SOCIETY FOR INDUSTRIAL ARCHEOLOGY

NEWSLETTER

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BRIDGES A SPECIAL ISSUE . . . .

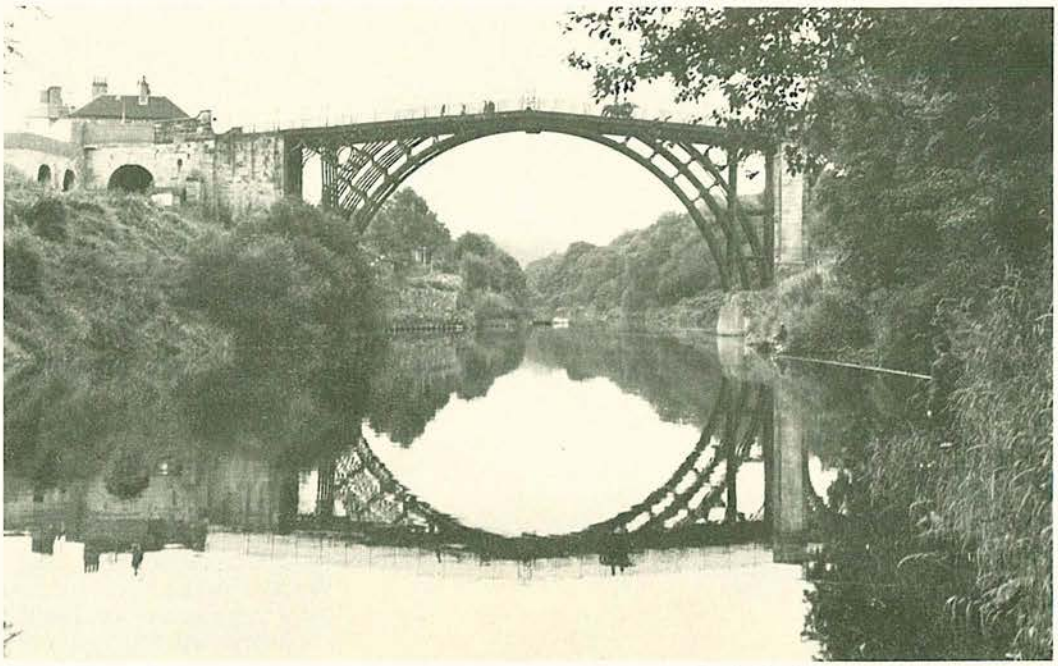
A NUMBER OF THINGS HAVE COMBINED to inspire the Newsletter's *first-ever issue on a single topic. Least tangible is that it seems to have occurred to several people that while many of the various technologies and interests embraced by the field of IA have their own highly focussed specialist/enthusiast following and forum—railroads; mills; RR stations; steamboats; and others—bridges don't. This, despite the fact that there is a clear and widespread interest in those structures regarded by many as the most varied and interesting of all the engineering works created by man. Without doubt, bridges are the most visible element of our IA, and at the same time, perhaps the most structurally comprehensible, their workings generally being exposed fully to view.*

Then too, the history of bridge engineering covers about as long a life span as anything with which we deal, and has involved nearly every structural material ever known, from stone through wood, all the ferrous metals, many of the artificial stones such as brick and concrete, and a huge number of combinations of these. It is a subject full of vitality and range.

There are two chronologic reasons for an all-bridge issue. This year signals the 100th anniversary of the practical incandescent electric light, in which we celebrate that essential bridge between night and day. And transcending all other considerations, 1979 also is the bi-centennial *year of the construction of the world's first iron bridge, in itself more than enough to make appropriate devotion of this entire issue to* bridges.

IRON BRIDGE BI-CENTENARY

In July 1779 the last of the great cast ribs was placed, completing the superstructure of the first civil engineering work in the world to be formed entirely of iron. The momentousness of the event was recognized at the time and has never been lost sight of. The Iron Bridge, crossing the River Severn in a small Shropshire village that was promptly renamed Ironbridge, has long been the most recognizable single artifact symbolizing the advent of the Industrial Revolution. While the steam engines of Newcomen and Watt often are cited as the physical devices that essentially represent that upheaval in man's relationship with his planet, the initial offering of neither inventor survives.



Ironbridge Gorge Museum Trust photograph.

The Iron Bridge, fabricated by iron-founder Abraham Darby at his nearby Coalbrookdale works, is here and now, visually unchanged from the day it was completed. It alone is the primogenitor of the huge family of metallic framed structures that descended directly from it. Long may it stand.

The Ironbridge Gorge Museum Trust plans a mammoth series of special events and publications in honor of The Relic's 200th birthday, extending not only over this entire year, but into 1981 in commemoration of the fact that the bridge actually was completed and opened to service in 1781. We will report on these as timely.

Published by the Society for Industrial Archeology Editor: Robert M. Vogel
Room 5020 National Museum of History & Technology Smithsonian Institution Washington, DC 20560

ANTHRACITE TOUR, FALL 1979

In consequence of a variety of conflicts it has been necessary to change the date of this from that announced in the Nov. SIAN. It now is definitely to be held on

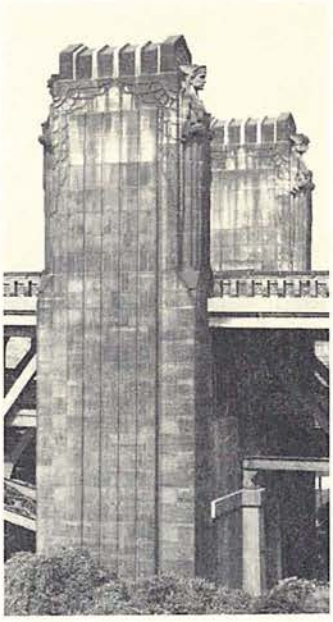
12 & 13 October.

Details, as always, to follow.

FROM CLEVELAND

The battle to save the Art Deco pylons on the 1932 Lorain-Carnegie Bridge has been won. Two massive sandstone pylons—*Guardians of Traffic*—stand at each end of the bridge. There are two carved figures per pylon, each bearing a different symbol of transportation progress; a covered wagon, a stagecoach, a Model T Ford, a motor truck, &c, eight in all.

J. Lowe photograph for HAER.



In 1976, Cuyahoga Co. Engineer Albert S. Porter proposed removing the pylons so that the bridge, which crosses the Cuyahoga River close to downtown, could be widened from four to six lanes when rehabilitated with a new deck. Public outcry against their removal and their listing in the Natl. Register caused the county to reconsider. Six traffic lanes were not necessary in any case, according to a traffic study commissioned by the county.

Ronald A. Stackhouse, current Co. Engineer, is now grumbling about the increased cost as a result of the decision to save the pylons, charging that construction costs will be much higher due to environmental studies required by federal law, and the delay in construction. Eric Johannesen, Preservation Officer of the Western Reserve Historical Soc. in Cleveland, thinks the public came out ahead. Obviously, maintaining the bridge at four lanes instead of widening it to six will save money. "And anyway," says Johannesen, "the pylons are unique examples of Art Deco structure in the city and perhaps in the U.S. That's enough of a reason to preserve them." *C.P.M.*

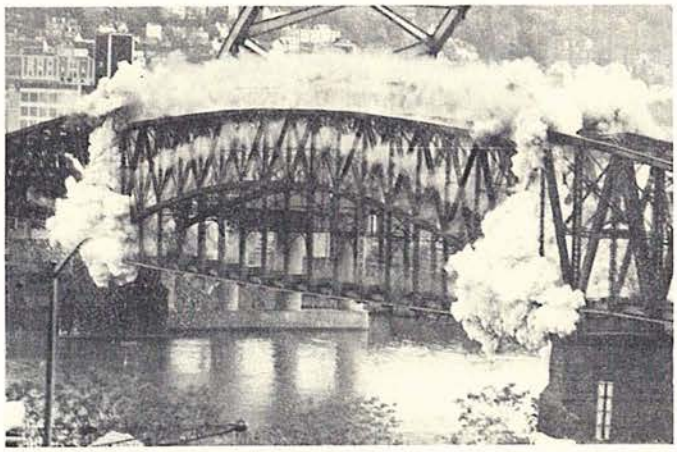
CONTRIBUTORS TO THIS ISSUE

Brenda Barrett, Ickesburg, Penna.; Mark R. Edwards, Md. Historical Trust; Donald C. Jackson, HAER: Carol Poh Miller, Historic Preservation Consultant, Cleveland; David A. Simmons, Ohio Historic Preservation Office; Miriam F. Wood, Ohio Covered Bridge Committee. *With Thanks.*

PITTSBURGH PUNISHED FOR BRIDGE DEMOLITION

The demolition by explosives of the Brady (formerly the S. 22nd) Street Bridge over the Monongahela, a heavy, trussed 3-hinged arch of the "Bonn" type built in 1896, exacted a high price as the job went fearfully awry. The old span, replaced by the new Birmingham Bridge, was to have been blasted off its pins, broken up as it hit the water, and the pieces fished out—all with impediment to the extremely heavy river traffic of no more than 24 hours. It didn't happen that way. After a week of mishaps during preparation for the demolition, the bridge was blown down allright, but failed to disintegrate. The Penna. Dept. of Transportation and its demolition contractors were unable to remove the essentially intact main span and for the better part of two weeks in the spring of 1978 the river was completely blocked, leaving barges of coal, petroleum, sand, gravel, and other substances backed up on both sides of the wreck, causing great industrial anguish and an eventual loss of $6 million.

The span finally was cut and blasted out of the channel by the Pittsburgh Engineer District of the Corps of Engineers. The suspension of traffic was the worst on the river since the flood of March 1936. It would have never happened if they'd listened to the preservationists in the first place. (Extracted from *The Waterways Journal,* June 24, 1978.)

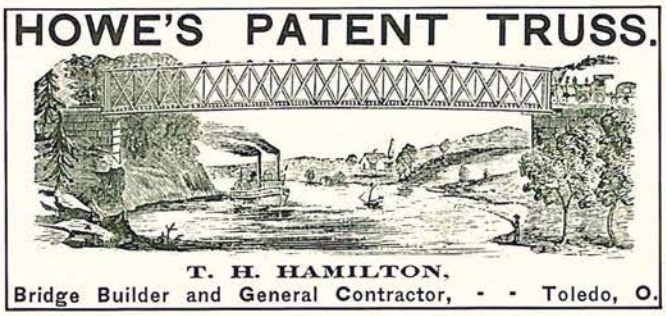


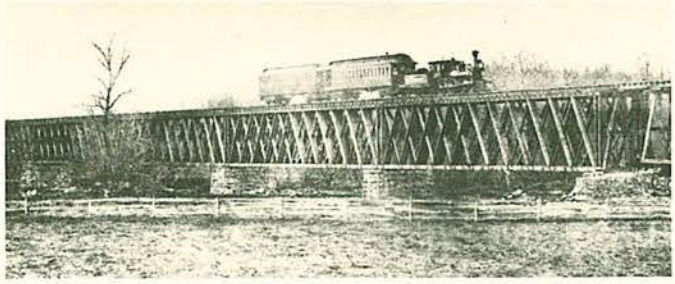
Brady St. Bridge, 1896. Main span: 520 ft.; side spans: 260 ft. A high price for a hard death. *Anthony Kaminski photograph for the Pittsburgh Press.*

MYTH EXPLOSION DEPT. — Brooklyn Bridge

A letter to the Editor of *Civil Engineering*, Jan. 1979 issue, from Russell N. Myer of Pittsburgh points out the error in a *CE* article on the engineering of N.Y. City in which it was stated that when the Brooklyn Bridge was completed in 1883 its main span of 1595.5 ft. was 50% longer than any predecessor. Mr Myer observes that while this indeed was 51% longer than the 1057-ft. span of Roebling's previous bridge, crossing the Ohio between Covington, Ky. and Cincinnati, completed in 1867 [SIAN May 78:5], Samuel Keefer's "Honeymoon" foot and carriage suspension bridge over the gorge below Niagara Falls had a clear span of 1268 ft., which Brooklyn Bridge exceeded by only 26%. While Keefer's may not have been one of the world's major bridges, having a deck width of only 10 ft., it *was* the longest in the world for 13 years. (The bridge was rebuilt several times and finally replaced by the steel-arch Honeymoon Bridge in 1899.)

