

# SOCIETY FOR INDUSTRIAL ARCHEOLOGY

## NEWSLETTER

Volume 20

Winter 1991

Number 4

*Deadwood, S.D., Oct. 9-12, 1991*

### SIA Fall Tour finds IA gold in the Black Hills



SOUTH DAKOTA  
CONTRASTS.

*Left:* SIA tour bus atop the world's largest earth-fill dam, Belle Fourche Dam (1910), which extends more than a mile across a virtually treeless valley. A. Eisenpress photo.

*Below:* Busy Main Street, Deadwood. Income from the recent legalization of gambling has permitted the city to completely replace water and sewer pipes, turning Main Street into a major construction zone. A gambling-funded city archeologist monitors the work. M.D. Hamilton photo.

If you saw the Academy Award-winning movie "Dances With Wolves," which was filmed in western South Dakota and the Black Hills, you have some idea of the magnificent country that served as the backdrop for the 1991 SIA Fall Tour, October 9-12. Our base was Deadwood, the historic mining community of the Old West made famous by Wild Bill Hickok and Calamity Jane. Although most of us came prepared for the rigors of autumn in the Black Hills, we were pleasantly surprised by four days of sunshine, with crisp nights and daytime temperatures reaching the 70s.

Deadwood boomed following the discovery of gold on French Creek by members of General George A. Custer's expedition. By the summer of 1876, there were 25,000 people there, together with a colorful assemblage of saloons, dance halls, brothels, and gambling halls. As the placer gold became exhausted, many miners left. The storied town, named for the narrow gulch in which it lies, lived on tourism and the Homestake Mine at Lead, three miles away. But it continued to wither away, losing people and jobs.

Two years ago, voters changed the state constitution to allow legalized gambling in Deadwood. Today Deadwood is a tourist destination and gambling is a fever, with slot machines and blackjack tables filling every storefront in a town that, now, never sleeps. Interestingly, part of the profits from gambling are earmarked for the preservation of Deadwood, a National Historic Landmark.

Most flights had arrived in Rapid City by noon on Wednesday, the 9th, leaving plenty of time to explore Deadwood. Some tried their luck at the slots. More athletic types



made the steep climb up historic Boot Hill to **Mt. Moriah Cemetery**, which contains the graves of James Butler ("Wild Bill") Hickok, Martha ("Calamity Jane") Canary, and "Potato Creek Johnny" (John Perrett), a local legend who may—or may not—have found one of the largest gold nuggets ever panned in the Black Hills. (Some old-timers believe the 7-ounce nugget was actually several nuggets melted together.) Still others visited the **Adams Memorial Museum**, a veritable attic of artifacts of Black Hills history, donated to the city of Deadwood by a local benefactor in 1930. Not least of its many fascinating displays were a miniature nudist colony hand-carved by a disabled gold miner and a taxidermic two-headed calf.

In the evening, some sixty of us convened for a wine and





The courtyard horse barn (c1883) at the National Landmark Frawley Ranch. M.D. Hamilton photo.

cheese reception in the historic **Franklin Hotel** (1903). There, we were welcomed by Allyson Brooks, chief tour organizer, and Vince Cole, president of the Deadwood-Lead Area Chamber of Commerce, who described Deadwood's rise, decline, and recent turnabout. After dinner on our own, we adjourned to either the Franklin or the **Bullock Hotel** (1895), at opposite ends of the compact town. All was quiet at the Franklin; outside the Bullock, however, jackhammers and other heavy equipment worked through the night, excavating and rebuilding Main Street to the dismay of tourgoers hoping to get a good night's sleep. Thanks to a busy schedule of activities, by the second night most were too exhausted to hear a thing.

The Fall Tour offered a pleasing balance of natural beauty and industrial sites, the latter focusing on four Western industries: farming and ranching, gold mining, logging, and recreation. Our first stop, on Thursday morning, was the **Frawley Ranch [NHL]** with its handsome courtyard barns, believed to be unique in the U.S. The 5,000-acre beef cattle ranch, one of the largest in western South Dakota, was assembled by owner Henry J. Frawley's grandfather and namesake beginning in the 1880s. The limestone barns—one for horses, the other for cattle—were designed to stay cool in summer, while the courtyards offered the animals shelter in inclement weather. Hank Frawley patiently answered a multitude of questions (after all, most of us were city folk) about the particulars of cattle ranching.

Next stop was **Belle Fourche** (pronounced "bell foosh," meaning "beautiful fork"), one of the earliest irrigation projects of the U.S. Bureau of Reclamation (established in 1902 as the Reclamation Service). Work on the Belle Fourche Project began in 1905 and was completed in 1914, though the irrigation facilities have been continually upgraded since that time. Belle Fourche uses a diversion dam, reservoir, and siphons (formerly flumes) to irrigate a broad valley east of the

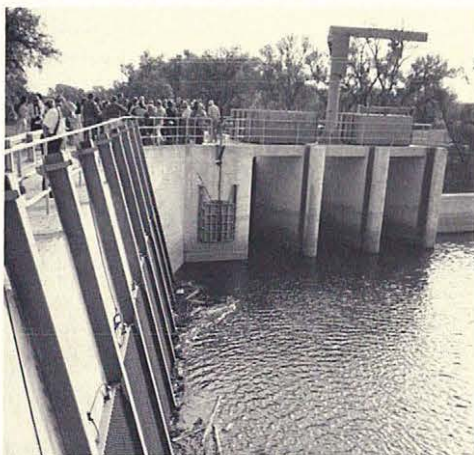
confluence of the Redwater and Belle Fourche rivers in western South Dakota, an area formerly unsuitable for agriculture.

Completed in 1910, the **Belle Fourche Dam [NR, ASCE]** (known locally as **Orman Dam** after the contractor who started the project) is 6,262 feet long and 122 feet high—the largest earth-fill dam in the world. Earth for the dam was excavated by steam shovel and animal power from "borrow pits," then moved to the site by dinky trains. The tour bus stopped at the top of the dam, where spectacular views of the open plain were broken only by clumps of cottonwood and olive trees. Below the dam, remnants of the Reclamation Service construction camp were visible. The Belle Fourche Project irrigates just over 57,000 acres of alfalfa, corn, hay pasture, oats, and wheat.

Following a hearty hot lunch, the bus headed to the **Pope & Talbot lumber mill** in Spearfish. Manager Jim Rarick and his assistants led the group through the state-of-the-art facility, which was rebuilt in 1981 and equipped with advanced computer technology. The mill uses photocells to measure the length, diameter, and shape of the log; a computer then dictates how the log will be sawn to minimize waste. We toured the mill in sequence, watching as the lumber—ponderosa pine, harvested by private contractors from National Forest Service lands in the nearby Black Hills—was sawed, dried, planed, graded, and trimmed. The mill produces 110 million board feet annually, supplying pine for the U.S. repair and remodeling market. Nothing is wasted: shavings and sawdust go to a manufacturer of particle board, while the bark fuels the boiler that supplies heat to the plant and its drykilns.

Next stop was the **D.C. Booth Historic Fish Hatchery [NR]** in Spearfish. Between 1899 and 1983, the hatchery (originally known as Spearfish Station) produced millions of fish for Western states. The facility is named for D. C. Booth, superintendent of the Spearfish Hatchery from 1899 to 1933, who played a key role in the early development of

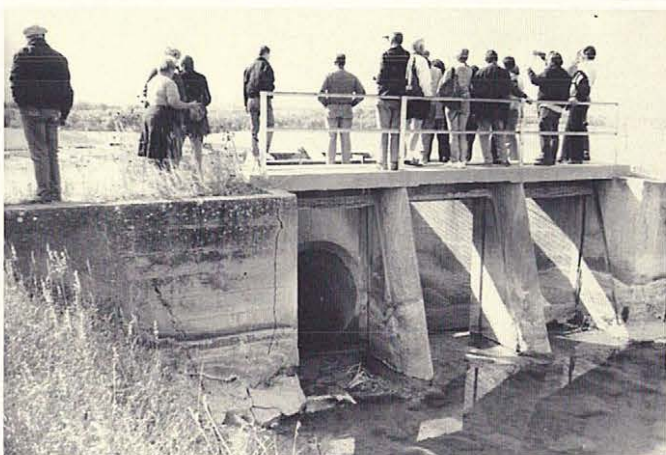
The D.C. Booth Historic Fish Hatchery complex at Spearfish. In the foreground are the hatchery raceways. A. Eisenpress photo.



