

There's An Important Survivor Of Suspension Bridge Technology In Dresden

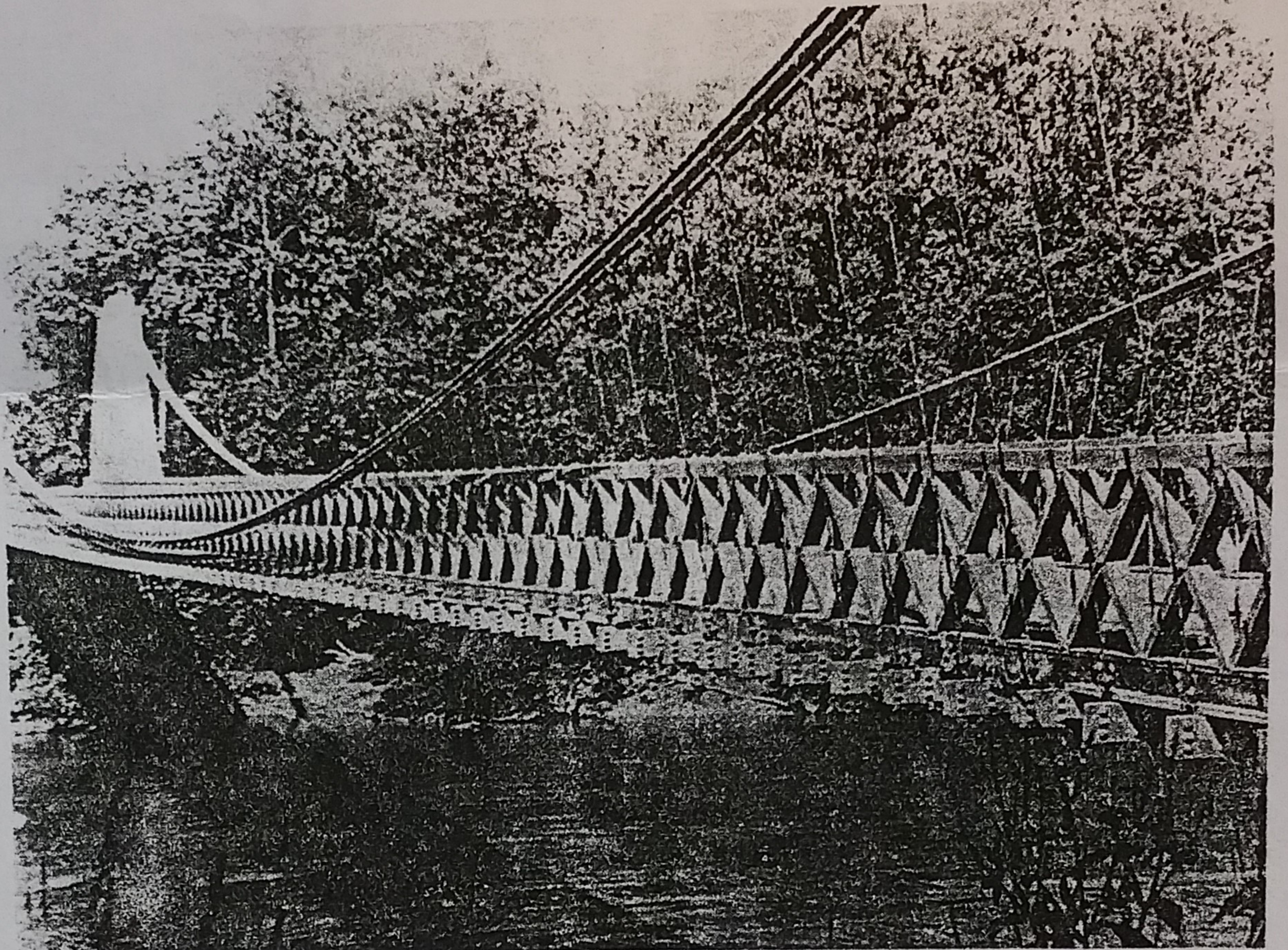
By David A. Simmons, Ohio Historical Society

The Dresden Suspension Bridge is an important and rare survivor of 19th century eyebar or "bar chain" bridge design in Ohio. It was constructed in 1914 over the Muskingum River in northern Muskingum County near the end of the pin connection era of bridges.