THE HOWE TRUSS LIVES

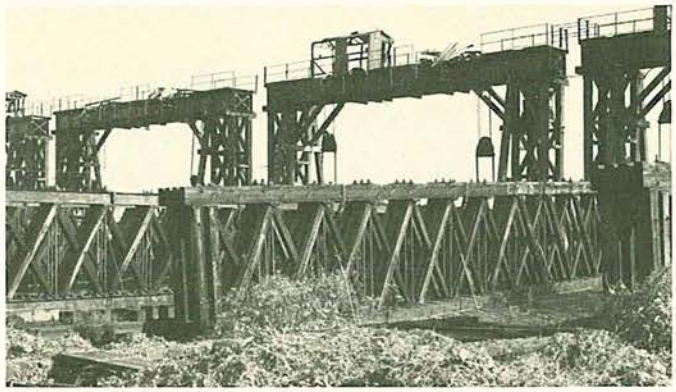




Neshaminy Creek Trestle on Phila., Newtown & NY RR (Penna. RR), c1878, a typical Howe-truss bridge. *National Museum of History & Technology.*

The timber bridge trussing system that more than any other furthered the spread of the railroad across the N. American landscape in the 19thC was that patented in 1840 by William Howe. In its classical form the Howe truss was, strictly speaking, a composite one, for despite the fact that the lower (tension) chord as well as the upper and the web diagonal struts were of heavy timber, the web verticals, in tension, invariably were formed of wrought-iron rods with ends threaded to take nuts that bore against the chords. The truss was statically determinate and thus simple to design, and was equally straightforward in its detailing and erection. For these reasons it quickly became the standard for railroad bridges, until the end of the century flourishing to the near exclusion of all other types where wood was to be used. Examples for highway use in such wood-rich areas as New Brunswick were built well into the 20thC.

Although once they numbered in the thousands, few if any Howe railroad trusses survive, a consequence of the limited life of even treated timber. Or so it was thought, until surprise of surprises, not one, but an entire family surfaced recently in, of all unlikely places, Philadelphia. They are—or were— transfer bridges at the once-important Port Richmond coal terminal of the Philadelphia & Reading, on the Delaware River several miles north of the city center. Transfer bridges are the short spans that provide the access to RR car ferries and floats. They are pivoted at the land end, the water end carried by some sort of hoist for accommodation to tidal variations. True, they might be regarded by the purist as something other than railroad "bridges"—perhaps 2nd cousins of low birth—but, if a bridge is a structure that furnishes a (more-or-less) level way across a barrier, more often than not a watercourse of some



Land ends of the Pt. Richmond Howe-truss transfer bridges. The water ends were supported by the gantries until set on the car floats.

sort, these are bridges.

Their date of construction is unknown but as the timbers are creosoted, they could be 50 years old or more. Why timber construction at that late date? Presumably cheapness: much free timber on the P&R's land, simple fabrication in their own shops, and simple erection on the spot by their own crews. For such light service—locomotives did not venture onto the bridges or scows—a not unreasonable solution.

Their fate too, is unknown, but may be imagined. Here would seem to exist a stock of ideal bridging material for an excursion RR.

AMMANN CENTENNIAL

A number of events will celebrate the 100th anniversay of the birth of Swiss-American civil engineer Othmar H. Ammann on 26 March 1879. Ammann left, among his numerous memorials, three of the World's greatest long-span bridges: The Bayonne (N.J.) arch (1931); the George Washington (1931); and the Verrazano-Narrows (1965), whose main span at 4260 ft. is longest in the world.*

In Schaffhausen, Switzerland, Ammann's birthplace, an exhibition—The Development of Long-Span Bridge Building—will be in place until 25 May, at the Museum zu Allerheiligen. The show will be in Zürich, 20-22 September, at the Eidgenössische Technische Hochschule.

A plaque honoring Ammann will be placed on the Verrazano Bridge by the American Soc. of Civil Engineers, and the ASCE conducted a symposium on the history of the long-span bridge at its Convention in Boston. (The collected papers are available. See *Publications.)*

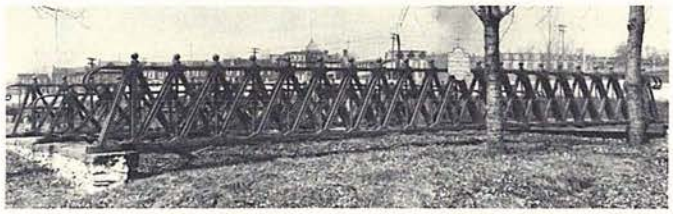
*Soon to be displaced by the suspension bridge now under construction over the Humber at Kingston upon Hull, England, completion in 1980. Towers: of concrete, 500 ft. high. Main span: 4625 ft! Who will be first with a mile?

WHAT'S HAPPENING HERE? It appears for all the world that the (ex-Penna. RR) Conrail bridge over Conestoga Creek, on the eastern edge of Lancaster, Penna. is in acute distress. Actually, it isn't. If you know why it looks as it does, send your interpretation to the Editor. First prize is an all-expenses-paid week in Lancaster. Second prize is two weeks. *Herbert H. Harwood photograph.*

THE FINK TRUSS: ONE DOWNED, TWO FOUND

Although timber was widely used in bridges from the outset of railroad construction in N. America, there never was any question in the minds of engineers that although plentiful, cheap, and quickly worked, these worthy characteristics were overbalanced by the material's inherent defects. When an early railroad could muster sufficient capital, it built in stone; otherwise in wood. Not until the availability of wrought iron in structural quantity and price was a compromise material brought into the picture.

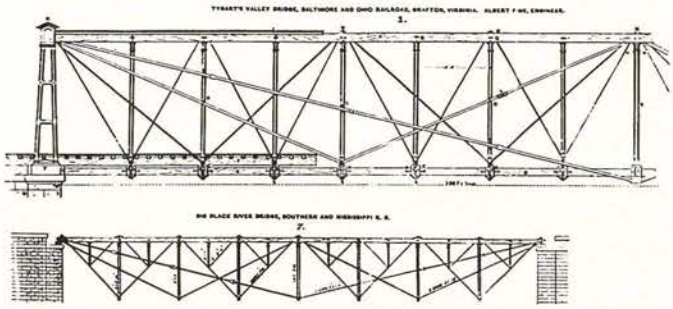
While not as durable or maintenance-free as masonry, iron did not burn or rot, and its cost lay somewhere between stone and wood. Tentative use of iron for railroad bridge construction began in the early 1840s with the composite trussing systems of Howe and others, in which certain tension members of timber trusses were formed of iron rods. The first all-iron railroad bridge in N. America was Richard Osborne's pony Howe truss of 34-ft. span on the Phila. & Reading at Manayunk, west of Philadelphia, erected in 1845. Six



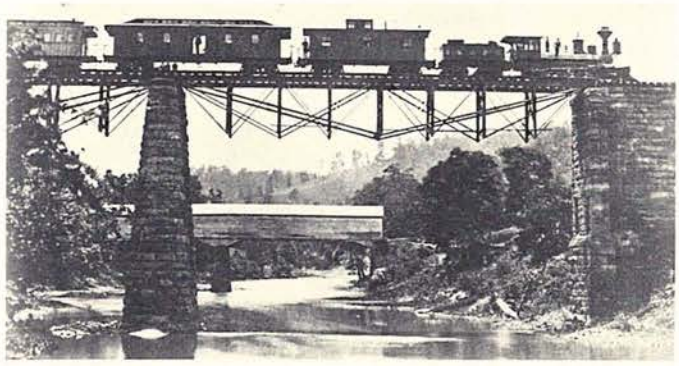
The three lines of iron Howe trussing from the Philadelphia & Reading's Manayunk Bridge, in service 1845-1901, exhibited after retirement. One of the outer trusses survives in the collections of the Natl. Museum of History & Technology (not presently on exhibit). *NMHT photograph.*

years later Wendel Bollman patented an all-iron bridge trussing system that became the first in the world to find consistent use in railroad service—on the Baltimore & Ohio. Bollman, at the time the B&O's Master of Road, had as his assistant a young formally-trained German immigrant, Albert Fink, who in c1852 designed a truss similar to Bollman's in broad principal but improving upon it. Both types were used by the B&O until the mid-1870s.

The Fink truss, as the Bollman, was based on the method of reinforcing a simple beam by trussing it with a tension rod beneath, held apart from the beam by a strut at mid-span. Each adjacent pair of panels in the Fink truss is in effect such a trussed beam, their ends supported by other "beams" comprising longer groups of panels. At mid-span of the truss a principal strut and a pair of diagonal tension bars carries all loads to the abutments. The upper chord acts as the common "beam" for each of the sub-beams. If the bridge is a deck truss, no lower chord is employed, and in through trusses what appears to be the lower chord is a non-structural element of the deck system.



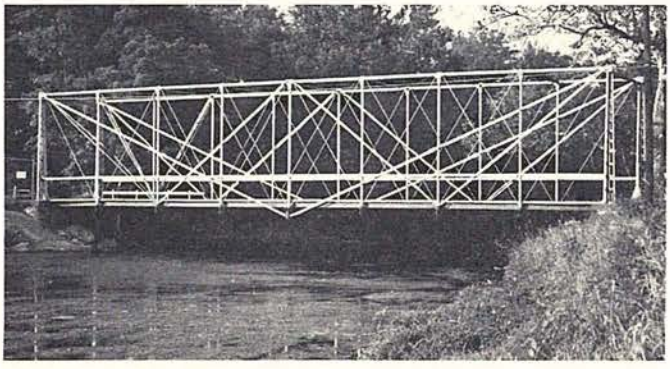
The Fink truss as a timber-iron composite, the through form above (half the span shown), the deck form below. Photograph: the B&O's bridge over the West Fork River near Walkersville, W.Va., c1880. *Natl. Museum of History & Technology.*



THE "SOLE SURVIVOR" LOST

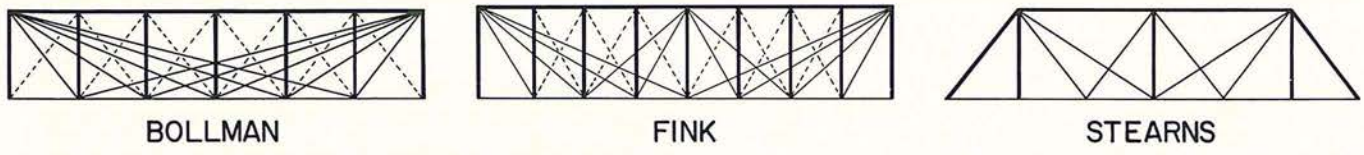
The Fink truss was moderately popular with American railroads. Away from the parent B&O most were found in the South, a consequence largely of Fink's migration to the Louisville & Nashville in 1857. His major work was the Penna. RR's crossing of the Ohio at Louisville (1868-70) which employed 25 Fink deck trusses of c180-ft. span. (The two channel spans were long-span through trusses of another type.)

But the Fink design also was applied to highway bridges, both in composite wood/iron and all-iron form. One firm, at least—the Trenton [N.J.] Locomotive & Machine Mfg. Co.—made a specialty of the Fink truss, both for RR and highway service. Until recently, a 100-ft.-span through truss on a county road at Hamden, Hunterdon Co., N.J., built by Trenton in 1857, was believed to be the only Fink truss bridge surviving anywhere in the world, as well as one of the earliest operational iron trusses standing in N. America.



The Hamden truss had been "discovered" by photographer-author David Plowden [SIA] in 1969, and in 1975 was placed in the Natl. Register and recorded by HAER. On the evening of 2 Oct. 1978 a 17-year-old motorized vandal, in a state of blind misjudgment, or worse, smashed into one of the veteran's cast-iron vertical posts, the impact cracking it completely. Although in a through Fink truss the

Disaster at Hamden. The N.J. Locomotive & Machine Mfg. Co. Fink truss of 1857 up & down. *Above photograph by Terry Karschner for N.J. Office of Historic Preservation.*



Configuration of the Bollman, Fink, and Stearns trusses. Compression members heavy, tension light; dotted counter stays act only under certain loading conditions. *From the Historic American Engineering Record's ROOF & BRIDGE TRUSS POSTERS. Full description and ordering instructions in SIAN March 1976:8.*

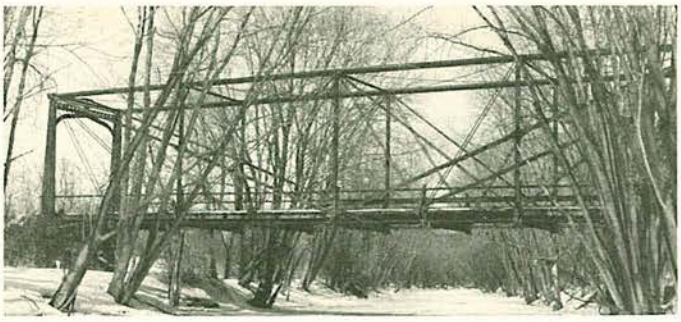
posts theoretically carry no load, they do act to stiffen the upper chord vertically. Additionally, their connection with the chord is more or less rigid. Between the loss of the post and its wrenching when hit, the hollow upper chord—also of cast iron—gave way and the entire span collapsed into the South Branch of the Raritan, two ft. deep at that point. The driver, unfortunately, was not seriously hurt.

