Bradley

The Nursery of the Iron Trade

Some notes on the Bradley Canals for the Inland Waterways Association,
Birmingham Branch

Compiled by

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Captions by John Butler and Dave Pearson
Introduction

As Coalbrookdale has now become a world heritage site and is popularly known as the “Cradle of the Iron Trade”, it then follows that South Staffordshire deserves recognition for the development of this trade. For it is in this region that significant advances were made in smelting pig iron and the manufacture of wrought iron, which benefited iron manufacture throughout the world.

Integral to this development was the local canal network. Shropshire was handicapped through terrain, as the trade there spread out from river valley to higher ground. It was not until 1849 with the opening of the Shrewsbury & Birmingham Railway that Shropshire was able to effectively compete with the South Staffordshire & East Worcestershire Trade. For the Shropshire ironmasters, of the mid eighteenth century, transport was limited to tramways to the Severn and loading on flat bottom craft, known as “trows” for conveyance to river side quays at Bridgnorth, Bewdley, Worcester and Gloucester. Whilst such vessels passed freely along the river below Worcester, trade from Coalbrookdale was restricted to times of higher water known as Springs.

Whilst Shropshire had some pioneering ventures that took smelting iron ores with charcoal to smelting with coke. Transport within and from the region became a limiting factor. By contrast the region that was to become popularly known as the Black Country had a similar iron making pedigree, all be it not so advantageously recorded.

The iron smelting trade began in South Staffordshire as bloomeries and was later improved through charcoal smelting in blast furnaces such as existed at Rushall or on Cannock Chase. In East Worcestershire similar charcoal smelting was conducted at Cradley and near Himley. Experiments in smelting with certain types of coal were also conducted in East Worcestershire by Dud Dudley.
Dud Dudley’s work has been largely discounted by Twentieth Century historians, but has more recently been appreciated again, mainly through the realisation that Abraham Darby grew up here.

(a) Iron Smelting at Bradley

At Bradley the first South Staffordshire coke smelting furnace was established by John Wilkinson between the years 1757 and 1758. Early historical accounts originally put the date of Bradley Furnace as 1770, but records from the Knight family have demonstrated iron was supplied to them some ten years earlier by Wilkinson of Bilston. Wilkinson’s furnace was also shown on James Brindley’s survey of the BCN (1767). The canal, as surveyed, was to pass close to the "iron furnace".

This was district rich both in coal and ironstone. Wilkinson’s furnace broke from the tradition of smelting near water where the flow from stream or pool might be directed to drive a water wheel, which in turn through cams worked on bellows to make the blast. Bradley was located on ground that lacked any significant watercourse. The suggestion that water pumped from the mines was utilised to drive a waterwheel can be considered as one possible explanation. Another possibility is the use of mechanical power. The Bradley Furnace may have benefited from an improved method of blast that was devised, and patented, by his father, Isaac Wilkinson 1, whilst the lack of an adequate water supply, lends support to the theory that a Reciprocating Steam Engine assisted the blast here. Indeed the Wilkinson patent provided for the use of mechanical power.

Wilkinson’s first Bradley furnace was placed near to the turnpike that linked Wolverhampton with Birmingham. The then town of Birmingham specialised in working up metals into finished products and several “ironmongers” lived there. They also had the benefit of a local smelting
furnace at Aston, a forge at Bromford and slitting mill at Nechells, all then in the possession of the Jennens Family.

Bradley Furnace promised a greater and more regular supply of iron along the turnpike. This turnpike was also busy with coal wagons bringing coal to the furnace and smith fires in Birmingham from the existing mines placed near Bilston and Wednesbury.

(b) The first canal link to Bradley

Transport by turnpike was costly. In order to improve this transport route, and reduce the cost of carriage, a canal was proposed to link the mines with Birmingham. James Brindley was appointed surveyor for the scheme, but this plan quickly grew into a proposal to join up with others being planned to connect the Mersey, Trent and Severn by inland navigation.

Little of Brindley’s original Birmingham Canal route was made to the survey plan of 1767. Problems in making a tunnel at Smethwick led to the abandonment of this work and serious revision of the route from there northwards. The canal now followed a level some 18ft higher from Smethwick to Wolverhampton. Had Brindley’s original line been adopted the canal would have followed a route by Wilkinson’s Furnace and then by Bilston to pass Wolverhampton and descend by 17 locks to Aldersley. The revised route as principally surveyed by Samuel Simcox wound through Tipton, and Bloomfield passing Bradley to the west before swinging back to Coseley. This route known as the Old Main line was completed through this district during 1770 and had reached Wolverhampton a year later, where a temporary wharf was set out near the present Cornhill. The opening through to Aldersley and the union with the fledgling canal network was made in 1772.

