

# The Worcester-Birmingham & Droitwich Canals Society

## Heritage Open Weekend 2024



heritage open days

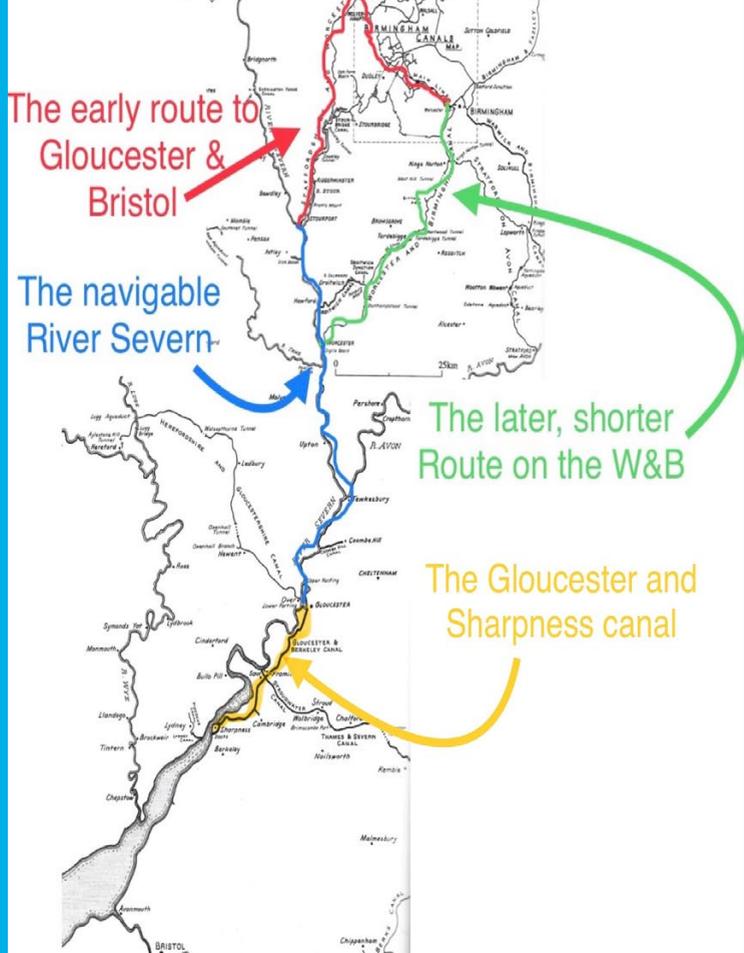
**ROUTES**

**NETWORKS**

**CONNECTIONS**

**Sept. 14th - 15th**

The Development of Inland Waterway Connections 1776 > 1815



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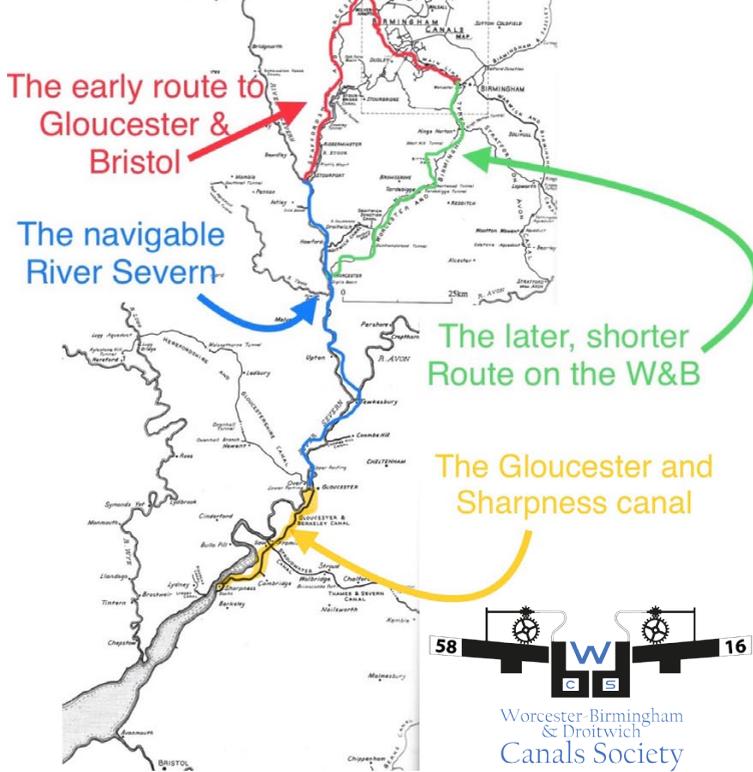


Worcester-Birmingham  
& Droitwich  
Canals Society



# Routes, Networks, Connections

The Development of Inland Waterway Connections 1776 > 1815



The years 1792-1794 saw a period of “canal mania” where there was a rush from entrepreneurs to cut new canal routes which promoted new industrial growth and generated huge financial profit by opening heavy good routes along new waterways. Worcester traders wanted access to cheaper industrial goods and most importantly, coal from Birmingham collieries. Birmingham industrialists wanted a quicker route to move goods South to the River Sever and the ports of Gloucester and Bristol.

Before the Worcester and Birmingham canal, goods were transported through Birmingham and the Black Country via the Staffordshire and Worcester canal

which joined the River Sever at Stourport. This river route often suffered delays due to the unpredictability of seasonal events such as flooding, low water (due to drought) and silting on its way down to Worcester. Hence the Worcester and Birmingham canal was first

proposed in 1785 with an initial route through Stourbridge with 128 locks. This was rejected by Parliament and the new more direct route we see today was surveyed by John Snape in 1789 but did not receive Parliamentary approval until June 1791. The route of the proposed canal was shorter in distance and therefore time which would lead to cheaper freight charges from Birmingham down as far as Bristol.

Land carriage had an increased risk of damage due to poor roads and cost £4 per ton (80 shillings).



**Gloucester Docks c1880**

Water carriage per ton was charged at 7 shillings (s) and 6 pence (d).

This “heroic canal” period would no longer follow natural contours but would need more cuttings, embankments, tunnels and lock flights.

The canal section North of Tardebigge tunnel forms part of ‘the Birmingham Level’ 453 feet (144 m) above sea level, and which extends nearly 50 miles to Dudley, Tipton and Lapworth. There are no locks on the canal between Birmingham and Tardebigge but it was necessary to construct four tunnels:

Edgabaston (96 Metres), West Hill (2493M or 1.55 miles long the sixth longest canal tunnel still in use), Shortwood (561 M) and Tardebigge (530M). From Tardebigge the canal descends 448 feet (130 m) through 58 locks to the River Severn at Diglis.

Construction began in the spring of 1792 from the Birmingham end of the canal as water was at one level and the newly built canal would be easier to water and revenue could be made as each section was completed. However, the initial construction costs were underestimated, and funds regularly became exhausted with new funding needing to be raised to progress the navigation in stages.

