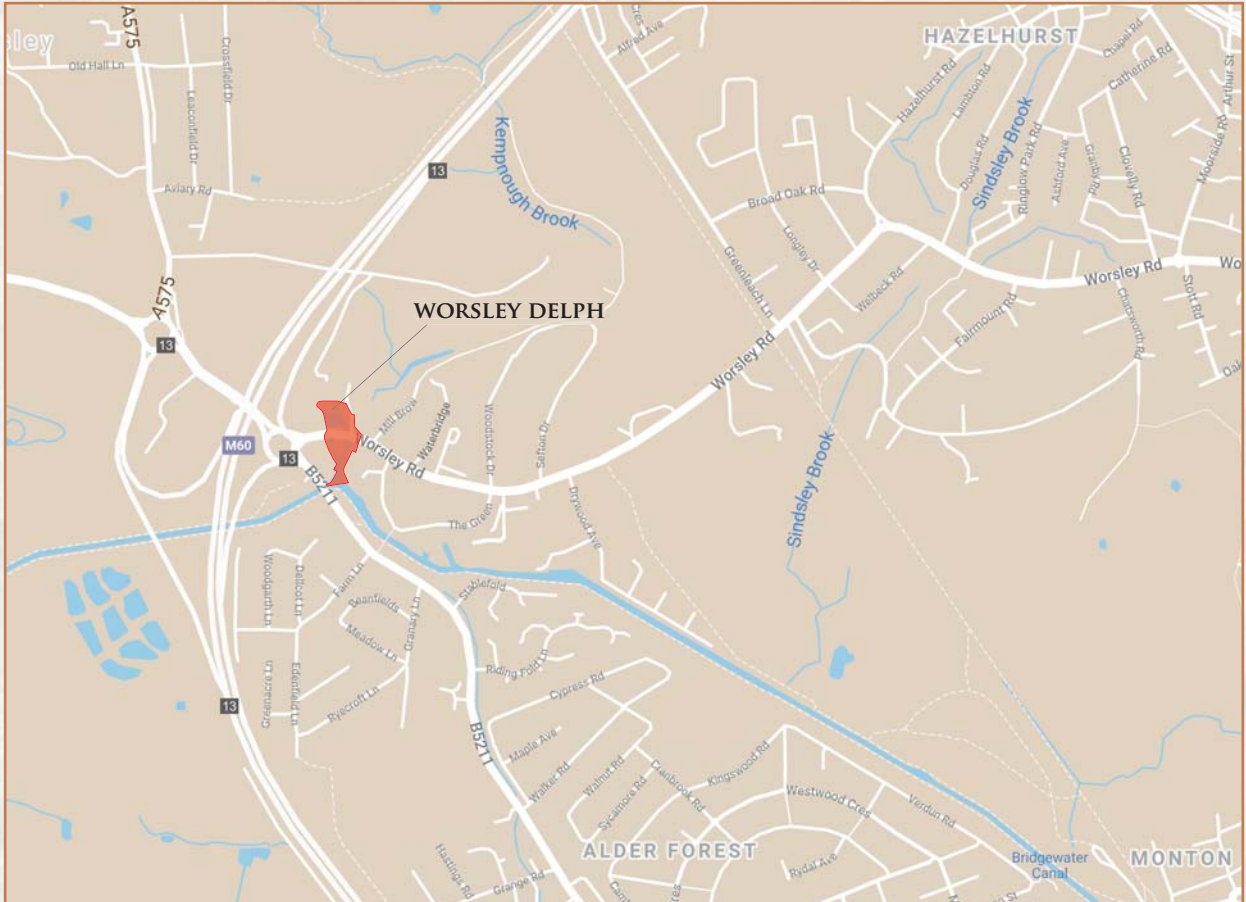




Worsley Delph:

CARVED IN STONE





Location of Worsley Delph shown on modern mapping and satellite imagery (© Google)

FOREWORD

Worsley Delph is a 'jewel in the crown' of Greater Manchester's industrial heritage. Its national significance is recognised through its designation as a Scheduled Monument. It represents the extraordinary ability of Georgian engineers to utilise water for industrial and commercial purposes. In 1761 the Duke of Bridgewater's scheme at Worsley ingeniously linked a system of underground canals with an eight-mile long, lock-free, surface canal which took coal straight from the mine to the burgeoning industrial town of Manchester. This successful scheme transformed the transport of commercial goods and heralded the golden age of canals.

In recent decades the canal basin and mine portals at Worsley Delph fell into neglect so that it was difficult to access and appreciate the site's hugely important industrial heritage. Whilst the coal mine canal tunnels sadly remain too dangerous to access, Salford City Council has nonetheless been able to complete a remarkable scheme of restoration and interpretation of the basin and its various heritage features.

As one of the last parts of the restoration scheme, Salford Archaeology has produced this heavily illustrated booklet to complement the on-site restoration and interpretation. It provides a deeper understanding of the historical development of the Delph, the results of archaeological investigations undertaken during the works, the key heritage features associated with the coal mine and canal system, and places all of this within the context of the rich, wider heritage of Worsley Village.

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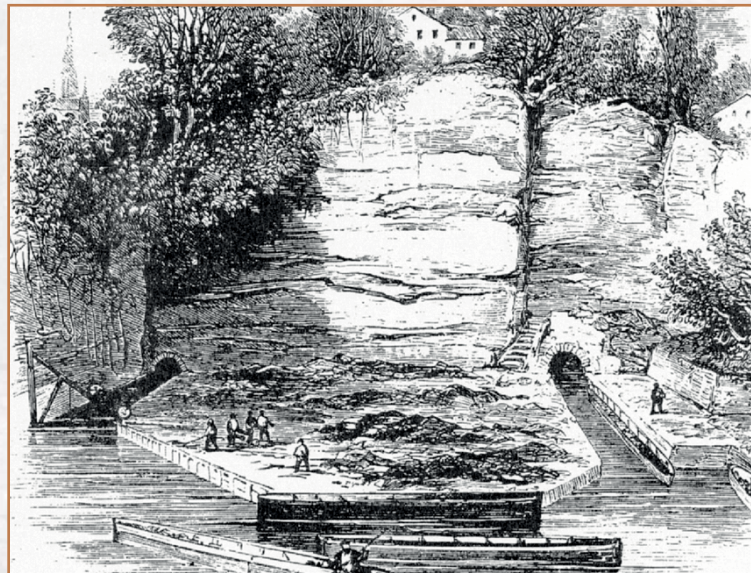
Greater Manchester Archaeological Advisory Service

INTRODUCTION

The historic village of Worsley lies on the north-western fringe of the city of Salford and, as the birthplace of the Bridgewater Canal in the mid-18th century, became an important cradle of the Industrial Revolution. Designed by John Gilbert, agent and engineer to Francis Egerton, the 3rd Duke of Bridgewater, the canal was intended to serve the Duke's growing business enterprise that involved actively promoting the exploitation and management of the rich coal resources on his estate. The profitability of the Duke's business was hampered by the high cost of using packhorses to transport the coal from his collieries, and the ground-breaking decision to build a navigable waterway provided an innovative solution and led to the creation of the world's first true arterial industrial canal.

