



IRONBRIDGE GORGE

BIRTHPLACE OF THE INDUSTRIAL REVOLUTION



John Weibel · CTCC 26

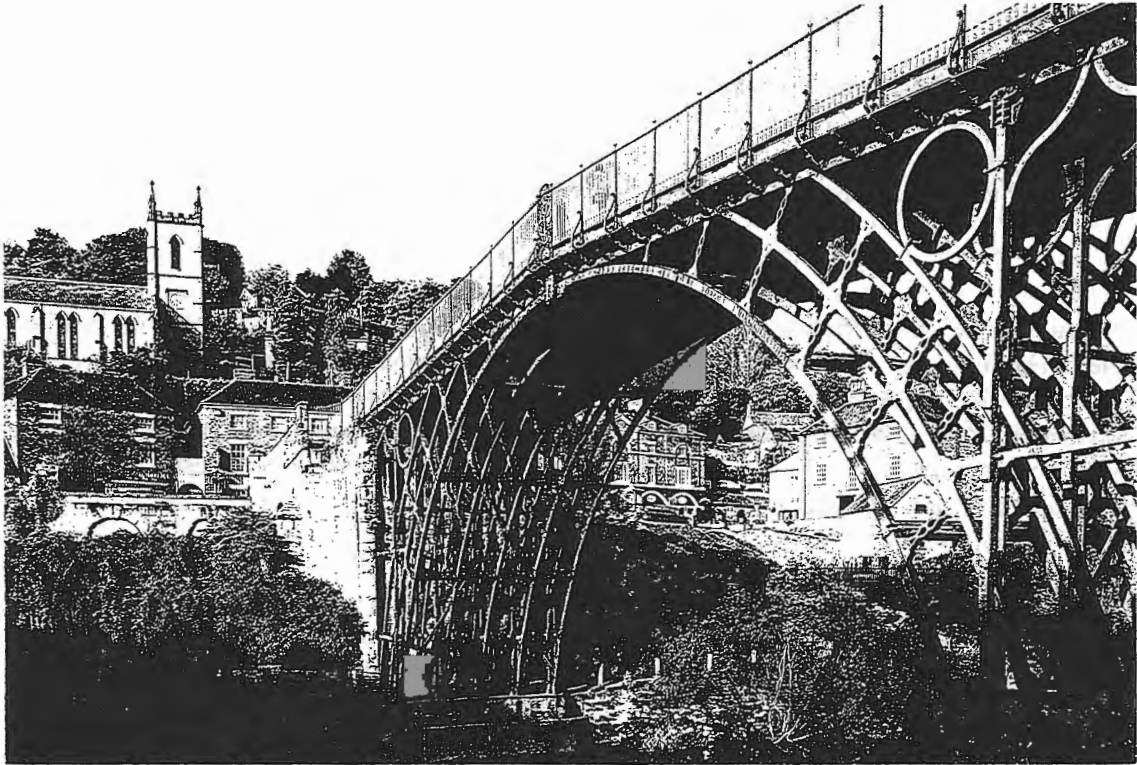
This past April, my wife and I visited England's historic Ironbridge Gorge, located in Shropshire, east of Wales and west of Birmingham. Having a keen interest in the Industrial Revolution as well as historic bridges, this was a must-see place for me. The importance of this area was confirmed in 1986 when the United Nations Educational, Scientific and Cultural Organization (UNESCO) designated the Ironbridge Gorge a World Heritage Site, proclaiming its "exceptional and universal value". What happened in this area during the eighteenth century, for both good and bad, profoundly changed the world. From the 1770's to around 1815 visitors came here from all over the world to learn about the new technologies and bring these concepts back to their own lands. Our modern industrial society can trace its very beginning back to this out of the way area on the River Severn.

This article discusses the Ironbridge Gorge primarily as it relates to Shropshire tokens featuring the famous Ironbridge (D&H 3 - 17). Typical obverses feature a longitudinal view of the bridge with a vessel sailing under and the legends: IRON BRIDGE AT COALBROOK DALE 1792 / ERECTED ANNO 1779 / SPAN 100 FEET. Earlier tokens (D&H 3 - 4) lack the sailing vessel and feature the single legend: IRON BRIDGE AT COALBROOK DALE 1779. Tokens D&H 5, 6, 7 add HEIT. 50 FT. after SPAN 100 FT. All reverses show a man working a machine on a masonry platform with a wheeled cradle on a slope, attached to the machine by cable. In exergue are the legend and date: INCLINED PLANE AT KETLEY / 1789. Most edges feature the lettering: PAYABLE AT COALBROOK - DALE AND KETLEY. The tokens were issued by ironmaster William Reynolds for the Coalbrook Dale Iron Company. The dies were engraved by George Wyon and manufactured by Peter Kempson. Approximately three tons were struck in Birmingham. As a type, this is a common token that saw wide circulation.