(c) The Lower Level Canals

Once the Birmingham Canal became part of the network traffic in coal and iron
flourished. There was an incentive to get more coal and set up more smelting furnaces. A large tract of land at Bradley was owned by the Hoo family, and later this passed into the ownership of the Scotts and Foleys. The building of a section of the Birmingham & Fazeley Canal from Ryders Green to Broadwaters (1785/6) had provided canal access to the lower part of the Bradley mineral estate belonging to the Hoo’s and with the BCN Act of 1794, the extension of this canal through to Walsall was authorised. Branch canals were also sanctioned and built for both Birmingham & Fazeley and Walsall, and private canals were also made.

One such private canal was the branch known as Scott & Foley’s which joined the Birmingham & Fazeley Canal at Moorcroft Junction. It crossed the mineral estate that belonged to Scott & Foley and was constructed to the old turnpike and beyond and was modified and extended as mining was developed. Map evidence suggests that four locks were made on this waterway. At the top of the fourth lock the canal divided into to branches, or arms. One was directed north, the other westward. The west branch was later known as the Bradley Hall Branch. Construction of the first part of the branch was started prior to 1800.

A smelting furnace, known as Moorcroft, was erected with access to both the Walsall Canal and the Scott & Foley branch. This was owned and operated by the Addenbrooke family. A narrow gauge tramway was built that ran parallel and north of the canal to ironstone and coal pits located on Bradley ad Bradley Lodge Collieries.

Mines at this time were limited to shafts and relatively short headings at different depths. Most prized was the thick coal, which existed in seams up to 30ft thick, ironstone and clay existed in other seams above and below the thick coal. In addition to the Thick Coal there were the brooch, heathen and other coals.
The pre Ordnance Survey maps of the period 1808-1816 include South Staffordshire. This section of map c1816 shows roads, turnpikes and tramways. Bradley Locks (Scott & Foley) route from Moorcroft Furnace to the turnpike (Gospel Oak- Bradley) and beyond where it divided into a north branch (crossed by tramway to Bradley Hall Colliery) and a western branch (Bradley Hall)
A section of the original Ordnance Survey of c1834 that shows parts of the upper (Wolverhampton) level canal (left) and part of the lower (Walsall) canal (right), which is a difference of 65 feet.

Various branches can also be seen

1. Bradley Marr- Old Main Line to Lower Bradley
2. Tipton Old Church and tramway- Old Main Line to Tibbington House
3. Ocker Hill- Old Main Line to Ocker Hill Engines
4. Broadwaters- Walsall Canal to Broadwaters Furnaces
5. Scott & Foley and Bradley Hall- Walsall Canal to Bradley Hall
6. Monway- Walsall Canal to Monway Field
7. Gospel Oak- Walsall Canal to Gospel Oak
8. Ocker Hill Tunnel- Walsall Canal to tunnel mouth

Also evident are the long tramways such as from Moorcroft Furnace to Bradley Hall Collieries and Mines. The turnpike, which crosses the Scott & Foley Branch by the top lock runs north-south in the centre and has a toll gate at Gospel Oak. Pit shafts are marked with circles.

The Bilston Tithe map shows the course marked out for the Birmingham, Wolverhampton & Dudley Railway, but was produced before the Bradley Extension Canal was made. The plan shows a water course that flowed alongside the canal switching from side to side. This plan shows 4 locks on the route, the winding curse of the Bradley Hall Branch and the northern branch cut short and widened into a basin. The top lock was located west of the Turnpike, there were then two locks close together and then the bottom lock. Side pounds were seemingly provided to assist with supply of water for the middle locks.
A second private canal, which became known as Bradley Marr, joined the Old Main line south of Tup Bridge and descended through two locks to a lower basin level also on the lands belonging to Scott & Foley. These locks were arranged as a staircase pair.

The making of this branch was probably done before or by April 1801. Mr Hood reported to the BCN committee that water raised out of mines at Bradley since the communication between them and old Bilston Hollows had been opened was so impure that the Ocker Hill Engine boilers had been very much injured by it. Hood advised the building of a reservoir at Ocker Hill to supply soft water.