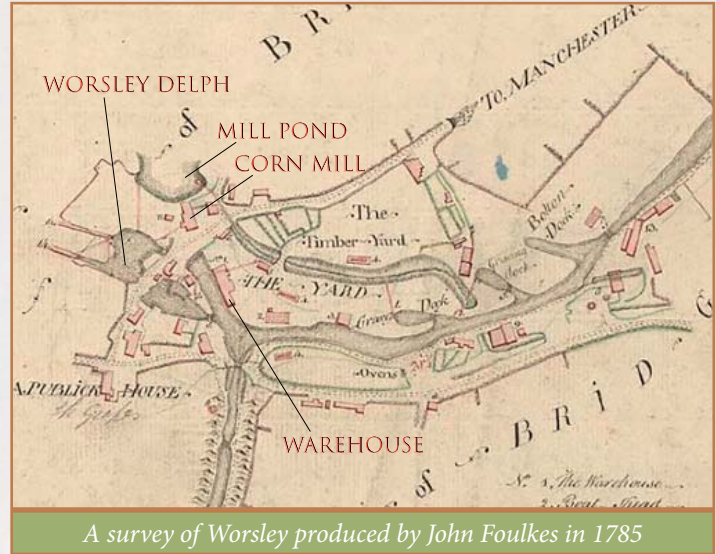
Remarkably, the canal extended into the Duke's coal mines, providing a means of draining the workings in addition to offering an efficient way of transporting the coal. Known as the 'Navigable Level', the underground canal system extended westwards from Worsley to pass under Boothstown, and northwards to Walkden, Swinton and Farnworth. The underground canal eventually served four different levels that were connected via inclined planes with numerous side branches to give a total length in excess of 80km. This incredible system was accessed from Worsley Delph, an old stone quarry on the edge of the village that was transformed into a canal basin.

The main line of the canal from Worsley Delph to Stretford opened in 1761, and was then extended to a terminus basin at Castlefield in Manchester in 1764. A second entrance tunnel to the underground canal was constructed at Worsley Delph in 1771 to allow empty boats to enter by one tunnel and full ones to exit by another. The pioneering technology that contributed to the success of the underground canal system has no parallel in Britain, whilst the commercial success of the canal inspired a period of intense canal building during the late 18th century.



An illustration of Worsley Delph showing the two entrance tunnels to the underground canal, produced by Samuel Smiles in 1874

Francis Egerton also established a canal warehouse and an industrial complex known at the 'Duke's Yard' in Worsley. Lying adjacent to Worsley Delph and a corn mill, the Yard was essentially a complex of canal workshops that provided premises for boat builders, sail makers, stonemasons, blacksmiths and carpenters that served the mining operations and the boats that plied the Bridgewater Canal and the Navigable Level. Rows of cottages were also built across the estate to attract workers to take up the numerous new jobs that were created.



A survey of Worsley produced by John Foulkes in 1785

Industrial interests in the estate dwindled following the death of Francis Egerton in 1803, and there was little investment or expansion thereafter, although the output of coal from the mine had doubled by 1840. The 4th Duke of Bridgewater was even said to have regarded Worsley as 'a God-forgotten place', although he was responsible for implementing some improvements to the village. The inexorable decline of the canal network, however, was signalled by the arrival of the railways in the mid-19th century, which eventually superseded canal transport throughout the country. The last coal was hauled out of the tunnels at Worsley Delph by boat in 1887 and the lower coal workings were abandoned, although the canal remained in use as a drainage sough.



Canal boats moored in Worsley Delph in the late 19th century after the mining operations had ceased



*A late 19th-century view of the Duke's Yard
(© Salford Museum & Art Gallery)*

The Worsley estate passed to Francis Charles Granville Egerton in 1862, and the following decades brought considerable change to Worsley. The corn mill fell into disuse and the mill pond was drained, whilst the canal workshops were cleared to enable a new green to be created as part of a wider programme of gentrification to turn the area into a garden village. By 1910, 30 estate houses had been built around Worsley Green, and a new bridge erected across the canal to the south.

The development of the modern road system in the second half of the 20th century had a significant impact on Worsley, initially with the construction of the Stretford-Eccles by-pass in 1957-60, which was eventually absorbed by the M60. Barton Road and Worsley Road became busy thoroughfares for commuters, as the village expanded as a desirable residential suburb. Worsley Delph had fallen into dereliction by this time, leading the Worsley Civic Trust to implement some landscape improvements.

The first phase of these works was carried out in 1966-67, and included the removal of a vast quantity of silt from the abandoned canal basin. The path from School Brow to Worsley Delph was also built to allow access for machinery, and the spit of land known as 'The Island' between the two tunnels was reconstructed, although this introduced the central steps that were not an original feature. Worsley Civic Trust carried out further landscaping works in 1974-75 as part of European Architectural Heritage Year, which involved dredging the canal basin and making improvements to the tunnel mouths and paths. However, by the end of the 20th century, the canal basin had become silted up and overgrown, and the reconstructed sluice mechanism had fallen apart.



Views of Worsley Delph from Worsley Road Bridge before the landscaping works in the 1960s and following their completion



The immense historic and archaeological importance of Worsley Delph is reflected in its statutory designation as a Scheduled Monument, and its inclusion in the Worsley Village Conservation Area. In addition, the two tunnel entrances and their associated sluice gates are afforded protection in the planning system as Grade II listed buildings, together with a plethora of buildings and structures in the immediate vicinity. Attempts to enhance the incredibly rich heritage of the area and improve public access have been the focus of several projects since the late 20th century.

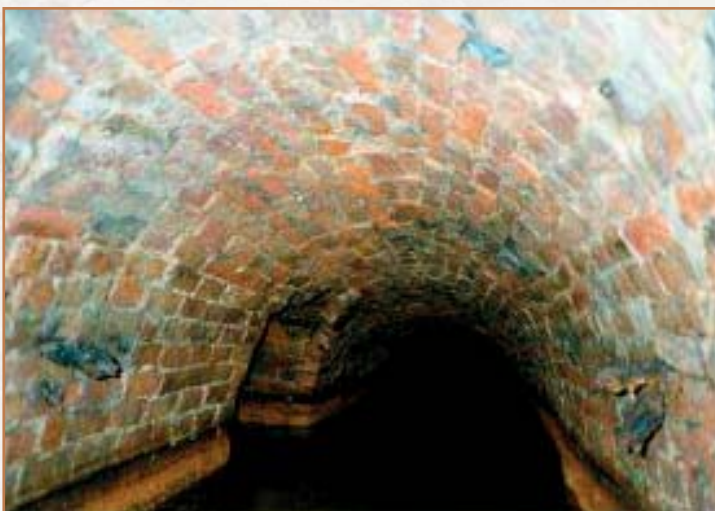
In the late 1990s, Salford City Council embarked on the 'Steam, Coal and Canal' project, which aimed to create a linear heritage corridor along the Bridgewater Canal, linking Barton Aqueduct, Worsley Delph and the colliery museum at Astley Green. The viability of opening a section of the underground canal as a visitor attraction was explored as part of this project, which required entering one of the tunnels by boat to check its structural integrity. Whilst the tunnels had been inspected regularly by the Coal Authority and Mines Inspectorate for many years after mining operations had ceased, the survey in 1998 was the first time a boat had ventured into the underground canal for 30 years. This showed that the tunnels were in remarkably good condition.