Ironbridge Gorge and other nearby areas saw an explosion of industrial activity during the eighteenth century. Foremost among these innovations are: The first smelting of iron with coke by Abraham Darby I at Coalbrookdale in 1709; first casting of iron cylinders for steam engines in 1722; first casting of iron railway wheels in 1729; first iron rails laid on timber ties in 1769; first cast iron bridge in 1779; first iron boat by John Wilkinson in 1787; first iron bridge fabricated for export in 1791; first iron aqueduct at Longdon-on-Tern by Thomas Telford and William Reynolds in 1795-6; first cast iron framed building in Shrewsbury in 1796; first high pressure steam powered railway locomotive in 1802.

In the 1960's, the British government created the planned "new town" of Telford, incorporating a large expanse of territory, including Coalbrookdale and the market town of Ironbridge. The bridge and the decaying remnants of the Gorge's industrial past were wisely viewed as being potentially valuable to the new town. Intense reawakened interest helped bring development funds into this long neglected region. In 1967 the Ironbridge Gorge Museum Trust was created to preserve and promote these eighteenth and nineteenth century industrial sites as educational and tourist assets. Collectively known as The Ironbridge Gorge Museums, these sites include:

- The Ironbridge and Tollhouse
- Museum of Iron and Darby Furnace
- Blists Hill Victorian Town
- Coalport China Museum
- Jackfield Tile Museum
- Broseley Pipe Works
- Museum of the River
- Bedlam Furnace Ruins
- The Tar Tunnel
- Darby Family Houses



THE IRONBRIDGE

By the 1770's the rural Severn Gorge was rapidly becoming the most important industrialized area in the world and the Severn, England's busiest waterway. The need for a new bridge was critical as existing ferries failed to satisfactorily accommodate the growing cross river traffic. There was a consensus among local businessmen that a bridge was needed and Coalbrook Dale, the best location. At that time, the name Coalbrook Dale was applied to most of the surrounding area. Today's Coalbrookdale encompasses a much smaller area north-west of the Ironbridge. Later, the Georgian market town of Ironbridge sprung up at the bridge's north end, taking its name from the bridge. The regional economy peaked about 1815, then declined steadily afterward as the area was eclipsed by the industrial growth of other competing urban centers.

Spanning 100 feet - six inches over the River Severn, connecting the communities of Broseley and Ironbridge, this is the world's first iron framed bridge. Designed by Shrewsbury architect Thomas Farnolls Pritchard (1723 - 1777), work on the bridge began in 1777. Quaker ironmaster Abraham Darby III (1750 - 1789) took on the major responsibility of financing and building the new bridge. Other local businessmen and ironmasters such as John Wilkinson may have participated, but to a lesser extent. There was considerable doubt about the practicality of using iron in such a bold venture, but Darby believed it would succeed and help to advance his family's iron making business. Despite the bridge's success, its ultimate cost far exceeded

Darby's initial estimates leaving him deeply in debt. His Coalbrook Dale company however, did gain world wide notice and prospered for generations afterward.

Component pieces were cast at Abraham Darby III's nearby furnaces in open sand molds and transported to the site. It's unclear exactly how the bridge was erected since few records of its construction exist. But we do know it was assembled in the same manner as a timber bridge. Mortise and tenon joints, dovetails and wedges held the bridge together. The builders used the known technology of the day based on traditional wood and stone structures. The science of structural engineering as we know it today had yet to be developed. Bolting, riveting and welding of structural components came much later with further advances in iron and steel.

The bridge opened to traffic on January 1, 1781 with a wide range of tolls based on type of wheeled vehicle and by number and type of animals. Those crossing on foot paid a toll of one halfpenny; the Ironbridge token itself may very well have been used as payment. A four story Georgian brick tollhouse was constructed on the south bank alongside the bridge. Still existing today, it now houses exhibits and a gift shop where one can purchase a certificate attesting to having walked across the bridge.