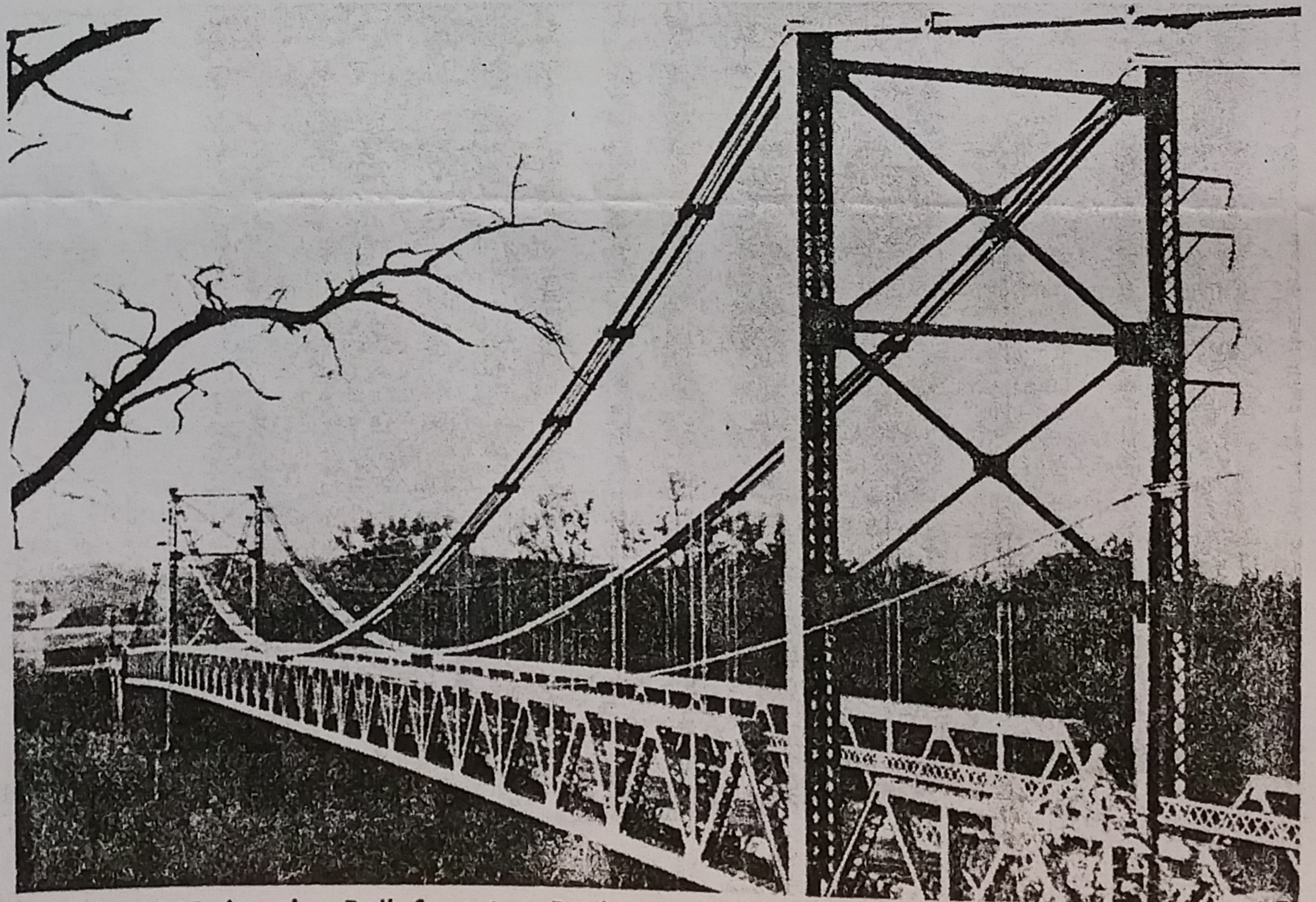
The development of suspension bridges through the 19th century was a complex process with major contributions by British, French, and American engineers. James Finley, a Pennsylvanian working in the first decade of the 19th century, was the first to determine the basic principles utilized in contemporary suspension bridges. The British, taking advantage of an already well established iron industry, improved on Finley's developments with the invention of the eyebar chain, a feature which became a trait of their suspension bridges throughout the century. In France, on the other hand, significant manufacturing resources of high quality iron wire led their engineers to become the international leaders of wire suspension bridge design. The Wheeling Bridge over the Ohio River, completed in 1849, owed much to the French training of its American engineer, Charles Ellet. With the construction of this bridge, the longest in the world at that time, the United States became the unqualified leader of suspension bridge design through the next century.