Aerial view across Worsley, marking the Grade II listed buildings in the village

Key:

- | | |
|---|---------------------------|
| 1. Worsley Delph | 2. Stonemason's workshop |
| 3. Worsley Road Bridge | 4. Nail-maker's workshop |
| 5. Rock House | 6. Worsley Court House |
| 7. The Packet House | 8. Estate Workers' houses |
| 9. Old Police House | 10. Oil and Powder Store |
| 11. 10-14 Worsley Road | 12. Boat House |
| 13. Fountain | 14. Worsley Dry Dock |
| 15.-16. 'Garden Suburb' Houses on Worsley Green | |



The interior of one of the tunnels taken in 1998 (© Alan Davies)

Further investigation was carried out by the University of Manchester Archaeological Unit (UMAU) in 2002, which included a survey of Worsley Road Bridge and the quarry face of Worsley Delph, together with the excavation of five trial pits on The Island. This concluded that material to a depth of 1.3m had been deposited across The Island during the landscaping works in the 1960s and 1970s. This was confirmed in 2003-04 when the excavation of three trenches for the installation of water-treatment plant was monitored by an UMAU.

In 2011, Salford City Council adopted the Bridgewater Canal Corridor Masterplan, a key element of which aimed to improve and manage public access and provide enhanced interpretation and educational resources within Worsley Delph. Following consultation with the Greater Manchester Archaeological Advisory Service (GMAAS) and Historic England, it was recommended that further archaeological investigation would be required to inform the design proposals for this scheme. In the first instance, Salford Archaeology excavated several evaluation trenches on The Island to establish whether any archaeological remains survived *in-situ* beneath the material that had been deposited during the 20th-century landscaping works. A series of test pits was also excavated in two former workshops in the arches beneath the Worsley Road Bridge. A large amount of silt removed from the canal basin in the 1970s had been dumped in the arches, and the test pits were excavated to establish whether the floors of the workshops survived beneath the silt.



Monitoring the installation of a water-treatment pump in 2004



Historic brick surface exposed in an evaluation trench excavated on The Island in 2014

The data gathered from the initial trenches and test pits enabled Salford City Council to finalise details of the restoration, and work commenced on site in 2018. This was focused on the clearance of topsoil across The Island and the installation of a replica crane, the dredging of the canal basin, the replacement of an existing and largely redundant viewing platform on the eastern side of the basin, and the restoration of a sluice gate at the mouth of one of the canal tunnels. These works were monitored by Salford Archaeology, which enabled a full record of any unexpected discoveries to be made.

The restoration of Worsley Delph has provided a valuable and exciting opportunity to better understand the original layout and character of this hugely significant site. In addition to this flagship project, however, several other archaeological projects in the village have uncovered other fascinating elements of the area's rich heritage, which are all associated in some way with Worsley Delph. A community-led project in 2012, for instance, revealed the substantial and well-preserved remains of Worsley New Hall, which was built in 1839-45 for Lord Francis Egerton. More recently, in 2018-19, a research and community project involved limited excavation across the site of the Duke's Yard and the Manor House on Worsley Green. This booklet presents the fascinating results from the archaeological investigations at Worsley Delph and other associated sites in the village, and places them in their historical context.



Dredging the canal basin at Worsley Delph in 2018/2004



View of Worsley Delph and The Island upon completion of the restoration work

EARLY DEVELOPMENT OF WORSLEY

EARLY SETTLEMENT IN WORSLEY

Physical evidence for prehistoric activity across the Greater Manchester conurbation is relatively sparse when compared with other parts of England, which to some extent probably reflects the intensive development during industrialisation from the late 18th century onwards that removed remains derived from earlier periods. However, important evidence for prehistoric activity in the region has been gained from archaeological work carried out since the 1980s, particularly around Salford. Flint tools of probable Mesolithic date (10,000 – 3500 BC), for instance, were discovered during excavations by UMAU at Nook Farm in Barton in 1992, 1993 and 1995.

The identification of an Iron Age settlement to the west of Great Woolden Hall Farm on the fringe of Worsley is of particular note. The settlement survives as a promontory fort that lies on a narrow ridge of sandy alluvium overlooking the expansive peat bogs of Chat Moss and Glazebrook Moss. The promontory fort has steep slopes on the east, south and west sides, and is defined by a defensive double ditch curving around the northern side. Archaeological excavations in 1986-8 revealed that the enclosed area measured 120m by 100m, and had contained roundhouses and livestock pens. Romano-British pottery and a large sample of pottery known as Cheshire Stony VCP confirmed that the site was occupied during the period 500 BC to AD 200.



View of the Iron Age promontory fort and defensive ditch at Great Woolden Hall Farm



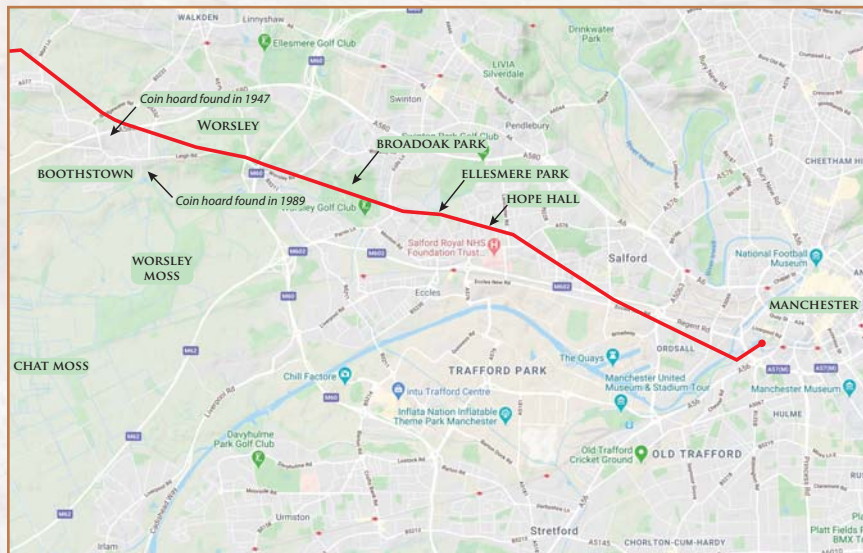
Excavation of the Iron Age promontory fort in 1987-88

The military fort of *Mamucium* that was established at Castlefield in Manchester in the late 1st century AD was the main focus of Roman settlement in the area. This was connected to other Roman forts and settlements by an extensive network of roads, including one to Wigan that is thought to have taken a course through Worsley. On leaving the west gate of *Mamucium*, this road crossed the River Irwell at Wodens Ford, described by antiquarians as a paved causeway, and continued on the line of what is now Regent Road to the high ground at Hope Hall. From there, the line crossed the modern housing estate at Ellesmere Park, where its course was confirmed in 2005 through an archaeological excavation by local residents. The excavated section of the road's surface was approximately 6m wide, with well-defined ditches on both sides.



Excavated section of the Roman road at the Three Sisters in Ellesmere Park, Eccles (courtesy of Wigan Archaeological Society)

Continuing north-westward from Ellesmere Park, the ditches marking the line of the road were identified near Broadoak Park in 1984 prior to landscaping works for Worsley golf course, whilst the remains of the road that was 'about seven yards wide' were reportedly exposed just beyond Worsley during the construction of the Eccles to Wigan railway in the mid-19th century. The route of the road is lost on its approach to Boothstown, although several Roman coin hoards have been discovered by chance. These include a cache of 550 coins dating between AD 259-78 that were found by workmen in 1947, and approximately 850 coins discovered at Boothsbank in 1989, which again all dated to the 3rd century.