The county had had an essentially passive concern for the historic structure since the notoriety of 1975, whatever interest there was being kept alive principally by Terry Karschner [SIA] in the state's Office of Historic Preservation. The accident has left the County Freeholders (commissioners; selectmen) in something of a dilemma, wanting to make an effort at restoration, but reluctant or unable to appropriate the necessary funding. County Engineer David Stem happily is sympathetic and has had the wreckage removed from the drink as carefully as possible and stored in a maintenance yard pending a decision as to the next move.

There appears no chance at all for a total restoration that would put the span back in service. The crossing itself probably will be abandoned, the traffic rerouted. Restoration of the bridge at another site, as a historical monument, depends entirely on available money. The cost of even a non-load-bearing reconstruction will be high, for some of the castings were shattered beyond recall and will have to be replicated, and many of the wrought-iron eye bars forming the diagonals were badly bent, with extensive forge work needed to straighten them. The wreckage has been examined by civil engineers A.G. Lichtenstein and Emory L. Kemp [both SIA], who have made a speciality of bridge rehabilitation, in order to arrive at a procedure and figure for restoration. On the basis of that, the Office of Historic Preservation will attempt to locate funding.

DISCOVERY I—OHIO

Meanwhile, a remarkable, apparently unique iron through truss of indeterminate parentage and date has been noted near Zoarville, Tuscarawas Co. by the Inventory of the Ohio Historic Preservation Office. There has arisen some controversy as to just how it should be typed, one school of though classifying it as a "Stearns" truss; another as a Fink. The Stearns design, patented in 1892, was a minor variant of the Fink, featuring as its perceived improvement over the Fink design a slight simplification by eliminating—when rendered as a through-truss—the vertical posts in alternate panels (see the Hamden truss, above). This would have been feasible in short spans where loads were light and the upper chord members could be made sufficiently stiff to span two panels without requiring the intermediate support of the posts.



The skeptical, however, tend to look upon the Stearns modification as a doubtful improvement on anything, and on the rare occasions when these trusses turn up, stand firm in regarding them as *Fink* trusses, plain and simple, merely lacking the essentially redundant verticals. A further point that compels viewing at least the Zoarville bridge as Finkian is that Stearns lengthens the basic Fink truss two panels by adding inclined end posts—a feature absent in this example.

The bridge, officially known as "Old State Route 212 Bridge," may thus fairly be taken as the sole known Fink through truss in the world standing on its original foundations. It has a clear span of 110 ft., about ten ft. longer than that of the Hamden truss. It is privately owned and completely out of service, the deck being badly deteriorated. The remaining superstructure, though, is in fairly good order. There are no known plans for restoration or conscious preservation although the state probably will move to have the bridge placed in the Natl. Register.

Stearns or Fink? While not a pure version of either, more like the latter than the former. All-wrought-iron mystery truss near Zoarville, Ohio, maker and date unknown. *Photographs by James Addington for Ohio Department of Transportation.*

DISCOVERY II—VIRGINIA

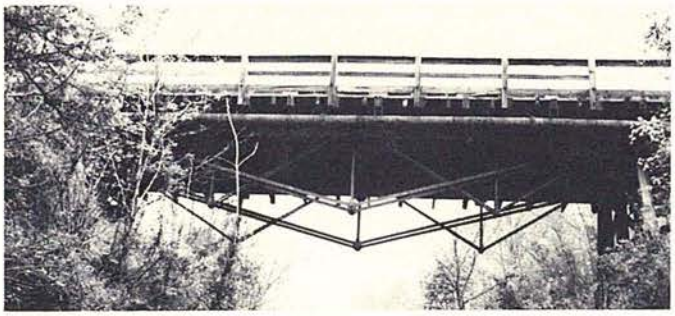
The Fink truss appeared in its most curious aspect when built as a deck-type bridge, the traffic way carried at the level of the upper chords. In this style the non-structural lower chords were dispensed with entirely and the bridge took on a pronounced ethereal quality.

Most Fink bridges were of this type, of composite construction, the chords—under compression—of heavy timber, and the diagonal ties—under tension—of wrought-iron eyebar links. The vertical posts typically were of cast iron. In the spring of 1978 one of these classic Fink trusses were discovered in West Lynchburg, Virginia.

It was, according to a study conducted by Howard Newlon, Jr. [SIA], Assoc. Head of the Va. Highway & Transportation Research Council and the little span's principal advocate, built c1870 by one of the railroads that combined in 1870 to form the Norfolk & Western. As it became too light for rail service, it was moved, in 1893, from an unknown location to its present one to carry Old Forest Road over a deep cut on what now is a branch of the N&W. At that time its timber top chords were renewed.

As the only surviving Fink deck truss and the sole example of composite construction, its significance is considerable. Newlon,

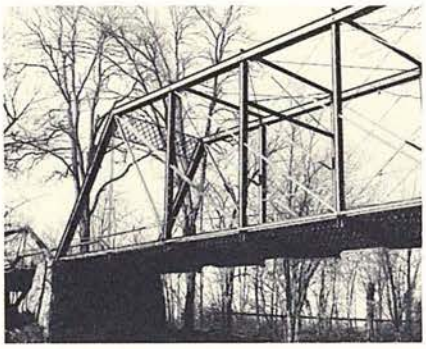
also Chairman of the History & Heritage Comm. of the Virginia Section, American Soc. of Civil Engineers, has nominated the truss for ASCE designation as a Natl. Historic Civil Engineering Landmark, and is negotiating to have it re-erected in a park setting for permanent preservation when in several years the state highway dept. removes it from service.



THE KING IRON BRIDGE & MFG. CO.

The King Iron Bridge & Mfg. Co. of Cleveland, Ohio, was one of the leading manufacturers of metal truss bridges in the U.S. during the 19thC. It was established in 1858 by Zenas King, who, like many of his engineering counterparts, had no formal training and learned his profession through practical experience.

While in Cincinnati in the 1850s, King became agent of the Moseley Iron Bridge Co. which specialized in a unique "tubular wrought iron arch bridge" patented in 1857. The arch itself was a tube, triangular in cross section and also featured inverted "counter arches." King apparently was a successful salesman. Of the 47 bridges listed in the 1867 Moseley catalog, almost half were in Ohio. The firm, administered by Thomas W. H. Moseley, relocated to Boston about the time of the Civil War.



(L) Moseley Iron Bridge Co. arch-truss of 1860 (Lawrence Co., Ohio), basis of Zenas King's patent tubular arch bridge. *1924 photograph, Ohio Historical Soc. Archives-Manuscript Divn.* (R) Double-intersection Pratt truss by King Bridge Co., crossing the Monocacy nr. Harney, Md., between Carroll and Frederick cos. *Herbert H. Harwood photograph.*

During this work with Moseley, King was impressed by the fallibility of wooden bridges and the potential offered by the metal arch. Thus, it is no surprise that his first of a number of bridge designs was the "King Patent Tubular Arch" patented in 1861. King substituted a square-shaped tube for the triangular Moseley design. By this time King had relocated to Cleveland and established a boiler and bridge works, although the boiler manufacturing was soon dropped as the tubular arch grew in popularity.

King's success was not, however, immediate. The 1879 Cuyahoga Co. history related that his design initially met considerable resistance because of its cheapness, use of less material, and comparative lightness. This is indicative of the early oppositon to metal truss bridges based, in part, on the visual slenderness of their trusswork which seemed to be too drastic a change from the massive wooden bridges common before mid-century. King "resolutely pushed its claims" until the company ultimately became one of the nation's largest and most successful metal bridge builders. King continued to build the reputation of his arch until by 1875 over 2700 had been erected. The firm's 1875 book of designs indicated that 250-300 bridges were manufactured each year, and that 200 ft. of bridges could be produced per day. Like most 19thC bridge companies, King also made a variety of deck, pony, and through trusses along with a line of seemingly ubiquitous roof trusses, piers, jail work, and fencing.

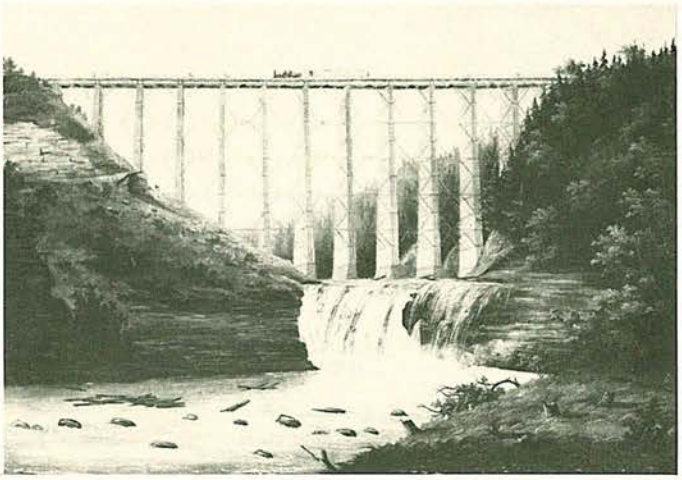
The record of the company in the 20thC was, unfortunately, not as stellar as during its early history. Administration was taken over by Harry Wheelock King, son of Zenas (who eventually died in 1911), and he was forced to reduce the value and amount of the capital stock in 1906. The same year the company was the defendant in a civil action resulting in its official dissolution. Shortly thereafter—and perhaps as a direct result—the company was revived as the King Bridge Co. of New Jersey, and then reorganized in the 1920s under Norman C. King, formerly the secretary of the preceding corporation. The firm finally disappeared from the Cleveland city directories a few years after World War II.

In spite of their organizational difficulties, the King company erected a number of impressive structures in the 20thC. Perhaps their most significant was the central steel arch of Cleveland's Detroit-Superior High Level Bridge, completed in 1917. Listed today in the Natl. Register and recorded by the Historic American Engineering Record, it has a 591-ft. span and rises 196 ft. above the valley floor. It remains as a fitting memorial to the extraordinary role played by this company in the history of the nation's bridge building industry. *D.A.S.*

Detroit-Superior High Level Bridge, Cleveland, shortly after construction by King, 1917. *Natl. Museum of History & Technology.*

A comprehensive article on the preservation of early bridges in Ohio by David A. Simmons [*SIA*] *appears in* Ohio Cities & Villages, *August, 1978, pp. 13-18.*

I A IN ART



National Museum of History & Technology.

THE PORTAGE VIADUCT by EDWARD BEYER.
Oil on Canvas, 1852.

Only infrequently in the history of American fine art has an engineering structure of any consequence been a featured subject. Lots of rustic stone bridges as picturesque secondary elements in landscapes, to be sure, and of course Jasper Cropsey's rendering of the great Starrucca Viaduct in the distant background of his *American Autumn* (1865), and even countless bridges and tunnel portals as the theme of lithographs, engravings, and other types of prints, but rarely a major structure painted by a major artist.

Between 1849 and 1857 the German Edward Beyer (1820-65) travelled throughout the eastern U.S. painting landscapes. He is best known in the U.S. for his series of Virginia views published after his return to Germany as a folio of lithographs titled *Album of Virginia* (which included several important bridges such as the B&O's Tray Run Viaduct).

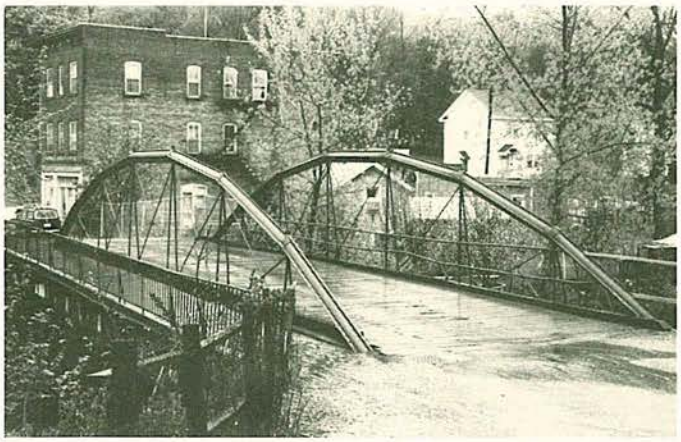
It is no wonder that Beyer was so taken by the Portage Viaduct for it probably was the most spectacular bridge in N. America—perhaps the world—in a setting extraordinarily scenic. It was built in 1852 by the N.Y. & Erie RR to carry a branch line across the gorge at the falls of the Genesee near the town of Portage, N.Y., c45 miles SSW of Rochester in what now is Letchworth State Park. The viaduct, largest timber structure in the world when completed, was designed by the Erie's chief engineer Silas Seymour and built by the contractor constructing the line. The length was 850 ft., the rail base 234 ft. above the river bed. Construction was entirely of pine—1,600,000 board ft.—taken from the area, reinforced with 107,000 pounds of wrought iron.