Meanwhile John Wilkinson had enlarged his iron making concern at Bradley, constructing additional works that extended from the original furnace at Lower Bradley, alongside the road and up to the banks of the old BCN where two new smelting furnaces, a foundry and an ironworks was constructed. The location of this second group of iron works being the site of the present BW Workshops. Later still, a fourth smelting furnaces was erected on the adjoining Hallfields Estate.
Wilkinson also had other iron making operations which included New & Old Willey at Broseley. It is well documented that an iron boat was made from New Willey iron and erected alongside the River Severn for Wilkinson. Less has been established about iron boat building at Bradley. Some historians have assumed that all Brindley’s early iron boats were made at Willey Wharf. However in Aris’s Gazette account of the iron boat reaching Birmingham, it is suggested that the boat was made at Bradley. Several letters were published in newspapers in different parts of the country during 1865 that took as their theme, iron boat building and Wilkinson was credited with the making of early iron boats. Correspondents provided conflicting information, in particular boats made at Willey were said to be launched in both 1787 and 1788. The report in a letter published in the Leeds Mercury indicated that the first Wilkinson Iron Boat had been launched on, or about July 6th 1787. If it had been launched at Willey Wharf, the craft would have passed down the Severn to Stourport with a “Spring”, a difficult journey as no towing path then existed. This craft would have had to then navigate the Staffordshire & Worcestershire Canal as far as Aldersley and then the BCN through to Birmingham to arrive on or about July 28th 1787 to fit the Aris’s Gazette notice. The wording:

A few days ago a boat built with English Iron, by J Wilkinson, Esq. of Bradley Forge, came up our canal to this town, loaded with 22 tons, 15 hundred weight of its own metal.
Aris’s Gazette July 30th 1787

- is an indication of construction at Bradley, rather than Willey. Later other iron narrow boats were built for John Wilkinson. In 1816 the executor of Wilkinson’s estate had ten iron boats for sale.
The old BCN followed a winding route southwards towards Tipton and several new ironworks and furnaces were established alongside its banks. Most notable was the Wednesbury Oak ironworks and furnaces that came to be operated by the Philip Williams and the William’s estate bordered on the extensive Bradley Colliery there. Philip Williams (junior) had control of Wednesbury Oak Ironworks and also came to have his say on the Board of the BCN.

**Tame Valley Canal and the extension canal to Bradley**

This group of waterways were made as part of the general canal improvements and canal extensions made from Salford Bridge to Wednesbury that were known as the Tame Valley Canal. This was a major project and created a canal highway from the heart of the Black Country iron district to London through Salford Bridge, the Birmingham & Warwick Junction Canal, the Warwick Canals, Oxford Canal and the Grand Junction Canal.

The construction coincided with a major breakthrough in the way wrought iron was made
that simplified the process and encouraged the growth of wrought iron production in the area. Making the Tame Valley had been conducted under the able direction of James Walker whose team had influenced the route taken and superintended the construction throughout. It was a massive engineering work comparable to contemporary railway building that included high embankments, deep cuttings, iron aqueducts and the careful placing of the locks to one part of the route. It became in effect a canal bypass for merchandise and mineral traffic avoiding the congested BCN main line through Birmingham and enabled a speedier transit to and from other canals and most notably favoured the long distance carrying of iron goods. Whilst the Tame Valley Canal was finished in 1844, the extension through to the productive ironworks ad furnaces around Bradley was soon considered.

There can be little doubt that Philip Williams influence on the board assisted the making of the Bradley Extension Canal that was constructed in 1849 and formed a junction with the line of Scott & Foley’s private canal. The combined waterway was nearly a mile long. For the BCN this was a time of change, the Dudley Canal network had been recently incorporated into to main network and various new canal routes were surveyed, even if they were never built. Their progress can be followed in the minute books of the Engineering Board 4.

Under consideration in February 1848 were:

1. Proposed shortening of Wyrley & Essington Canal between Lord Hay’s branch and Sneyd Junction
2. New communication Bradley Lower Locks and the Wolverhampton Level
3. Branch at Pelsall
4. Branch at Titford
5. Branch to Wyrley Bank
6. Conversion of Cannock Chase Feeder
The lack of information in BCN proprietor’s minutes is an indication that the Bradley Extension was constructed as cheaply as possible. Henry Smith, contractor, tender for the earthwork was presented to the Engineering Board, March 21st 1849. The offer was considered “fair and just”, but was passed onto Philip Williams for approval which he evidently agreed to for BCN accounts indicate payment to Smith, for the work, commenced in April 1849. These payments were continued until October 1849.