Projected course of the Roman road from Manchester to Wigan (© Google)



Worsley Man

Roman activity is also evidenced at Worsley Moss, where the head of a man was found in 1958. With a wound behind the right ear, a fracture on the top of the skull, and a cut through the vertebrae indicating that the man had been beheaded, it was thought originally to be a recent murder victim. However, the skull was re-examined following the discovery of 'Lindow Man' in 1984, and radiocarbon assessment dated 'Worsley Man' to the 2nd century AD. Digital scanning of the skull carried out by the University of Manchester in 2014 also identified a sharp, pointed object hidden deep within the neck.

After the collapse of formal Roman administration in the 5th century, many of the established urban centres in the region were abandoned, and the area around Worsley is likely to have been a sparsely populated and isolated part of the country with a landscape dominated by forest and marshland. In AD 924, Edward the Elder captured all the land between the rivers Mersey and



A portrayal of Edward the Elder produced in a 14th-century manuscript

Irwell, making it a demesne in the Anglo-Saxon Kingdom of Wessex. Whilst firm evidence or any settlement at Worsley during this period is lacking, a Pipe roll of 1195-96 refers to the place as 'Werkesleia', which may be translated as 'place cleared' and suggests a Saxon origin. This document describes the settlement as half a ploughland, held by the Barton family, one of whom changed their name to de Worsley. There is also reference to a 'mill brook' in Worsley in 1206, which probably refers to the water-powered manorial corn mill that lay immediately to the east of the later Worsley Delph. The Worsleys appear to have retained the manor until 1370, when the Massey family of Tatton inherited the property.

The Massey family occupied Drywood Hall to the east of Worsley village before the manor passed by marriage to the Brereton family at the beginning of the 16th century.

In 1598, Worsley was passed from Richard Brereton to his illegitimate son, Sir Thomas Egerton, a distinguished lawyer who rose to be Attorney General from 1592-94, became the Lord Keeper of the Great Seal in 1596, and was knighted in the same year. He may also have been responsible for building Worsley Old Hall to the north-west of the village in the early 17th century. This impressive timber-framed building became the seat of the Egerton family.

The Worsley estate was inherited by John Egerton in 1617, who was given the title of the Earl of Bridgewater after the town of Bridgewater in Somerset, where he also owned estates. John died in 1649 and was succeeded in turn by two further Johns, who inherited the titles of 2nd (1622-86) and 3rd Earl of Bridgewater (1646-1701) respectively. In 1701, the Worsley estate passed to Scroop Egerton, the 4th Earl of Bridgewater (1681-1744), who was created the Duke of Bridgewater in June 1720.



Drywood Hall following its reconstruction in the 19th century



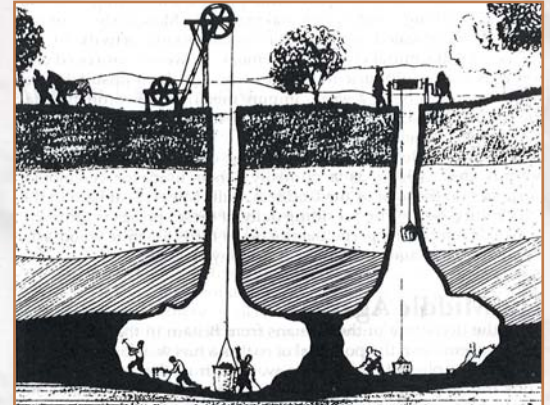
Worsley Old Hall is currently a Grade II listed building in use as a restaurant

EARLY INDUSTRIAL DEVELOPMENT

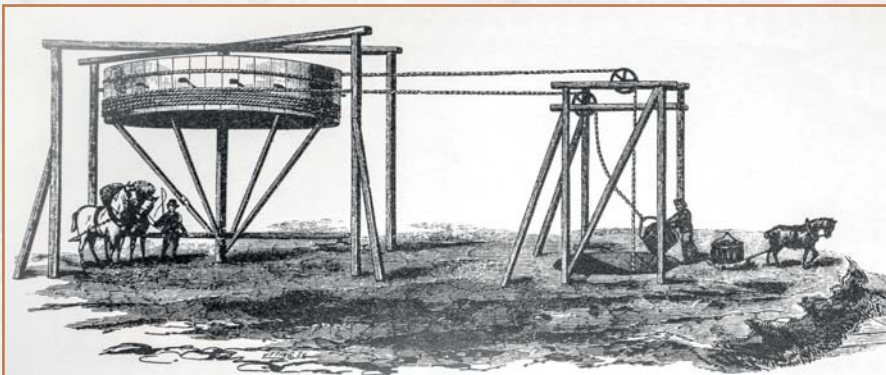
Worsley had developed into a large village by the mid-17th century. The hearth-tax returns of 1666 record the total number of hearths in the township as 276, of which Worsley Old Hall had 17. The local economy was dependent upon agriculture and domestic industries based on traditional textiles, primarily woollen and linen goods that were manufactured using hand-operated spinning wheels and looms. Stone quarrying must also have had some economic importance, as Worsley Delph is first mentioned as being exploited for sandstone in 1676.

Another important local resource that became fundamental to Worsley's prosperity was coal. The demand for coal from the Lancashire Coalfield began to rise during the early 17th century, with export shipments from Liverpool increasing from approximately 1200 tons in c. 1620 to more than 4000 tons by the 1640s. In addition to the export markets, the demand locally increased from the metal-working and lime-burning trades, and also for domestic purposes as the population expanded.

Small-scale coal mining in Worsley dates from at least 1376, when coal was probably extracted from surface outcrops. Mining works that exploited seams beneath surface outcrops appear to have been introduced to the area in the 16th century. The arrangement was simple and effective, consisting of a shaft that was sunk into a coal seam, which was then worked until the cavity became unstable. These workings needed to be above the level of free-drainage, thereby restricting the quantity of coal that could be mined. Initially, the pits were small and typically less than 8m deep, although shafts were being sunk to depths in excess of 30m by the end of the 16th century.



Cross-section through early shafts, which were often known as bell pits on account of their shape

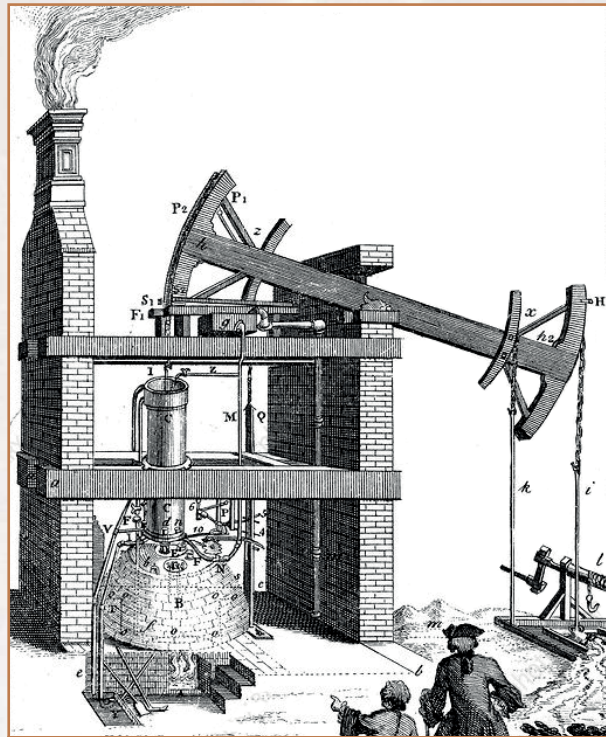


A horse gin raising baskets of coal to the surface

The coal was loaded into circular baskets, or corves, and dragged to the shaft bottom on wooden sleds, where it was raised to the surface by a capstan or horse-powered gin.



