

Bridges and Byways

Journal of the

Ohio Historic Bridge Association
Volume XXX Number 1
Spring/Summer 2016

Meeting Notes:

OHBA

July 17, 2016, noon

Summer Picnic at the Salt Creek Covered Bridge. Bring a chair, a dish to share, beverages and your own tableware. Located east of Zanesville off interstate 70 on Arch Hill Rd. (CR82).

Speakers: Janis Ford and Pat Hoffmannbeck will talk about their covered bridge safari to New Hampshire and Vermont.

September 18, 2016

Fall Bridge Tour TBA

November 20, 2016, 1:30 pm

Annual Business Meeting. Ohio History Connection Auditorium, 800 E. 17th Avenue, Columbus, OH (Exit 111 off Rt. 71)

Other

Sept. 30 & Oct . 1-2, 2016

The National Society for the Preservation of Covered Bridges, Fall Weekend in Kentucky & Southern Ohio. Contact Bill Caswell at wscaswell@yahoo.com for further details.

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Our website is currently under construction. For updates about meetings and tours call one of our officers

Yearly Dues:

Your mailing label has the year of your membership lapse above your name. Please see page 7 to renew your membership.

OHBA is a not-for-profit organization incorporated in the State of Ohio and is recognized as a non-profit organization under 501 (c) 3 of the Internal Revenue Code.

President's Corner..... David A. Simmons

As historic preservationists interested in old bridges, it is important for us to have a basic appreciation for the elements of structural engineering. It is essential ammunition for discussions on how to preserve historic bridges, talks that invariably involve individuals trained as civil engineers.

So that's why I was honored and delighted to receive an invitation to serve as master of ceremonies for the Iron and Steel Preservation Conference at Lafayette, Indiana. As explained elsewhere in this issue, this three-day meeting included both lectures and hands-on preservation training in the specialized issues and techniques of working with iron and steel. I was also pleased to, for the first time, use a portion of the proceeds from our Pauline Miller Fund to cover the registration fees for three Ohio registrants to the conference.

Engineers generally rate the strength of a bridge according to its weakest component. Often the limiting factor in a particular bridge is its floor beams. In metal bridges built before WW II, the floor beams were often what are characterized today as "built-up" members. Instead of a solid rolled I-beam as in a modern steel bridge, floor beams were fabricated in the shop by riveting together angles and plates. A single floor beam was routinely made from five separate pieces. Modern inspectors often consider such floor beams as weak elements that critically limit the capacity of an old bridge.

That's why I was delighted to learn about the recent research done at Purdue University involving testing built-up beams. They were able to demonstrate that because there are at least five separate parts to a built-up beam, there is, in reality, an impressive redundancy and reserve strength that should help change attitudes towards these elements in historic bridges. It may encourage engineers to value these elements on an old bridge instead of viewing them as weak and suspect.

Spreading word of recent research is one of the great benefits of such conferences. And improving attitudes among those responsible for maintaining old bridges is always a vital first step. In historic preservation, after all, little can be accomplished without the right attitude.

Bridge News.....Elma Lee Moore, David Simmons, and Doug Miller

McClellan Covered Bridge, Columbiana County (35-15-02)

OHBA member Tom Walczak sent a copy of an article appearing in the *Morning Journal* of Lisbon, Ohio dated February 13, 2016. The historic McClellan Covered Bridge is undergoing restoration. The bridge was built in 1871 and spans the West Fork of the Little Beaver Creek. State and federal funding in the amount of \$500,000 has been obtained for the restoration. The bridge was no longer safe for motorists and a steel beam was inserted last year to keep the roof from sagging. The restoration will include raising the bridge a foot, replacing one stone abutment and repairing another, and replacing or restoring wood siding and flooring. The wood will be treated with fire retardant. The approach will be regraded, a parking area added and barriers will be provided at the bridge entrance to prohibit vehicles from driving through.