The viaduct served well until May 1875 when it was totally destroyed in a dramatic blaze. It was replaced immediately, with an iron version by George S. Morison, designed, fabricated, and erected in the remarkable time of 90 days. That structure was reinforced in 1903 and again in 1943-44 and still stands.

While Beyer may have been the only artist of note to paint the Portage Viaduct, it was an endlessly popular subject for 19thC print makers and photographers and its likenesses in these forms are widely found.

We would be pleased to learn of other American paintings—not prints—of engineering structures. Ed.

THE PRESERVATION OF SMALL IRON TRUSSES—ONE APPROACH



The feasibility of preserving small metal truss bridges *ex situ* has been noted here from time to time, and the plan continues to be applied when the conditions are right. Most recently the City of Beacon, N.Y. has undertaken to preserve one of the few surviving bowstring trusses built by the Phoenix Bridge Co. of Phoenixville, Pa., which crossed the Fishkill Creek on the line of Churchill St. The 70-ft. pony span was one of Phoenix' stock designs, the polygonal arch formed of segments of standard Phoenix column, a proprietary compression section patented in 1862 by the firm's founder, David Reeves. The inspiration for the bridge's design clearly was Squire Whipple's celebrated cast-and-wrought-iron arch-truss of 1841, widely used for highway service during the quarter century following.

The late-19thC. truss has been carefully dismantled, painted, and placed in storage pending a decision—and funds—for its re-erection at another site in the city, most likely as a pedestrian crossing in a park. The preservation scheme is the result of cooperation between the director of the city's Community Development Agency and Raymond W. Smith [SIA], program analyst of the N.Y.S. Office of Parks & Recreaction, Divn. of Historic Preservation.

Although the bridge has not yet been placed in the Natl. Register, it is fully eligible and thus is afforded essentially the same degree of protection. As some federal funding was involved in the replacement span, it was necessary to obtain approval of the federal Advisory Council on Historic Preservation, which Smith ensured by the drafting of a memorandum of agreement with the city, specifying the preservation steps to be taken.

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CHRISTIAN THOUGHT FOR THE DAY . . .

Architectural and structural historian Charles E. Peterson, an inveterate searcher of the literature of another day, discovered the following in a quite recent issue of the *Penna. Magazine of History & Biog.* (July 1978). It is taken from the Diary of Sarah B. Wister, whom we may assume was a Pennsylvanian and zealous daughter of the North. . .

"June 17, 1861 . . . There is no news; those unprincipled monkies the newboys were shouting 'Fight near Newport' all about the streets, but the papers contained nothing but some further particulars of the burning of the great bridge at Harper's Ferry. There is a considerable amount of poetical justice in it, almost all the stock of the Baltimore & Ohio RR Co. (to whom the bridge belongs) is owned in Baltimore; so they are tasting the fruits of their own sowing . . ."

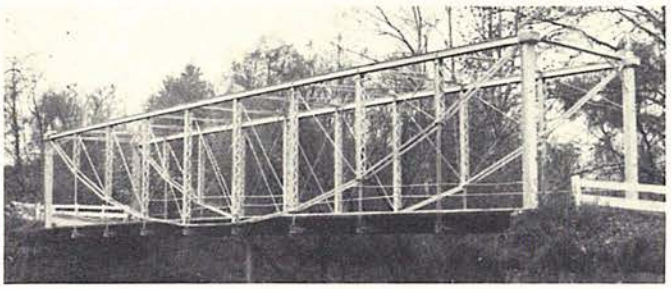
THE UNUSUAL METAL TRUSS BRIDGE OF THE BI-MONTH

After a year's lapse we revive this feature, in multiple, in celebration of this All-Bridge Issue. The first of the following essays notes a pair of spans of which one, in metal, appears to be the sole survivor of a truss design that might have amounted to a "system" had it been produced in greater quantity, while the other brings to light a seemingly unique composite timber/iron truss design. The second essay describes a design by a prominent civil engineer that was built in modest numbers.

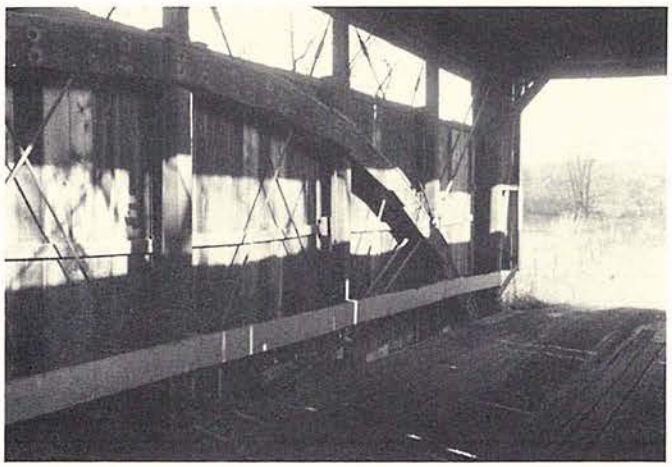
I—THE JOHN BRIGHT BRIDGES

Of great interest to historians, bridge engineers, and bridge enthusiasts in general are the two John Bright bridges of Fairfield Co., Ohio, spanning Poplar Creek a few hundred yards apart. "John Bright No. 1" is a steel bridge on Havensport Rd. and "John Bright No. 2" is a covered wooden bridge around the corner on Bish Rd. They take their names from the pioneer Bright family, early settlers in the county.

The apparently unique No. 1 bridge features an eye-bar suspension truss that is a perfect inversion of the classical arch-truss so widely erected from the 1840s to the 1870s by Squire Whipple and his licensees. In the Whipple plan the upper or compression chord is arched, its horizontal outward thrust being counteracted by the open-link lower or tension chord. In the Bright bridge the upper chord is straight and acts principally to absorb the horizontal *inward* thrust of the inversely arched lower chord which behaves much like a suspension cable. The assemblage is in effect a truss inasmuch as the system of vertical struts and diagonal ties in the web transmit a certain amount of the load from panel to panel and carry shear stresses.



John Bright Bridges: No. 1 above; No. 2 below. *Miriam F. Wood photographs.*



As a deck truss, the floor beams would have been placed on the upper chord with no further members necessary; in the case of a through truss such as the Bright bridge the floor beams are simply hung from the lower panel connections by rods. There is, of course, no additional chord at the deck level. The vertical end posts, which are topped with ornamental urns, serve only to carry the end reactions down to the abutment masonry, and do not participate in the truss action. A timber trestle bent at mid-span is a later addition, apparently a response to excessive deflection that developed as the bridge aged.

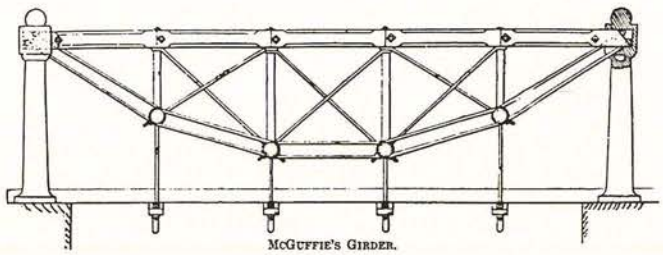
A sign over the north portal states that the bridge was built by the Hocking Valley Bridge Works, but no date is given. August Borneman owned HVBW and was active in the bridge building trade in central Ohio for many years. He also was known as an inventor and held patents for farm machinery, a composite bridge pier, and a low-truss steel bridge (Pat. 219,846 of 1879). Several of these low-truss bridges stand in Fairfield Co. today and for years a sketch of the truss was used on the HVBW letterhead.

Borneman died c1890 and the company was sold to a Benj. F. Dum, but it is believed that Borneman was the builder of the John Bright bridge because of the striking similarity of its truss to the one used in the unusual No. 2 bridge.

John Bright No. 2 ranks as one of the most unusual covered bridges in Ohio. It was built in 1880 by August Borneman & Sons for $993.75. The truss is quite like that of its neighboring steel bridge, but is a composite of timber and wrought iron. It too is a suspension truss, with wooden posts of varying lengths, iron tension rods and eye-bars, and wooden end posts. Timber arches formed of short chord blocks co-axial with each truss appear to have been added later, again to reinforce against sagging.

The bridge is in very good condition. Borneman was known to have built timber and iron Howe truss bridges in Fairfield Co. and elsewhere in central Ohio, but this is the only one known on his "suspension truss" design. Both John Bright bridges are listed in the Natl. Register. *M.F.W.*

Editor's note. Bridge historian William P. Chamberlin [SIA] calls attention to the similarity between Borneman's suspension truss and William O. Douglas' "parabolic" truss (patented in 1878) that was the basis of the Berlin Iron Bridge Co's. extensively built lenticular truss bridges (see article on Neshantic Station Bridge). Further, points out Chamberlin, is the even closer similarity—to the point of being identical—between the Borneman design and an "Improvement in Construction of Bridges" patented in 1861 (No. 33,954) by Archibald McGuffie of Rochester, N.Y. (shown below). The similarity is such as practically to preclude coincidence.



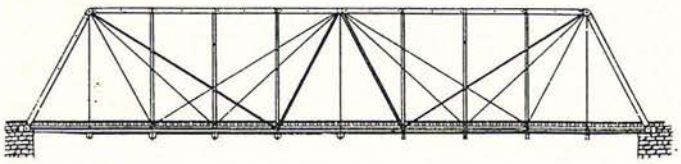
McGuffie's Girder.

Borneman, with access to the patent records, may either have built under royalty to McGuffie, or used the design freely after the patent's expiration in 1878.

A composite covered bridge similar to John Bright Bridge No. 2 stands near Germantown, south of Dayton, Ohio. Its relationship to Borneman, if any, is unknown.

II—THE THACHER TRUSS

Although economic considerations encouraged standardization of bridge truss systems, engineers continued to innovate with truss designs throughout the 19thC. Among these is the Thacher Truss, developed by Edwin Thacher (1840-1920), chief engineer of the Keystone Bridge Co. of Pittsburgh. An 1863 graduate of Rensselaer Polytechnic Institute, Thacher first described his truss to the ASCE membership in Nov. 1883 and it was published in their 1884 *Transactions.*



The basic Thacher truss. *ASCE Transactions, 1884.*

In its basic form, the truss combines features of the multiple-intersection Pratt and Warren trusses, and utilizes certain design principles employed in the Bollman and Fink trusses. Thacher referred to it as a "combination of the triangular [Pratt/Warren] and suspension [Bollman/Fink] systems" and indicated that the members were arranged and connected with one another in a manner "free to change figure from the effect of temperature." Thacher believed temperature stresses to be very significant within many truss bridges he had inspected and his truss was designed so that "the inclined suspenders are connected with each other at [the] bottom [of the vertical compression members] but have no fixed connection with the bottom chord." Thacher stated that this insured that there was only one route for the load at any panel point to take to the abutments, eliminating temperature stresses within the truss.

The article illustrated variously lengthened versions of the truss, the longest stretching to over 500 ft. Most of these designs never moved beyond the theoretical, however, as the actual use of the Thacher Truss was confined to spans less than 200 ft.

Thacher worked for Keystone (a firm closely associated with Andrew Carnegie's iron and steel empire) at the time he introduced his truss, and it is interesting that he advocated its use as a composite structure with wood for the compression members and iron for the tension members. The first Thacher Truss was such a combination, a 147.4-ft. span built in 1881 for the Burlington, Cedar Rapids & Northern RR over Iowa's Wapsipinicon River. Thacher claimed this structure deflected only 3/4 of an inch when loaded with three engines. The design also was used for all-metal bridges, and the Wrought Iron Bridge Co. of Canton, Ohio fabricated several examples. The oldest surviving Thacher Truss known is the 1889 all-metal Niver Road Bridge over the Shiawasee River in Saginaw Co., Mich., identified in HAER's 1975 Lower Michigan Inventory. In Virginia, a slightly altered 1898 example spans Daphna Creek near Broadway in Rockingham Co., listed in the Natl. Register. Several other examples are known to have existed, and it is possible more survive.

In his ASCE obituary, Thacher is credited with designing over 1,000 bridges in the U.S. during the late 19th and early 20thCs.

Thacher truss over Daphna Creek, Broadway, Va., by Wrought Iron Bridge Co., Canton, Ohio, 1898. *Donald C. Jackson photograph.*

These included the Topeka River Bridge (1897) in Topeka, Kansas, the first major multi-span reinforced-concrete bridge in the U.S. (concrete spans were his specialty), and the still extant, but seriously endangered, 6-span Walnut St. Bridge of 1891 over the Tennessee River in Chattanooga.[1] This employs pin-connected "camelback" trusses with subdivided panels, not Thacher trusses, indicating that Thacher by no means limited his efforts to his own special truss type.[2]

Though the Thacher Truss never was built in great numbers and cannot be considered a major development in the history of engineering design, it is significant in representing the efforts of a major 19thC bridge engineer to improve truss bridge design. The 1880s and '90s are usually considered a period of increasing standardization and uniformity in bridge design, but industrial archeologists would be remiss if they thought that only Pratt and Warren trusses were built during this time. Much work remains to be done on analyzing the development of this era's bridge design, and its relationship to both the iron and steel industry and the growth of the civil engineering profession. *D.C.J.*

1. This bridge's proposed replacement threatens the "Bluff Furnace" site noted in the May 1977 SIAN.
2. Thacher is also remembered among historians of civil engineering as inventor of the Thacher Cylindrical Slide Rule. Its enormous effective length made possible readings to a number of decimal places adequate for engineering calculations, and it was widely used by civil engineers until the general adoption of the mechanical calculator during the 1920s.