Scroop Egerton (1681-1744), the 1st Duke of Bridgewater

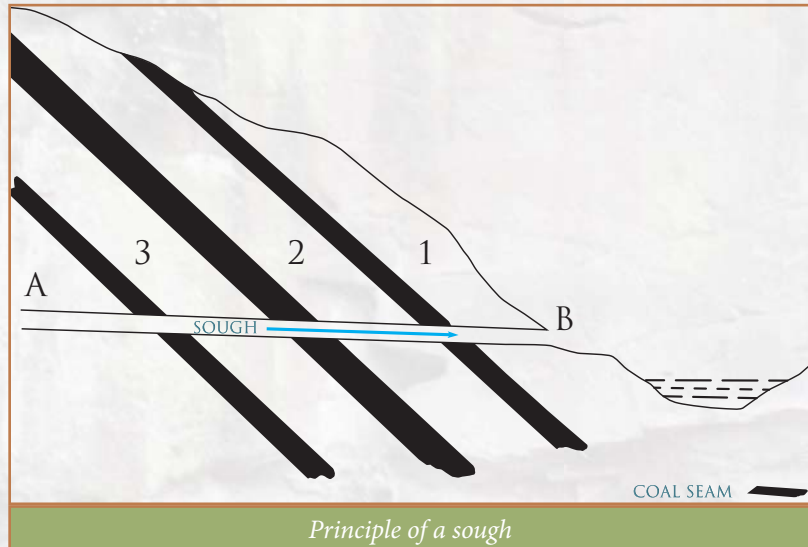


An engraving produced in 1747 showing a Newcomen atmospheric steam engine being used for pumping at an early colliery

The growth of coal-mining operations in Worsley was due largely to the endeavour of Scroop Egerton, the 1st Duke of Bridgewater, who inheriting the estate in 1701. He recognised the huge financial opportunity that the increasing demand for coal offered, and set out to expand the small-scale workings located on the high ground to the north of Worsley. This required much deeper shafts to be sunk to reach the lower coal seams, presenting a greatly increased risk of flooding from water that percolated through the overlying sandstone strata.

The issue of flooding in coal pits at this time was usually addressed by hoisting water up the shaft in leather or iron buckets and discharging it into surface drains, although this was slow and laborious. The practice of driving drainage tunnels, or soughs, to allow water to be channelled out of the underground workings began to be adopted in Lancashire by the end of the 16th century, although this could be very expensive. The introduction of pumping machines powered by waterwheels provided an alternative solution in some mining districts, but the use of waterwheels was impractical across many parts of the Lancashire Coalfield, including the low-lying areas around Worsley. An effective solution was provided by the introduction of Thomas Newcomen's atmospheric steam engine, the first example being set to work pumping water from coal mines on Lord Dudley's estates near Birmingham in 1712.

The Duke's mines were managed by his appointed engineer, John Massey, who was responsible for all mining operations from 1721-45. Notwithstanding the apparent efficiency and reliability of the newly introduced steam-powered pumps, Massey advised the Duke in 1724 to permit the excavation of a sough that would channel water from Wood Pit Mine to the Worsley Brook. Water was raised by hand from deeper levels of the mine and then emptied into the drainage sough.



Principle of a sough

The sough was later extended and, by 1729, had reached a length of nearly 2.5km to the north of Worsley village. The extension of the sough meant that new and existing coal mines could benefit from the drainage system. Eventually, miles of tunnelling connected the coal seams in the hillsides, served by drainage tunnels that discharged into Worsley Brook. While the sough permitted much deeper and more efficient coal mining, it required constant repair work and was insufficiently deep, so flooding posed a persistent threat.

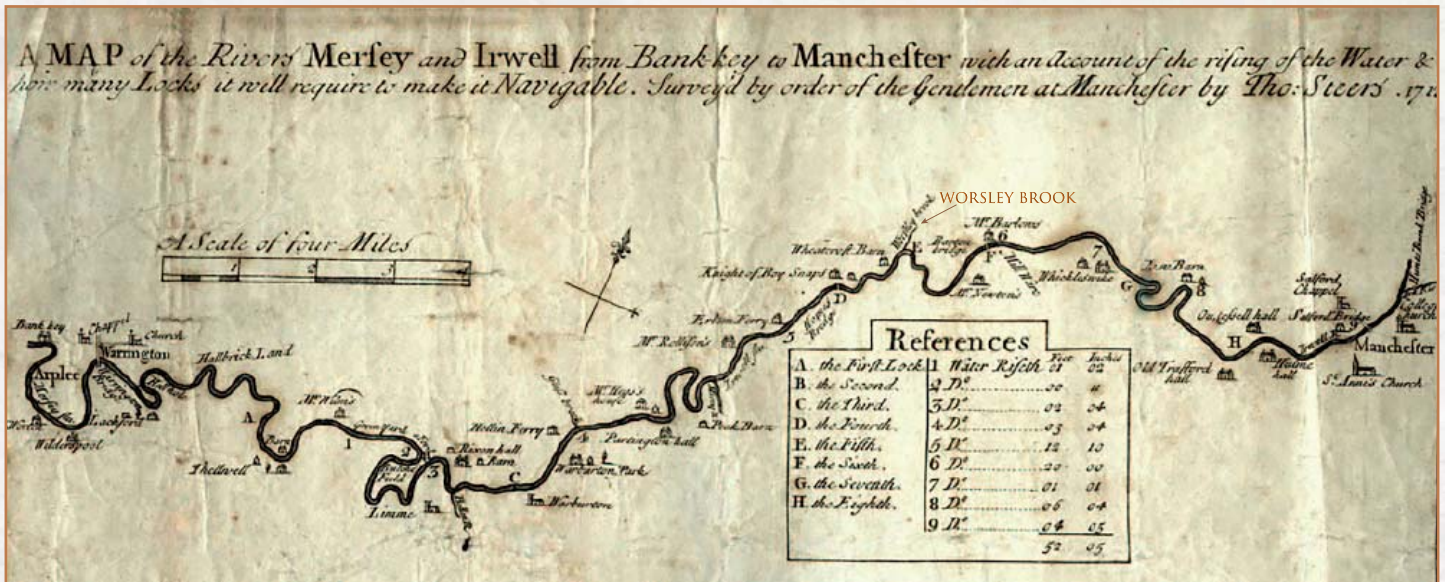
The transportation of coal from the mine to its market presented another significant problem. The only viable options available to the 1st Duke of Bridgewater were to use long packhorse trains or horse-drawn carts, although these were expensive and unsuitable for bulk transport. An alternative and more effective means of transport was necessary and was in the interest of entrepreneurs and merchants, who increasingly required the delivery of bulk loads of raw materials to mass produce items, which in turn needed transporting to their markets.



An early 19th-century illustration of a horse-drawn wagon carrying coal

Several schemes to make some of the rivers that flowed through industrialising areas in the North West navigable were considered in the early 18th century. These included the rivers Mersey and Irwell, with the aim of creating a transport link between Manchester and the port of Liverpool. The route was surveyed by Thomas Steers in 1712, and the Mersey & Irwell Navigation Act was passed in 1721. The navigation was largely complete by 1735, and immediately proved to be of enormous economic benefit, although the problem of getting coal from Worsley to the navigation for transportation into Manchester was still an issue.