Lock construction was evidently left in the hands of BCN workmen. Such staff had already been active in repairing and reconstructing locks on the Ogley Flight of the Wyrley & Essington Canal and elsewhere.

It seems that 5 locks were initially considered for the Bradley Extension Canal and the existing 4 of the private canal would make a total of 9 locks to pass from the Wolverhampton level (473 ft o.d) and the Walsall level (406 ft o.d). Charges for the ten lock gate timber (there were 2 single gates to each lock) required was distributed amongst the different BCN Districts (then 6 in number).

- 2 to District 1 & 4
- 2 to District 5
- 4 to District 2
- 2 to District 6

Looking back along the line of the canal from Cross Street/Bradley Lane (Bridge infilled and culverted - major obstruction number two)
William Cottrell Plan 1879 of Bradley Locks. Four locks have become three. The remnant of the Northern Branch is still a wide basin and the original top lock has been rebuilt as Lock 7. There is now a wide stretch of water opposite Bradley Boiler Works and two locks here have become one. The next pound has also been widened and there is a towpath side bridge over the entrance to a pair of basins that serve the boiler works and Moorcroft Colliery.

Coping stones were to be supplied from Eyre Street Basin, whilst the locks were to constructed to the dimensions 82ft long by 7ft 3in wide, whilst the gearing and paddles were to be same as supplied to Ogley and Rushall. Calloway was to send in a tender for brickwork for locks and bridges in locks.

By August 1849 the cleansing of the branch at Bradley for Scott and Foley had been ordered and 14 extra men were to be employed at Bradley “old locks”. Such mention implied that work had proceeded sufficiently on the Bradley Extension Canal for BCN workmen to deal with the reconstruction of the Scott & Foley Branch.

Engineering Board minutes dated August 23rd 1849 mention the taking out of water between Gospel Oak and Brierley Bridges. This note may indicate the time set aside for forming the junction of the new waterway with the upper level.

The work included not only the making of the extension canal, but also seems to have included a new piece of waterway at the upper level (473ft o.d.) that became known as the Rotton Brunt Shortening. The “Rotton Brunt Canal” was a short length of straight waterway from Batmans Hill Junction to Wednesbury Oak Junction that was a shortening of the original “old main line” from Tipton through Bradley to Deepfields. The Bradley Extension Canal joined the Rotton Brunt Canal near the top lock of the flight.
By, or during, December 1849 the additional workers at Bradley Locks had been discharged. Their work had included the building of locks and reconstruction of others. The final ratio of each was seemingly determined by subsidence. This was a heavily mined district and the canal passed through an area that had mineral extraction over centuries rather than years.

William Cotterell’s map of the Bradley Lock Branch (1879) shows 6 locks on the straight line from Rotten Brunt Shortening to the junction with the Bradley Hall Branch and three on the former Scott & Foley Canal to meet up with the Walsall Canal, at what is now termed Moorcroft Junction (and on Cottrell’s map as Bradley Junction).

William Cottrell’s 1879 Survey of Bradley Locks, which shows the junction between the Bradley Hall Branch and the Bradley Extension Canal. A side bridge was provided to carry the towpath over the entrance to the branch. Subsequent alterations shown in red indicate a tramway laid across Bradley Hall Branch and the reduction of branch to form a basin. The southern arm was directed towards the Wednesbury Oak estate (Philip Williams). Lock 6 is the lowest of the Bradley Extension Locks constructed 1849. All locks, apart from Lock 1 were of a simple design with a central lock island that served as lock and was combined with the weir structure.

**(f) Industry alongside Bradley Locks**

Coal mining and ironstone mining was the principal industry. Iron smelting was conducted at nearby furnaces. These furnaces included Bradley (Thornycroft),
Moorcroft (Addenbrooke), Wednesbury Oak (Williams) and Willingsworth (various owners). Other works included Bradley Boiler Works and Hunt’s Acid Tip.

The 1879 plan has like many BCN maps many annotations and amendments. It shows the junction at the 473 ft level and the lock house beside the top lock. The locks descend alongside the northern perimeter of the Wednesbury Oak Ironworks to join up with the Bradley Hall Branch.

Lock 7 was placed west of the Turnpike Bridge. On passing under the old Turnpike, Bradley Boiler Works were placed on the north and towpath side of the waterway. Lock 8 was next and then there were then two more basins on the towpath side before the GWR over Bridge. Finally lock 9 lowered the canal to the Walsall Level. Mining was still conducted at Moorcroft Colliery where Moorcroft Furnaces had formerly stood. South of the canal was located mines and furnaces associated with Willingsworth Ironworks as well as Hunt’s waste acid tip.