NEW HIGHWAY ACT: POTENTIAL BRIDGE PRESERVATION TOOL

The Federal Aid Highway Act of 1978 (formerly H.R. 11733) amends the Federal Highway Admin's. "special bridge replacement program" which threatened to deplete the nation's stock of older and historic bridges.* The new legislation allows rehabilitation as well as replacement of unsafe and obsolete bridges, but it still is unclear whether FHWA's standards for rehabilitated bridges will allow for retention of a structure's historical integrity: witness the Woodstock Bridge, SIAN Jan. 78:1.

The amendment requires the Secy. of Transportation, in consultation with the states, to inventory bridges both on and off the federal-aid highway system, determine their condition, and set priorities with respect to the need for and the cost of replacement. Of special interest to bridge preservationists is the additional provision that permits the Secy. of Transportation, at the request of the states, to inventory bridges for historic significance. These historical surveys may be funded with 80% federal funds and must be requested by the state depts. of transportation. For more information contact Donald C. Jackson at HAER: HCRS, Dept. of the Interior, Washington, D.C. 20243; (202) 343-4256. *B.B.*

**Copies of the amendment are available from SIA, Room 5020. Please enclose a stamped return envelope with your request.*

BRIDGE PRESERVATION AT THE STATE LEVEL. . .

N.Y.S. INVENTORY

Under Raymond W. Smith (see Truss Preservation, above) the State of N.Y.'s Office of Parks & Recreation has undertaken a statewide inventory of metal truss bridges built prior to 1920. The project is being conducted on a county-by-county basis, using standardized reporting forms and drawing on volunteers to as great an extent as possible. The program, of long standing, was intensified in the fall of 1976, and to date has covered the counties of Chenango, Columbia, Greene, Niagara, Rensselaer, Sullivan, and Westchester. The increased activity was the result mainly of the growing efforts on the part of the federal and state governments at large-scale replacement of the numerous "old" metal bridges that are perceived by many jurisdictions to be deficient and, in the long run, a threat to public safety.

While that may be true to a very limited extent, governmental and media reaction to the situation has been typically one of overreaction. Whereas many—perhaps the majority of—defective bridges could readily be rehabilitated at a fraction of the cost for their total replacement with new spans, and in many cases with no appreciable harm to their historic aspect, the common response has been to propose demolition and building anew.

Smith and his colleagues hope that the inventory will draw attention to the double resource represented by the state's early metal bridges, which form at once a body of working structures capable of rehabilitation if given the chance, and a visual asset, invariably far more interesting as landscape elements than the innocuities that generally succeed them.

As a means of affording some protection to the more important and interesting of the early spans, many of them will be placed in the Natl. Register, either individually or, where appropriate, in blocks as thematic nominations.

KENTUCKY'S COVERED BRIDGES

The Kentucky Heritage Commn's. *Heritage News* reports that although a bit late in developing a constructive consciousness of the state's timber bridges, there is at last a concerted effort underway to rehabilitate and preserve the survivors. At the end of the 19thC there were between 300 and 500 in the state; by 1945 the number was down to 45; today there are 16 located in 10 counties. Of these, 7 are county maintained, 2 by the state, one is private, and the other 6 are apparent orphans.

Kentucky's historic-preservation community and even the state and county governments have only recently been sent into mild shock at the realization that these numbers compare quite embarrassingly with the present inventories in: Vermont (95—all under official protection); Ohio (240); Indiana (360); and Penna. (366). As a first step in a program of formal preservation, the 16 spans were placed in the Natl. Register as a group, and their consequent eligibility for HCRS funding is being explored. Another scheme—for systematically splitting maintenance costs among the respective towns and counties, the state historic preservation office, and the state highway dept.—is being looked at as well. The concept of regarding a coherent group of historic structures as a unified resource and dealing with the problems of preservation on that basis is unquestionably the most rational and efficient, and in the long run, bound to be the most effective.

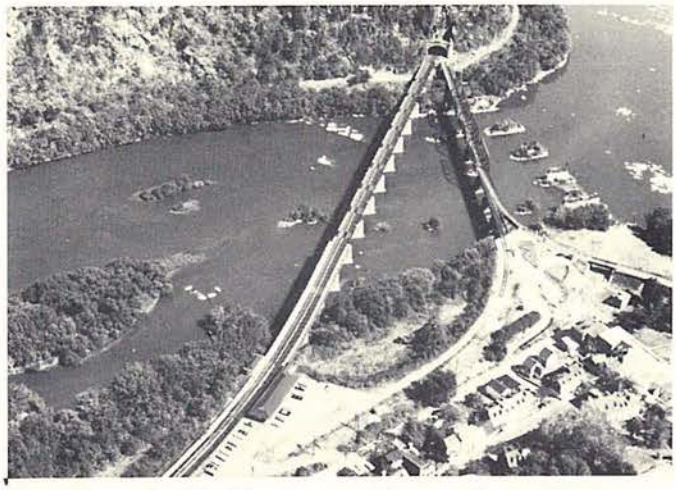
MARYLAND—NATIONAL REGISTRY, COUNTY AWARENESS, AND SEMI-PRESERVATION

Maryland has long had a well developed sense of the importance of its historic bridges, as has been noted here on many occasions. A flurry of activity during the past few months has furthered bridge preservation in the Free State . . .

PLACED IN THE NATL. REGISTER have been a "crossing" and 5 bridges. In what presumably is a Register first, the **Baltimore & Ohio RR's Crossing of the Potomac River at Harpers Ferry** was entered. (Harpers Ferry is, of course, in W. Va., but the state line is at the W. Va. shore; thus the entire river is in Washington Co., Md.) It is difficult to know whether it is a concept or a group of structures that is in the Register—in a sense both.

What is historically significant about the Crossing is that the B&O has carried its main line across the river at that crucial location on three separate alignments, each of the latter two improvements on their predecessors. The first crossing (1836) was by a timber structure designed by B. H. Latrobe and built by Lewis Wernwag, replaced during and after the Civil War by Bollman trusses in iron. As the line followed the bank on either shore and the crossing was laid out to be as short as possible, there was a fearsomly sharp curve at either end, a severe operational impediment. In 1894 the rock spur on the Md. bank was tunneled and a steel truss and girder bridge was erected, considerably relieving the curvature at both ends.

Finally, in 1931, a long deck-girder bridge was built and the tunnel "bell-mouthed," resulting in a tangent on the Md. side and a very easy curve on the W. Va. This is the present route. The 1894 structure survives carrying a branch line, and most of the piers and the W. Va. abutment of the original crossing remain, the majority of the Bollman spans having been in place as late as 1936 when they were carried away by the Great Flood.



The Baltimore & Ohio RR's Potomac River Crossing at Harpers Ferry, 1836/1870/1894/1931 (R to L). Looking N. from Harpers Ferry to Maryland Heights.

Le Gore bridge over the Monocacy. *Herbert H. Harwood photograph.*

In Frederick Co. 3 iron trusses have been registered: **Bullfrog Rd. Bridge** (Parker truss by York Bridge Co., 1908); **Fourpoints Bridge** (Pratt truss by Wrought Iron Bridge Co., c1896); **Poffenberger Rd. Bridge** (double-intersection Pratt by W.I.B.Co., 1878); and **LeGore Bridge**, a 5-span stone arch over the Monocacy built in the late 19thC by the owner of a limestone quarry.

The Jericho Covered Bridge crossing the Little Gunpowder Falls in Baltimore Co. was registered—a Burr arched truss of 1865, still in use.

FREDERICK COUNTY, in an unprecedented move, has acted to preserve *in situ* eight historic timber and metal bridges, including

2 of the 3 noted above, a King Iron Bridge Co. bowstring truss of c1880, and a Pratt truss of 1882 by the Pittsburgh Bridge Co. Cherilyn Widell and Dana Keister of the Frederick Co. Preservation Office inventoried over 40 truss bridges and worked with the Co. Highway Dept. in devising a means of preserving the most historically significant ones. The Co. Commissioners approved the plan worked out by the two groups. This is the first known action taken by a county government to recognize the historical significance of metal truss bridges as a structural type and it points the way for other enlightened counties and communities. It is especially welcome to preservationists in Md. as it runs counter to the attitude of the government of adjacent Carroll Co. which last fall demolished the Keysville Rd. Bridge (see below).

Even those bridges in Frederick Co. that will not be preserved *in situ* are recognized as significant and efforts will be made to remove them to parks and recreational areas, which Widell and Keister hope will save the county money in the future. Information on this program: Ms. Cherilyn Widell/ Ms Dana Keister, Office of Historic Pres., Winchester Hall, 12 E. Church St., Frederick, Md. 21701.

IF YOU CAN'T SAVE THE BRIDGE SAVE THE BITS.

Through the assistance of the Frederick Co. Office of Historic Preservation representative pieces of the Keysville Rd. Bridge have been saved. The bridge, a unique example of a two-span bowstring arch-truss bridge, was built c1873 by the Wrought Iron Bridge Co. of Canton, Ohio. It spanned the Monocacy River between Carroll and Frederick counties, near Keysville.

In June 1977 the bridge was nominated to the Natl. Register but early the following year Carroll Co.—which had jurisdiction over it—commissioned a study for its replacement. Although the study estimated that upgrading the existing structure to 10-ton loading would cost only $72,000, the County Commissioners approved construction of an 18 ft.-wide, 20-ton capacity replacement at a much higher figure. Members of the Md. Historical Trust (MHT) staff, the American Soc. of Civil Engineers History & Heritage Comm., and local citizens campaigned to have the decision reversed. Although the county roads dept. acknowledged that the site was in the inundation area of a proposed dam, the county chose to scrap the old bridge.

Despite all efforts to stop demolition (because no federal funds were used for the replacement, the bridge received no protection under federal regulations), it was razed in the fall of 1977. The demolition contractor—Thomas, Bennett & Hunter of Westminister, Md.—agreed, though, to store the dismantled structure until representative pieces could be selected.

Early in 1978 some elements of the bridge were used in the reconstruction of a single-span bridge of the same type that had been moved from Detour, Md. to Cunningham Falls State Park [SIAN Jan. 78:5]. In April representatives of the MHT, the Frederick Co. OHP, and the Smithsonian met to earmark certain pieces of the structure for salvage. Sections of the unusual built-up arched chord, lattice vertical struts, and various other parts were cut out of the wreckage and transported to the Museum of History & Technology as a public-spirited gesture by contractor Richard F. Kline of Frederick. Carroll Co. looked on in shame the while.

These elements, with the measured drawings and photographs made of the bridge in Nov., 1975 by the SIA's Montgomery C. Meigs Original Chapter, have ensured that a thorough graphic and physical record has survived its passing. *M.R.E.*

Keysville bridge, membered and dismembered. *(L) Eric N. DeLony for HAER, (R) Mark R. Edwards for Md. Historical Trust.*

BRIDGES FOR FUN & PROFIT

Recently discovered in the Calif. State Archives, Sacramento, was a 1937 proposal by Hamden, Conn. engineer Joseph Bazzeghin to double the utility of the recently completed Golden Gate Bridge by superimposing on it "The Golden Gate Bridge Bolt." The Bolt was a hyper-roller coaster in which trains of self-propelled, open cars would have carried its patrons along tracks attached to the bridge's main cables. Actually, the tracks were to have been raised considerably above the path of the cables, the cars starting at one anchorage, rising to a summit some 300 ft. *above* the first tower (say, 1000 ft. above the water surface), and dropping 750 ft. to deck level at center-span at which point speed would have been 190 mph. Then shooting up over the other tower top, and a final breathtaking rush down to the base of the far anchorage, dropping 1000 ft. and hitting 220 per. *Wow!* But not to worry. To prevent suffocation and whatever, cheap pressed-paper masks extending over the eyes, nose, and mouth were to have been issued. His grand scheme rejected, the inventor blamed ". . . the usual resistance which obstructs the acceptance of all new ideas."

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MORE ON THE RE-CYCLING OF BRIDGES

T.G. Hobbs, Jr. [SIA] advises that the adaptive use of masonry bridges is a practice not unknown in places beside Stamford, Conn. and Rochester, N.Y. [SIAN July 78:5]. He reports that the Chesapeake & Ohio RR in Virginia uses a considerable number of stone culverts and aqueducts, and a tunnel, built by the James River & Kanawha Canal, c1838-50. Nothing endures like stone.