A consortium of local businessmen, with Scroop Egerton as a Commissioner, gained parliamentary consent in 1737 to make the Worsley Brook navigable from Boothstown to Barton, where it joined the Mersey & Irwell Navigation, and there were further plans to build a tramway from the Worsley mines to Boothstown, although neither scheme was executed. In 1754, another group of Manchester merchants proposed building a canal from the Wigan coalfield, through Worsley to Salford, but this scheme also fell through.



The proposed route of the Mersey & Irwell Navigation, surveyed by Thomas Steers in 1712 (© Salford Museum & Art Gallery)

THE BRIDGEWATER CANAL & NAVIGABLE LEVEL

Francis Egerton was nearly 12-years old when he succeeded to the title of the 3rd Duke of Bridgewater in 1748, following the premature death of his older siblings. Initially, Francis was placed under the guardianship of the Duke of Bedford, Samuel Egerton, and the Earl of Gower. These guardians arranged for Francis to be educated at Eton, and subsequently sent him on a 'Grand Tour of Europe' under the guidance of a classical scholar. This included a visit to the Canal du Midi in France, which may have provided some inspiration to the young duke when later considering the viability of a canal in Worsley.

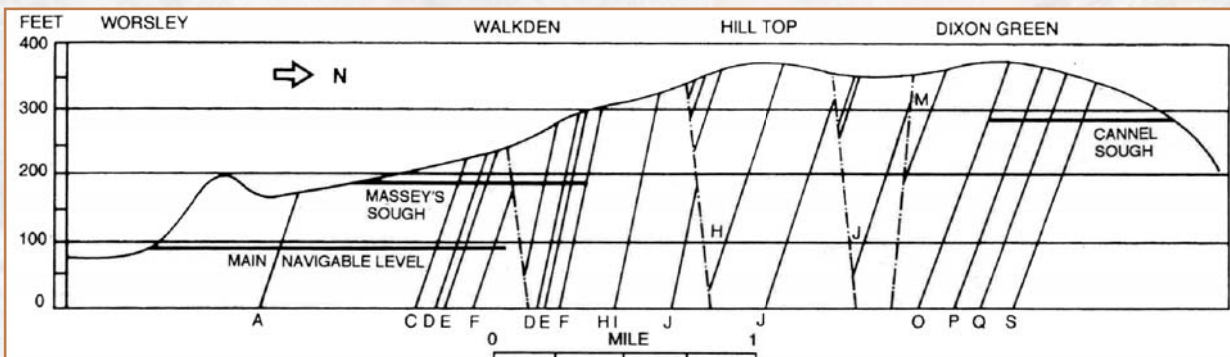


Francis Egerton, the 3rd Duke of Bridgewater (1736-1803)

In his role of a guardian, the Earl of Gower secured the appointment of Thomas Gilbert to supervise Francis Egerton's interests. He deferred the responsibility of managing the Worsley estate to his younger brother and trained engineer, John Gilbert, who took up the post in 1753. He moved to Worsley and took up residence at Worsley Old Hall when Francis Egerton became legally responsible for the estates in 1757. John Gilbert immediately set about studying the coal mines and implementing improvements, which included repairs to the drainage sough and experimentation with steam-powered pumps. He also studied the viability of building a canal from Worsley to Manchester, and extending it into the underground workings in order to provide an economic method of transporting the coal whilst also creating a supplementary means of drainage at a deeper level to John Massey's sough of 1724.



John Gilbert (1724-95)



Schematic geological section from Worsley to Dixon Green (the vertical scale has been exaggerated)

John Gilbert also carried out an initial survey of the route of the canal from Worsley towards Manchester, with a connection to the Mersey & Irwell Navigation at Hollin Ferry. This enabled a bill to be presented to parliament, and an Act to build the canal along the 82ft contour from Worsley to Salford received Royal Assent in March 1759, representing the genesis the world's first true arterial industrial canal.

In the same year, James Brindley was engaged as a consulting engineer on the project, having recently designed an innovative pumping system that drained the Wet Earth Colliery on the Clifton estate. The proposed route of the canal was amended shortly after Brindley's appointment, and a second Act was passed in 1760 that carried the canal over the River Irwell on an aqueduct at Barton, and extended it to Castlefield in Manchester. This new route would increase competition with the Mersey & Irwell Navigation and make future canal branches easier to construct.



An engraving of c. 1794 featuring James Brindley's remarkable aqueduct carrying the Bridgewater Canal across the River Irwell



The opening of the Bridgewater Canal in 1761 was celebrated in a painting by Ford Madox Brown that was commissioned in 1892 as a series of murals to illustrate the city's proud history to adorn the newly completed Great Hall in Manchester Town Hall

The Bridgewater Canal opened to commercial traffic from Worsley to Stretford on the 17 July 1761. In the same year, Brindley and his assistant, Hugh Oldham, surveyed the route of an extension of the canal westwards to Runcorn, and a connection with the Mersey Estuary via a flight of ten locks. This secured parliamentary approval, and a third Act was passed in March 1762.

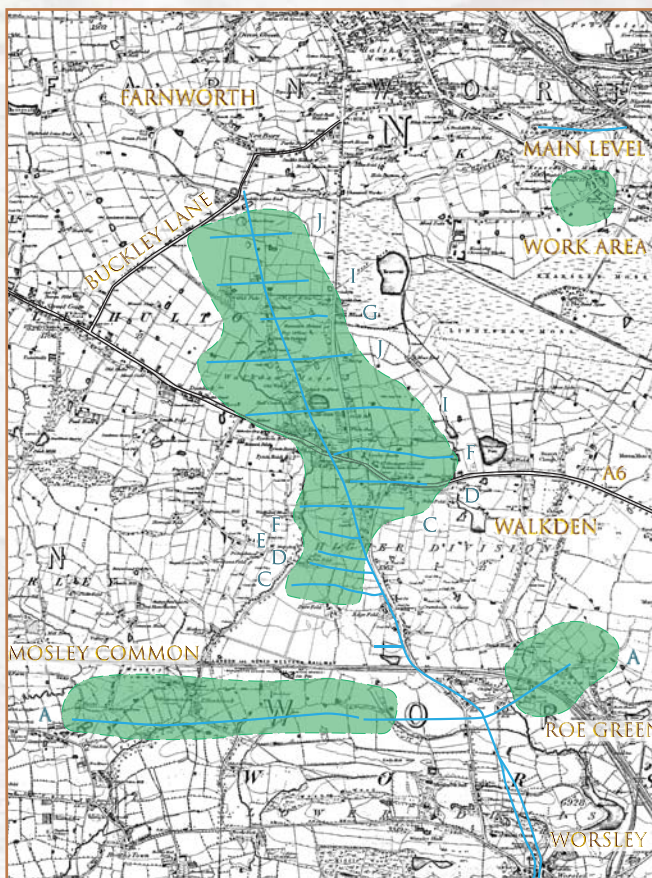
The extension to Castlefield in Manchester was completed in 1764, and the canal was fully opened to the River Mersey at Runcorn in 1776. Further Acts allowed the Bridgewater Canal to connect with the Trent & Mersey Canal at Preston Brook in 1766, and an extension from Worsley to Pennington, near Leigh, to join the Leeds & Liverpool Canal opened in 1799.