The Severn Gorge is subject to periodic floods and suffered one of its worst in 1795. This "Great Flood of 1795" caused considerable destruction, washing away many of the timber and stone bridges in the valley. The Ironbridge survived intact, proving to all the unquestionable strength and durability of iron. After this momentous event, iron became the preferred material for bridges and engineered structures throughout the world. The Sunderland bridge, also made of iron and depicted on Sunderland penny tokens (Durham D&H 2 - 3), followed in 1796 with a more daring span of 236 feet across the River Wear. It was demolished in 1929.

Continual geological movement of the river banks has stressed the Ironbridge ever since its initial construction. Over the centuries, numerous repairs and reconstructions have been required to stabilize the bridge. Inadvertently, its flexible timber-like assembly may have actually helped prolong its life by accommodating some of this movement. It wasn't until the 1970's that this geological condition was finally addressed in order to assure the bridge's long term stability.

River bank movement required the demolition of the original south abutment in 1802. Timber arches were installed and remained until 1821 when cast iron arches, still existing today, were constructed. Bolting and plating of iron members was required by 1863 to repair and stabilize the structure. By 1926, demolition of the bridge was considered as it was deemed to be obsolete and unstable. Fortunately, no action was taken. In 1934 the bridge was closed to vehicles, making it accessible only to foot traffic. Pedestrian tolls continued to be imposed until 1950

when ownership passed from private proprietorship (descendants of Darby's in-laws) to Shropshire County Council control. The bridge has been a free pedestrian crossing since then.

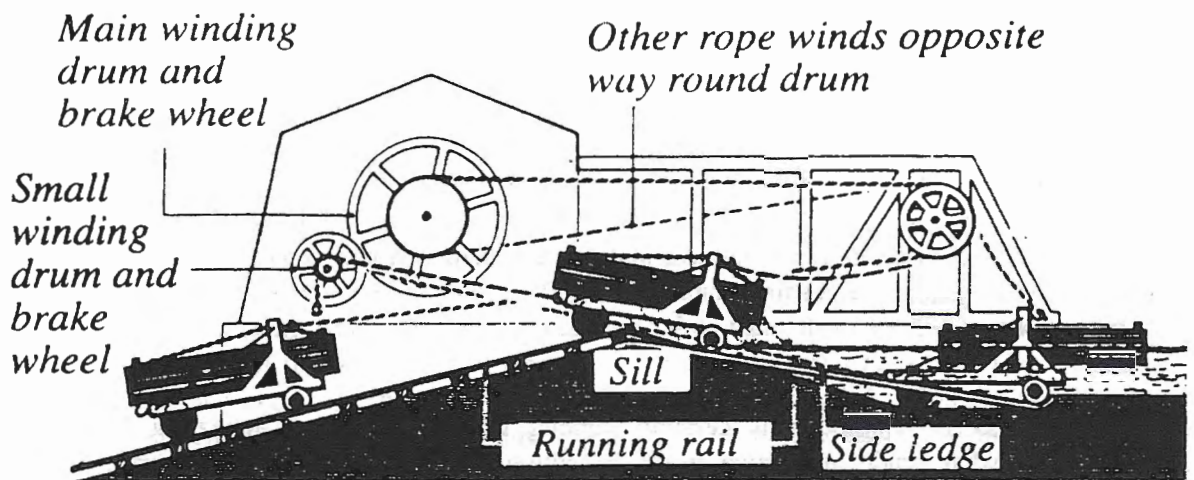
The 1967 founding of the Ironbridge Gorge Museum Trust brought about a major project to restore the Ironbridge for its 200th anniversary in 1979. From 1972 - 1975 the bridge underwent major repair and reconstruction. A massive inverted concrete arch was constructed on the river bed to permanently hold the shifting abutments in place. Restoration was complete by 1980 - 1981 when it was completely repainted with a dark gray coating to protect the ironwork.