A BERLIN LENTICULAR TRUSS: RECORDING & LOCAL POLITICS

*Last August the Historic American Engineering Record Emergency Recording Team (ERT) undertook to record one of the dwindling number of lenticular (lens-shaped) truss bridges erected by the hundreds from c1880 into the late 1890s by the Berlin Iron Bridge Co. of E. Berlin, Conn. (*IA*, vol. 5, 1979 will contain an article on BIBCo, one of the few New England bridge companies, by Victor C. Darnell.) The occasion turned into an interesting mix of field work, hospitality, and the politics of preservation. The following account is by Magda C. Westerhout, one of the ERT members, now a student at the School of Architecture, Univ. of Maryland.*

As members of the HAER Emergency Recording Team, half a dozen of us (Eric DeLony, Principal Architect; Donald Jackson, Engineer; Suman Sorg, Architect; Chris Reynolds and Magda Westerhout, Architectural Technicians; and Ronda Wist, Historian—joined at the site by SIA member Robert Holton of Essex Fells, N.J.) were scheduled to go to Neshantic Station, Somerset Co., N.J.

The highway bridge we were to record is a local landmark, built in 1896. It is one of few bridges of its type left in the U.S., and the most southern known. It is in danger of being replaced by a two-lane concrete bridge.* The proposed destruction of the bridge was a touchy topic, and as it was an election year all the county commissioners, their challengers, and several mayors were present to meet us. "Save This Bridge" petitions were being circulated by local Boy Scouts, who had also brought a fife-and-drum crops and a troop of Revolutionary War Minutemen replete with muskets, presumably to welcome us. It was quite a surprise, after traveling through the far reaches of the New York City suburbs, to find ourselves in such an idyllic rural setting.

DeLony, crew, & observers at Neshantic Station Bridge. *Photograph by Rich Pipeling, Whitehouse Station, N.J.*

To one side of the one-lane bridge was a stone grist mill; to the other an old railroad bridge. The town of Neshantic Station was founded in the 18thC and retains much of its colonial charm. The bridge is part of that charm and our recording project had attracted a crowd of almost 60 people. We were plied with doughnuts and sodas by the historical society as DeLony addressed the group on the historical value of the bridge. After talking with the local press who also were present, we settled down to our field work.

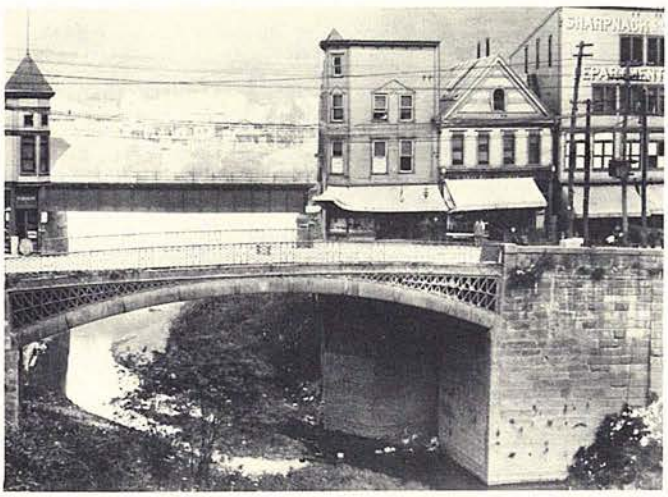
Around noon we were invited to a large buffet lunch at the Neshantic Station Inn. This also was provided by the historical society and gave us the chance to discuss our work with the politicians and townspeople, whom we found generally sympathetic.

The interest and concern that had been expressed was very encouraging and transformed the entire weekend into an enjoyable experience. The high level of participation by the community augurs well for the eventual preservation of the Neshantic Station Bridge and for the future of preservation efforts in general.

*Civil engineer A.G. Lichtenstein [SIA] has since issued a report stating that the bridge can be rehabilitated for 12-ton traffic loading for $420,000, which now is being sought by the local authorities. Ed.

MISC. BRIDGE AFFAIRS

DUNLAP'S CREEK BRIDGE HONORED. The first all-iron bridge in the U.S. was a small arch crossing Dunlap's Creek in Brownsville, Penna., on the line of the National Road. It was designed by Army engineer Capt. Richard Delafield and based essentially on British practice. It consists of five parallel arch ribs, each formed of five cast-iron segments, the arch spanning 80 ft. clear. A novelty was that the segments were elliptical in cross-section, the long axis vertical. The castings were produced and machined locally. The bridge, which still stands, was opened in 1839, and has been designated by the American Soc. of Civil Engineers a Natl. Historic Civil Engineering Landmark. The dedication ceremony will take place on 19 May at 11:00 AM.



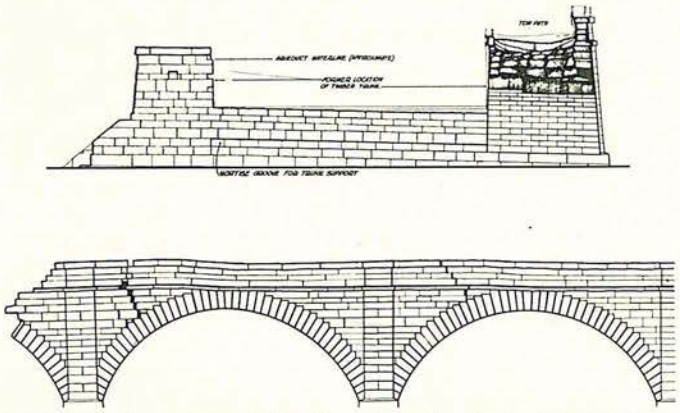
Library of Congress, Divn. of Prints & Photographs.

HISTORICITY VS. PRIVATE RIGHTS. *Historic Illinois,* the organ of the state's Divn. of Historic Sites, in its Aug. 1978 issue points out the conflict that can—and often does—arise when a historic structure is privately owned. The U.S. Army engineering corps, which built the Brownsville cast-iron arch, at about the same time built a number of stone arches to carry the Natl. Road over watercourses on its way westward. Many of these survive. A fine example of coursed stone in Clark Co. was abandoned in 1933 when the alignment of what then was U.S. Route 40 was changed. It stands in the middle of property now owned by an individual, and it is assumed belongs to him rather than the federal government. Recently re-discovered by the state Dept. of Transportation, it was nominated to the Natl. Register, as it had every reason to be. But the owner—who doesn't for a moment dispute the bridge's historic worth—is not at all pleased at the prospect of the notoriety of Registration, for it will bring the world to his door with all the attendant vandalism, liability, and other unwelcome problems. He therefore plead against Registry of the bridge, but was over-ruled by the state's NR review board who simply were following their charge of designating sites and structures that in their view possessed historic value, quite apart from current political, social, or personal considerations.

Here, then, is a preservation concept correct in theory, but with unfortunate implications for the property owner. A solution may be to classify all references to the location of such sites in the official records, as now frequently is done in the case of dirt-archeological sites, as a means of preventing access by the unprincipled.

SCHOHARIE CREEK AQUEDUCT STABILIZATION. The aqueduct (1841) which carried the enlarged Erie Canal across Schoharie Creek at Ft. Hunter, N.Y. has suffered a series of mishaps in recent years, the result principally of demolition in the 1940s of four of its limestone arches to reduce impedence to the flow of the creek. This left the remaining arches which carried the towpath

with no counterthrust and those at the free end of the structure gradually flattened and cracked. The outermost arch, in fact, collapsed in March 1977 [SIAN May 77:4; July 77:1]. The cry for stabilization was raised, and finally the state Office of Parks & Recreation has carried out a job that should have been done years before. The structure has been reinforced by cables embedded in the towpath, to carry the horizontal thrust of the unsupported outer arches back to a concrete anchor block at the abutment. Simultaneous sealing of the towpath itself will prevent water seepage down to the arch rings, which contributed to the deterioration. Parapet stones, pushed off by vandals, also have been fished out of the creek and replaced. A bit late with all this, but better than not at all.



Schoharie Creek Aqueduct: typical section and elevation of arches 8 and 9, the latter now collapsed. Spans: c43'-6". Three sheets of measured drawings produced by HAER in 1969 have been of help in the present stabilization project. *HAER drawing by David Bouse.*

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WHAT HAVE WE HERE?? A pony Pratt truss in iron or steel, unmarked, of indeterminate date and unusual construction. Top chords & posts: built up of channels; web diagonals: round rods; bottom chords: flat bars with riveted splices. Pin-connected top chord; bearing blocks at bottom chord. Perhaps ex-RR (newish ties for floor beams, supporting plank wearing surface). Over a branch of Codorus Creek on a private access road, adjacent to Northern Central r.o.w. (Now Conrail.) N. of Glen Rock, York Co., Penna.

Company-made or home made? One-off or member of a family? Old or middle-aged? Certain knowledge or suppositons to editor. *Herbert H. Harwood photograph.*

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SIA AFFAIRS

GREAT LAKES CHAPTER. This most recently formed of the Society's local chapters plans a joint meeting with the Mich. Chapter of the Soc. of Architectural Historians at Fairlane, Henry Ford's estate in Dearborn, on **Saturday, 2 June.** In the morning will be separate business meetings, at 9:30, and after lunch a guided tour and lecture on the mansion and its powerhouse (1914) which was Ford's pride and joy. It was designed by his friend Thomas Edison. Principal equipment is two 50-KW hydroelectric units and a 35-KW steam engine-generator. The hydro units recently were restored by Univ. of Michigan-Dearborn students. It is hoped they can be demonstrated. Fee for the entire event: $10. Information: John Bowditch, Henry Ford Museum, Dearborn, MI 48121. (313) 271-1620.

ROEBLING CHAPTER will mark the Edison Light Centennial with a tour of the Edison Laboratory Historic Site, W. Orange, N.J., **Saturday 23 June.** Of special interest is the machine shop which stands essentially as when last used by TAE in 1931. Other tour features: a presentation on other Edison sites of IA interest in N.J.; tour of Energex Lighting Co., occupying last of the Edison concrete buildings in W. Orange (mfgrs. of light bulbs); Montclair Station, DL&WRR; and Chas. Shultz House, Montclair, containing many IA items. Assemble promptly at 8:45 AM, Edison Museum, Main St., W. Orange. Information: Thorwald Torgersen, Box 429, Hackettstown 07840.

ROYALTIES. In the issue of last March (p. 7) was noted the publication of *Historical Archaeology: A Guide to Substantive & Theoretical Considerations*, edited by Robert L. Schuyler [SIA]. By agreement between Prof. Schuyler and the publisher, all royalties are to be disbursed, in varying proportions, to support the work of the following societies: SIA; Society for Historical Archaeology; Society for Post Medieval Archaeology; Australian Society for Historical Archaeology.

With understandable pleasure, and gratitude to both Prof. Schuyler and Baywood Publ. Co., we announce receipt by the Society of a royalty contribution in the sum of $108.26.

Historical Archaeology &c. *304 pp., paper, Smythe-sewn, illus. $16.50 PPd. Baywood Publ. Co., P.O. Box 609, 120 Marine St., Farmingdale, NY 11735. Descriptive flyer available.*

CONSULTANTS & SERVICES DIRECTORY. A 2nd edition of this is to be put in work shortly. If you were in the first and your entry is OK, do nothing. If you wish it changed, or want out, or want in, advise Prof C.T.G. Looney at the editorial address. Please keep altered/new entries brief and in style of 1st edn.

CORRECTIONS

In the last two SIANs there were several errors of ommission and commission, which we hasten to correct. Most serious was the inadvertent dropping of a line in Robert M. Frame's article on Minneapolis IA (Sept., p. 2). The third line of the segment on grain elevators should read: "Built 1899-1900 by grain co. owner Frank H. Peavey and architect/builder Charles F. Haglin, the single 125 ft. tube . . ." In the article on TICCIM (Nov., p. 4) we failed to note that among the N. American delegates was André Berubé of Quebec. Apologies to Messrs Frame and Berubé. Finally, the steam yacht *Kestrel* (Sept., p. 6), which was attributed to N.Y., is, of course, based in West N.Y., Hudson Co., New *Jersey*, on the *right bank* of the Hudson. Sorry.

1980 ANNUAL CONFERENCE

DETROIT, the date now absolutely set: 29 May - 1 June, and a gala one it already sounds as though it is to be. (No, that is not Memorial Day weekend, but the one *after.*)

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MISC. NOTES

NEWS OF MEMBERS

EUGENE S. FERGUSON has retired from his post of Historian of Technology in the Univ. of Delaware/Hagley Program but will stay on at Hagley as Resident Scholar. His successor is **DAVID A. HOUNSHELL** who had been teaching history of technology at Harvey Mudd College, Claremont, Calif.