Severe wind caused havoc with another covered bridge—**Roley School Covered Bridge in Fairfield County (35-23-49)**. During a storm in April, the bridge collapsed but it is being dismantled and will be stored until it can be reconstructed at another location. It was currently located at the Fairfield County Fairgrounds. The bridge was built in 1899 to span the Ohio Canal at Baltimore, Ohio.



Ballard Road Covered Bridge, Greene County (35-29-18)

Restoration has not started in the Ballard Road Covered Bridge. (Elma Lee passes this bridge every other day.) The Howe Truss bridge (1883) gets limited vehicle traffic since it ends in a cul-de-sac abutting U.S. 35. It is in need of a new roof, new sliding and replacement of some members. The project is bid at \$486,000. This is one of several bridges being rehabilitated under the direction of County Engineer Bob Geyer.

(Photo Courtesy of Elma Lee Moore)

35 Historic and Unique Bridges in Ohio

In the event you missed it, the June 2016 issue of *Ohio Magazine* ran a special advertising section “Visit Ohio’s Historic Bridges.” The four-page section featured 35 historic bridges in Ohio with a brief description and GPS co-ordinates. The list of bridges in the ad was compiled by the Ohio Department of Transportation in collaboration with the Ohio Historic Bridge Association, Ohio History Connection’s State Historic Preservation Office, TourismOhio, and historicbridges.org.

Fire Protection for Ohio Bridges.....Doug Miller

Doug Miller has been working with a proposal for fire protection for Ohio covered bridges. The Ohio Department of Transportation (ODOT) granted Statewide Planning and Research Funds for FY2016(\$25,000) and FY2017 (\$25,000) for a Personal Services Contract in two phases.

Phase 1 will create a Statewide Covered Bridge Fire Protection and Security Preservation Plan. A standard list of applicable materials and equipment for covered bridge fire protection will be created using various research sources. A summary of this research and sources will be identified creating a standard Covered Bridge Protection Build Sheet.

Phase 2 will actually execute the plan which will apply a standard “build sheet “ and cost estimate. Bridge owners will be contacted and provided with these build sheets and cost estimates.

The Federal Highway Administration, State Historic Preservation Office, Ohio Historic Bridge Association and the Ohio Department of transportation have identified approximately 100 covered bridges, open to traffic, which would benefit from a federally-sponsored initiative to install fire protection, lighting and surveillance equipment. The objective is to protect Ohio’s National Register of Historic Places from fire damage and vandalism.

Covered Bridges and the Birth of American Engineering is still available free to you. Executive Editors are Justine Christianson and Christopher H. Marston of the Historic American Engineering Record (National Park Service). Our own David Simmons served as one of the editors. While supplies last, David Simmons has some books to distribute. To request a copy, write him at 800 E. 17th Avenue, Columbus, Ohio 43211 and enclosed \$3.50 to defray mailing costs.

The National Society for the Preservation of Covered Bridges’ Summer 2016 issue of *Covered Bridge Topics* had an excellent article “**A Visit to Brown County, Ohio with Harold MacKenzie.**” The article contained photos of MacKenzie’s visits to twenty-three bridges in 1950 and 1951. Many of these bridges no longer exist.

Spring Bridge Tour Eldean Covered Bridge, Miami County.....Elma Lee Moore

This tour was a new format for OHBA-focusing on one bridge intently rather than visiting many in one county. Prior plans were to meet at the bridge and hold a morning presentation there, then eat a box lunch and explore the bridge after lunch. However, we *are* in Ohio and May 15 turned out to be a day with temperatures in the low forties and windy. At the last minute, Doug Christian (retired Miami County Engineer) and Doug Miller, tour leader, changed the meeting place to the County Highway Garage lunch room and directed us there from the bridge. All photos, unless otherwise noted, courtesy of Doug Miller. **Eldean Restored.** →



← Photo of the Eldean Covered Bridge in 1932.