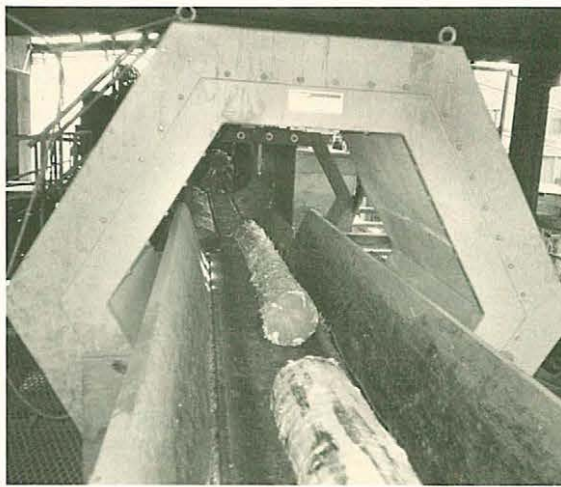
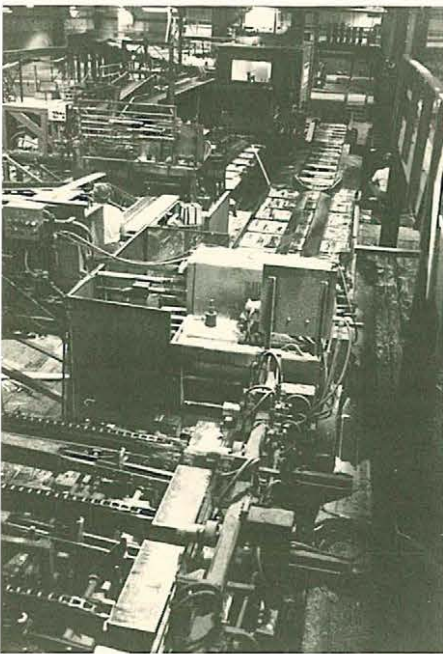
BELLE FOURCHE IRRIGATION PROJECT.

Left: Trash racks and outlet at the Belle Fourche diversion dam. A. Eisenpress photo.

Right: Standing over a siphon that probably was built between 1907 and 1909. With a fall of 75 ft., it carries water more than a mile across the valley. M.D. Hamilton photo.





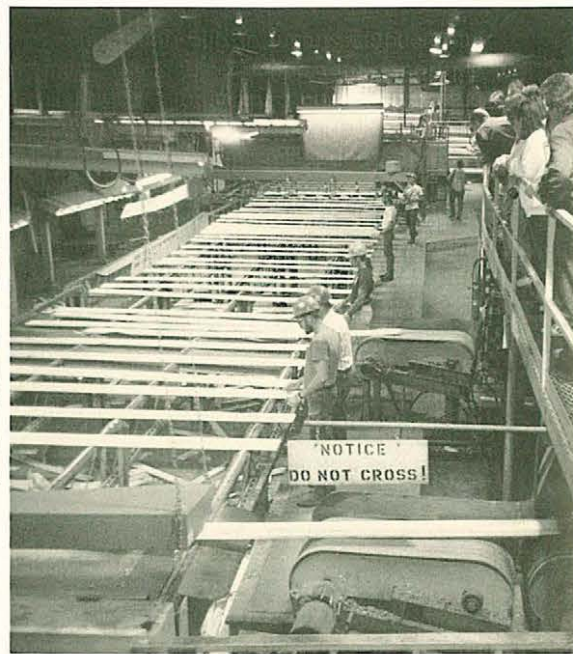


POPE & TALBOT MILL.

*Left:* Overview of the plant, where lasers measure each log and computers calculate its optimum use and cut. Robotic manipulators handle the work throughout the process. *M.D. Hamilton photo.*

*Above:* Logs leave the debarker (at rear) and pass through this metal detector.

*Right:* Quality control staff inspect the lumber. *A. Eisenpress photos.*



Western fishery resources. Following a tour of the Superintendent's House of 1905 and the National Fish Culture Hall of Fame and Museum, we enjoyed coffee and donuts in the former hatchery building, now a museum.

Our final stop of the afternoon was the **Homestake Mining Co. Hydroelectric Plant No. 2**, located in beautiful Spearfish Canyon. (The memorable winter camp scene, at the end of "Dances With Wolves," was filmed here.) We then headed back to Deadwood for a quick dinner on our own (and, for many, a stop at the drug store for Chapstick to combat the dry mountain air) before journeying by bus to **Mount Rushmore National Monument**. There, the visitors' center, normally closed at that hour, was specially opened for our group.

Intermittently between 1927 and 1941, the likenesses of four American Presidents—George Washington, Thomas Jefferson, Abraham Lincoln, Theodore Roosevelt—were carved

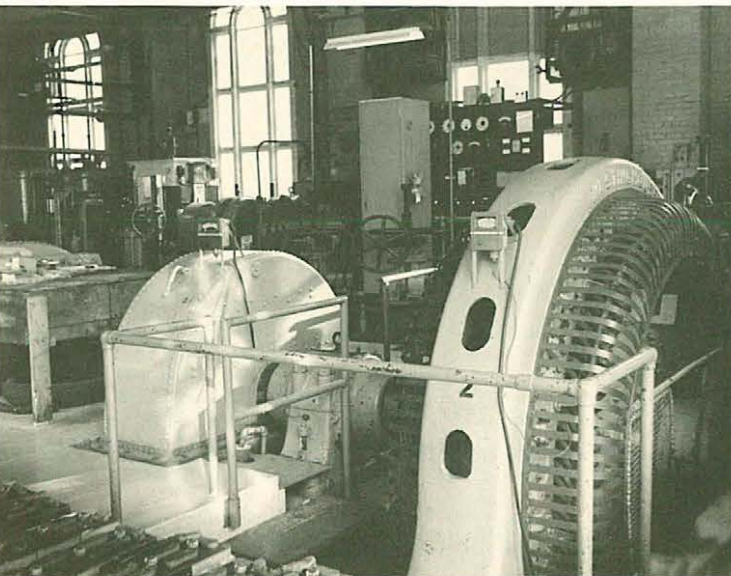
by a crew of up to 35 men working under the supervision of sculptor Gutzon Borglum. The nighttime views of the monument, especially as the bus wound its way slowly up the mountain, were spectacular. Less exalting was a canned, supernaturalistic video—"Four Faces on a Mountain"—and pep talk by park ranger Faye Walmsley, capped by a group singing of the national anthem.

Friday morning was devoted to touring the operations of the **Homestake Mining Co.** in the mile-high city of Lead (pronounced "leed" and named after an outcropping of ore on the earth's surface that leads to an underground ore body). Homestake, with the largest underground gold mine in the Western Hemisphere and the longest continually operated gold mine in the world, mines both underground and from an open cut. According to Homestake guide Scott Zieske, some 1,300 employees produce 1,000 ounces (or about 22 400-ounce bars) each day, working, on average, 6 to 7 tons of rock

#### HOMESTAKE MINING CO. HYDROELECTRIC PLANT NO. 2.

*Right:* The exterior of the hydroelectric plant, located in scenic Spearfish Canyon. *A. Eisenpress photo.*

*Below:* The plant interior, still in operation. *M.D. Hamilton photo.*





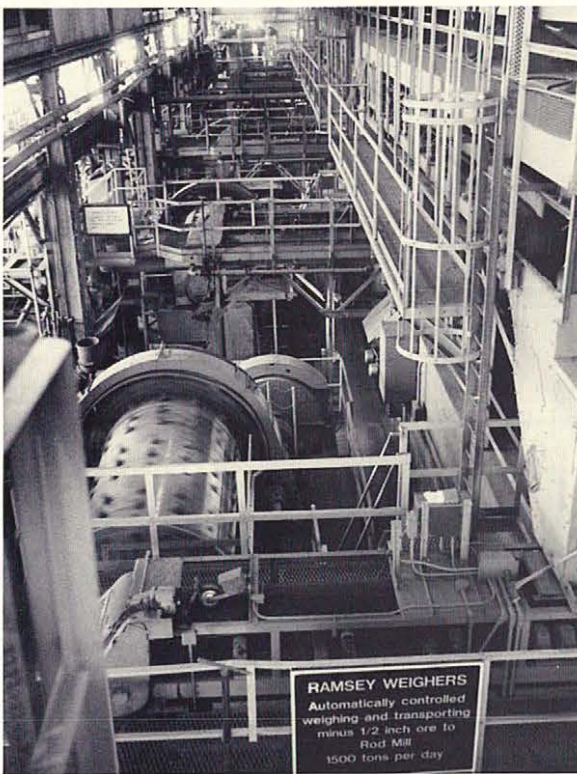
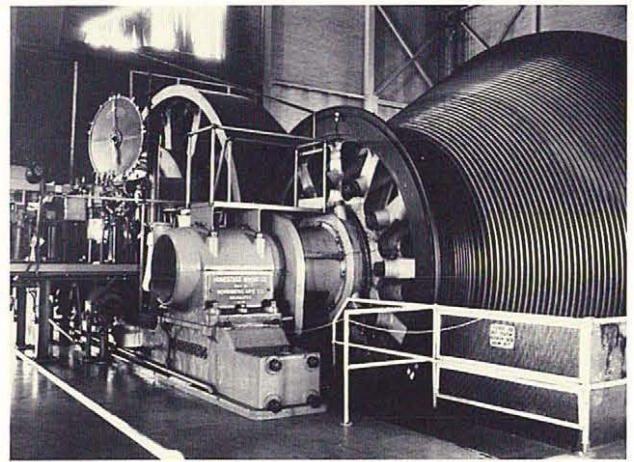
HOMESTAKE MINING  
CO.

Left: Outside the South Mill.  
*A. Eisenpress photo.*

Left below: Inside the South Mill. Rod mills, in foreground, reduce the gold ore to the size of sand.

