN	= Railway & Locomotive Historical Society Newsletter
RH	= Railroad History
RMQ	= Railroad Museum Quarterly
SCA	= Society for Commercial Archeology Journal
T&C	= Technology & Culture: Quarterly of the Society for the History of Technology
VAN	= Vernacular Architecture Newsletter

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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.

Documenting a WWI Shipyard

Redevlopment is under way at the site of the former Merchant Shipbuilding yard on the Delaware River in Bristol, PA. Merchant Shipbuilding was one of only three shipyards that "fabricated" vessels during World War I.

Little of the shipyard remains, and the property is being redeveloped for residential use.

In 1917, the great American reservoir of human and material resources promised to win the war for the Allies. However, the benefit of those resources was stymied by the inadequacy of the ships available for transport to Europe. Construction capacity at existing American shipyards was already dedicated to building destroyers to fight the submarine menace, converting merchant ships to troop transports, and converting seized German and Austrian passenger liners to troopships. The U.S. needed freighters desperately.

The simple expansion of existing conventional shipyards would not solve the problem. Traditional shipbuilding methods required time and skilled workers. Many ships were needed, and they were needed quickly. The problems of time and labor had to be overcome by technological innovation.

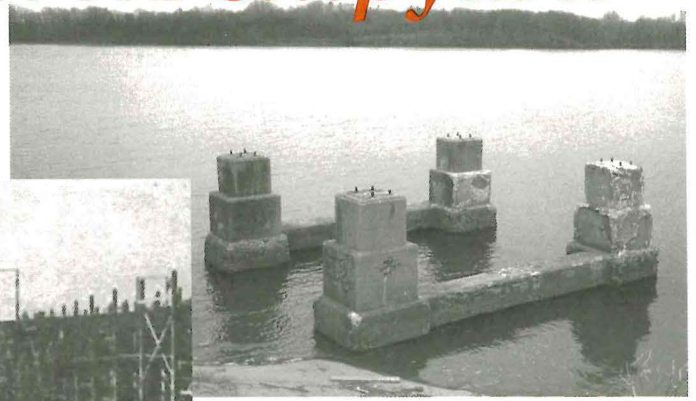
That innovation was known as "fabrication." It achieved mass production through standardization and premanufacturing. Three new shipyards, officially known as "fabricating plants," were established under the eye of the Emergency Fleet Corp. of the U.S. Shipping Board. The EFC's headquarters was in Philadelphia, since the Delaware River was a center of American shipbuilding. The shipyards were designed like assembly plants, where structural and mechanical components manufactured at hundreds of remote mills, foundries, forges, and shops would be assembled and installed. Mass, off-site production of standardized items for standardized ships was intended to streamline the shipbuilding process, and would be easier for novice workers to master.

The three fabricating plants were the 28 shipways of Submarine Boat's Newark Bay yard in Newark, NJ (site of the present-day marine terminals adjoining Newark Airport); the incredible 50 shipways of American International Shipbuilding's Hog Island yard on the Delaware River in Philadelphia (site of the present-day Philadelphia Airport); and the 12 shipways of Merchant Shipbuilding's yard, far up the Delaware in Bristol, more than 100 miles from the sea.

Merchant Shipbuilding's contract of Sept. 7, 1917, called for the construction of 40 standard single-screw, steel cargo vessels of 8,800 deadweight tons. The ships were 418-ft. long and 54 ft. in beam, drew 25 ft. of water laden, and could make 11 knots. Their boilers were oil fired, but convertible to coal. The ships were to be taken to Philadelphia upon completion, where they were to be painted with "dazzle" camouflage. Its bizarre patterns and colors deceived the eye—especially an eye peering through a periscope. If the camouflage did not work, and push came to shove, deck guns were mounted on the bow and stern for defense.

A planned residential development was constructed to house the several thousand workers and their dependents at Bristol. Known as the Town of Harriman, it was named for the family of industrialists who undertook the enterprise for the EFC. Most of the houses remain occupied to this day.

Submarine Boat won the race to launch the first fabricated ship.



Michael Bernstein

Concrete pedestals are all that remain of a Merchant Shipbuilding shipway in Bristol, PA.

Merchant Shipbuilding launches a "fabricated" freighter. Source: *Emergency Fleet News*, Sept. 19, 1918.

American International awed the world by virtue of its incredible capacity. Merchant Shipbuilding was always slighted, although its ships had greater deadweight tonnage than Submarine Boat or American International. Merchant Shipbuilding also suffered the embarrassment of seeing its first ship, *Watowan*, get stuck on the ways during its aborted launching on Aug. 3, 1918.