In the late 1760s, three dry docks were built on the north bank of the canal at Worsley for the purpose of building and repairing boats that plied the Bridgewater Canal and the Navigable Level. The dry docks were designed by John Gilbert and James Brindley, and comprised hammer-dressed stone retaining walls, wooden sluice gates and timber and iron sheds. Two of these survive today, representing the oldest inland waterway dry dock in the country.

The construction of the Main Navigable Level went hand in hand with the construction of the Bridgewater Canal, and at the committee stage of the second bill in January 1760 James Brindley was able to report to the House of Commons that over 130m of the underground canal from Worsley Delph had been completed. The first workable coal seam, known as the Worsley Four Foot mine, was reached a distance of 700m from the entrance at Worsley Delph in 1761. Branch levels were created along the seams as the coal was extracted; the canal branch along the Worsley Four Foot mine reached a length of 2.8km, for instance, whilst the Main Navigable Level eventually reached a length of 6.4km before terminating near Farnworth.



Worsley dry dock continues to be used for boat repairs

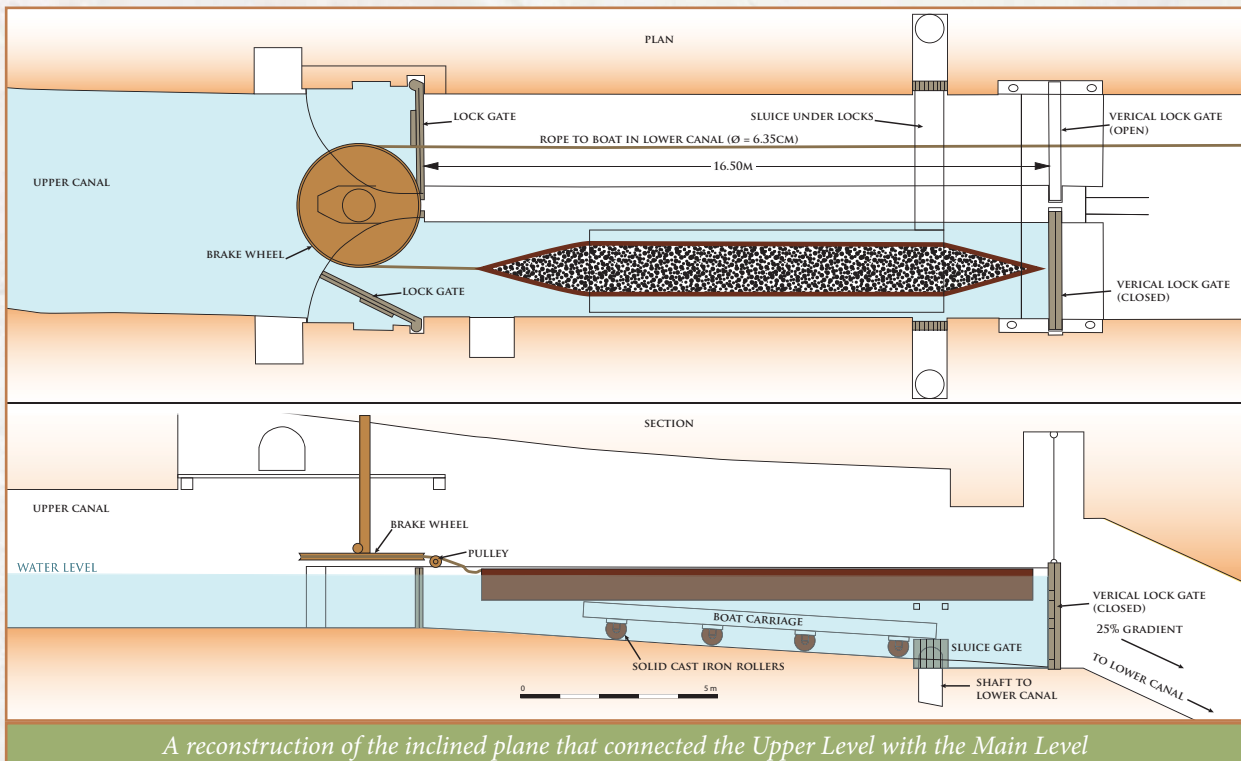


The Main Navigable Level and branches 1770-1800 superimposed on the 1850 OS county map

The underground canal reached Walkden in 1770, and a decision was made to widen and extend the original Walkden Moor drainage sough of 1720 that lay approximately 32m above the Main Navigable Level. This resulted in the creation of the Upper Navigable Level and its 14 branches, with a combined total length of nearly 18km of underground canal, which enabled the valuable Cannel mine to be reached in 1780 and the Dean Moor mine in 1783. The Upper Level and the Main Level were connected via an inclined plane that was designed by John Gilbert and constructed in 1795-97, providing an ingenious solution to negating any need for transshipment inside the mine.

The system comprised two locks at the top of the inclined plane, with each gate having a sluice to drain the water and allow a loaded boat to be lowered onto a cradle that ran on rollers. This was connected by a rope to a second cradle at the bottom of the inclined plane in the Main Level, upon which was secured an empty boat. The weight of the full boat drew up the empty boat into the second lock, which was then flooded to allow the empty boat to float off the cradle and be ready for use. The process took approximately 15 minutes to complete, and the system remained in use until c. 1822 when mining on the Upper Level ceased.

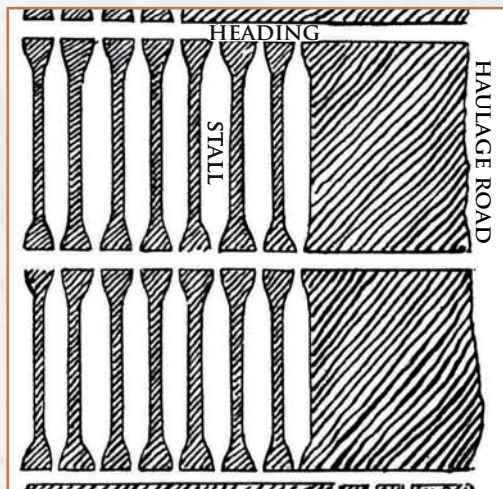
Coal was also gained from seams below the Main Level, and this led to the creation of two Lower Navigable Levels, with a combined total length of c. 27km. These deep workings used either a horse gin or steam power to wind coal up a shaft to the Main Level, or the surface.



A reconstruction of the inclined plane that connected the Upper Level with the Main Level

A branch level was driven into a workable coal seam wherever one was intercepted, and these became the main haulage roads, from which were mined small roadways known as 'headings'. These were connected by cross passages to allow ventilation before the coal could be extracted. Work commenced at the point furthest from the main haulage road, and the 'pillar and stall' method appears to have been employed whereby stalls were worked out from the headings, with pillars of coal left in place to support the roof of the workings, creating a grid pattern.