Photo Courtesy of the Ohio History Connection image number MSS1615AV_19321029

Several non-members and members who have not previously attended the tours joined us. Doug Christian began with an in-depth history of the Eldean Covered Bridge. The bridge was built in 1860 replacing a previous bridge at the same location built in 1847. The bridge was originally a white 224 foot 2 span Long truss. The county commissioners selected the Long truss because they had previous difficulties in building a Howe truss for which they had not paid for the patent. The cost of the bridge was \$4,044. Its original name was Allen's Mill Bridge and was one-quarter mile west of the Miami-Erie Canal. Allen's Mill burned in 1944 but Lock 11 of the canal is still nearby but buried. The bridge had several other names - Marshall Bridge (the old Marshall farm was at that location in 1816) and the E.L. Dean Bridge. The correct name though is Eldean which is a combination of the name of a daughter of Allen's partner, Ellen Dean Wheeler.

The bridge had previous renovations including adding 15-inch I-beams that elevated the bridge enough to save it during the 1913 flood. The high water mark from the flood is still visible. The most recent renovation removed most of the steel rods, thereby making it very close to the original. Heat sensors, video cameras, and interior lights were added. Doug explained that there is still more research to be completed about the bridge. One point that Doug made was the importance of asking the community for help in research. Many of his photos came from family albums that captured the bridge as part of a family history. Others remember stories told by their elders.

Jim Barker, covered bridge preservationist, then began the second part of the presentation which focused more on Stephen Long. Barker called Long the Rodney Dangerfield of civil engineers. Long's design functioned much like those of Howe except that Long used entirely wood while Howe used iron rods. Otherwise the designs were alike. The significance of the Long truss was in adding wedges to tighten the truss after the green wood dried and shrank and with the inclusion of X-type bracing running in both directions. However, Barker pointed out that Stephen Long was more than a bridge designer. Long was an explorer who led expeditions into the western wilderness. For example, he was the first to climb Pike's Peak and he named the state of Wisconsin. He wrote an engineering text about railroad design for "controlling grade". In discussing the renovation process. Barker made the point that the "roof, siding and floor of covered bridges were meant to be replaced when needed". He discussed the renovation of the wedges and splices in the lower chords of the Eldean Bridge. Barker's main point was "weak preservation is poor preservation".



We broke for box lunches provided by Susie's Big Dipper in Piqua.

← We then walked a short distance to the Fairview-Snodgrass Road Bridge which originally spanned Spring Creek. The bridge was moved via truck to serve as a pedestrian bridge crossing the Great Miami River Recreation Trail over Beedle Ditch. The Pratt Pony truss built in 1913 was the 2012 Ohio Historic Bridge Award recipient as a good example of sustainable planning and adaptive use of a historic bridge.

The tour then continued to the Eldean Bridge but the afternoon was still very windy but warmer

than earlier. The renovations were pointed out to us in detail by both Jim Barker and Doug Christian.

Iron & Steel Preservation Conference and Workshop.....Elma Lee Moore

I had the pleasure of attending the Iron & Steel Preservation Conference and Workshop held in Lafayette Indiana in May. I was a bit reluctant to attend because the list of speakers were mostly engineers and I was concerned that everything would be way over my head. However, I found that I was able to follow all presentations save one (which had a few too many formulas). I would recommend anyone who is interested in preservation attend this conference. I feel confident now that I *might* be able to call myself a preservationist.

Lansing Community College and Purdue University partnered for this conference under the direction of Vern Mesler. Vern is the manager of VMJ Metal Craftsman, LLC. He has over thirty years experience in welding as well as experience as an adjunct instructor in welding at Lansing Community College. Vern has followed the philosophy of restoring metal truss bridges in a way that retains as much original material and construction details as possible.