The first suspension bridge, erected at Dresden in 1853, was remarkably similar in design to the work of Charles Ellet. The groupings of small cables forming the main suspension cables and the truss work deck stiffening in particular were reminiscent of Ellet's designs for both the Fairmount Bridge, the first major wire suspension bridge in America built in Philadelphia between 1840 and 1842, and the Wheeling Bridge (the present appearance of the Wheeling Bridge is the result of several renovations starting as early as the 1880s, which left only the cables

(Continued on Page 18)



The original Dresden Suspension Bridge, built in 1853, was demolished after the 1913 flood damaged it beyond repair. It had been constructed along the principles espoused by Charles Ellet, one of America's preeminent suspension bridge designers of the 19th century.



Built in 1913 by the Bellefontaine Bridge Company, the present Dresden Suspension Bridge is the only major structure in Ohio which utilizes the eyebar chain technology developed by British engineers in the early 19th century.

Dresden Suspension Bridge

(Continued from Page 14)

and towers of the original). The geographical proximity of Dresden to Wheeling suggests a close link between the two structures, although unfortunately no information is available on George Copland, the builder of the first Dresden bridge. This 1000' span bridge was so badly damaged in the 1913 flood that the county commissioners advertised for a different structure. The new bridge was built the following year by the Bellefontaine Bridge Company who shortened the main span to 443' by constructing concrete piers to support the towers within the valley. The choice of an eyebar chain for the main suspension member, thus harkening back to early 19th century British precedence, was not surprising in light of the prominence of the Bellefontaine firm in Ohio's pin connected bridge industry. All elements of the Warren truss deck stiffening, towers, and 6' eyebars of the suspension chains were easily manufactured by the

firm thereby requiring no subcontracting. The use of eyebar chains was revived for a short time in the United States in the mid-1920s, but has been abandoned since the early 30s because of its higher cost of construction over wire cables.

In combination with being the sole major eyebar chain suspension bridge remaining in the state, the Dresden Suspension Bridge is a source of considerable historical pride for the community of Dresden.

The author is indebted to "Links in a Chain: The Development of the Suspension Bridge, 1801-1870," by Emory Kemp, in THE STRUCTURAL ENGINEER, August 1979.

Grain Truck Causes Truss Bridge Damage

(Continued from Page 10)

plates enough to weaken them significantly.

2. The corrosion worsened when extremely high waters in June of 1980 and 1981 deposited debris on top of the hanger plate connections trap-

ping moisture on the steel members.

3. Poor design of the hanger plates resulted in the hanger plate end area being cut in half by the pin connection.
4. The south vertical members of the truss suffered numerous collisions since the roadway approach from the South is a 90° curve. This placed excessive fatigue on the hanger plate connections on the south end of the bridge.
5. The deflection of the floor joists at mid panel under heavy loads caused the hanger plates to be under great twisting stress.

A combination of all of the above factors probably caused the failure of the floor beam hanger plates on the east side of the last floor beam.

As a result of this accident, the Allen County Engineer, Clayton T. Bacon, has decided to post load limits on eight more truss bridges bringing the number of posted bridges in Allen County to 27, with four bridges closed indefinitely. All other truss bridges in Allen County, built before 1945, are undergoing a more rigid inspection with more load limit postings likely.