Left bottom: The "open cut" mine, on the site of the original 1876 gold discovery.

Right: The main hoist at the Yates Shaft Headframe. Installed in 1940, this Nordberg hoist uses two 1,500 HP DC motors. The shaft extends to 5,000 ft.  
*M.D. Hamilton photos.*



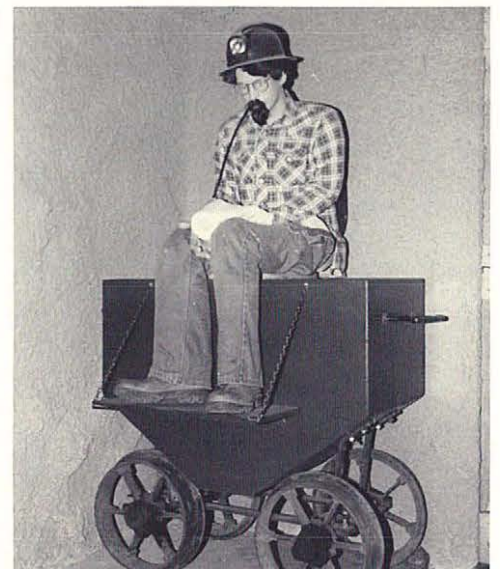
to yield a single ounce of gold. The closely built, picturesque city clings to the hillsides; street signs—"Historical English (Finnish, Italian, Slavonian) Neighborhood"—identify the ethnic heritage of the miners.

Our first stop at Homestake was the **Yates Shaft Headframe**, a major surface shaft extending to a depth of over 5,000 feet, completed in the late 1930s. Four **Nordberg hoists**, built in 1939, raise and lower the cages and ore conveyances, or skips, in the shaft. We saw the **Crusher Room**, where blocks of ore up to 30 inches are reduced to pieces one inch or less, and the nearby **South Mill**, where rod and ball mills grind the ore into the consistency of sand prior to processing. Finally, we traveled into the yawning gash of the **Open Cut**, site of the original Homestake discovery by Fred and Moses Manuel in 1876. Between 1876 and 1945, 40 million tons of gold ore were mined from the Open Cut. Homestake resumed open-pit mining of this area in 1985 and expects to work it for another 20 years.

Pasties, the traditional (Cornish) miner's lunch, were served at the **Black Hills Mining Museum** in Lead. The museum features a simulated underground level of the Homestake Mine with 20 full-size displays illustrating drilling and blasting techniques, powder and cap magazines, mine locomotives and ore cars—even the "red wagon" miners use to take care of personal business. (Today the red wagons sport a curtain in deference to the many women who work underground.)

The extraction of seemingly minute quantities of gold from massive quantities of rock was underscored by an afternoon

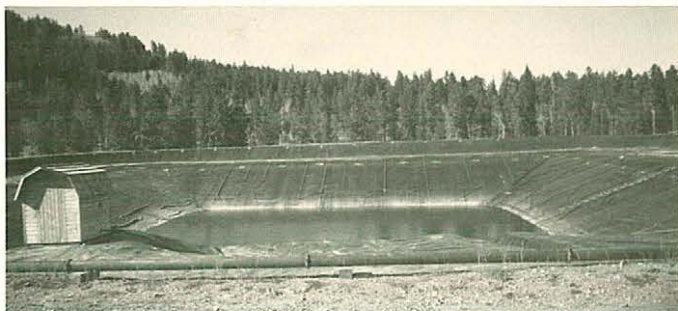
On exhibit at the Black Hills Mining Museum in Lead is an original "red wagon." Here, its proper use is demonstrated for the uninitiated. *M.D. Hamilton photo.*







Wharf Resources' heap-leaching process creates an immense pyramid (above) of crushed, previously mined, gold-bearing rock. A solution of 100 ppm of sodium cyanide is passed through the "heap" to leach out the gold. The solution is collected and the gold retrieved. Below is the cyanide neutralization pond. *Hamilton & Eisenpress photos.*



visit to **Wharf Resources' Annie Creek/Foley Ridge Mine**, a modern "heap leach" operation located in the historic Bald Mountain mining district where over 30 small mines once operated. Wharf Resources crushes previously mined (and discarded) gold-bearing rock to approximately 2-inches in size, then heaps it atop a specially engineered pad. For a period of 17 months, the huge piles are sprayed with a dilute cyanide solution. The cyanide solution percolates through the pile, extracting the gold. The solution is recirculated; the spent ore, meanwhile, is rinsed, removed, and disposed of.

Our final visit of the day was to the ghost of the **Bald Mountain Mill**, which operated from 1928 until 1959 and still stands, an almost perfect shell of its onetime self. There, Paul A. Miller, former superintendent of the Bald Mountain Mining Company, described the milling and "roasting" (by cyanidation) of refractory ores previously believed to be impossible to treat. Tourgoers gathered for the traditional group photo before heading back to Deadwood.

An evening banquet at the atmospheric Franklin Hotel closed the official tour program. Guest speaker Prof. David Miller, of Black Hills State Univ. in Spearfish, presented a humorous overview of mining in the Black Hills, describing Mount Rushmore, indecorously, as "the most profitable surface mine in Black Hills history." (Indeed, by mid-October, more than 2.5 million people had visited the monument in 1991, and the traffic has spawned a garish clot of motels and

souvenir shops in nearby Keystone.) In a more serious vein, Prof. Miller reflected on technology's impact on Black Hills history.

As the majority of participants were not leaving South Dakota until Sunday, tour organizers planned a full day of post-tour activities for Saturday. In the morning, there were two options: a walking tour of Deadwood's historic architecture or visits to the underground **Broken Boot Gold Mine** and the now-abandoned **Homestake Mining Co. slime plant** in Deadwood. Slime, or "fines," contain a significant amount of gold packed too tightly for the cyanide process to recover. Mining engineer Charles Merrill developed a clarifying filter, slime press, and sluicing system which successfully recovered gold from the slime. The plant operated from 1906 until 1973. Joel Waterland, a 40-year veteran of Homestake and author of a recently published history of mining in the Black Hills (*The Mines, Around and Beyond*), accompanied the group into the Broken Boot Mine, first tunneled in 1890, imparting his vast experience and dry wit in equal measures.

The afternoon was devoted to non-IA pleasures, especially the incomparable scenery of the northern Black Hills. Bus driver Rex Schreckenghaust, who had accompanied us throughout the tour, assumed guide duty, taking us, first, back

Ruins of Bald Mountain Mill at Trojan. The mill used the all-sliming, continuous current decantation cyanide process and could handle 350 tons of ore per day. It closed in 1959. *M.D. Hamilton photo.*







Left: Fall Tour veterans pose for a group portrait at the Bald Mountain Mill ruins.

Above: While in town, Dorothy helps raise more historic preservation money for Deadwood. A. Eisenpress photos.

to **Mount Rushmore** for a daytime glimpse of the monument (it is more impressive then), then to **Crazy Horse**, a massive mountain-carving-in-progress initiated by sculptor Korczak Ziolkowski at the request of the Lakota tribe (and now carried on by the Crazy Horse Memorial Foundation), which someday will surpass Mount Rushmore in size. On, then, to a breathtaking drive on the Needles Highway (SD Hwy. 87) with its solid granite upthrusts (including one with a great slit, suggesting the eye of a needle), and into **Custer State Park**, comprising 73,000 acres of spectacular terrain and abundant wildlife. We were among the very few tourists on the 18-mile Wildlife Loop Road, allowing Rex to stop the bus repeatedly as we spied bison, long-horned sheep, elk, mountain goats, prairie dogs, and other animals. Easterners, especially, were delirious with wonder. Rex, our ever-patient driver, answered an unending stream of questions about Black Hills flora and

fauna.

At nightfall, we made our way to Rapid City to spend our final night at the historic **Alex Johnson Hotel** (1928). The guest rooms have been "remuddled" Ramada-style, but the lobby, with its massive timberwork and Native-American decoration, was redolent of the Old West. Following a farewell reception, many of us adjourned for dinner in the hotel. Some couldn't resist the opportunity to try buffalo steak, but pronounced it "tough"; local trout proved the better bet.

To Allyson Brooks and Jim Wilson of the South Dakota Historical Preservation Center are due the 1991 Fall Tour's unrivaled success, as well as: Jeff Buechler, Jeanie McCallister, Dana Vaillancourt, Kerry Lippincourt, Kimball Banks, Mark Wolfe, and Ann Wilson. To all, thanks for a truly memorable tour.

C.P.M.

## NOTES & QUERIES

**STOP PRESS—BODIE IN DANGER.** The fragile ghost town of Bodie, Calif. [NHL], which contains one of the most intact collections of mining community structures in the U.S., is under assault from several directions—modern mining, toxic leaks, and financial difficulties [see lead story in the Natl. Trust's *Preservation News*, July/Aug. 91]. The "Bodie Protection Act of 1992" has been introduced in Congress and its passage is a critical step in the struggle to save Bodie. For info. on ways to help save Bodie, contact the Calif. State Park Rangers Assn., POB 292010, Sacramento CA 95829-2010 (916-383-2530).