By 1797 the canal had reached 8.8 miles to Hopwood. Again, due to financial difficulties, it was 1807 before the navigation reached Tardebigge at what is now known as ‘Old Wharf’ (a public wharf with accommodation, machine house, stables and an Inn) half a mile to the north of ‘New Wharf. Initially projected as a “barge” canal all channels and tunnels to this point were 14 feet wide. As the cost of works soared the canal company ran out of funds several times and it was decided that work from Tardebigge south wards would be constructed for “narrow boats”.

1809: building work recommenced on the Tardebigge tunnel and lock flight and also saw the building of an experimental boat lift (see p17-20).



## ***Worcester: Steamer loading narrowboats 1895***



## ***River Severn: Narrowboats being towed 1943***



## *Cadbury's Old Wharf c1916*

1811: saw the establishment of the New Wharf on land owned by the 6th Earl of Plymouth  
1815: the canal finally opened from Birmingham to Worcester and on to the River Severn in December.

Initially priced at £180,000 (plus £70,000 if needed) the eventual cost of the canal was £610 000.

There are 30 locks on the Tardebigge flight falling 220 feet in 2 miles making it the longest narrow lock flight in Britain. Locks are 71ft 6 inches long with a 7ft width. All the locks are listed as grade II monuments.

As the canal progressed Southwards local businessmen, landowners and farmers, often had their own boats and crews. Captains who owned their narrowboats were known as 'Number Ones'. Earnings were often small and limited expanding holdings into a fleet.

In effect boats were hired out to canal companies to carry goods with the owner providing crew or using other family members – wives and children - who often lived on board.

Canals were well suited to the movement of heavy bulky goods, coal, stone, timber along with building materials that were often carried for the canal itself as well as developing housing and infrastructure. Bricks, lime, limestone, gravel, sand, ash (for towpaths) were staples. Night Soil boats were regular in bringing "fertilizer" from the city. The Southwards journey meant that boats once empty were used to carry local goods back into Birmingham. The canal company encouraged this by offering return carriage free of toll, supporting the growing populations of the increasingly industrialized urban areas. Wheat, barley, oats, beans, peas, flax and bran were carried along with more perishable goods such as, milk, ground meal, eggs, poultry, fruit, vegetables and grain.

Carriers at Tardebigge included Thomas Dixon, his company starting with a "boat length and stacking ground" at Old Wharf and then from New wharf carrying coal, lime and timber

and using the warehouse to grind and produce poultry feed. Usually bulk carrying boats moved from 5am until 9pm but for lighter or perishable goods there were faster moving fly boats which could travel overnight and had preference in the locks and changes of horse and crews, Thomas and Matthew Pickford started life as carriers. These carriers developed businesses alongside the progression of the canal as they built strategic depots and wharfs, which would include warehouses, stables, waggon yards, cranes and accommodation for overnight boats.

Once the canal was fully open trade expanded seeing carriers advertise goods delivery to Worcester, Gloucester, Bristol, Swansea, Cardiff, Cork and all points between.

Eventually T&M Dixon company had over 50 boats with warehouses and wharves in Birmingham. (Dixons remained a principal carrier through Tardebigge for example in 1905 the company commissioned the narrowboat "Enterprise" to be built in Stoke Prior and powered by a converted motor engine.

This was the first motor canal boat in the country travelling to Birmingham in 3 and a half hours, half the time of a horse).

By the 1840s the Canal companies themselves received Parliamentary approval to set up their own carrying companies, some of which were regulars through Tardebigge. The Worcester and Birmingham Canal Company carrying business by the 1870s was taken over / incorporated into the Severn and Canal Carrying, Shipping, Steam towing co. Ltd. The title of which reflected the progress of trade routes and communications.

The original Clippers and sail ships that brought goods up the Severn from around the world were being replaced by increasingly larger Steam powered ships. This meant new carrying opportunities for canals but also meant the bulk of goods along the W&B was



***Steam Tugboat 'Birmingham' 1936***

restricted to the narrow boats' capacity. Further company carrying mergers gave rise to fleets belonging to Fellows, Morton and Clayton and the Severn and Canal Carrying Company (SCCC) whose boats we often see along the W&B canal. Bulk carried goods now included timber from around the world, sugar, flour, wheat, copper, minerals and iron ores and later oil, gas and petroleum products.



## *'Worcester' & 'Birmingham' at Tardebigge*

Again, industries developed alongside the canal transporting their manufactured goods into Birmingham or south to Worcester and beyond. Worcester Porcelain works needed huge amounts of coal, lime and salt to process the china clay from Cornwall. Iron foundries in Birmingham and Worcester provided nails, screws, knives, chains and anchors and companies advertised making "any sort of castings" for new housing including kitchen ranges and stoves, water pumps and pipes, railings, streetlamps, gas fittings, manholes and mangles. Parts for agricultural machines, trams, mill machinery and machine tools were all carried through Tardebigge.

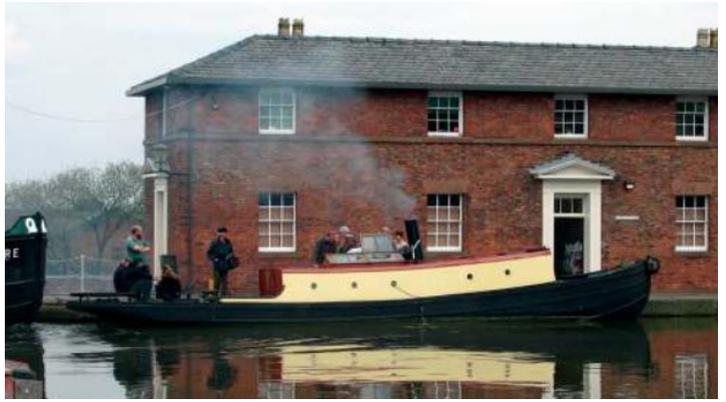
Worcester and Birmingham had Gas Light and Coke companies, again using huge amounts of coal and lime and pushing the chemical carrying trade which included manganese, phosphorus (England Glory Matches) pitch, coal tar, rubber, candle fat, petroleum and oil.

The production of calcium carbonate at Selly Oak Chemical works, was transported for use in agriculture, foodstuffs, paper making, rubber and plastics and cosmetics.

Alkaline chemicals and soap production grew out of the salt works of Stoke Prior with entrepreneurs like John Corbett originally involved in the lucrative canal salt carrying trade. However, the 1860s saw a potential decline in goods traffic on the canal as the same investors in water carriage were now developing road and rail carrying links.