GARY KULIK, formerly Curator of the Slater Mill Historic Site, Pawtucket, has been appointed Curator of Textile Machinery, Natl. Museum of History & Technology. He has been succeeded at SMHS by **STEPHEN VICTOR,** who has worked in various areas of textile history, most notably the mechanization of the American hair cloth industry.

HERBERT LEVY, who has extensively examined the gas industry in Philadelphia, has closed his own architectural office to join Geddes Brecher Qualls Cuningham Achts. (2410 Pine St., Phila., Penna. 19103) where he will specialize in archeology, restoration, and adaptive re-use of historic buildings. He is on the city's Historical Commission.

RESEARCH INQUIRIES

WATER POWER. Interested in developing information on all aspects, including mechanical transmission from the prime mover, introduction of the turbine, &c. Especially concerned with power derived from the Lachine Canal, Montreal. Larry McNally, 420 Lebeau St., St. Jean, Que. J3B 1L1.

IA IN ART. Attempting to compile a listing, in connection with an article, of all depictions by 19thC American painters of industrial processes, machinery, and activities. Raymond L. Wilson, 1231 Kedith St., Belmont, CA 94002.

PRR TERMINALS, NYC AREA. Seeking photographs, other graphic material, track plans, and other information on Penna. RR facilities, especially Exchange Place, Jersey City and Manhattan and Brooklyn ferry houses; most especially Exh. Pl. track plan of c1858. Current studies and reminiscences of living users of Exch. Pl. also welcome. Luther W. Gette, Edwards Hotel #207, 72 Hudson St., Hoboken, NJ 07030.

POSITIONS AVAILABLE

Jointly: Coordinator of Hagley Grad. Program and Asst. Prof. of History, U. Delaware. Teaching and admin. of MA-PhD program in economic/industrial/technological history. PhD, speciality in some aspect of above; admin. exp. desirable. Dossiers by 1 June to Hagley Prog. Search Comm., Dept. of History, U. of Delaware, Newark 19711.

Project Director, Chatham Co.-Savannah Metro. Planning Commn. To direct planning & redevelop. of large tract for public & private use. Large portion occupied by the shop complex of Central RR of Ga. (c1855), a Natl. Historic Landmark. Knowledgeable about grant programs and procedures; adaptive reuse. Salary: $18-22,000. Metro. Planning Commn., Box 1027, Savannah, GA 31402.

ARCHIVAL MATTERS

ARCHITECTURAL DRAWINGS. The Archives of Ontario has received one of the most significant gifts in its history: the **J.C.B. & E.C. Horwood Collection of Architectural Drawings,** the largest such in the Dominion. It contains over 10,000 drawings for 1,200 Canadian buildings by 55 architects, spanning 1829 to the present, but 2/3 of the collection pre-dating 1914. Included are commercial buildings, warehouses, power houses, a few bridges, factories, textile mills, gas works, RR stations, hydraulic works, &c. Although the collection will not be accessible until completion of conservation and processing, a splendid 24-page listing of the structures, by firm and date, and a series of biographies of the architects represented, are available from the A of O (77 Grenville St., Toronto, Ont. M5S 183).

LOCOMOTIVE PHOTOS. The collection of photos of locomotives (and some automobiles) built by the American Locomotive Co., in custody of the Mohawk & Hudson Chap. of the Natl. Ry. Historical Soc., has been listed in a revised **ALCO Historic Photos Catalog.** It lists over 5600 steam, electric, and diesel locomotives — 1867 to 1954 — for which at least one photo is available, and covers all ALCO plants except Manchester and Montreal. 150 pp., 24 full-p. illus. $4. PPd. ALCO Historic Photos, Box 655, Schenectady, NY 12301. (518) 374-0153.

EVENTS

HISTORIC PRESERVATION SUMMER INSTITUTE, Univ. of Vermont. Series of courses & workshops on Community Conservation; Historic Preservation & Land Use Planning; and **IA Institute,** 9-13 July. Recognition & evaluation of IA, documentation techniques, recording, &c, based on the area's sites. Intensive. Flyer: Summer Session, Grasse Mount, U. Vermont, Burlington 05405.

STUDY TOUR OF ENGINEERING & INDUSTRIAL MONUMENTS IN THE UK. 30 July-17 Aug. ASCE Comm. on the History & Heritage of American Civil Engineeing. London, York, Edinburgh, Chester, Birmingham, Bath, Bristol; and Ironbridge on "America Day," part of Bicentenary celebration. $1370 (from NYC). Flyer: Dr Alan I. Prasuhn, Dept. of CE, South Dakota State U., Brookings 57007. (605) 688-6526.

130th MINNESOTA HIST. SOC. CONF. 27 Oct., Minneapolis. Papers invited: some aspect of 20thC Minn. or upper-Midwest history, ideally emphasizing collections of MHS. Honoraria & exps. provided. Information: Nancy Eubank, Prog. Chairman, MHS, Bldg. 25, Ft. Snelling, Minneapolis, Minn. 55111.

FIFTH-ANNUAL ALTERNATIVE VEHICLE REGATTA, 21-23 June, Mt. Washington, N.H. (See SIAN Jul/Sept 75:5 for the full scam on these extraordinary events.) Entrants & observers welcome. Information: Charles E. MacArthur, Brown's Mill, 16 Vaughn St., Dover-Foxcroft, ME 04426. (207) 564-8614. (Prospects this year for a *solar* car, among other mobile portents of the future.)

ALTERNATIVE ENERGY/LIFESTYLE EXPERIENCE. Two days, anytime, by appt., at Brown's (ex-woolen) Mill, Dover Foxcroft, Maine, with Chas. MacArthur (above). Direct, personal, hands-on involvement with the many interesting things taking place in this experimental environment: hydroelectric generation; hydraulic air compression; wood-fired steam generation; micro-businesses; crafts; alternative energy systems; early-technologies revivals, &c. "Nothing fancy; long hours & sore muscles," but, by golly, *interesting*. $150/person all in. Ten-person max.

See also SIA AFFAIRS for other events.

AVAILABLE

KEG-MAKING MACHINERY. Complete family of 16 machines — 19th & early 20thCs — for manufacturing churns + 1 & 2½ gal. wet kegs, scrap oak the raw material. Presently in production. Expertise on re-erection and operation available to purchaser. Market way beyond any reasonable output. Priced in 20s. Tom Hussey, Hussey Enterprises, Inc., PO Box 1795, Martinsville, IN 46151. (317) 342-6784.

FILM: RETURN TO THE SEA. Commerce on the Mississippi from flatboat era to present. Said to contain outstanding footage of river scenes and accomplishments of Corps of Engineers. Avail. on loan: District Engineer Offices, Lower Miss. Valley Divn., U.S. Army C. of E., or Modern Talking Picture Svc., 2323 New Hyde Park Road, Hyde Park, NY 11040.

EDISON CENTENNIAL INFORMATION PACKET. Primarily for schools & libraries. Classroom activities, reading lists, photographs, &c. Write on letterhead: Edison Natl. Historic Site, Main St. & Lakeside Ave., W. Orange, NJ 07052.

WIND ENERGY. Synoptic wall chart showing historical development of principal windmill types, incl. physical characteristics, power output, &c, with bibliographic references and extensive data on rear on the subject today. In color. A swell thing. Windworks, Box 329, Rt. 3, Mukwonago, WI 53149. $3. sent rolled.

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LOWELL NATIONAL URBAN CULTURAL PARK. The U.S. Park Service has established a temporary office as the initial on-site manifestation of this important project, at 171 Merrimack St., Lowell, Mass. (See SIAN July 77:2).

PUBLICATIONS OF INTEREST

Conducted by Robert M. Frame III & Susan R. Queripel, Minnesota Historical Society.

BRIDGES

Martin Abramson, **Our Bridges are Falling.** In *Parade*, 7 Jan. 1979, pp. 4 & 7. A somewhat overdramatized view of the US's "unsafe" bridges, mostly old, whose principal failing is that they are undermaintained.

Nathan Rosenberg & Walter G. Vincenti, **The Britannia Bridge, the Generation & Diffusion of Technical Knowledge.** MIT Press (28 Carleton St., Cambridge MA 02142), 1978. 107 pp. $12.50. Sheds light on the historical learning process by reconstructing the problem-solving method involved in designing and building the great tubular RR bridge over the Menai Straits in Wales, 1846-49.

Designed by Robert Stephenson assisted by Wm. Fairbairn and Eaton Hodgkinson.

Quinta Scott (photographic essay) & Howard S. Miller (historical appraisal), **The Eads Bridge**. U. of Missouri Press, 1979. 144 pp. 97 photos. $19. Stunning photos—many from within, and a new look, from the metallurgical viewpoint, at the first American bridge to employ "steel" in its principal members. A handsome and historically important contribution.

Virginia Highway & Transportation Research Council, **Criteria for Preservation & Adaptive Use of Historic Highway Structures, Interim Report No. 1**; and Howard Newlon, Jr. [SIA], **A Trial Rating System for Truss Bridges.** Jan. 1978. Box 3817 University Stn., Charlottesville 22903. 34 pp., illus., biblio., appendices. Gratis. "Based upon a statewide survey of metal truss bridges . . . an objective numerical rating system for historic significance has been developed that considers characteristics in three categories: documentation (age and builder), technology, and environmental factors."

Dan Grove Deibler [SIA], **A Survey & Photographic Inventory of Metal Truss Bridges in Virginia, 1865-1932.** 5 vols. Vol. 1: **An examination of the development of the truss form including an annotated list of 19th and 20thC bridge companies.** 1975. 55 pp., illus., notes, biblio. Vol. 2: **The Staunton Construction District.** 1975. 47 pp., notes, appendix with inventory forms. Vol. 3: **The Culpeper Const. Dist.** 1975. 51 pp., as in vol. 2. Vol. 4: **The Fredericksburg Const. Dist.** 1976. 29 pp., as in vol. 2. Vol. 5: **The Richmond Const. Dist.** 1976. 35 pp., as in vol. 2. VA Highway & Trans. Research Council, as above.

Long Span Suspension Bridges: History & Performance. American Society of Civil Engineers. Collected & bound papers from Natl. Convention, Boston, April 1979, Sessions 70 & 78. Reprint 3590, 397 pp., illus. $16. (ASCE, 345 E. 47th St., NYC 10017.) Splendid overview of the entire subject, to date. Biog. sketch of O.H. Ammann; history from earliest attempts to beginnings of wire cable bridges; Wilhelm Ritter, Teacher of Maillart & Ammann (David P. Billington); Jas. Finley & the Modern Susp. Br. (E.L. Kemp [SIA]); + good series on the modern bridge.

Special Bridge Replacement Program—6th Annual Report of the Secy. of Transp., 1978. (USGPO, Wash., DC 20402. Senate Doc. 95-101.) Brief description of program and complete listing of bridges approved for replacement as of 31 Dec. 1977; table of funding by state.

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Leonard J. Arrington, **David Eccles: Pioneer Western Industrialist.** Utah State U. Press, 1975. 294 pp., illus. $10. The various enterprises of intermontane West's first multimillionaire (mid-19thC—1912). Rev.: *Idaho Yesterdays*, Fall 1977; *Business Hist. Rev.*, Winter 1977.

Bauer & Bollinger, **The Moffat Road.** (New edn.) Colorado RR Museum (Box 10, Golden, 80401), 1978. Illus. $19.95. Denver & Salt Lake Ry before the 1928 Moffat Tunnel. New chapter added to old edn.

H. M. Boettinger, **The Telephone Book: Bell, Watson, Vail and American Life, 1876-1976.** Riverwood Publ. (Croton-on-Hudson, N.Y.), 1977. 192 pp. $30 cloth. B,W&V and technological developments of the telephone and how they affected the U.S. Rev.: *Journal of the West*, Jan. 1978.

Blue Clark, **The Beginning of Oil & Gas Conservation in Oklahoma, 1907-1931.** In *The Chronicles of Oklahoma*, Winter 1978, pp. 375-391, illus.

John Fitch, **The Autobiography of John Fitch.** Ed. by Frank D. Prager. Phila.: American Philosophical Soc., 1976. 215 pp. $7. Fitch (1744-98) was the first American to build a steamboat. Rev. by Eugene S. Ferguson [SIA] in *Bus. Hist. Rev.*, Spring 1978.

Eleanor Haskin (Ed.), **Independent Telephony in New England: A History from 1876 to 1976.** Independent Telephone Pioneer Assoc., New England Chapter (Box 9, Waitsfield, VT 05673), 1976. 364 pp. Paper. No price.

Dow Helmers, **Historic Alpine [Colo.] Tunnel.** (reprint) Colorado RR Museum (Box 10, Golden 80401), 1977. 200 pp., illus., maps. $15. South Park Line.