**MINING HISTORY CONF.** The Mining History Assn.'s 3rd Annual Meeting will be June 4-6, 1992, at Boise State Univ. in Idaho. The agenda includes: June 4, workshops on

mining museums and the historic preservation of mining sites; June 5, paper sessions and banquet; June 6, paper sessions and tour to Idaho City led by local historical society members and the Forest Service, which recently built a visitor center and is inventorying and preserving c1860s+ placer mining sites. On June 7 is an optional post-conf., day-long tour to Silver City, including an 1860s gold and silver camp with a modern mining tour (heap leach plant) within the historic mining landscape. For program info., contact Ronald C. Brown, Dept. of History, Southwest Texas State Univ., San Marcos TX 78666-4616.

The **Mining History Assn.** is a relatively recent organization that sponsors annual meetings with papers and tours, publishes a meaty newsletter, and has plans to initiate an annual mining history journal. Membership dues are \$10. Info.: Robert L. Spude, MHA, POB 150300, Denver CO 80215.





*Above: On the morning after the fire, Pittsfield residents view the gasholder's damaged roof and ventilator. The building was demolished a month later. Joel Librizzi photo courtesy of the Berkshire Eagle.*

## Pittsfield gasholder burns

An early morning fire of unknown origin severely damaged the 1873 gasholder house in Pittsfield, Mass., last Sept. 5. Called a "million dollar fire" by one official, it also destroyed the offices, computers, and records of the Berkshire County Assn. for Retarded Citizens (BCARC). Newspaper reports the next day indicated that, despite heavy damage to the interior and roof, fire officials felt that the thick brick walls remained structurally sound. A month later, however, the building suddenly was demolished, possibly in anticipation of efforts to save it. The property is owned by Omega Corp., which leases it to BCARC, now operating out of the former gasworks engine house nearby. Only a flat, ground-level, round concrete base of the gasholder house remains today, where once there was an 18-ft.-deep cellar.

The Pittsfield building was among those described by Mary E. Pyne in "New England's Gasholder Houses" (*IA* 15 (1989): 54-62). According to Pyne, it was designed by architect Charles T. Rathburn for the Pittsfield Coal & Gas Co. The original conical roof, later covered with asphalt shingles, was topped with a small ventilator. Original tank capacity was 85,000 cu.ft., making it the third-largest of the 13 New England gasholders described by Pyne. After its gasholding days, the building saw many uses, including furniture and automobile storage, a bakery, and a stop-smoking clinic. Just before BCARC moved in, it was under consideration as a restaurant. One owner's refusal to replace the asphalt shingles with slate, as it originally had been, reportedly disqualified the structure's nomination to the National Register of Historic Places.

V.R.R.

*Below: The gasholder house and its neighbor, the engine house, in happier days. The engine house has been converted to apartments. Vic Rolando photos.*





## NOTES & QUERIES

**INDUSTRIAL COLLECTIONS WORKSHOP.** The Intl. Institute for Conservation—Canadian Group is presenting a “Standard Threads: Industrial Collections Preservation Workshop, May 26-28, 1992, at the Natl. Museum of Science & Technology, Ottawa, Ont. The three-day session is a prelude to the IIC-CG annual conf., which begins May 29. Presentations will include a cross-section of approaches and techniques, with an emphasis on machinery finishes as fragile records of industrial technology. There will be a trade fair, demonstrations, and a session on casting reproduction parts. Particular presentations will include “Salvaging Yukon Dredge No. 4,” “Restoration Planning for Hamilton Steam Pump,” “Development of Machinery Finishes,” “Aircraft Finishes,” “Lubrications Overview,” “Storage of Historic Batteries,” “Corrosion Dynamics,” “Wax Coating for Outdoor Metals,” “Durable Restoration Finishes,” “Acid Cleaning of Ferrous Metals,” “Carriage Preservation,” “Rolling Stock Restoration,” and “Mothballing/Restoration of Aeroplanes.” There will be an open house at the restoration shops of the Natl. Aviation Museum, and tours of the Canadian Conservation Institute, and facilities of the Canadian Parks Service. Registration is limited. Contact ASAP: Workshop May 26-28, POB 9195, Ottawa, Ont., Canada K1G 3T9.

**INTL. HISTORIC BRIDGES CONF.** An international conference on the rehabilitation of historic bridges is scheduled for Aug. 27-29, 1992, in Columbus, Ohio. Jointly sponsored by the Civil Engineering Dept., Ohio State Univ., and the Historic Preservation Div., Ohio Historical Soc., this is the fourth in an ongoing series bringing together the divergent views of highway engineers and historic preservationists. Issues of safety and durability will be discussed, as well as special techniques necessary to preserve historic engineering structures. Planned to coincide with the quincentennial of Columbus's landing in the New World, the conference will include speakers from North America and abroad.

The two-and-a-half-day program will include, among others, papers on the construction and restoration of the 1779 Ironbridge, the world's first major iron bridge; the analysis and repair of masonry-arch bridges worldwide; and covered bridge restoration in the U.S. and Europe. Along with formal paper sessions, an on-site symposium of rehabilitation techniques will take advantage of the international perspectives present. Info.: Betsy Lindsey, Dept. of Civil Engineering, OSU, 2070 Neil Ave., Columbus OH 43210 or David A. Simmons [SIA], OHS, 1982 Velma Ave., Columbus OH 43211 (614-297-2365).

On Weds., Aug. 26, there will be a pre-conf., day-long seminar, “Upgrade or Remove,” focusing on the rehabilitation of historic bridges and designed for engineers and others involved in historic bridge work. It will be conducted by Eric DeLony, chief of HAER, and Abba Lichtenstein, internationally recognized bridge engineer. For info., phone DeLony (202-343-9603) or Lichtenstein (201-796-6550).

**US/UK CONSTRUCTION HISTORY SEMINAR.** A day-long seminar on the transfer of ideas and technology in construction history is slated for Aug. 12, 1992, in London. It is co-sponsored by the Construction History Society and the Panel for Historical Engineering Works of the Institution of

Civil Engineers, both based in England, and the Civil Engineering Interest Group of the Society for the History of Technology (SHOT). The program includes papers from the U.S. and the U.K. Among the U.S. presentations, David Billington will compare four large-scale bridge projects and Jeffry Cody will examine the Fuller Construction Co.'s experience co-operating with Japanese builders in the 1920s. In addition, Sarah Wemeil will compare U.S. and U.K. 19th-C fireproof construction, Patrick Hislop will discuss timber construction in both countries, and Michael Chrimes will examine technical books as a means of transatlantic technology transfer. This is the 10th seminar organized by the Construction History Society. It will be followed by a day of visits to archives and other places of interest in London. Info.: Peter Harlow, Chartered Institute of Building, Englemere, Kings Ride, Ascot, Berkshire SL5 8BJ England; phone Ascot (0344) 23355.

**CANADIAN RR CONF.** The 1992 annual convention of the Canadian Railroad Historical Assn. is scheduled for May 14-18 in Montreal. 1992 is the 60th anniversary of the founding of the CRHA and is the 350th anniversary of the founding of Montreal. There is a full schedule of events:

—Fri., May 15: tour of Youville Shops of the Montreal Metro system; guided trip on the soon-to-be-rebuilt electric commuter line featuring 75-year-old electric locomotives; banquet at Mount Stephen Club, former home of George Stephen (later Lord Mount Stephen, first pres. of CPR and financier of Gt. Northern Rwy. in U.S.).

—Sat., May 16: paper presentations; tour of recently opened McCord Museum of Canadian history, with special exhibit on Victoria Bridge (1854-59) over the St. Lawrence at Montreal.

—Sun., May 17: tour of historic rwy. facilities & other sites in Montreal; visit to Canadian Rwy. Museum at Delson/St. Constant.

The complete package is \$125 members, \$150 non-members. If interested, contact ASAP: CRHA, St. Lawrence Valley Div., C.P. 22/P.O. Box 22, Station B, Montreal, Quebec H3B 3J5.

**IOWA RR CONF.** The Iowa Historic Preservation Alliance will hold a statewide conference May 8-10, 1992, on the preservation of Iowa's railroad heritage. The event will be in Creston, Ia.'s restored 1899 CB&Q depot. The Alliance will bring together RR representatives, transportation officials, historians, preservationists, and “rails-to-trails” groups to discuss issues and alternatives involved in saving the state's historic stations and railway landscape. RR enthusiasts, depot owners, city officials, historical societies, and design professionals are invited to contact the IHPA, POB 532, West Branch IA 52358 or Jan Nash, 906 S. Lucas St., Iowa City IA 52240 (319-351-5156).

**HOMESTEAD CENTENNIAL 1892-1992.** The 100th anniversary of the strike and lockout at Andrew Carnegie and Henry Clay Frick's Homestead Steel Works along the Monongahela River near Pittsburgh will be marked by a series of commemorative events on July 5, 6, and 7. A symposium on “The Lessons of Homestead” will feature noted social and labor historians. Other events will involve the preservation of parts of the historic works and the possibility of establishing a Western Pa. Labor History Museum, Archives, and Research Center. Info.: Russell W. Gibbons, Homestead 1892 Centennial Labor Committee, 108 Bishop Boyle Center, 120 E. 9th Ave., Homestead PA 15120 (412-237-4554).