In 1868 the Worcestershire and Birmingham Canal Company went into receivership and was bought out by Gloucester and Berkeley Canal Company in 1873 and became the Sharpness New Docks Company (SND). By 1827 the 16-mile Gloucester and Berkeley Ship canal had opened allowing ships of 600 tons to bypass the shallows of the lower River Severn, further developing trade routes into Gloucester docks.

The takeover of the W&B helped stem the decline of the canal, goods were transferred from sea going ships to river craft or narrow boat for their journey North from Gloucester. Steam powered tugs could pull loaded narrow boats along the river and then transfer back to horsepower for the journey along the canal. The company itself had 80 pairs of donkeys for the task. Once Tardebigge flight was completed the new canal steam tugs could pull a string of laden boats into Birmingham.



*'Worcester' tugboat restored*

The life of the canal was also extended by its most famous traders, the Cadbury family. Cadburys were originally traders in Tea and Coffee and carrying Cocoa for the sweet drink by the 1830s. By the 1840s this could be profitably turned into solid chocolate. In 1880 work started on the development of Cadbury's model village at Bournville (Bourn from the local brook with Ville added as French chocolate was well esteemed).



*A typical boating family*

By 1905 the process for milk chocolate production was established with a resulting increase in canal goods movement. To convey huge quantities of milk into Bournville was not feasible as it would go off. Instead, cocoa was ground up at Bournville and transported back down the canal to Frampton, on the Sharpness canal, where condensed milk was mixed with sugar and dried to produce "chocolate crumb" which was in turn taken back to Bournville for the final processing into chocolate.

By the 1920s Cadbury's were using an old munitions factory at Blackpole to make boxes and packing, again carried in bulk along the canal. At this time George Cadbury was also a director of the SND and was a firm advocate for the revival of Inland waterways. He set up a fund to subsidise the W+B canal and with production at Cadbury's continuing onto the 1970s. This may well explain why, despite a general decline in use across the country, our canal had been better preserved than many others.



## Water Management and the Worcester Bar

The existing Birmingham Canal Navigations (BCN) company and local Mill owners (particularly the metal rolling and grinding industries) protested the route with concerns around the canal taking their water.

Water could be collected from “springs” along the route and from rainwater but not directly from existing streams or rivers (which were to be protected and would need to run through culverts under the canal).

To stop leakage into the W&B canal the BCNs company built a seven-foot wide (84 yards long) bar in Gas Street Basin, Birmingham, the site of which can still be seen today.

The Worcester bar meant traffic had to stop and off load freight over the bar.

However when the W&B canal was completed and trade flowed, the BCN then had difficulties accessing southward routes itself so introduced a stop lock and toll between the two canals (8 pence for a ton of coal, 4 d for anything else which reflects the importance of coal transit).

## The Name Tardebigge?

Found as Taerdebigan in c. 1000 and Terdeberie in Domesday, the name is still obscure in origin and meaning despite the early records.

One conjecture of the name Tardebigge is derived from the Old English Tyrde Bicgan meaning “Big Tower” or “Tower on the Hill” which may refer to the siting of a pre-Norman building where the original church stood.

## Tardebigge Church

The present church was rebuilt 1777 following the collapse of the octagonal tower of the previous medieval building. Designed by R Francis Hiorn and sited north of the original church using stone from previous buildings and the closely situated quarry below the current church.

In the 18th century the parish church of St.Bartholomew was described as Norman although having Saxon architectural features indicating an existing building prior to the Norman conquest thought to lie south of the present building.

Tardebigge is one of the few places to have appeared in three counties: Staffordshire from around 1100 to 1266, when it became a part of Warwickshire until the boundary changes of 1844 finally placed it within Worcestershire.

In the 18th century the parish church of ‘St. Bartholomew’ was described as Norman although having Saxon architectural features indicating an existing building prior to the Norman conquest thought to lie south of the present building.

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# Old Road

A "hollow way" can be seen running up the field approximately opposite the warehouse across the canal. This is the site of the old Alcester Road which was re-routed around 1810 to its present position across the top of the mouth of the canal tunnel thus negating the cost of another bridge to carry the original road.

## Ridge and Furrow Fields

Looking across the fields below the church there are ridge and furrows on the ground from the old farm system initially used communally by Tardebigge residents. Medieval warming periods allowed for crop growing being viable across the higher areas which became more marginal as farming land as summers became cooler and farming spread downhill leaving the area for sheep grazing and hence preserving the old field lines.

## Tardebigge Tunnel and Warehouse.

The tunnel is 580 yards long under the hill that was known as "the Shaws" which had many allotments on it up to the 1960s. This was land owned by Lord Windsor as part of the Hewell estate, where the prison is today.

This tunnel was mostly cut through solid rock proving more costly and time consuming than previous tunnels. It is suggested that controlled blasting of the rock using gunpowder was needed.

The south end was originally started in 1796 and a shaft sunk from the hill top 1/3 of the way along. However, building of the canal stopped in 1807 at old wharf. The cost of the remaining 500 yards of tunnel was reviewed and new contractors were sought to finish the project, recommencing work in 1809 (see later).

Tunnel ends lined with bricks 3 layers thick. Two carpenters were employed to make wooden "ranges" or formers for the brickwork arches. Timber for supports and lock construction was local, notably from Rednal and Stoke Prior.

Approximately 200,000 bricks were used.

Bricks were made from local clay as found along the route of the canal, usually initially fired in pits in the ground and transported along the growing canal on rafts.

In 1809 some 5 million bricks were commissioned each being 10x5x3 inches.

Tardebigge reservoir (down towards Worcester, about ¾ of a mile away) was the site of the largest local clay pit with Dial House farm hosting the initial work huts which became the brick works.

Many other brickworks were used as the canal grew. Sandstone blocks for the façade were quarried from Dust house quarry – on the wharf side down the hill and filled as rubbish tip in the 1960s - and Church Quarry which can still be seen below the Church.

There is documentary evidence for the use of tramways that would run across the fields from the quarries to the wharf. Tramways from the Church quarry side would have run across the hillside to the accommodation bridge below lock 58 as it is too steep for the horses pulling the carts to pull straight up or downhill.

Tramways were temporary and small gauge with small trucks pulled by horse or donkey. "L" shaped rails were laid on stone blocks on which cart wheels sat either side, the cart wheels having no flange so they could be pulled independent of tracks when reaching the flat wharf areas.

One local source suggests that the bottom half of the hollow way may be filled in line of an old short arm canal extension to collect stone directly from the quarry below the church.

Sandstone was also quarried for the construction of the 2ft thick stone warehouse, one of the original buildings on the wharf c1810.

An unloading crane would have projected from the second floor. Maps indicate another crane to the right side of the warehouse later.

Boats were taken through the tunnels by the traditional method of legging. Two 7ft. planks were laid across the foredeck either side of the boat tied to metal rings in the gunwale. Leggers lay on their sides and "walked" along the tunnel.