Shropshire's historic Ironbridge is certainly among the world's most appealing bridges. Although somewhat crude and naive in its execution, it surpasses many later bridges in gracefulness and simple elegance. Its arched ironwork proudly proclaims in white lettering on both sides: THIS BRIDGE WAS CAST AT COALBROOK = DALE / AND ERECTED IN THE YEAR MDCCLXXIX. The iron circles at each end appear as porthole windows or eyes looking out onto the water. The bridge's roadway rises steeply from each end toward a central peak. When looking across the roadway from one end, people appear to rise up or disappear as they ascend toward and descend away from the peak. The roadway is lined on both sides by a vertical picket fence. At the center peak, decorative ironwork panels announce "ERECTED IN 1779". The depiction of Ironbridge on the Shropshire tokens is very similar to its actual appearance today. The only difference being the absence of the decorative lampposts shown on the token at three locations above the roadway. The views from the bridge up and down the river are absolutely beautiful, green and bucolic. Its hard to picture this pastoral setting as ever having been a major center of industrial activity. Illuminated at night, the bridge's arch is beautifully reflected in the water forming a complete circle when viewed from a distance.

INCLINED PLANE AT KETLEY

Until visiting Ironbridge Gorge, I had a rather dim idea of what exactly an inclined plane was. Here, one can visit a similar preserved example - the Hay Inclined Plane at Blists Hill. Ketley was one of several iron producing sites in the hills around Coalbrookdale. Ketley was also site of the first of three inclined planes constructed throughout the hilly region. An inclined plane is basically a railed slope on a hillside where small boats are pulled up from a lower canal to a higher canal. William Reynolds (1759 - 1805), cousin of Abraham Darby III and fellow Quaker, had these structures built as a means of raising and lowering canal boats without the need for expensive locks. The inclined plane was a significant engineering achievement which allowed canals to be used in the hilly Shropshire iron and coal fields. Transporting iron ore and coal became easier, faster and cheaper thanks to this invention.

I'm not certain exactly how the inclined plane at Ketley operated, but information displayed at the remaining Hay Inclined Plane and at the Museum of Iron could be applicable to Ketley. According to these displays, the Hay Inclined Plane was originally operated by horses upon starting up in 1791 then converted to steam power in 1793. Since Ketley was built earlier (1788 - 1789), it too may have been initially powered by horses and then converted to steam afterward.



“-- tub boats were floated unto wheeled cradles which carried them up and down the slope on iron rails. At the top of the incline, a steam engine was employed to pull the cradles up the reverse slope and out of the water. Normally the incline was self acting, the weight of a loaded boat descending pulling an empty one up from below, but when a loaded boat lay at the bottom, the steam engine would be required to draw it up the slope”. 2

Man made canals and natural rivers were the primary means of transporting goods in eighteenth century Britain. The later development and expansion of railways made many of these canals and the inclined planes obsolete. The Hay inclined plane was last used in 1894 and totally abandoned by 1907. Nearby sections of the old Shropshire canal have been re-excavated and restored. Portions of the canal can be seen in Coalport at the bottom of the Hay incline, and directly above it on Blists Hill.

BLISTS HILL VICTORIAN TOWN

This “open air” museum contains a fascinating collection of original industrial sites with relocated and reconstructed Victorian era shops, workshops and other buildings. Costumed “residents” demonstrate Shropshire village life circa 1900. Here modern currency can be exchanged at the town’s bank for “twentieth century British tokens” at the rate of 1d to 40 pence to spend in the shops and pubs. I brought back several uncirculated sets of these Birmingham minted, 1987 dated tokens. The set consists of seated Britannia copper farthing, halfpenny and penny pieces and a crowned “3” nickel three pence. Intended to mimic turn of the century pre-decimal coinage, perhaps these tokens may become sought after collectibles in the future. The surviving Hay Inclined Plane, sans machinery and derelict for nearly a century, can be visited at Blists Hill.

REFERENCES

1. Bell, R.C., *Commercial Coins 1787 - 1804*, Corbitt & Hunter Ltd, 1963
2. Blists Hill Open Air Museum, *The Ironbridge Gorge Museum Trust Ltd and Jarrold Publishing*, 1995-6
3. Coalbrookdale and the Museum of Iron, *The Ironbridge Gorge Museum Trust Ltd and Jarrold Publishing*, 1996
4. Dalton, R. and S.H. Hamer, *The Provincial Token Coinage of the 18th Century*, 1990 Update, Davissons, Ltd
5. Dawes, N. and R., *American Preservation*, Vol. 3 No. 2, March - April, 1980
6. *Ironbridge - A World Heritage Site*, *The Ironbridge Gorge Museum Trust Ltd and Jarrold Publishing*, 1996
7. *The Ironbridge and Town*, *The Ironbridge Gorge Museum Trust Ltd and Jarrold Publishing*, 1995