# SOCIETY FOR INDUSTRIAL ARCHEOLOGY NEWSLETTER

PUBLICATIONS OF INTEREST

A SUPPLEMENT TO VOL. 20, NO. 4

WINTER 1991

Compiled by

John M. Wickre

61 Clapboard Ridge Road, Danbury, Connecticut 06811 (203-730-9532)

## REFRIGERATION

Chronological listing of recent articles published by ASHRAE, with thanks to Bernard Nagengast [SIA]:

B. Donaldson, "Nineteenth Century Heating and Ventilation - The Houses of Parliament, London, and the New York State Capitol, Albany." In *ASHRAE Transactions* 90, pt.2B, 1984, p461-77.

J. McClive, "Energy Management in the Restoration of Wainwright and Guaranty Buildings." In *ASHRAE Transactions* 90, pt.2B, 1984, p478-80.

R. Downing, "Development of Chlorofluorocarbon Refrigerants." In *ASHRAE Transactions* 90, pt.2B, 1984, p481-91.

Jyo Teshima Bridgewater, "Andy Anderson: Hawaii's Refrigeration Pioneer." In *ASHRAE Hawaii* 85, p29-34.

F. H. Faust, "The Early Development of Self-Contained and Packaged Air Conditioners." In *ASHRAE Transactions* 92, pt.2B, 1986 p353-60.

J.R. McClive, "Early Developments in Air Conditioning and Heat Transfer." In *ASHRAE Transactions* 92, pt.2B, 1986, p361-65.

H. K. Steinfeld, "Pioneer Developments in Self-Contained Air Conditioning." In *ASHRAE Transactions* 92, pt.2B, 1986, p366-374.

B. A. Nagengast, "Room Coolers Prior to 1930 and the Technical Impediments to Their Development." In *ASHRAE Transactions* 92, pt.2B, 1986, p375-384.

B. A. Nagengast, "Historic Bathhouse Heating." In *ASHRAE Insights*, 4/1988.

Bernard Nagengast, "A Historical Look at CFC Refrigerants." In *ASHRAE Journal*, November 1988, p37-39.

Lorne W. Nelson, "Residential Comfort: A Historical Look at Early Residential HVAC Systems." In *ASHRAE Journal*, January 1989, p21-26.

"Valves Yesterday and Today... An Historical Perspective." In *ASHRAE Journal* April 1989, P2, p34-35

B. A. Nagengast, "A History of Refrigerants." In *CFC's: Time of Transition*. Atlanta. 1989 American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., p3-15.

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## PATENTS AND INVENTIONS

Special issue of *T&C*, Vol. 32, October 1991

Carolyn C. Cooper [SIA], Guest Editor

Carolyn C. Cooper, [Introduction to issue:] "Making Inventions Patent," p837-45.

Pamela O. Long, "Invention, Authorship, 'Intellectual Property,' and the Origin of Patents: Notes toward a Conceptual History," p846-84.

Christine MacLeod, "The Paradoxes of Patenting: Invention and Its Diffusion in 18th- and 19th-Century Britain, France, and North America," p885-910.

Liliane Hilaire-Pérez, "Invention and the State in 18th-Century France," p911-931.

Steven Lubar, "The Transformation of Antebellum Patent Law," p932-59.

Carolyn C. Cooper, "Social Construction of Invention through Patent Management: Thomas Blanchard's Woodworking Machinery," p960-98.

Kendall J. Dood, "Pursuing the Essence of Inventions: Reissuing Patents in the 19th Century," p999-1017.

Ross Thomson, "Crossover Inventors and Technological Linkages: American Shoemaking and the Broader Economy, 1848-1901," p1018-46.

Steven W. Usselman, "Patents Purloined: Railroads, Inventors, and the Diffusion of Innovation in 19th-Century America," p1047-75.

Larry Owens, "Patents, the 'Frontiers' of American Invention, and the Monopoly Committee of 1939: Anatomy of a Discourse," p1076-93.

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## GENERAL SUBJECTS

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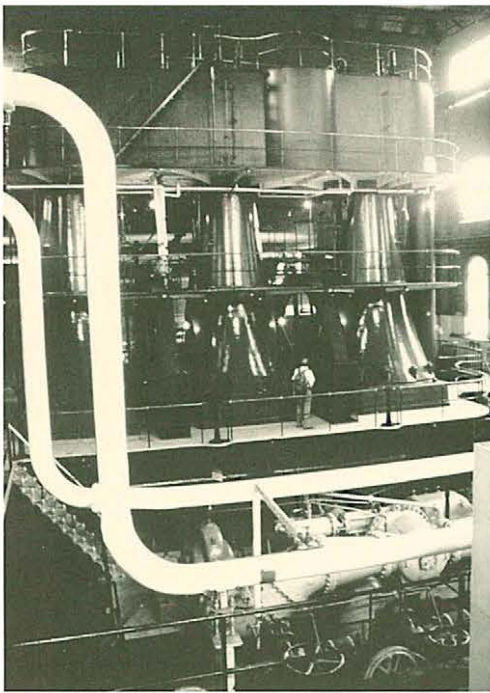
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#### Abbreviations used in this PoFI:

AHR American Historical Review.  
BHR Business History Review.  
CRM [Cultural Resources Management], NPS, POB 37127,  
Wash. DC 20013-7127.  
JAH Journal of American History.  
RRH Railroad History

Readers are urged to send all notices of pertinent publications to John M. Wickre, Compiler, Publications of Interest, SIA Newsletter, P.O. Box 55158, St. Paul MN 55165-0158 or 61 Clapboard Ridge Road, Danbury, Connecticut 06811.





## Hackensack Water Co., county, face preservation options

Last August, the Hackensack Water Co. (HWC) offered to donate to Bergen County, N.J., 47 acres of property, including the company's historic filtration plant and pumping station buildings. Portions of this New Milford facility date to 1882. The county has long had an interest in preserving open space along the Hackensack River, and the gift would provide an opportunity to extend the county's linear park along the river as well as preserving this historic site. A study of the buildings was conducted by Edward J. Lenik [SIA], Sheffield Archaeological Consultants, to assess the site, buildings, and equipment, and make recommendations regarding preservation.

The New Milford Pumping Station stands on Van Buskirk's Island at the head of navigation on the Hackensack River and has a commercial and industrial history dating to the late 17th C. The pumphouse, built in 1882, was designed by Charles Benjamin Brush, who was chief engineer until his death in 1887. A new pump and boiler house was added in 1898, followed in 1911 with an addition for three vertical, high-service, Allis-Chalmers pumping engines, one of which remains today. Later, electric pumps were installed and the plant was partially converted to electric power by the late 1950s. A filtration building was opened in 1906, with a filter design by George Fuller of Hering & Fuller, New York City.

In the late 1920s, the company's sanitary engineer, George Spaulding, experimented successfully with activated carbon in water treatment to remove undesirable tastes and odors. In 1931 activated charcoal became an integral part of the filtration process. Spaulding's technique now is used in systems worldwide.

By 1960, HWC needed to expand the New Milford plant, but its island location limited the possibilities and instead a new plant was built to the north in Haworth. Over the next decade the New Milford facility was phased out and closed completely in 1990.

The surviving buildings contain a variety of historic equipment, all in excellent condition. In addition to the triple-

### HACKENSACK WATER CO.

*Above:* The New Milford Pumping Station. The arched entryway marks the 1898 pump & boiler house.

*Above left:* The one remaining Allis-Chalmers vertical, triple-expansion pumping engine (1912).

*E. Lenik photos.*

expansion pump, there is: a c1900 Ball & Wood DC engine-generator; a 1914 Allis-Chalmers cross-compound centrifugal raw water pump; a 30 mgd DeLaval centrifugal steam-turbine pump (c1928); and filtration equipment.

Preservation has been recommended for at least the 1912 Allis-Chalmers engine and the 1914 pump. The county is expected to announce a decision on acceptance of the gift by June 1992. Info.: Ed Lenik, Box 437, 24 High St., Butler NJ 07405-0437.

*E.J.L.*

## NOTES

**DEATH OF CANADIAN RR HISTORIAN.** The world of Canadian railroad history lost one of its most respected chroniclers with the recent and sudden death of **Omer Lavallee** at age 66. Descended from a railroading family, Lavallee had worked his way up the Canadian Pacific Rwy. Co., becoming head of the newly established corporate archives in 1970. He retired in 1986 from a career marked by the publication of many articles and monographs. One of his early efforts was "Delorimier and Angus," a brief history of the locomotives constructed at these two famous shops in Montreal; ironically, Angus Shops closed permanently a few days before his death. Best known among his major works is the definitive *Canadian Pacific Steam Locomotives*, representing almost 15 years of research. He had recently completed a manuscript on the International of Maine, which awaits publication. Omer's contributions to rail history in Canada and his assistance with artifact preservation were officially recognized in 1988 when he was made a Member of the Order of Canada at a ceremony at Government House in Ottawa.