Apparently, men would await legging work in the local hostelry and were often reported as being intoxicated by the time their services were required.

The local vicar - Canon Dickens - successfully petitioned for the closing of the Plymouth arms following the deaths of several leggers within the tunnel.

In early navigations boats were pulled by men - bow hauling. Men and women would pull the boats using a chest fastening strap. 2, 4 or 6 men in step would pull the line. Locals seeking work were often undercut by Severn Canal Carrying Company crews. Crews often wore out the toes of their boots and stuffed them with rags leading to the derogatory term of toerags.



## Plymouth House and Plymcote Stables

The wharf was built on land owned by Robert Henry Clive, the 6th Earl of Plymouth.

He also built the Inn (The Plymouth Arms). The current building has been converted into luxury flats. In its past the building was used as a hotel and inn, a funeral undertakers, a guest house and nursing home in the 1980s. The Inn would have been for locals and passing road traffic. Stables are also part of the buildings to the left (*not in photo*).



*Plymouth House circa 2008*

# Tardebigge New Wharf

## New Wharf construction started 1809 and opened in 1811

Originally comprising of the wharfage with an additional basin for winding (turning) boats. There was an old toll house outside the entrance on the road.

(Looking down the road to the right is Tug Row terrace from 1878 – see below).

Inside the entrance would have been a Weighbridge point likely to have been in use prior to the opening of the canal. The weighbridge cottage indicates this area. The other brick cottages included a machine house and workers cottages. There would also have been stables.

The wharf was in use prior to the completion of the canal mainly as a coal depot with coal coming south from the Black Country to Old wharf and then distributed locally by road. Businesses had moorings along the wharf running parallel to the canal company warehouse and public wharf. The Dixon family were noted coal merchants. William Ward used the depot to take coal to Droitwich and return with salt. The large house on the left of the entrance was the later superintendants house.

The wharf was expanded in 1830 with the addition of the sluice arm, which again was extended in 1924 to provide a dry dock facility for ease of repair and boat maintenance as it still is today. An early map of the wharf indicates a crane located on the second storey of the warehouse and another, possibly on rails along the wharf to its left. The crane in the courtyard is from the 1960s.

In 1868 the Worcestershire and Birmingham Canal Company went into receivership and was bought out by Gloucester and Berkeley Canal Company in **1873 and became the Sharpness New Docks Company (SND). In this period steam tugs were introduced and in 1876 Tug Row was built to house the extra workers.**

1909-11 saw SND make Tardebigge their principal maintenance yard. These later Sharpness buildings, those of grey brick, were typical services for a wharf...offices, carpenters, wood store, blacksmith shop, coal store, stables, chandlers and workshops.

The large workshop has a sawtooth roof design the original upright roof faces having windows to allow good natural light but angled away from direct sunlight and heat which would be uncomfortable to workers. The design also increases better use of headroom and floorspace. This energy saving design may well make a comeback.

The company initials and dates of the buildings can still be seen on brickwork of some of the buildings

Locks were constructed on site. Single locks used along Tardebigge were transported along the canal to where they were needed.

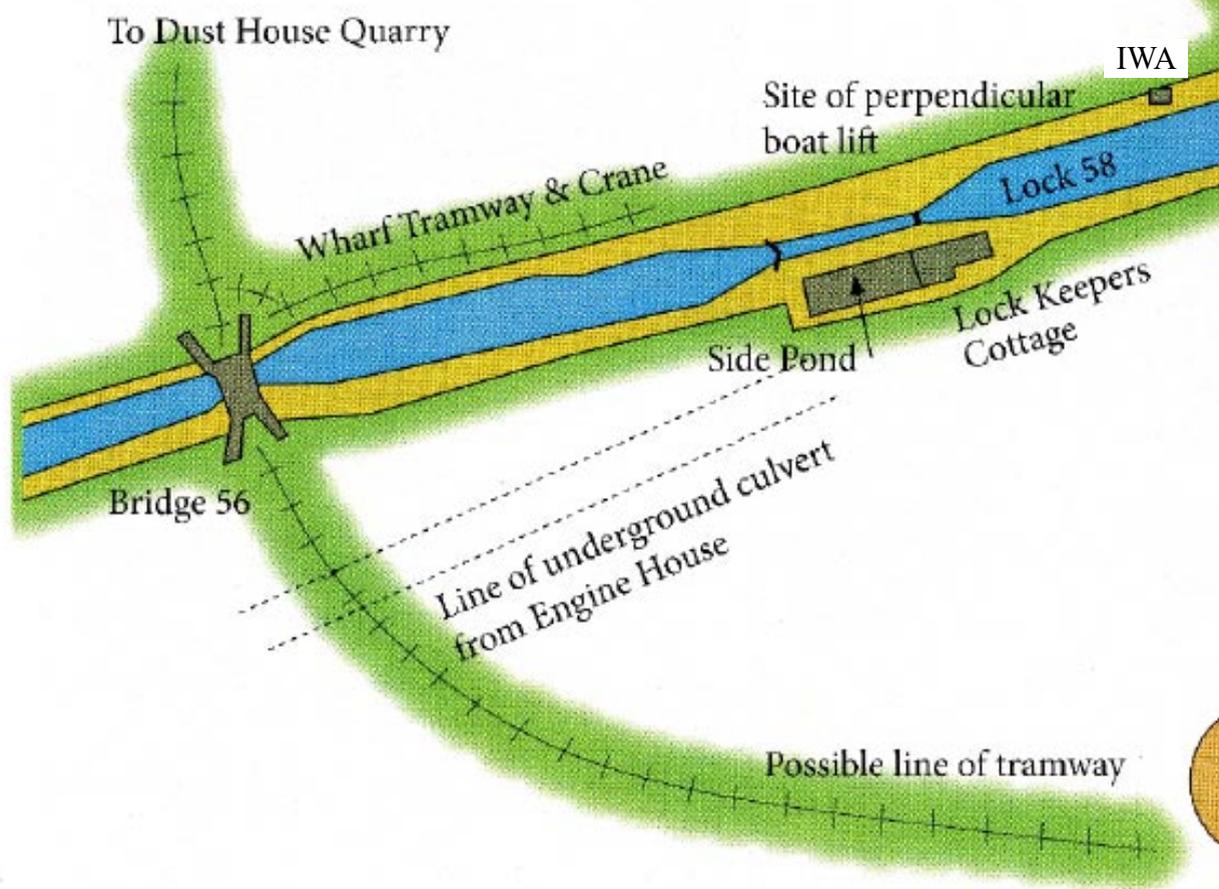
Double width gates for Worcester River locks were more of an issue. On the sides of what is now the main depot we can see different bricks alongside the bottom of the doorway. This is due to bricks having to be removed from the main building doors in order to take out these larger lock doors.