The Great War ended before the EFC shipbuilding program hit its stride. Merchant Shipbuilding laid fifteen keels at Bristol before the armistice of Nov. 11, 1918, but they delivered none prior to that time. Bristol's 20-ship contract of Dec. 22, 1917, was canceled. A few Bristol ships carried food to the troops and hungry civilians in Europe during 1919.

After the war, a manufacturer of amphibious passenger aircraft occupied portions of the shipyard buildings and used one shipway for access to the river. Other manufacturers occupied the buildings during World War II and thereafter. By the late 1990s, the only remaining operation was Dial's detergent plant, which occupied the old General Stores and Mold Loft building. The concrete pedestals for several shipways also remained.

In the 1990s, the Bucks County Redevelopment Authority received state and federal funding to identify industrial and commercial sites that could be amenable to redevelopment (so-called "brownfield" sites). In part because of its riverfront location, the Merchant Shipbuilding site ranked highest in priority.

Environmental conditions were a key factor in the redevelopment effort, particularly contamination associated with a former zinc processor. An environmental assessment was completed, and a remedial action was conducted that satisfied criteria of the Pennsylvania Land Recycling and Environmental Remediation Standards Act.

On Oct. 20, 2000, the Secretary of the Pennsylvania Dept. of Environmental Protection, the director of the EPA Superfund program, and various legislators and officials held a press conference at the former shipyard. Construction of the residential development, known as the Riverfront North Project, was already under way. Derelict portions of the shipways were being removed. Survival of the old General Stores and Mold Loft building is uncertain.

The Sept. 1999 issue of *Nautical Research Journal* (v. 44,3) published by the Nautical Research Guild contains a full-length article on the Merchant Shipbuilding enterprise. It was my effort to document the historic shipyard before it is obscured forever.

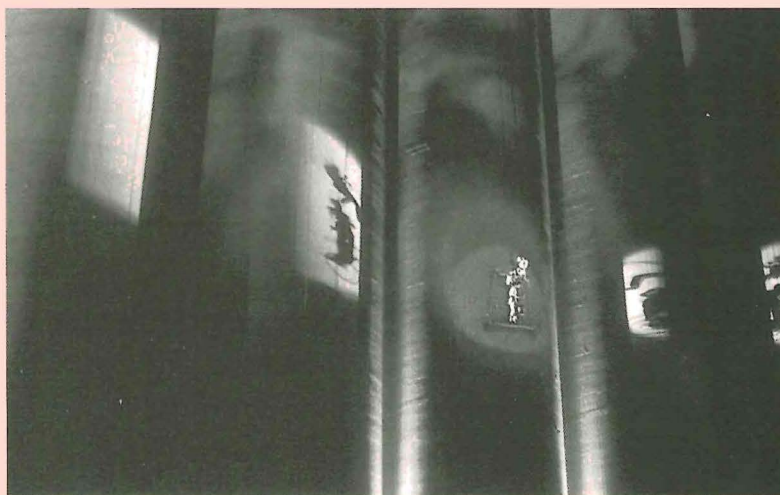
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IA and Performance Art?

IA has met performance art. The ZACCHO Dance Theater, based in San Francisco, turned ConAgra's Marquette Grain Elevator in Minneapolis into a stage for their *Picture Powderhorn* production last summer. The dancers hung from the elevator by climbers' ropes while symbolically acting out grain processing. Several hundred spectators gathered at the foot of the silos to watch the spectacle.

The performance began with the arrival of a raw product (corn) delivered by a farmer and child riding atop an aging Moline tractor. From there, a dancer took a sack of corn and flew through the night air to the top of the elevator while theatrical lighting carved eerie spaces around the concrete silos. Later, the theater company projected film footage on the elevator, including views of the working interior of the elevator and parts of two early railroad movies—*L'Arrivée d'un train à la gare des Ciotat* (1895) and *The Great Train Robbery* (1903). Backing up the visual feast were audio interviews with elevator employees, the sounds of trains on the elevator spurs, city soundscapes of local celebrations, and conversations with residents of the surrounding Powderhorn neighborhood, after which the theater company named the production. Groups of dancers descended the silos on ropes and at times bounced from one silo to another. A descending dancer delivered bags of milled corn and tortilla shells to the audience as a finale.