*R.J.C.*





Pittsburgh in 1906, viewed from the roof of Union Station. The Chautauqua Lake Ice Co. building is the large, multi-story structure at the center of the photo. Photo courtesy Carnegie Library of Pittsburgh.

VIEW WEST FROM ROOF OF UNION STATION  
FROM A POINT ON NORTH SIDE OF BUILDING AT  
MIDDLE DISTANCE FROM EAST END.  
WEATHER CLOUDY-WIND FROM SOUTH EAST  
JUNE 20/1906. 11:05 A.M. N°2764

## From urban ice house to major museum in Pittsburgh

The Historical Society of Western Pennsylvania is finalizing agreements to acquire the former Chautauqua Lake Ice Co. building for reuse as the Pittsburgh Regional History Museum. The c1880, seven-story building served as the offices, ice manufacturing plant, and storage facility for “natural” ice cut from the water of Lake Chautauqua in Mayville, N.Y., and a distribution center for one of the city’s largest ice dealers. This new home for HSWP once housed stables, a water-bottling plant, machine shop, freezing condensers, and, later, smoke houses, with the Wilson Meat Packing Co. purchasing space from Chautauqua’s successor, the Consolidated Ice Co.

A RR spur built by the Allegheny Valley RR enters one corner of the building and may be used to help interpret rail

transportation in the remodeled museum space. Its extant 120-ft. loading dock is long enough for several RR cars. The original cobblestone floor and track remain in place. Much of the original office area is preserved, including wood panelling and a walk-in safe. Beautiful arched brick ceilings cover the first floor.

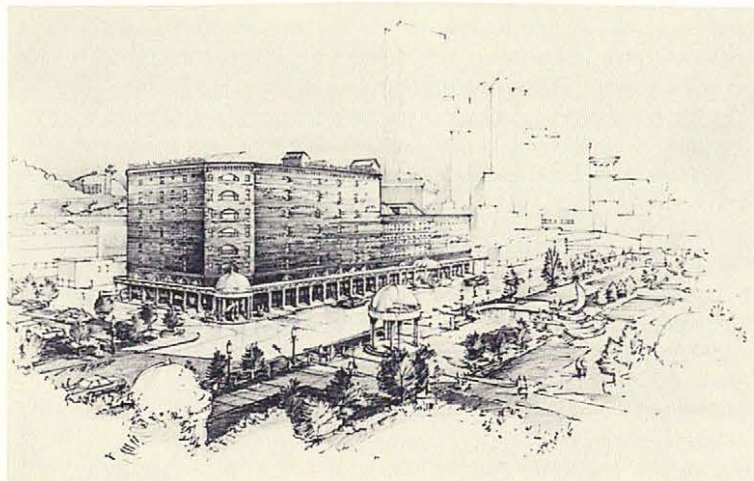
The remodeling plans call for more than 30,000 sq. ft. for exhibits, 30,000 sq. ft. for programs and collections, and 50,000 sq. ft. for library and archives. Total area in the remodeled building will be 160,000 sq. ft. The Pittsburgh Regional History Center is scheduled to open in 1997. Planning of the first core exhibit is under way with the support of an NEH grant.

B.A.R.



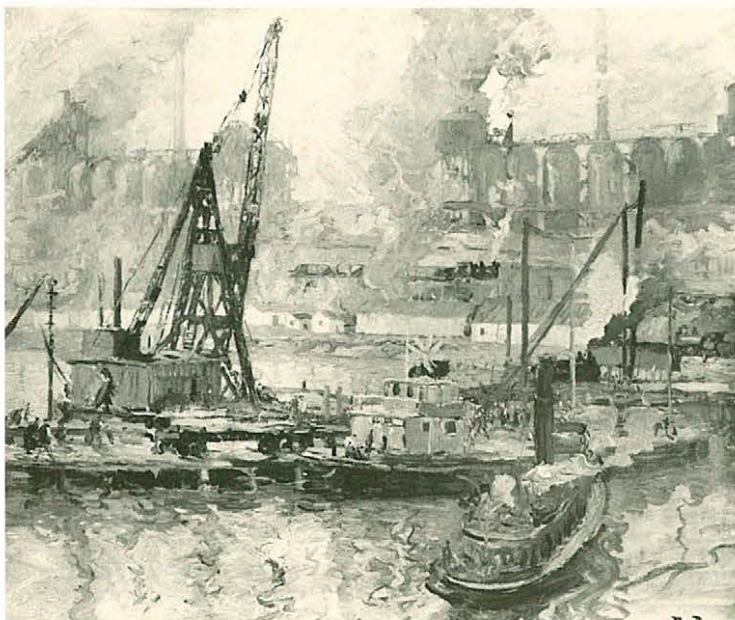
Left: First story detail of Ice Co. building.

Right: Architect’s rendering of proposed adaptation of Ice Co. building to museum. Photo & drawing courtesy Historical Society of Western Pennsylvania.





## “Painting Progress: American Art & the Idea of Technology”



EXAMPLES OF TECHNOLOGY IN AMERICAN ART. Left: Henry Reuter Dahl, *Blast Furnaces*, 1912, oil on canvas. Courtesy Toledo Museum of Art. Right: Russel Smith, *View of Pittsburgh from the Salt Works*, 1843, oil on canvas on board. Courtesy Historical Society of Western Pennsylvania.

Last Oct., the Allentown (Pa.) Art Museum sponsored a symposium based on their recently concluded exhibition, “Painting Progress: American Art & the Idea of Technology, 1800-1917.” Organized by Muhlenberg College’s Jadviga da Costa Nunes [SIA], who also delivered the keynote address, the show’s 52 works visually explored the complexities of America’s industrial and technological development through World War I. Her comments blended political, economic, aesthetic, and social history as she defined a challenging topic from several typological perspectives, including bridges, waterworks, boats, canals, factories, and artisans. Five other scholars from art history, literature, and history further considered the many issues suggested by da Costa Nunes’ exhibition.

Richard D. Brown, Univ. of Conn., discussed the nation’s ever-changing responses to technology in “Tradition Transformed: Nature, Technology, & Humankind in American Painting, 1800-1917.” Significantly, although the views presented by these painters were often highly subjective and selective, they rarely involved social protest, as did photographers Riis and Hine.

Susan Danly, curator at the Pa. Academy of the Fine Arts, in a talk entitled “‘Type of the Modern: Emblem of Motion & Power’: Images of the Railroad in American Art,” explored the connections between the man-made and the natural from the perspective of the nation’s most mythic mode of transportation.

Betsy Fahlman [SIA], Arizona State Univ., in “The Strength & Majesty of Human Labor: John Ferguson Weir & the West Point Foundry,” discussed America’s most forceful delineator of modern industrial history. His powerful foundry paintings were emblematic of contemporary technological attitudes.

Cecilia Tichi, Vanderbilt Univ., explored literary conceptions in “Landscapes, Machines—Taking Possession of the American Scene,” revealing how technology has been integral to the American character since the Colonial period.

Through a careful reading of Emerson and others, she considered the uneasy co-existence of art and machine, observing that gender issues are essential to a full understanding of the decidedly masculine history of American technology.

The program was concluded by Marianne Doezema of the Natl. Endowment for the Humanities, whose “Steaming Streets: The Urban Environment Depicted, Perceived” was focused on the early 20th-C paintings of George Bellows. He frequently depicted topical technological issues, including the excavations for Pennsylvania Station, and she carefully grounded his imagery in the larger popular culture of the period. His bold canvasses reveal a modern chaotic urban industrial metropolis.

An illustrated, 20-page exhibit catalog is available for \$8 from Allentown Art Museum, POB 388, Allentown PA 18105 (215-432-4333, fax 434-7409)



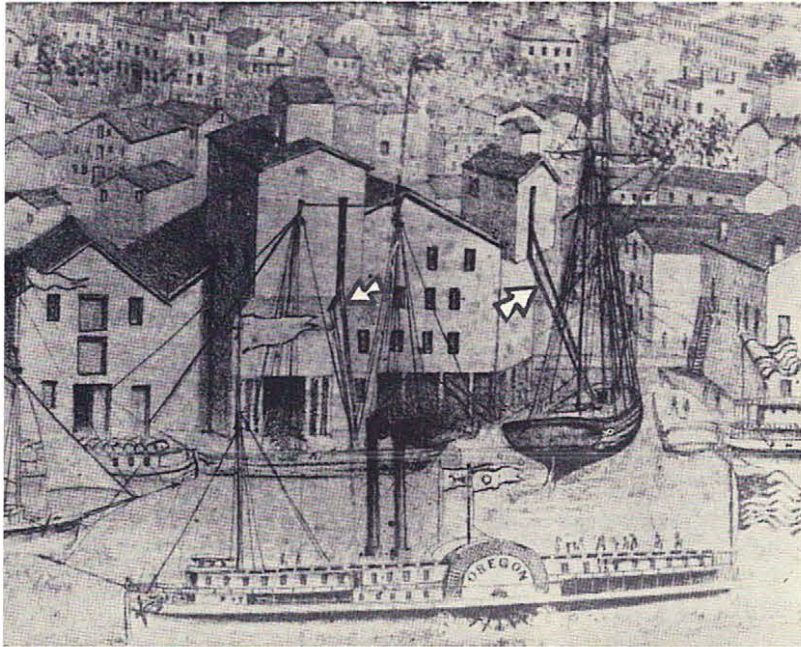
### CONTRIBUTORS TO THIS ISSUE

Carolyn C. Cooper, Hamden, Conn.; R. John Corby, Gloucester, Ont.; Aron Eisenpress, New York City; Betsy Fahlman, Arizona State Univ., Tempe; Michael D. Hamilton, Wash., D.C.; Edward J. Lenik, Sheffield Archaeological Consultants, Butler, N.J.; Richard Longstreth, George Washington Univ.; Dorothy Milek, Thermopolis, Wyo; Carol Poh Miller, Cleveland, Ohio; Alicia Moore, *Fortune*, N.Y.C.; Fredric Quivik, Univ. of Pennsylvania; Victor R. Rolando, Rutland, Vt.; Bart A. Roselli, Historical Society of Western Pa.; Joel Shprentz, Reston, Va.; Paul W. Schopp, Riverton, N.J.; David Simmons, Ohio Historical Society; Robert L. Spude, Denver, Colo.; and Gerald Weinstein, New York City.