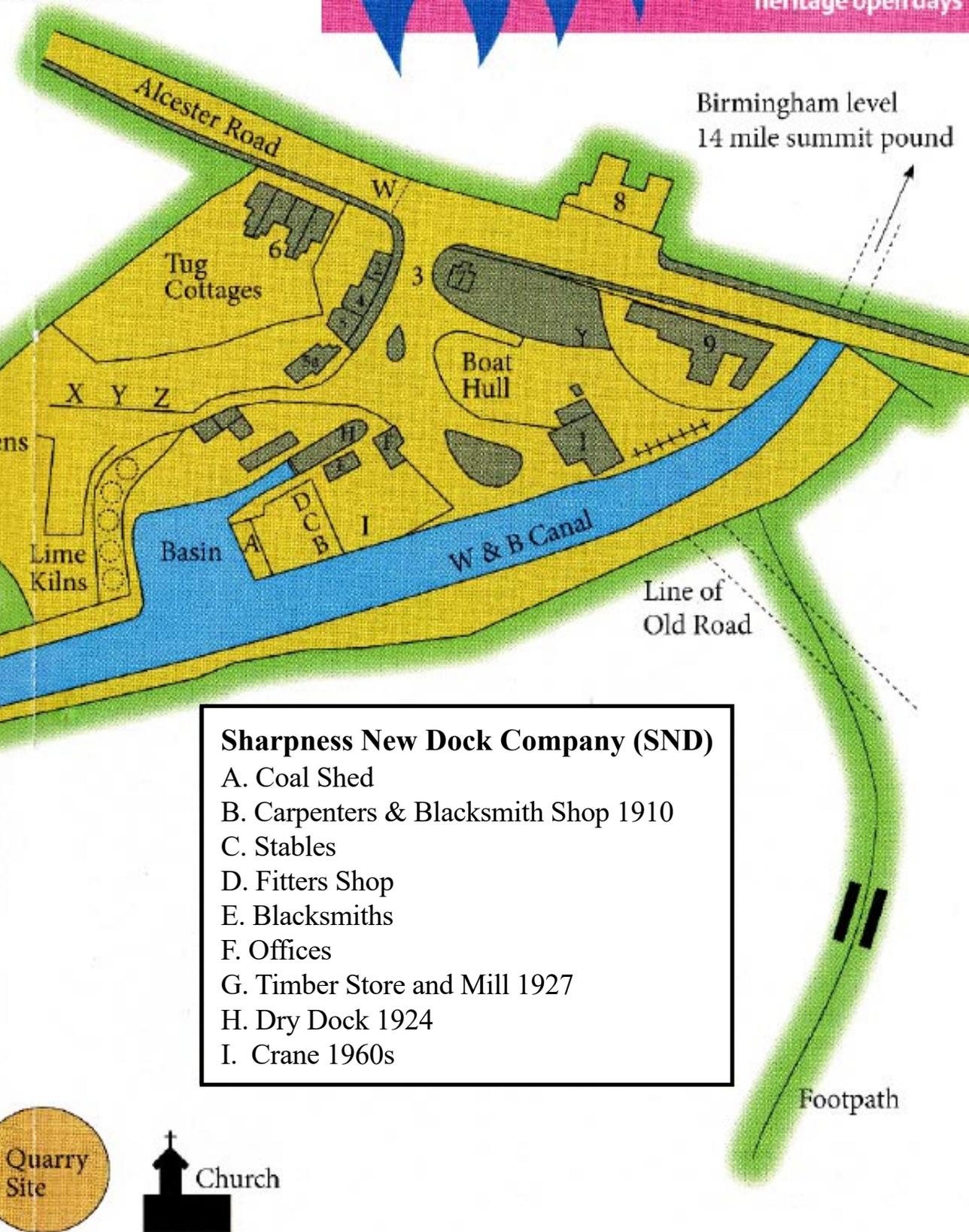
The wharf was later owned by British Waterways prior to transforming into today's Canal and River Trust depot.



# TARDEBIGGE WHARF 1808 to p

1. Warehouse 1810
2. Machine House / Weighbridge Cottage
3. Weighbridge Site
4. Workers Cottage
5. Workers Cottage: 5a Cottages
6. Tug Row 1876
7. Superintendents House 1918
8. Plymouth House 1812
9. The Plymcot Stables
- W. Old Toll Gate Site
- X. Pig Styes
- Z. Old Cottage Site?





Birmingham level  
14 mile summit pound

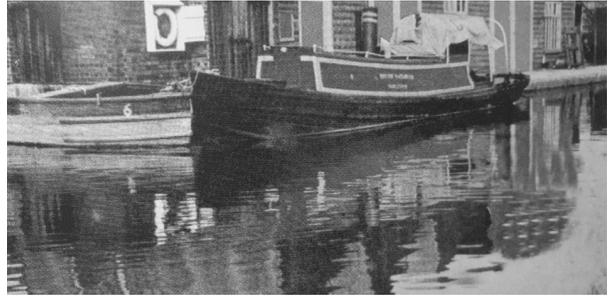
- Sharpness New Dock Company (SND)**
- A. Coal Shed
  - B. Carpenters & Blacksmith Shop 1910
  - C. Stables
  - D. Fitters Shop
  - E. Blacksmiths
  - F. Offices
  - G. Timber Store and Mill 1927
  - H. Dry Dock 1924
  - I. Crane 1960s



# Steam Tug 'Birmingham'

In 1878 four terraced cottages were built to the right of the wharf entrance for the tugmen and their families.

Earlier, in 1876 the need for traditional leggers became a thing of the past as the SND company invested in 3 steam tugs 'Birmingham' (left), 'Worcester' (right) and 'Gloucester'.



One steamboat would tow boats through the Tardebigge and Shortwood tunnels, a second would tow boats through West Hill Tunnel with the third on standby when the others were out of use or being serviced.

Crew consisted of an engineer and a "steerer". Although costly the mechanised tugs could haul more cargo at a quicker rate than previous trains of boats. Records show in 3 weeks 638 boats were towed (3 shillings for a laden boat, 2 for empty).

By 1907 tug towing across the whole summit level into Birmingham was now an option with a charge of 5 shillings for a full boat and 4 for an empty one. The stables were increased at this point as the horses would not be needed until boats made the return journey south.

By 1910, 5 trips into Birmingham and 5 trips back ran daily, pulling around 700 boats a month. 2 new oil powered tugs Sharpness and Droitwich were commissioned.

In the compound of the wharf there is the hull of tugboat 'Birmingham' (right). Its history is explained on the displays.

**This was a diesel engine boat replacing the original steam tug from 1876, she arrived in Tardebigge in 1912.**

Sister to tugboat 'Worcester' she worked in tandem, towing boats through the tunnels. However, by 1916 cargo carrying was in decline and operations were scaled down and 'Birmingham' was sold off.