Harvey R. Hougen, **Impact of Politics & Prison Industry on the General Management of the Kansas State Penitentiary, 1883-1909.** In *The Kansas Historical Quarterly*, Autumn 1977, pp. 297-318. The prison industrial boom, focusing on the various factories and coal mining operation of the KSP.

J.R. Hume, **The Industrial Archaeology of Scotland. Vol. 2: The Highlands & Islands.** London: B.T. Batsford Ltd., 1977. 335 pp., illus., maps. £7.50.

Keach Johnson, **Iowa's Industrial Roots, 1890-1910.** In *Annals of Iowa*, Winter 1978, pp. 163-190.

Kenneth M. Johnson, **Two Mines, Two Books.** In *Jnl. of the West*, Jan. 1978, pp. 27-38. The New Idria [mercury] Mine in Calif., 1853-1975, and the Emma Silver Mine, Utah, 1868.

John H. Krenkel, **The Founding of the Salt River Water Users Association.** In *Jnl. of the West*, Jan. 1978, pp. 82-90. The Roosevelt Dam in Arizona, built 1905-11 on a design of A.P. Davis of the US Geological Survey.

David Lloyd and Donald Insall, **Railway Station Architecture.** David & Charles (Box 575, N. Pomfret, VT 05053), 1978. 64 pp., illus. $8.95. New edn. of popular short history of British RR station architecture, 1825-1900.

John A. Lynn, **Reconstructing a Maine Lumber Camp of 1900: The Diorama as a Historical Medium.** In *Jnl. of Forst Hist.*, Oct. 1976, pp. 92-102. Exhibits at Penobscot Heritage Museum, Bangor.

Lowell S. Mengel, **Canadians in the Redwoods: The Little River Redwood Company.** In *Humboldt Historian*, May-June 1976, pp. 13-14. 1909-31 the Canadian-owned LRRCo. operated one of the largest sawmills in Humboldt County, Calif.

Donald C. Miller, **Ghost Towns of Wyoming** (116 pp., 138 photos, $12.50). **Ghost Towns of Idaho** (112 pp., 145 photos, $13.95). **Ghost Towns of Montana** (192 pp., 232 photos, $17.50). **Ghost Towns of Washington and Oregon** (135 pp., 148 photos, $12.50). Avail.: Colorado RR Museum, Box 10, Golden 80401.

M.S. Moss and J.R. Hume. **Workshop of the British Empire.** Heinemann Educational Books Ltd., n.p., n.d. 192 pp., 151 illus. £12.50. Mainly Clydeside, Glasgow, pre-1939. Rev.: Newcomen Soc. *Bulletin*, Dec. 1977.

James Greeley McGowin (& family), **James Greeley McGowin—South Alabama Lumberman: The Recollections of His Family.** Elwood R. Maunder, interviewer. Forest History Soc. (Santa Cruz, CA), 1977. 135 pp. $14. Oral history transcript.

Kenneth Baxter Ragsdale, **Quicksilver: Terlingua & The Chisco Mining Co.** Texas A&M U. Press, 1976. 327 pp., illus. $12.50. Howard E. Perry's late-19thC empire in the quicksilver mining area of west Texas. Rev.: *Jnl. of the West*, Jan. 1978.

K.H. Rogers, **The Newcomen Engine in the West of England.** Bradford-on-Avon, Wiltshire: Moonraker Press, 1976. 63 pp. $5.35 (surface; $7.25 air). Details of the discovery of the remains of some 50 Newcomen engines, dating from mid-18thC, in SW England. According to reviewer Louis C. Hunter [SIA] in *Bus. Hist. Rev.* Spring 1978, "this study is not a by-product of the burgeoning field of IA but simply the result of the chance discovery of a contemporary account book of a Bristol merchant, agent in the area of Abraham Darby's celebrated Coalbrookdale foundry . . ."

J.C. Ryan, **Early Minnesota Sawmills.** In *Timber Producers Assoc. Bulletin*, June-July 1977, pp. 36-38. Brief survey to c1930.

H. Lee Scamehorn, **Pioneer Steelmaker in the West: The Colorado Fuel & Iron Co., 1873-1903.** Boulder: Pruett Publ. Co., 1976. 231 pp., illus. $19.95. Development and growth of a small mining company into a corp. Rev.: *Montana Mag. of West. Hist.*, Jan. 1978.

Kent Stephens, **Matches, Flumes & Rails: The Diamond Match Co. in the High Sierra.** Corona del Mar, CA: Trans-Anglo Books, 1977. 176 pp., illus., maps, rosters, bibl., index. $12.95. Rev.: *Jnl. of Forest Hist.*, Jan. 1978.

Louis Torres, **Tuckahoe Marble: The Rise and Fall of an Industry, 1822-1930.** Harrison, NY: Harbor Hill Books, 1976. 91 pp. Paper $6.95.

Clair Towne, **Wood Cribbed Elevators Offer Many Advantages in Specific Locations.** In *Grain Age*, Oct. 1977, pp. 35-36. Basic wood-cribbed country grain elevator construction is described, and its advantages over steel and concrete. Towne still builds in the 19thC style in Minn. (See SIAN Sept 78:2.)

William Wagner, **Reuben Fleet & the Story of Consolidated Aircraft.** Fallbrook, Calif: Aero Publishers, 1976. 324 pp. During 1920s-30s Fleet was an executive of CA which later became part of Convair (1943) and General Dynamics (1953). Mixed rev.: *Bus. Hist. Rev.*, Winter 1977.

Margaret Walsh, **Pork Packing as a Leading Edge of Midwestern Industry, 1835-75.** In *Agricultural Hist.*, Oct. 1977.

Bruce M. White, **Working for the Railroad: Life in the General Offices of the Great Northern and Northern Pacific, 1915-21.** In *Minnesota History*, Spring 1978, pp. 24-30. Construction of, and office life in, the RR & Bank Bldg. (1914-15), today the Burlington Northern Bldg., St. Paul.

Donald F. Wood, **Carting Coal.** In *Special-Interest Autos*, May-June 1978, pp. 40-45. Coal deliveries for heating in homes, offices, stores, factories, etc., and the trucks used. 32 photos of trucks and dump mechanisms, c1919-WWII.

Frances & Dorothy Wood, **I Hauled These Mountains Here.**Caldwell, Idaho: Caxton Printers, 1977. $9.95. Life of David Wood (1851-1944) influential in pre-RR wagon freighting on the western slope of Colo. Rev. *Montana — The Mag. of Western History*, Jan. 1978.

Anna Zellick, **The Men From Bribir** [Yugoslavia]. In *Montana — The Mag. of Western History*, Jan. 1978, pp. 44-55. Late-19thC life and work of Croatian stonemasons of Lewiston, Mont.

Reprints

Walter A. Berg, **Buildings & Structures of American Railroads** (1893). Newton K. Gregg, Box 868, Novato, CA 94947, 1977. xxiv+ 500 pp. $15 (paper). Long a classic; a working textbook of all types of RR structures, from large terminals down to maintenance-of-way shacks. Descriptions, specs, bibliog. refs., plans, photos, etc. Priceless resource.

Thomas Edison, **The Beginning of the Incandescent Lamp & Lighting System** (1926). 1976. 33 pp. $2.50. Avail.: Henry Ford Museum, Dearborn, MI 48121, Attn.: Merchandising Dept.

William F. Fox, **History of the Lumber Industry in the State of N.Y.** (1901). Harbor Hill Books, Harrison, NY, 1976. 116 pp. $13.95.

William E. Lass, **A History of Steamboating on the Upper Missouri River** (1962). U. of Nebraska Press, n.d. Bibl., index. $15.95. 1819-1936.

Stanley South (Ed.), **The [1975] Conference on Historic Site Archaeology Papers.** Institute of Archaeology & Anthro., U. of South Carolina, Columbia 29208, March 1977. $8.

The 1905 Catalogue of Iron Store Fronts Designed and Manufactured by Geo. L. Mesker & Co., Architectural Iron Works, Evansville, Indiana. Intro. by Lee H. Nelson. In *APT Bulletin*, 1977, No. 4, pp. 3-41. Reproduced in its entirety. Illus. significant development in production and marketing of iron architectural elements.

The Lowell Offering: Writings by New England Mill Women (1840-1845). Ed. with intro. by Benita Eisler. Lippincott, Phila., NY, n.d. 223 pp., illus. $12.50. Rev.: *N. Y. Times Book Review*, Jan. 29, 1978.

Victorian Ironwork: The Wickersham Catalogue of 1857. With new intro. by Margot Gayle [SIA]. Phila.: The Athenaeum. (Avail.: Friends of Cast Iron Arch., Rm 20, 44 W. 9th St., NYC 10011.) 112 pp., casebound. $15. Catalog of John Bartlet Wickersham, one of foremost American producers of cast-iron fences, furniture, statuary, and architectural ornaments.

Special Publications

Ramon F. Adams, **The Language of the Railroader.** U. of Oklahoma Press (Norman 73019), 1977. 180 pp. $9.95. Indexed by word and phrase, cross-indexed by subject.

Andre Coté & Marie McComber, **Sources de l'Histoire du Saguenay-Lac-Saint-Jean: Inventaire du Fonds Dubuc.** In *Protee* 1976, No. 1, pp. 129-53. Inventory of the Dubuc family papers, 1892-1963, dealing with some 50 pulp and paper companies founded and directed by J.-E. Alfred Dubuc of Chicoutimi, Quebec, and by his son Antoine.

Thomas D. Bever, **Economic Benefits of Historic Preservation.** Reprint Series No. 3. 4 pp., $0.50. Preservation League of N.Y. State, 13 Northern Blvd., Albany, NY 12210.

Cornelia Brooke Gilder. **Property Owner's Guide to the Maintenance & Repair of Stone Buildings.** Technical Series No. 5. Preservation League of N.Y. State, 13 Northern Blvd., Albany, NY 12210, 1977. 10 pp., illus., notes, biblio. $1.25. Meticulous guide to stone identification, decay causes, cleaning, and repair, with list of "Sources of Stone for Restoration and Repair."

John R. Hebert (Comp.), **Panoramic Maps of Anglo-American Cities—A Checklist of Maps in the Libr. of Congress, Geography & Map Divn.,** 1974. v + 118 pp. (Avail.: Supt. of Documents, USGPO, Wash., DC 20402. Stock No. 3004-00011. $2.20.) Lists 1117 panoramic or "bird's-eye maps" of cities in 47 states and Canada, c1860-1930. These views are immensely valuable records of industrial structures of all types, often not illustrated in any other source.

Jean E. Koch, **Industrial Archaeology: A Selected Bibliography.** Council of Planning Librarians Exchange Bibl. No. 1382 (Box 229, Monticello IL 61856), Oct., 1977. 16 pp., $1.50. A few things not found in SIANs or SIA Introd. Bibl. No one's perfect.

John Marshall. **A Biographical Dictionary of Railway Engineers.** David & Charles (Box 575, N. Pomfret, VT 04043), 1978. 208 pp. $25. 600 biographies from Britain, Europe, N. America.

Sarah M. Sweetster, **Roofing for Historic Buildings.** Preservation Briefs No. 4. 8 pp., gratis. Technical Svcs. Divn., OAHP, HCRS, Dept. of the Interior, Wash., DC 20240. Description, history, uses, problems with, repair methods of various roofing materials.

Historic Preservation Feasibility Study of the Fairhaven Mill, Fairhaven, Minn. Miller-Dunwiddie-Architects, Inc. (7913 Southtown Center, Minneapolis, MN 55431), Feb. 1977. 24 pp., bibl., measured drawings. 1867 flour mill.

Historic Preservation Loans. Pamphlet HUD-452-H. Natl. Register of Historic Places and Dept. of Housing & Urban Devel., Wash., DC, July 1977. Federal Housing Admin. insured loans available from private financial institutions for preservation purposes.

Lowell: The Building Book. City of Lowell, Mass., Div. of Planning & Dev., and Anderson Notter Assoc., 1977. 71 pp., illus., bibl., glossary. $2.50. A building design, restoration, and repair guideline manual. Brief section on the adaptive re-use of mills.

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STOP PRESS

PHILADELPHIA, 11 MAY. Richard Stanton, Director of the Natl. Park Service's Mid-Atlantic Region, has announced that negotiations to purchase the DELAWARE AQUEDUCT from its present owner have been completed and title will pass to NPS about mid-June. NPS plans to continue the "aqueduct," a private toll bridge crossing the Delaware between Lackawaxen, PA and Minisink Ford, NY, in service—for light traffic only—toll free.

The Natl. Historic Landmark was designed and built by John A. Roebling in 1847-48, one of 4 aqueducts carrying the Delaware & Hudson Canal across major rivers in a major enlargement scheme. It is the oldest surviving suspension structure in the Western Hemisphere. (See SIANs Sept 72; July 73; July 77.)