With thanks.



## Site of landmark Buffalo grain elevator commemorated



The Dart elevator, located at the junction of the Buffalo River and Evans Ship Canal, is visible in this lithographic view. The two marine legs, both unloading vessels, are indicated by arrows. The legs were part of the elevator after 1846. *Courtesy Buffalo & Erie County Historical Society.*

The Industrial Heritage Committee of Buffalo and the Buffalo & Erie County Historical Society (BECHS) have erected a plaque on the site of the world's first steam-powered transfer and storage elevator. The marker on Buffalo's redeveloping riverfront acknowledges the major role of the elevator and its designers in the development of Great Lakes commerce.

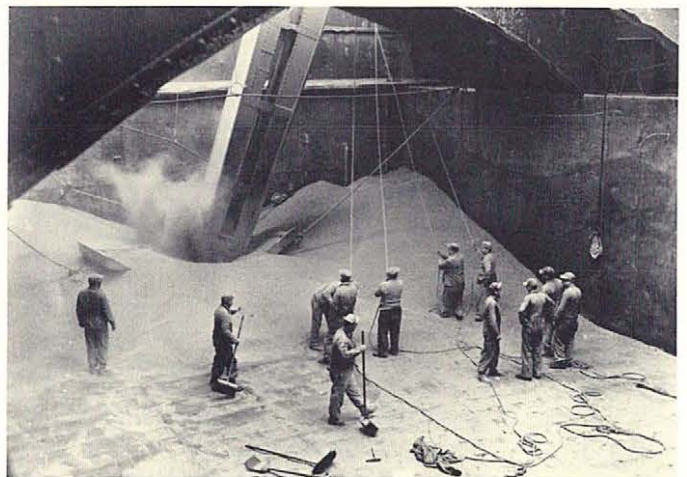
As a distinct type of industrial structure, the archetypal grain elevator resulted from a collaboration between merchant Joseph Dart (1799-1879) and engineer Robert Dunbar (1812-90). Dart acknowledged an explicit debt to the bulk-handling techniques first devised by Oliver Evans; however, it was Dunbar who came up with the characteristic unloading

device, called a "marine leg," for raising grain from a ship's hold into the elevator.

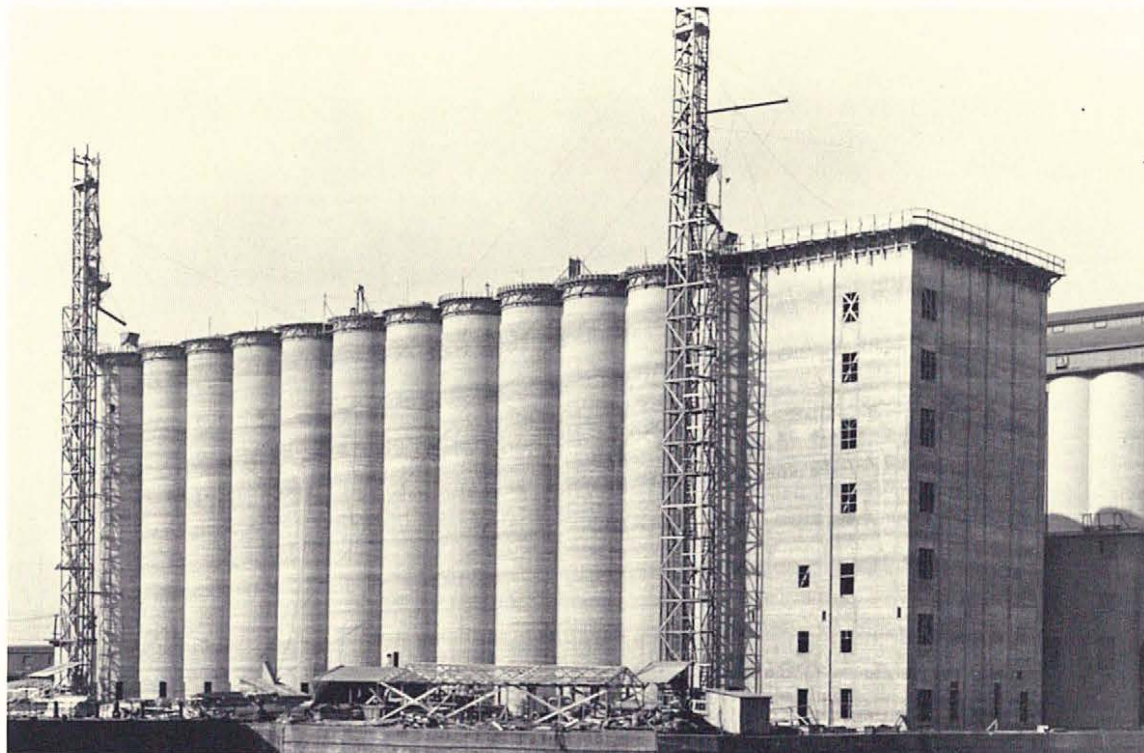
Construction of the Dart elevator commenced during the autumn of 1842 as Western grain imports continued to overflow Buffalo's congested docks. The original daybook charting early operations still survives in BECHS collections. The elevator's initial storage capacity of 55,000 bushels was doubled in 1846 with the addition of a second marine leg. The rate at which vessels could be unloaded—the key feature in establishing the elevator's efficiency—likewise doubled to 2,000 bushels per hour. (By the turn of the century, a fast marine leg would be rated at 20,000 bushels per hour!)

Built of wood, the Dart elevator succumbed to fire during the Civil War. Conspiracy theorists have speculated that Confederate saboteurs had a hand in the unusual rash of wartime blazes that erased several grain facilities from the waterfront.

The Dart elevator marker is located next to the departure point for the harbor boat tour that will be part of the Sunday agenda during the upcoming SIA Annual Conf. in Buffalo. The cruise will pass 14 extant waterfront grain elevators, descendants of Dart and Dunbar's 150-year-old plan for replacing the backs of Irishmen with the power of steam.



Above: By mid-20th-C, the original Dart marine unloading leg had evolved into this large leg. Here, "scoopers" in the hold of a lake boat use cables to control power shovels that move grain to the leg. *Courtesy Agway Collection.*



Left: The GLF Elevator A nears completion in 1941 using slip forms. The "slip form" method of reinforced-concrete construction revolutionized the grain-elevator industry by allowing concrete work to continue non-stop. GLF A was the last free-standing grain storage unit built on Buffalo's waterfront. Workhouses at either end would rise several floors above the bins. *Courtesy Agway Collection.*



**8th INTL. TICCIIH CONF.** The 8th International Conference on the Conservation of the Industrial Heritage will be held in Madrid, Spain, Sept. 16-18, 1992, with optional tours before and after the main sessions. Madrid was selected for The Intl. Committee for the Conservation of the Industrial Heritage (TICCIIH) meeting so it would coincide with the designation of Madrid as the "Cultural Capital of Europe for 1992," as well as with the commemoration of the 500th anniversary of the voyage of Christopher Columbus. Major paper sessions, therefore, will deal with the transfer of technology between Europe and America, including the diffusion of industrial techniques, the organization of labor, and the development of transportation and infrastructure networks. There also will be sessions of 20th-C IA and specialized workshops on building restoration, training and teaching IA, art as a source for industrial archeology, and labor history.

The conf. schedule includes: an optional tour to Barcelona on Sept. 13-15, with visits to industrial Barcelona, industrial Catalan museums, industrial settlements in the Llobregat Valley, and the Museum of Science & Technology of Catalonia; paper sessions, official meetings, and site visits during the main Congress, Sept. 16-18; and an optional trip to Expo '92, Seville, on Sept. 19th.

For additional info., contact The Technical Secretary, Natl. Railways Museum, c/o Paseo de las Delicias, 61; 28045 Madrid, Spain; phone: (1) 527-96-65 (International), 527-31-21 (National), fax (1) 527-31-42.