She then saw life as a council rubbish removal boat, maintenance boat and ice breaker, holiday cruiser and education boat before being abandoned in the 1990s when she was acquired by British Waterways and returned to Tardebigge to be preserved by Friends of the Working Boats.

The end cottage was an old Post office and at the end of the houses and leading down to allotments there would have been pig sties and stables. Horses, donkeys and mules would be used by the wharf workers and possibly were hired out. A lot of boat men preferred donkeys to pull the boats as they were small and sturdy and ate less and cheaper food than a horse. They could also be taken on board to pass through tunnels.



Anecdote: Mules used at the wharf came back from France after WWI but proved difficult to work with as they obeyed instructions only from men dressed in Khaki.

Fly boats were express carriers for fragile or small bulk high price items along with post or documents. Typically using 4-man crews and working over 24 hours with a change of horses. Pickfords, the removal company started life as this type of courier.

## The Tardebigge Lime Kilns and Garden area



Limestone was burnt with coal to provide lime mainly used in agricultural fertiliser and brick mortar cement (possibly used in the canal brickwork?).

This was probably an early business at the wharf with coal and limestone being brought in and lime products shipped out by road or canal. Thomas Dixon and family were noted canal carriers for coal and lime. It was also used in whitewash, destruction of infected bodies – cattle and humans- concrete, glass and metalwork, leather work – removing hair from hide and put into soap and toothpaste.

The kilns were in operation from at least 1814. They comprised of a bank of 5 'flare' kilns built into the bank of the wharf. The open fronts of the kilns can be seen from below and the circular inside "barrel" outline of the kilns can be seen from above.

Conservation work on the kilns has been suspended due to the presence of asbestos in the kilns from waste tipping after the kilns had fallen into disuse.

Alternate layers of coal and limestone rock crushed down to about fist size, would be tipped into the top of the kilns from the bank above, probably straight from a horse drawn cart. The kilns would be sealed and fired over a 24 hr period aiming for a temperature of 800-900 degrees celcius .Each kiln being fired one after another over 24 hours giving a continuous production across the site.

Workers would approach the heated kilns at the bottom 'stoke hole' and with a 'drag' and shovel to draw out the lime along the platform area below and probably into (tramway?) carts beside the stone platform.

Because issues with water contact the area would have had some covering from rain not for comfort of the workers but for preserving the product. If the lime was of good quality a small lump dropped into water would produce a violent reaction – hence 'quick lime'. When mixed safely with water it was like putty – slaked lime. When water was sprinkled on it broke down into a powder – Hydrated lime.

Workers were faced with overheating if clothing was thick as the lime reacted with the sweat on their skin.

Most wore sacking which was lightweight but were likely much scarred and pockmarked from the process irritating the skin. The lime irritated nose and mouth reacting with saliva so most workers were also prone to lung disease.

The site below the kilns was company allotments and orchard.

Much of the surrounding area was, in modern times, given over to farm land with the whole area covered in orchards up into the 1960s.

## Idle Women

In 1941 a young woman called Daphne March advertised for crew for her family working narrowboat "Heather Bell". At this time many of the male canal workers had volunteered or been called up to fight in the war. Apparently, this advert gave the Minister of War Transport the idea of recruiting women to take over this heavy hauling role. Similar to munitions girls and land girls there was an inland waterways section. Jokingly called 'Idle Women' after the IW on their National Service badges.

From 1942 crews of 3 women were trained to helm diesel powered narrowboats and a towing butty. At the end of the war the service was disbanded but many recorded their experiences providing a different view of life on the cut. It is worth remembering that throughout the history of trade on the canals work was often conducted by families working and living wherever the next cargo took them.

We know that Heather Bell worked with crew and laden with coal used the flight as there is a picture in the book 'Narrow Boat' who's author we now meet below.

*Worcestershire poet and singer, Heather Wastie and writer Kate Saffin tour with shows of theatre and poetry associated with the "Idle Women". [www.alarumtheatre.co.uk](http://www.alarumtheatre.co.uk)*

## Heritage Marker for Inland Waterways Association (IWA)

### The Cressy Memorial

During the Second World War Tom Rolt, a writer and engineer working for the Ministry of Supply, lived on his boat 'Cressy' (right) moored next to the Top Lock.

In the years before the war he and his wife had cruised the canal system and discovered that they were in decline.

Rolt wrote the book 'Narrow Boat' describing the state of the system and what he saw to be its uncertain future.

The book received wide publicity

and in 1945 Robert Aikman (a literary agent) visited Rolt at Tardebigge and together they agreed to form the Inland Waterways Association which has since played the leading role in saving the canal system.

**The Cressy memorial (top of next page) was erected to celebrate this meeting with a dedication on the top and an added plaque correcting the year of the meeting.**

By 1946 the IWA was identifying at-risk waterways and members were organizing and traversing routes that were practically closed due to neglect.



Boat rallies were established and well attended with national interest growing to open canal and towpath areas previously abandoned.

In 1955 following the governments Board of Survey report over 800 miles of canal were “for disposal” as they had no value for commercial traffic. The IWA protests and highlighting of the popularity of pleasure boating reduced this to just 90.

The IWA pioneered the purchase of semi-derelict navigations and their restoration by volunteers. Eventually the 1968 Transport act classified usable canals without commercial traffic as “cruiseways”.

The IWA continues to support major restoration projects through protest, blockade and lobbying along with new funding partnerships and conservancy projects.

In 1971 Close links were forged with the Worcester and Birmingham Canal Society when volunteers started working parties on the Droitwich Barge and Junction canals which had closed in 1939. The Droitwich canals Trust was formed in 1973 and thousands of people attended the “Droitwich dig” weekend working on the Barge canal. In 2011 the Barge and Junction canals were fully open.

IWA proposals for a waterways trust over the years saw fruition in 2012 with the establishment of the Canal & River Trust.

## Top Lock 58

### Lift vs Lock

As pictured on page 21 this was the site of an experimental perpendicular boat lift (see the red Transport Heritage plaque - right).

There is a working model of this in the care of the Worcester-Birmingham & Droitwich Canals Society.