Picture Powderhorn is based on the work of director and choreographer Joanna Haigood. According to the production's



Larry Mishkar

Dancers swing from ropes on ConAgra's Marquette Grain Elevator in Minneapolis while lights cast swirling shadows on the concrete silos.

program, she explores the idea of "place being a poetic vessel" that observers can closely examine for the physical evidence of history left behind and normally overlooked (sounds like IA!). *Picture Powderhorn* is the first in a three-part series celebrating the aspirations of inner-city communities in transition. This summer, the production will become *Picture Red Hook* at the Red Hook Grain Terminal in Brooklyn, NY, and *Picture Bayview* at the Islais Creek Grain Terminal in San Francisco.

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CHAPTER NEWS

Southern and Northern New England held the 14th Annual Conference on New England Industrial Archeology on Feb. 3, 2001 at Central Connecticut State Univ., New Britain. Besides a paper session, the group visited the university's robotics laboratory and the New Britain Industrial Museum.

Northern Ohio inspected the lower levels of the Lorain-Carnegie (Hope Memorial) and Detroit-Superior bridges in Cleveland in Nov. Bill Vermes, a bridge engineer who is working on restoration of the Hope Memorial bridge, led the group. The chapter held its annual meeting in Dec.

Oliver Evans (Philadelphia) held its 13th Annual Filmfest in Dec. As usual, Lance Metz brought some choice films from the collections of the National Canal Museum in Easton. The feature presentations were *Steel in America* (a Walt Disney film made for the American Iron & Steel Inst.) and *Skylines* (how engineers and workers build skyscrapers).

Roebling (Greater NY-NJ) members gathered at Brooklyn's Pratt Institute on New Year's Eve for the year-end steam-whistle blast. Pratt Institute's unique steam-power plant is a National Historic Mechanical Engineering Landmark. The chapter held its annual meeting at Drew Univ. in Jan. ■

IA EXHIBITS

Discover E (Engineering) is an exhibit at the National Canal Museum, Easton, PA, from Jan. 27 to May 6. The Oregon Museum of Science and Industry designed and produced the traveling exhibit. Discover E has children in mind and encourages them to explore engineering through hands-on activities. A main feature is a basic computer-aided program that allows visitors to design their own simulated bridges. Visitors can use various materials in play areas to build a variety of miniature bridges. They can also observe a groundwater flow simulation and operate a groundwater pump.

Wood: An American Tradition runs at the National Building Museum, Washington, D.C., through Apr. 22. Wood is a quintessentially American building material. The exhibit looks at the development and history of log construction, timber framing, balloon framing, and platform framing, including the influence of steam power and innovative wood working machinery.

At the National Building Museum through May 20 is **Monuments, Mills, and Missile Sites: Thirty Years of the Historic American Engineering Record**. The exhibit celebrates the diversity of the HAER collection and America's rich industrial and engineering heritage (see *SIAN* Spring 2000). A special viewing of the exhibit will be part of SIA's annual conference, May 10-12. ■

NOTES & QUERIES



The Consumers' Gas Company water gas purifying buildings (1926) in front of two large gas holders. The short rectangular ventilation shafts identify the building. Source: City of Toronto, Consumers' Gas photographic collection, SC 34 - #340.

Toronto Coal Gas Works. Is anyone an expert on the iron oxide method of coal/water gas purification? In 1899 the Consumers' Gas Company of Toronto completed a water gas purification building. It is still standing and currently undergoing adaptive reuse as a city police division headquarters. The architect wants to interpret the historic features of the building. Good technical literature exists on gas purification and the specific history of the property, with one exception. How did the four tall brick ventilator stacks function? The bottom of the stacks open into an iron oxide shed. Possibly the stacks were used to ventilate the room during the reconversion of iron sulphide back to iron oxide, but this seems unlikely since plenty of space was available below the purifier boxes. Did the stacks assist in ventilating the purifying room? If so, why was the opening so small between the iron-oxide shed and the purifying room? Standard literature of the period discusses the purification process without any reference to specific ventilation problems. Info: Chris Andreae, 61 Lonsdale Dr., London, Ontario N6G 1T4; fax (519) 473-8323; history@golden.net.

Nicolas Kalis has prepared a draft manuscript on the history and operations of the **Long Island RR Freight Sidings** along Yard A in Long Island City, NY (western Queens). It includes descriptions and brief histories of the many industries and businesses on Thompson Ave., Queens Blvd., Honeywell St., 39th St., 48th St., and Woodside Ave. SIA members who may be familiar with the area are encouraged to review, correct, or add information to the manuscript. Those who contribute will receive a final copy. An HO-scale model of the sidings is under construction in Kalis's basement. Info: Suite 600, 1420 Spring Hill Rd., McLean, VA 22102; (703) 734-6800; e-mail: nkalis@bellatlantic.net.