## LOCAL CHAPTERS

### Update and How-to

Pennsylvania has been the locus of recent growth in the number of SIA local chapters. During the past year, the **Three Rivers Chapter** was formally recognized. Based in Pittsburgh, it embraces southwestern Pa. and W.Va. Christine Davis, Pittsburgh, is the first president. The previous year, two other Pa. chapters were formed: the **Susquehanna Watershed Chapter**, encompassing the central part of the state, and the **Josiah White Chapter**, based in Easton and focusing on the Lehigh Valley.

Other individuals and groups in California and Oklahoma have expressed interest in forming chapters, but so far lack the necessary "critical mass." It isn't difficult to start a chapter. A local group need only hold a meeting to approve a set of by-laws and then send those by-laws to the SIA Board, accompanied by a petition requesting recognition and signed by 12 local members who also are members in good standing of the SIA.

Once recognized, the chapter enjoys considerable flexibility in its activities and must satisfy few requirements. The chapter need meet only twice a year and submit a brief annual report to the Coordinator (who sends a friendly reminder at the beginning of each year). Beyond these minimal requirements, chapters are encouraged to play a local public role in IA advocacy, encouraging the identification, analysis, recording, and preservation of artifacts and sites reflecting our

industrial and engineering heritage. Chapters also help SIA organize fall tours and annual meetings.

The level of activity of local chapters ranges from two or three weekend process tours per year, conducted by a small group like Montana's **Klepetko Chapter**, to an extensive program of events throughout the year by such larger organizations as the **Oliver Evans Chapter** in Phila. and the **Roebbling Chapter** in the greater New York City area.

The Phila. group meets monthly, visiting industrial operations or historic sites during pleasant weather and hosting speakers in the winter. Last fall, for example, members toured the Phila. Navy Shipyard, which was visited during the 1990 SIA Annual Conf. and now is slated for closing under Dept. of Defense cutbacks. This was a great opportunity for new, post-1990 members or others who were busy with the annual affair and missed the tour.

In addition to the usual tours, which have included activated sludge wastewater treatment plants (1990) and a N.Y.C. harbor tour by tugboat (1991), the Roebbling Chapter sponsors an annual IA symposium. Chapters also hold joint functions. The Southern and Northern New England chapters publish a joint newsletter and hold a winter conference together.

Recently, the Coordinator answered a chapter information request from a group in Latvia that wishes to form an organization comparable to SIA. Since that Baltic nation has gained independence, its citizens now have the opportunity to act on their interest in recording and preserving aspects of Latvian IA both before and after the Soviet takeover during World War II.

Local chapters provide many opportunities that the national SIA cannot supply. Not every SIA member can afford to attend national meetings on a regular basis, but local meetings are very accessible. The national meets only twice annually (the annual conf. and the fall tour), while local chapters can get together as often as members' IA appetites and energies permit. Finally, the IA interests of many members are focused on local industrial and engineering works and chapters provide a ready outlet. If you are interested forming a local chapter, sample by-laws and a chapter fact sheet are available from the SIA Local Chapters Coordinator, Fred Quivik, 7301 Germantown Ave., Phila. PA 19119.

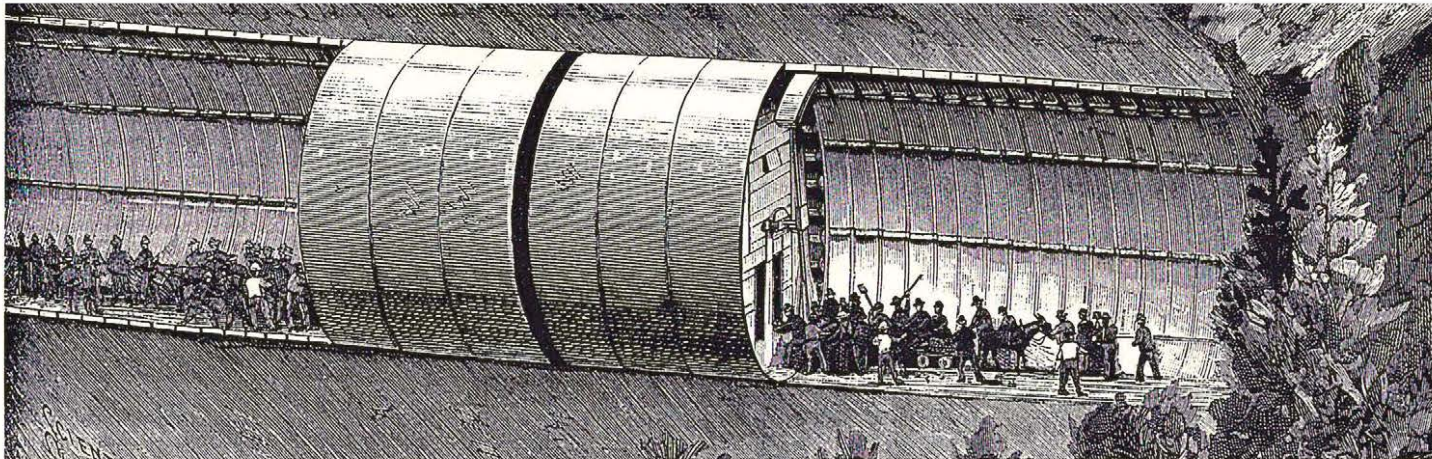
## LETTER TO EDITOR

### Viewing the *Exhibitionist*

I am the new editor of the *Exhibitionist* and would like to update the note published in your last issue [SIAN Fall 91:8]. To submit material for publication in the Natl. Assn. for Museum Exhibition's [NAME] 36-page newsletter, *Exhibitionist*, please contact Diana F. Cohen, Editor, c/o Office of Exhibits Central, Smithsonian Institution, 1111 N. Capitol St., SISC 3F11 MRC 808, Wash. DC 20560. For NAME membership info., contact Whitney M. Watson, c/o Putnam Museum, 1717 W. 12th St., Davenport IA 52803 (319-324-1933). (PS: NAME *does not* publish *Exhibit Builder* magazine.)

Diana F. Cohen





"The meeting of the great shields of the St. Clair River Railway Tunnel." *Scientific American*, Sept. 13, 1890. Courtesy Photo Recording Assoc., N.Y.C.

**ST. CLAIR TUNNEL MARKS 100th.** On Sept. 19th, exactly 100 years after this international tunnel between Port Huron, Mich., and Sarnia, Ont., saw its first official train, a special commemorative train passed through. The Grand Trunk "dignitary" train consisted only of two locomotives and a single car, the CN's observation car "Sandford Fleming," which carried officials to anniversary receptions and celebrations. Later, an excursion train shuttled back and forth through the tunnel, carrying some 1,500 tunnel-travellers during the day. Among the sights to visit was a 21-ft. monumental arch made from six 1,100-lb. tunnel-lining segments left over from construction, erected alongside the Sarnia station. Late in the afternoon, the Amtrak/VIA passenger train "International" arrived at Sarnia station en route from Chicago to Toronto, becoming the first regular passenger train through the tunnel in its second century.

The 6,026-ft. tunnel passes roughly east-west beneath the St. Clair River, which flows between Lake Huron on the north and Lake St. Clair on the south. Tests were begun in 1886 and work on the shafts, which ultimately proved futile, started in 1888. Driving of the tubes began in 1889. The work was done by forcing 80-ton iron shields, 21 ft. 7 ins. in diameter, ahead through the clay, using 24 hydraulic rams. In the section actually beneath the river, the work was done under compressed air. The lining of the tunnel was constructed of cast-iron segments, bolted together to form a continuous, watertight tube. This was the first tunnel in which the three elements that made the modern subaqueous tunnel possible—air, shield, and cast-iron lining rings—were employed together. At its lowest point the tunnel is 94 ft. below the river's surface. To haul trains through the tunnel, Baldwin Locomotive Works built four 97.5-ton, 0-10-0T steam locomotives, reportedly the largest in the world. In 1899, the

length of the tunnel was filmed with a movie camera aboard a specially equipped train. The movie seems to be lost today. In 1908 the tunnel was electrified, using six Baldwin locomotives rated at 750 HP each. Electrification lasted a half century until 1958, when the system was dieselized.

CN Rail is planning to build a parallel tunnel to accommodate double-stacked containers. Estimated to cost C\$150 million, work is slated to begin in 1992. CN Rail considered enlarging the historic tunnel but decided it would be cheaper to build a new one. At present, these containers are ferried across by barge, costing CN over C\$30 million annually. If all this comes to pass, it presumably will mean the end of rail ferry service, started by the Grand Trunk in the 1860s.

*R.J.C.*

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 \$25; couple, \$30; institutions, \$30; contributing, \$50; sustaining, \$100; corporate, \$250; student, \$20. Send check payable to SIA to Treasurer, Room 5020, National Museum of American History, Smithsonian Institution, Washington, D.C. 20560; all business correspondence should be sent to that office.

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**TO CONTACT THE EDITOR:** Robert M. Frame III, Editor, *SIA Newsletter*, P.O. Box 65158, St. Paul, MN 55165-0158. (W 612-227-9531; H 612-291-7882).

**USE FAX!** Transmit to Bob Frame at TeleFax phone 612-222-4139.

Room 5020 National Museum of American History  
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