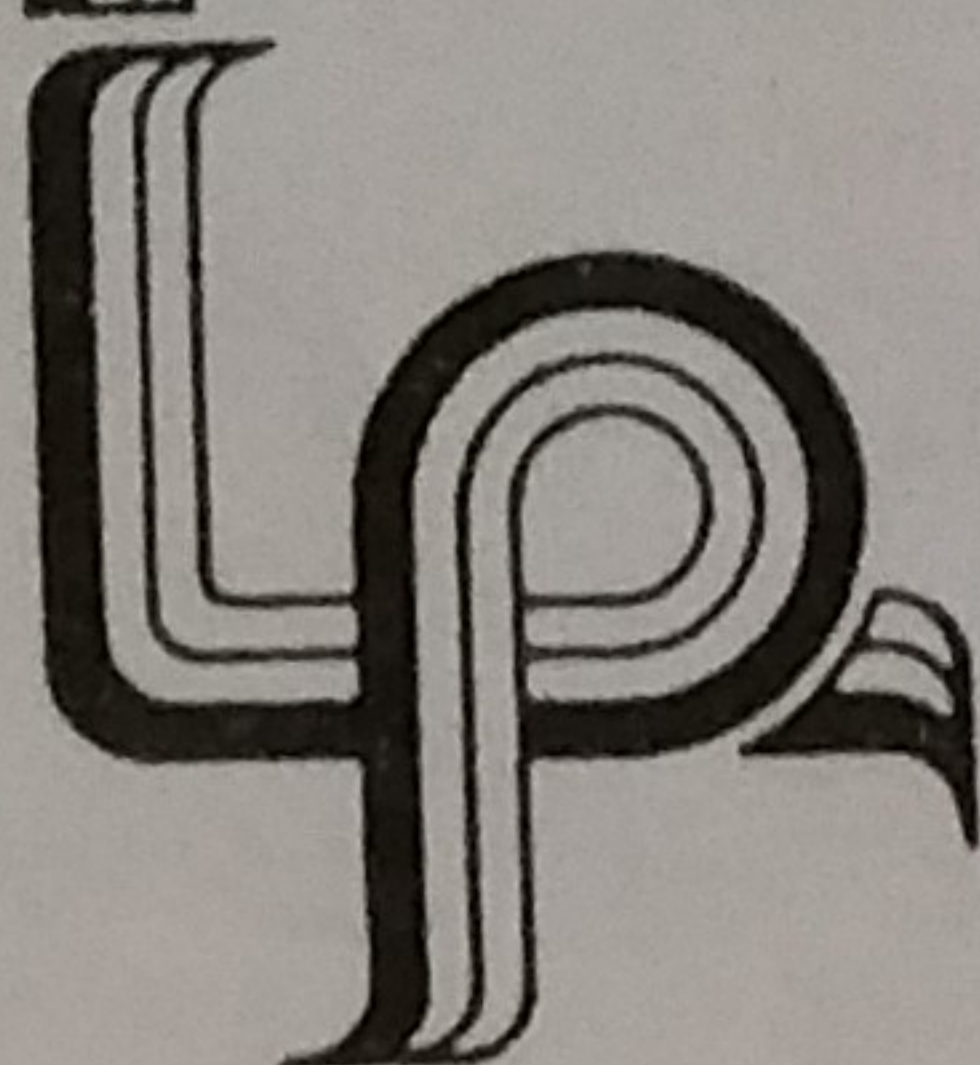
look to lawhead press:

For quality and service . . .

For creativity and
imagination . . .

For full range printing,
typesetting and
design services.

**We meet your total
publication needs.**



the lawhead press, inc.

900 EAST STATE STREET
ATHENS, OHIO 45701
phone 593-7744

CCA-C and Creosote Pressure Treated Material

- Guard Rail Posts
Round and Square
- Strip Flooring
- Piling and Caps
- Bridge and Backing Plank
- Fence Materials
- Treating Service

**McARTHUR
LUMBER & POST CO., INC.**

McArthur, Ohio 45651

Phone 614 596-5880