The *Duluth News Tribune* (Oct. 8) reports that the **Lake Superior Marine Museum Assn.** recently moved its collection of historical photos, charts, plans, and imprints from the U.S. Army Corps of Engineers Lake Superior Maritime Visitors Center in Duluth to Jim Dan Hill Library at the Univ. of Wisconsin-Superior. The collection's books alone fill 400 ft. of shelves. It also includes an estimated 30,000 photographs illustrating the evolution of Great Lakes shipping from sail through steam to diesel, and from schooners through whalebacks to modern lakers. Those who attended the SIA 2000 Annual Conference in Duluth may recall that Patrick Labadie gave a slide pre-

sentation featuring many of these images. He oversaw the collection's growth during the 25 years he directed the maritime museum. Finding a permanent home for the collection was one of his goals before retiring early last year. The library will provide a safe, archival environment, and the collection will be more accessible to researchers.

Rolling and Slitting Mill Query. Dick Vara is researching a mill that operated from 1818 to 1830 in Dover, MA. It produced barrel hoops, nail plates, iron bars, and rods. A 36-ft.-diameter overshot waterwheel supplied power. He is trying to gather as much information as possible on early 19th-c. rolling and slitting mills and on the Dover mill in particular, so that he can build an accurate scale model for the Dover Historical Society. Any assistance or information about similar models at other museums would be greatly appreciated. Info: Dick Vara, 11 Cranberry Lane, Dover, MA 02030; e-mail: rhvara@aol.com. ■

NEWS OF MEMBERS

At the banquet during the SIA 2000 Fall Tour in Sarnia, Ontario, the Ontario Historical Society awarded **Chris Andreae** with the J. J. Stokes Talman Book Award for the best book published in the last three years on Ontario history. Chris's book is *Lines of Country: An Atlas of Railway and Waterway History in Canada* (Stoddart Publishing, 1998). The historical society tries to present the award during a meeting attended by the author's peer group. What better occasion! Chris can provide the book to SIA members at a special price of \$70 Can. or \$50 U.S. (normally \$95 Can. or \$75 U.S. plus shipping). Contact Chris Andreae, 61 Lonsdale Dr., London, Ontario N6G 1T4; fax (519) 473-8323; history@golden.net. The book can also be viewed electronically at <http://http:home.golden.net/~history/index.html>.

The Preservation Alliance of Minnesota has appointed **Bob Frame** its new executive director. The alliance is a statewide non-profit organization, dedicated to safeguarding Minnesota's historic resources. Its programs include technical assistance and workshops, education and advocacy, and historic tours. Bob's photo with the Pillsbury "A" Mill in the background appeared on the cover of the alliance's bimonthly newsletter, *The Minnesota Preservationist* (Sept./Oct. 2000), so we know that his love of IA will carry over into his new work. Bob is a former editor of *SIAN* and currently serves on the SIA Nominations Committee. His new address is Ste. 54, 275 Market St., Intl. Market Sq., Minneapolis, MN 55405; (612) 341-8140; e-mail: frame@alum-ni.ksg.harvard.edu.

Allen W. Hatheway, professor of geological engineering at Univ. of Missouri-Rolla, has taken early retirement. He continues his work as a consultant specializing in expert testimony related to former gas plants and other coal-tar sites. His book on that subject is now in press with Marcel Dekker Publishers.

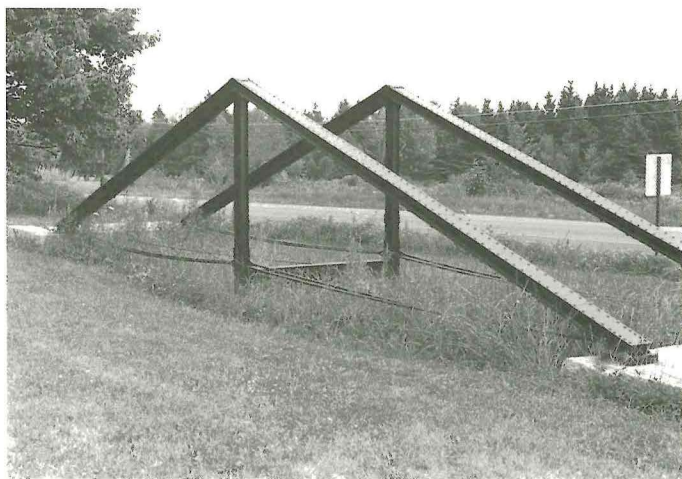
Bode Morin has started a new preservation and development job at Detroit's Historic Fort Wayne, a military complex (with some industrial connections) dating to the 1840s. The site is part of the Detroit Historical Museum. Bode leaves his position at Sloss Furnaces in Birmingham, where among many accomplishments he organized the SIA 1999 Fall Tour and served as the first president of the Southern Chapter. ■