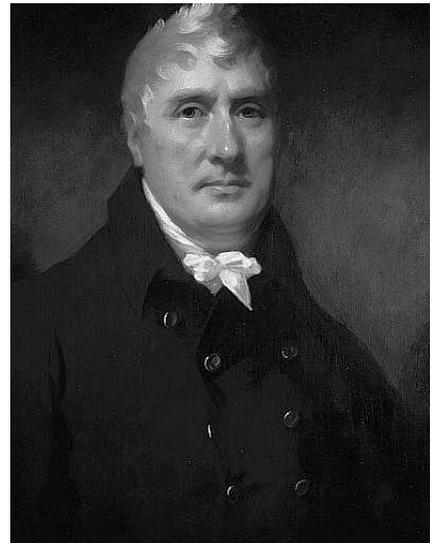
## The Woodhouse Perpendicular Lift

By 1809 the canal company entered its final stage of building to complete the canal from the Tardebigge summit down to Worcester. The concern of providing water to the canal remained, even to the extent of considering using steam pumping engines and reservoirs all the way along the route to pump water up from the River Severn at Worcester (Diglis).

The decision was confirmed that all locks or lifts would be “narrow” and not the initially proposed 14 feet wide.

The company consulted the renowned engineer **John Rennie** (right) who considered that a total of 72 locks would be needed. However, by this time a few canals were installing boat lifts to overcome the problem of maintaining the water supply.

The Company was persuaded by newly appointed resident engineer, **John Woodhouse**, to trial his patented boat lift in 1809.



**The idea was that a lift could move a boat using little water as it stays mainly within the lift. The projected 72 locks would each be 6 feet deep. The lift was proposed to be a depth of 12 feet deep.**

**Woodhouse also proposed that a total of 17 lifts would be needed down to Worcester working out cheaper. If successful, there was no reason in theory, that the lifts could not be made even deeper further reducing the number needed.**

**The lift was constructed on the site of what is now the Tardebigge Top Lock (No. 58).**

When work began the south side of the tunnel had yet to be completed. An initial stretch of 30 yards of canal between the tunnel and the lift and 40 yards below was constructed so the lift could be tested by running boats back and forth through it over 24 hours.

At least 2 boats were carried over the tunnel hill from Old Wharf for this purpose.

The mechanical parts of the lift were made of cast iron. The whole apparatus then being covered by a wooden building to protect the lift and its operators from the weather.

8 pulley wheels with a diameter of 12 feet sat on top of a 30ft. "Lever" wall. Each wheel had its own set of counterweights (iron boxes filled with bricks) which countered the balance of the 64-ton caisson, or box which could float one narrow boat. The caisson itself was 72 foot long, 8 feet wide, 4 and a half feet deep and made of 3-inch-thick planking.

Due to the weight of the boat displacing water in the trough the caisson would always weigh 64 tons no matter what the load of the boat.

The counterweights would settle into a pit on the far side of the wall when the caisson was raised, rising towards the top of the wall as the caisson was lowered.

Lengths of chain were attached below each counterweight box to aid weight distribution and smooth running of the mechanism as the boxes neared the top of the wall their chains being moved across the pulley wheels.

The caisson could be lifted by 2 men winding the winches on a common spindle as wheels 2 and 7 were geared with teeth.

Separate pulleys would be needed to raise and lower the gate paddles at either end of the caisson at the narrow gap between caisson and canal. A "valve" is described as being opened to fill and empty the caisson.

The grooves in the gates were lined with a thick felt so lateral pressure of water from the canal would create a seal.

Both container and canal would need to be sealed off by guillotine gates before movement of the box. This was a complex arrangement for its time and men operating the lift would need to be familiar with its workings and potential need for adjustment if there were any issues.

Manning lifts through shifts of 24 hours therefore became a cost in comparison to ordinary lock usage which all boatmen were familiar with.

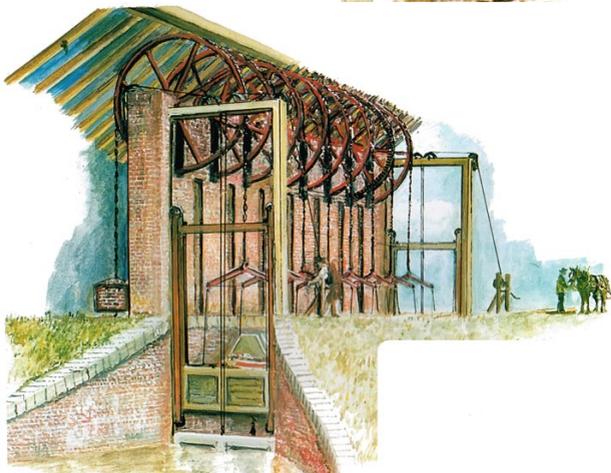
Trials showed the lift could manage 6 boats in one hour – 3 up 3 down which was 72 boats over 12 hours.

The canal board engaged engineer William Jessop to advise and witness the lifts efficiency. Unfortunately, at this demonstration a paddle was not sealed and as water escaped during raising the caisson it tipped, became lopsided and broke a pulley wheel injuring the winchman.

Other observers also witnessed issues as any flotsam could easily prevent the paddles closing and needed workers to enter the water to clear. This prompted concerns around winter as ice could also interfere with the mechanisms.

# John Woodhouses's Perpendicular Lift

Impressed by the climb The Worcester & Birmingham Canal had to make from the Severn Valley to the Birmingham plateau, John Woodhouse, an engineer from the Grand Junction Canal, who took over in 1809 as principal engineer of the Worcester & Birmingham had, in 1806,



proposed lifts to replace some of the locks on the Tardebigge Flight to save water.

Engineer John Rennie reported to the committee. Despite reservations shareholders pushed to continue with further trials as up to 1811 the tunnel was still not completed so the lift had not had a supervised trial with ordinary working boat traffic. It was decided to work the lift for 1 month. Feelings amongst shareholders with opposing views were running high and at one point the lift was sabotaged by screwing moving parts of the lift together under cover of darkness stopping the running of the lift necessitating a watchman to be employed. Further indignity was suffered when a lightning strike caused damage and the lift needed extensive repairs. When carefully supervised the lift managed a maximum of 113 boats moved in 12 hours, taking between 6 and a half to 8 minutes at worst.

However unreliability and a need for too much maintenance (where issues with any of the proposed 17 lifts would stop boats progressing along the whole of the flight) along with the expensive of needing a paid team of men to operate it saw most shareholders question the lift as an option. The final nail in the coffin of the lift came as it became clear that use of reservoirs near to the summit would be sufficient for the supply of water to operate the canal and therefor support the use of traditional locks. In the decisive report the committee considered the lift too "delicate" and "complex" and required "attentive and careful management" that was unlikely to occur when in general use on the canal.

Within it's time the lift continued to be used as the canal building progressed, although in 1813 it was recorded that it was "again broken and unserviceable" with damage being done by "ignorance and neglect" of those working it. This further convinced the committee that even this one lift would not be retained when the canal was completed.

**It was finally dismantled in 1814.**

**The canal was completed to Worcester in 1815 using locks with a drop of 7 feet which are the 58 locks we see today.**

Lock 58, Top lock is built on the site of the lift. This is a narrow pound lock 12 foot deep although frequently noted to be 14 feet i.e., supposedly double the depth of all the other 7 feet locks.