The two day conference was full with presentations by the metal bridge preservationist gurus, followed in the afternoon by observing in two labs at Purdue University. The speakers Robert Conner, Karl Frank, Matthew Hebdon, Quentin Collette, Nels Raynor, Frederick Rutz, and Ryan Sherman spoke about various aspects of riveting, load capacity, redundancy, fracture control, stress corrosion, structural response to wind, preservation, and reconstruction techniques. Outstanding ex-



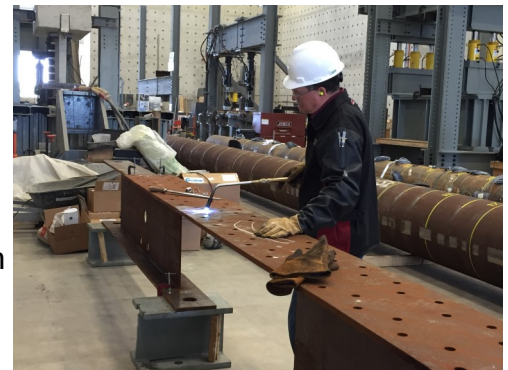
amples of bridge failures as well as bridge preservation were supported by specific data and research. Some of these will be expanded in future issues of *Bridges & Byways*. Dan McCain President of the Carroll County Wabash & Erie Central Canal Association discussed methods his organization used in recruiting and team building with volunteers in restoring metal truss bridges as well as building working canal boats and an interpretative museum.

The first afternoon was spent with a tour of Purdue's Bowen Lab and Purdue's S-BRITE center. The Bowen Lab proved to be a four story warehouse style building with many large pieces of equipment. Here graduate students and PhD candidates can perform various experiments and study methods of metal bridge construction. In the Bowen Lab there was a rather spectacular section of the I-35 bridge that collapsed in Minneapolis in 2007.



← We left the lab and went to Purdue's S-BRITE Center (Steel Bridge Research Inspection Training and Engineering Center). This is the Center for Aging Infrastructure or as I would describe it as a "bone-yard" for aging bridges. The 20 acre site, of which only about 12 acres are currently in use, has full scale bridges as well as components of bridges. This facility allows engineering students to have hands-on experience with aging structures by examining both successes and failures of techniques in a real life outdoor setting.

The next afternoon we returned to the Bowen Lab for demonstrations of industrial processes used in the industry today. These included electric arc welding, braze welding, flame straightening, show riveting with hydraulic riveters, cutting processes and field riveting with a field riveting hammer.



An additional morning was added to the conference for a workshop where participants could have hands-on participation in the repair, rehabilitation and restoration of metals. For me (as now a preservationist), this was the most enlightening part of the



conference. However, I felt rather daunted when I was unable to put together my hard hat and Vern had to fix it plus lace up my steel toed boots tightly. (Did I mention that I was one of three women attending?) I had the opportunity to attempt to work with metals in every area. My favorite was riveting. The hydraulic hammer was so heavy that I needed assistance to hold it but I am proud to say that I produced better rivets than some of the men.

I recommend this conference and workshop to anyone interested in preservation. All materials were presented in a format that even those without experience could understand. The hands-on workshop was an

added bonus to be able to apply everything that was discussed in the morning presentations. All photos courtesy of Elma Lee Moore.



OHBA Officers & Membership Information

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Web Master:

Dues: Senior (age 55 and over) \$8; Student \$8; Single \$10; Family \$15; Contributing \$25; Supporting \$40; Life \$250.

Annual dues include subscription to Bridges & Byways, quarterly journal of the OHBA. Dues period is the calendar year. Dues paid after October 1st cover the succeeding year. Renewal dues to be paid by 1/15

Please fill out the membership application form below and send it with your check made out to the OHBA and send it to Mr. Charles at address above. Be sure to include your 9 digit zip code.

I wish to join/renew (circle) membership with the OHBA.

My name is _____

My mailing address is _____

City _____ State _____ Zip Code(9 digit) _____

My email address is _____

Enclosed is my check made out to the OHBA in the amount of _____ for a _____ year membership.



Eldean Covered Bridge photo by Serena Miller

Spring Bridge Tour May 15, 2016 (Note our Winter Coats!)