SITES & STRUCTURES

Local preservationists rescued a 1915 steam-powered **cotton compress**, nearly three stories tall, from the rubble of the Napoleon Ave. wharf in New Orleans in Aug., reports James Guilbeau [SIA]. The group raised \$20,000 to buy the compress and have it removed from the warehouse before the owner sold it for scrap. If everything goes as planned, the compress will become an exhibit at the new state history museum in Baton Rouge, scheduled to open in 2003.

The newly inaugurated National D-Day Museum, also in New Orleans, reports the acquisition of a rare artifact, an **LCS Mark II landing craft**, manufactured by the city's Higgins shipyards in 1944. The 36-ft. long craft was found in poor condition near San Francisco. The museum trucked it back to New Orleans for restoration and eventual exhibition. The LCS, or landing craft support, is one of several hundred produced by Higgins. Its function was to go ahead of the troop carriers and combat enemy defenses at the shoreline. It has armor plating on the sides, an armored cabin on top, and would have been equipped with four Browning machine guns, two rocket racks, radio equipment, and a smoke generator to hide the troop carriers coming to shore behind it.

Patrick Hansbarger



A late-19th-century, metal kingpost truss bridge graces the roadside on US 2 near Palmyra, ME. Everett Barnard, Maine DOT's bridge maintenance engineer, recognized the small bridge's historic significance and salvaged the simple truss from the scrapyard. He replaced damaged cover plates and rivets, and provided the rare truss a new home on the front lawn of the state maintenance yard in Palmyra. Good job!

The 1855 **Lake Park Lighthouse** in Milwaukee is at the center of a preservation controversy according to the *Milwaukee Journal Sentinel* (Nov. 27). One faction wants to restore the abandoned lighthouse and adjacent keeper's quarters as a museum, while another wants to move it. The lighthouse is in the residential Lake Park neighborhood, designed in 1891 by Frederick Law Olmsted, and some residents fear that a history museum will attract unwanted tourist traffic. The controversy has pitted preservationists against each other. The federal government has pledged to transfer the decommissioned and deteriorated lighthouse to the county government if a preservation plan can be worked out.

The *Milwaukee Journal Sentinel* also reports on an unusual industry that survives in the city. **DESCO Corp.**, est. 1937, makes the bulbous metal deep-sea diving helmets used by the U.S. Navy and featured in the recent movie, *Men of Honor*. The company is the only manufacturer of historically accurate diving equipment surviving in the U.S. Besides copper and brass helmets, it also produces breast plates, belts, shoes, knives, and other gear. During World War II, DESCO employed upward of 150 men and women and turned out 3,000 Mark V helmets in about three years. Today, it employs five workers and sells about 40 helmets per year to collectors and historic diving enthusiasts. It is still running the machine tools it used 50 yrs. ago.

The **Institute for the History of Technology & Industrial Archeology (IHTIA)** at WV Univ. in Morgantown reports on several important documentation and preservation projects in its latest newsletter (v.10,1). Institute staff has been working with a local preservation alliance to develop a preservation plan for the **Bretz Coke Oven Complex** in Preston, WV. The Elkins Coal & Coke Co. constructed the National Historic Landmark in 1904-05. It is one the best preserved banks of beehive coke ovens in the region. In May, an IHTIA recording team documented the engine house at the **Oxford Furnace**, Oxford, NJ. Oxford was the site of several notable technological innovations in iron smelting, including the first American use of hot blast in 1835. The site has been previously recorded, but little was known about the hot blast operation. Staff will produce an isometric process drawing showing how hot waste gas was diverted from the iron furnace to produce steam that powered the blowing engine.

IHTIA is researching the history of Ohio's **Muskingum River flood control system**, a series of fourteen dams and reservoirs built with Public Works Administration funds from 1935 to 1938. A National Register nomination will be prepared. IHTIA is also working on a Geographic Information Systems (GIS) database featuring 19th-c. engineering works and other structures documented by HABS/HAER along the Potomac River.