Halfway along top lock are the wooden remains **of the sluice winding gear for a Side Pond constructed at the same time as the lock was built replacing the lift (building 2 locks and a pound to replace the lift site would have been costly in moving a significant amount of earth)**. The side pond itself is the rectangular stone basin seen in the garden of the lock keeper's cottage.

Side ponds allow lock keepers to divert half a lock of water into storage whenever the lock is used. When a boat goes down opening the side sluice means that half of the water is diverted into the pound and saved. The gate paddles (one in either side of the tail gates) are then opened as normal lowering the boat down to canal level.

When filling the lock for an up boat (alternative up and down boat haulage being the most efficient use of water) or a down boat, the water stored in the pond is put into the lock first, half filling it. The water to complete the filling of the lock being taken from the canal by the usual opening of the ground paddles (Either side of the head gate). The process is repeated each time saving half a lock of water. As all locks on the flight a pair of gates sits at the tail with a single gate at the head.

There is a paved area under wooden beams. Red and blue brick originals with raised "kickers" for grip (blue bricks were fired to be tougher and are also used on the edge of bridges to combat wear from rope marks).

Another point of interest is the small metal spike sited on the offside of the lock just ahead of the gates head and tail. These are the Worcester and Birmingham Hooks which seem to be unique to the canal. The hook would allow the boatman to loop a rope over and haul against it to aid in moving the boat forward out of the lock.

*Looking south...*

Between the accommodation bridge and the top lock the offside would have been a busy wharf area where the tramways terminated and materials for the building of the canal were loaded or off loaded. A tramway cart with crane gear on wheels would aid the process.

## Engine House

Built circa 1823 with a Horseley Iron Company engine brought along the canal from works in Tipton. Water was brought to summit (approx. 50ft) level beyond top lock via a 3-foot diameter brick culvert, the collapsed remains of which can be seen in the fields behind the top lock keeper's cottage.

It is unclear today where the water would have emptied into the canal and if it would be pumped directly into the pound above lock 58 or stored in a pound behind the lock keepers cottage until it could be let in by sluice as needed.



## Tardebigge Reservoir

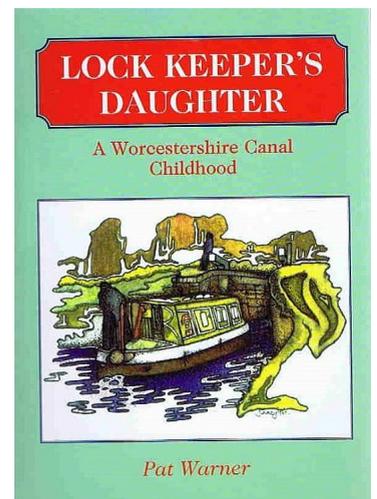


In 1822 the reservoir commenced on the site of the old clay pit for making bricks.

Between 1824 to 1826 it was deepened by raising and strengthening the embankment which you can still see around the side from the towpath. The increased capacity holding some 5000 locks worth of water. Just before the reservoir you can see paddle gear that used

to operate the overflow sluice from the canal into the reservoir. A contour culvert leads from the reservoir to provide water for the canal emptying out on the lock bottom at lock 43.

The cottage by the reservoir is where author **Pat Warner** lived. Her memoirs 'Lock Keeper's Daughter' were written by her when she was growing up between the wars.



The weekend of September 14th and 15th saw the volunteers of the Worcester-Birmingham & Droitwich Canals Society taking part in the Heritage Open Days (HODs) event around the Tardebigge New Wharf area of the Birmingham and Worcester canal.

Supported by Canal and River Trust our member volunteers, along with some lock keeper volunteers, guided members of the public around the top lock and wharf area giving a view of how the area would have looked when in full industrial swing.

The event days themselves are part of a national fortnight of heritage events coordinated by the National Trust.

This year's topic of Routes, Networks and Connections led us to develop new information boards and stories describing the growth of the canal and its role in moving goods locally, when being constructed, to developing regional industries along its route and finally enabling passage of goods from around the world into Birmingham.

This year we were also joined by our friends from the Bromsgrove and District Amateur Radio Club who broadcasted the event to their members locally and around the world.



For further information see their website and the BIWOTA site 'British Inland Waterways On The Air' [www.bromsgroverradioclub.co.uk](http://www.bromsgroverradioclub.co.uk).

Thankfully the weather was better than initially thought, although it did cloud over on the Sunday. Our volunteers guided small groups around the area and returned their guests to the gazebo for tea and cake before some visitors went for a boat ride on 'Cecilia' through the Tunnel to Tardebigge Old Wharf and back.

This year we also increased our ties with the Bromsgrove and Redditch Councils' Cultural Compact for North East Worcestershire project (ReNEW) with our event appearing in council flyers. During the event our volunteers worked hard on collecting feedback from visitors.

The feedback confirmed that guests fully appreciated our warmth and good humour as well as feeling informed and entertained by our descriptions and stories. Building on this success in engaging interest in the heritage of the Tardebigge Wharf area may well support our own future projects by applying for small grant funding from the ReNEW project.

In conclusion another enjoyable event.

For further information see our Facebook page [www.facebook.com/wbdcs.org.uk](http://www.facebook.com/wbdcs.org.uk) where you can see more event pictures and view our fabulous drone footage.

So that's it until next time!

*Al Gibbs,  
WB&DCS Heritage Coordinator*





heritage open days



**Worcester-Birmingham  
& Droitwich  
Canals Society**

[www.wbdcs.org.uk](http://www.wbdcs.org.uk) | [Twitter @wbdcs58](https://twitter.com/wbdcs58)  
[Facebook @wbdcs58.org.uk](https://www.facebook.com/wbdcs58.org.uk)

If you are interested in canals, narrowboats, boat crewing, natural history, walking, cycling, industrial archaeology, local history, canal work parties, preservation and enhancement of the environment as well as meeting up with like-minded people, then please consider joining this Canal Society.

We usually hold our regular monthly meetings at the Alvechurch Boat Centre, Scarfield Wharf, Alvechurch, B48 7SQ (just behind the award winning Weighbridge pub). Meetings are held on the first Tuesday of the month at 7.45pm. If you are in the least bit curious then please come along, as non-members are always welcome (we publish meeting information on our Facebook page). You do not need to be a boat owner as most of our members are not.

Presentations usually involve having a guest speaker and slideshow/video. We also hold social events for members. Further details are available on our website and Facebook where you can find out lots more about us (details below).

Our own society narrowboat 'Cecilia' is available for use by groups or individuals for half and full day trips (*terms & conditions apply - see our website for details*).



**Please visit our website: [wbdcs.org.uk](http://wbdcs.org.uk)**

*(where you can also download a membership application form)*

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