![Robert Noyes (1780-1843) painting of Bradley Ironworks c1817- the horse drawn tramway (centre) is consistent geographically with the tramway from Moorcroft Furnaces to Bradley Hall Mines and the location of the artist close to the bank of the Scott & Foley Canal. From this perspective Moorcroft Furnaces, as then worked by Addenbrooke. The centre background would be Wilkinson’s former foundry, ironworks Lower Bradley and Upper Bradley furnaces, part then worked by Fereday & Smith.](image-url)
Bradley Locks Branch
1912 distance table as published 1919

In miles, furlongs and links

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance</th>
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<tbody>
<tr>
<td>Junction with Rotten Brunt shortening</td>
<td>10-0-015</td>
</tr>
<tr>
<td>Bradley top lock and office</td>
<td>9-7-815</td>
</tr>
<tr>
<td>2nd lock</td>
<td>9-7-365</td>
</tr>
<tr>
<td>Basin off side</td>
<td>9-7-195</td>
</tr>
<tr>
<td>3rd lock</td>
<td>9-6-915</td>
</tr>
<tr>
<td>4th lock</td>
<td>9-6-465</td>
</tr>
<tr>
<td>5th lock</td>
<td>9-6-015</td>
</tr>
<tr>
<td>6th lock</td>
<td>9-5-565</td>
</tr>
<tr>
<td>Slagworks &amp; Bradley Colliery (no 2/3) basin offside</td>
<td>9-5-165</td>
</tr>
<tr>
<td>End of old canal</td>
<td>9-4-145</td>
</tr>
<tr>
<td>7th lock</td>
<td>9-4-065</td>
</tr>
<tr>
<td>Bradley bridge</td>
<td>9-3-907</td>
</tr>
<tr>
<td>Bradley Colliery (no 5)</td>
<td>9-3-825</td>
</tr>
<tr>
<td>8th lock</td>
<td>9-3-315</td>
</tr>
<tr>
<td>Bradley boiler works &amp; Breeze hearths basin (towpath side)</td>
<td>9-3-045</td>
</tr>
<tr>
<td>GWR railway bridge</td>
<td>9-2-975</td>
</tr>
<tr>
<td>Basin offside</td>
<td>9-2-665</td>
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<tr>
<td>Chance and Hunts tip</td>
<td>9-1-585</td>
</tr>
<tr>
<td>Junction with Walsall Canal</td>
<td>9-0-065</td>
</tr>
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</table>

The total distance was 50 links short of 1 mile.

William Cotterell’s 1879 Map shows the junction with the Rotten Brunt Shortening, a towpath bridge across the junction and a lock cottage and toll office opposite the top lock (No 1). No bypass weir is provided at the top lock, but these are in place for locks 2-6.
Bradley industry in transformation

The iron trade was never static, it changed with time and demand. It was an industry with peaks and troughs where periods of profits were interspersed with losses. The wary ironmaster adapted and survived the less astute generally ended up bankrupt.

Work on the upper level came and went. A long-term survivor was the Batman’s Hill Ironworks. Less successful was the Bradley Bridge Ironworks opposite the entrance to the Bradley Marr, which had various owners and was in operation between c1866 and 1883. Two smelting furnaces were erected here.
The Rotten Brunt Shortening was cut through a strip of land near the branch, or basin, that served the Wednesbury Oak Ironworks and included the making of a new bridge near the Junction (Howl Bridge). Partridge Bridge was located on the original loop.

**(h) The Modern Waterway**

Today the canal is in water as far as the BW workshops. It is filled in beyond. As far as the Bradley Locks branch is concerned much of this line was filled in. The section from A4098 Great Bridge Road (Bradley Bridge) to the Walsall Canal has remained in water. The locks are still essentially intact, although buried. Restoration is not inconceivable and would no doubt improve boating options in this area.

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1 See South Staffordshire Ironmasters, Ray Shill, History Press 2008
2 Shown as such on Sedgley Tithe Map and BCN Map
3 TNA PRO Rail 810/8 Proprietors Minutes September 4th, 1801
4 Waterways Trust Gloucester Archives BW 78/59/9
5 Waterways Trust Gloucester Archives BW 165/14/10/4

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The End
At least the end of navigation at present.
The correct way to arrive at Bradley Workshops - by water!