Architectural plans to redevelop the historic **Washburn-Crosby A Mill** on the Minneapolis waterfront are nearly complete, according to the Minnesota Historical Society's newsletter (v.9,4). The society will adaptively reuse the mill as a museum, education center, and office building unlike any other. The museum will have an eight-story ride in a "Flour Tower," a 40-seat elevator-style theater that will move visitors up through exhibits. An observation deck on the roof will offer spectacular views. Exhibits will focus on flour milling, waterpower on the Mississippi, and regional economic development, immigration, railroads, and agriculture. The architect has left in place as much of the flour bins, milling machinery, the engine house, rail line, and wheat house as possible. The mill, once the largest in the world, was built in 1878. Fire significantly damaged it in 1991 and 1998.

Blaenavon Industrial Landscape, S. Wales, U.K., is now on the prestigious World Heritage List by vote of UNESCO's committee in Nov. The collection of coal and iron mines, quarries, a primitive railway system, furnaces, and workers' houses is a remarkably complete 19th-c. industrial landscape. The World Heritage List is expanding, but industrial sites yet are underrepresented. The list now has 690 sites of all types in 122 countries. The committee uses a criterion of "exceptional universal value" to accept nominations to the list. Web site: www.unesco.org/whc/ ■

2001

Mar. 2-12: SIA Study Tour to the Ruhr, Germany. 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 Sq., Easton, PA 18042; (610) 559-6626.

Apr. 18-22: Society of Architectural Historians, Annual Meeting, Toronto, ON. Info: www.sah.org.

Mar. 31-Apr. 1: Fourth Biennial Symposium, Latrobe Chapter, Society of Architectural Historians, Univ. of Maryland, College Park, MD. Topic: John Joseph Earley: Expanding the Art & Science of Concrete. Info: Jere Gibber, Conference Coordinator; (703) 768_6987; jgibber@aol.com; www.artnouveau.org/latrobe.

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

Apr. 25-29: Vernacular Architecture Forum, Newport, RI. Panel discussion: history and historic preservation along America's Atlantic Rim. Tours: colonial and early national period architecture, early textile factories and mill villages in the Blackstone Valley, Native American building practices, Mashantucket Pequot Museum. Info: John Vaughan; vafinfo@aol.co; www.VAF2001.org.

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

May 10-13: SIA 30th Annual Conference, Washington, DC. Hosted by the Montgomery C. Meigs Original Chapter. All SIA members will receive registration materials in the mail. Info: Christopher Marston, HABS/HAER, (202) 343-1018; christopher_marston@nps.gov; or Dean Herrin, (301) 624-2773; dher-rin@fcc.cc.md.us.

May 30-June 2: Society for Commercial Archeology, Annual Conference, Indianapolis, IN. "Cars and Commercial Crossroads." Info: Sue Fischer, (317) 639-4534; SCANewsEd@aol.com; www.sca-roadside.org.

June 1-3: Railway & Locomotive Historical Society, Annual Meeting, Jacksonville, FL. Info: Box 997, Sacramento, CA 95812; 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 Assn. (see below). Info: Richard Williams, TICCIH Mining Section, Industrial Heritage Consultancy, Poldark House, Poldark, Wendron Cornwall TR13 OER, U.K.; phone +44 1326 573173; heritage@eurobell.co.uk.

June 14-17: Mining History Assn., Annual Meeting, Butte, MT. Info: MHA, Box 150300, Denver, CO 80215; www.lib.mtu.edu/mha/mha.htm.

Aug. 17-24: Assn. for Industrial Archaeology, Annual Conference, Cambridge, U.K. Info: AIA Office, School of Archeological Studies, Univ. of Leicester, Leicester, U.K. LE1 7RH; AIA@le.ac.uk; www.industrial-archaeology.org.uk.

Sept. 1-10: SIA Study Tour to Cornwall, England. Optional pre-excursion to the Great Dorset Steam Fair, Aug. 30- Sept. 2. Info: Bierce Riley, 19 Budd St., Morristown, NJ 07960; (973) 455-0491; bierce.riley@worldnet.att.net.

Sept. 13-16: 3rd Colloquium on the Preservation of Industrial Heritage, TICCIH-Chile, Santiago, Chile. Industrial archeology, conservation case studies, papers and tours. Info: Tel/fax (56-2) 3364 2113; conpalch@entelchile.net. ■

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