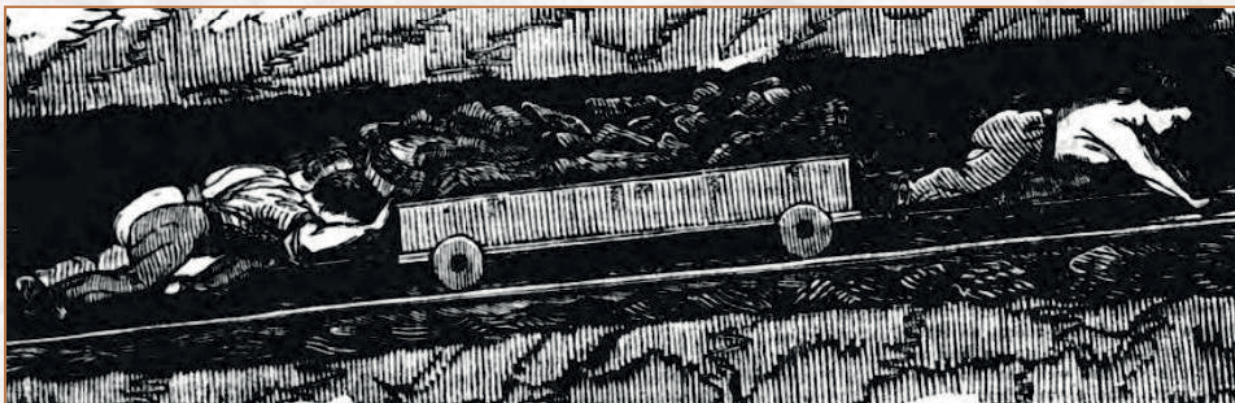
Coal extracted from the pit face was placed in a wicker basket fitted with iron runners that could be dragged to the haulage road and transferred to wagons that carried it to boats on the Navigable Level. Writing in 1769, Arthur Young describes a man pushing a 10cwt wagon along a haulage road to a revolving tippler over a hole in the crown of the canal tunnel roof through which the coal was dropped into a waiting boat. Later accounts mention a staging that was set 4ft (1.2m) above the water level, from which coal was discharged into boats. Estate accounts indicate that approximately 100,000 tons of coal *per annum* was carried out of the mine on the Navigable Level by the end of the 18th century.



A schematic plan showing the 'pillar and stall' method of mining



A drawing printed in 1843 showing coal being hauled on a sledge

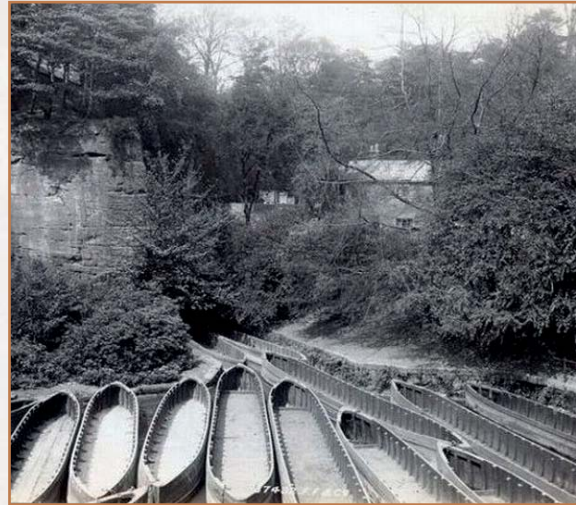


A drawing printed in 1843 showing children hauling coal in a wagon

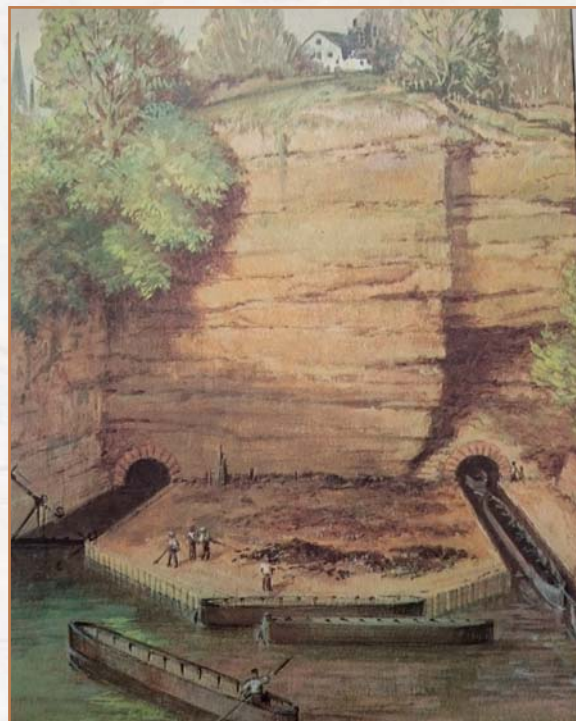
Several different types of boats were used on the Navigable Level, most of which were variations of a simple narrow vessel that became known as a 'starvationer' on account of their prominent internal ribs being exposed. The boats were strongly built, with both the bow and the stern sharply triangulated to enable them to move in either direction.

The carrying capacity of the smallest boats was between 44 and 54 baskets, each basket holding approximately 230lbs (104kg). A slightly larger type of boat, known as 'Pudding Dicks', were capable of holding 84 baskets, whilst the 12-ton and 18-ton boats could carry 105 and 160 baskets respectively. Even larger boats were introduced, but these could not access the entire network of underground canals, and only three main sizes were in use by the end of the 18th century. The largest, or 'M boats', were used on the Main Level, and were 45ft (13.71m) long and 5ft (1.52m) wide, and were capable to carrying 12 tons of coal. Slightly smaller vessels, known as 'T boats', were used on the other levels, and were also deployed for maintenance work. The third type, known as a 'B boat', was developed later and was approximately 2m longer than 'M boats'; their use was probably restricted to the section of the underground canal between Worsley Delph and the inclined plane.

The boats were propelled by a combination of 'legging', where the sides of the tunnel allowed, and the use of hand rails attached to the tunnel walls. Loaded boats were moved back to the surface canal much more easily by the flow of water draining into the canal. Upon leaving the Navigable Level, five or six boats were chained together and hauled along the canal by a horse or a pair of mules.



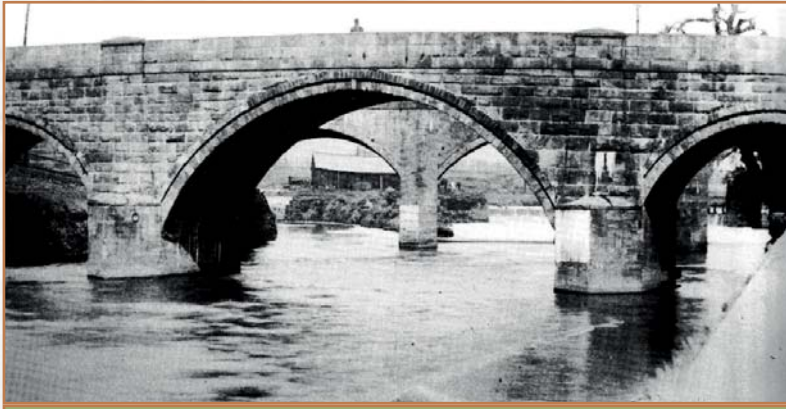
A variety of starvationers moored in Worsley Delph in the late 19th century



A train of starvationers emerging from the underground canal into Worsley Delph

WORSLEY DELPH

Worsley Delph originated as a stone quarry, where the sandstone outcrop was exploited for local building materials that are still visible within some of the structures in and around the village today. The earliest record of stone being quarried at Worsley dates to 1676, when nearly 5,000 loads of stone were carried to Barton to erect a bridge across the River Irwell; the bridge was rebuilt in the 1760s, again using stone from Worsley Delph. In addition, stone procured from Worsley was used for reconstruction work at Eccles parish church, and it also provided the bulk of the masonry for building the canal.



A 19th-century view of the stone-built bridge at Barton, with a pier of the canal aqueduct visible to the rear



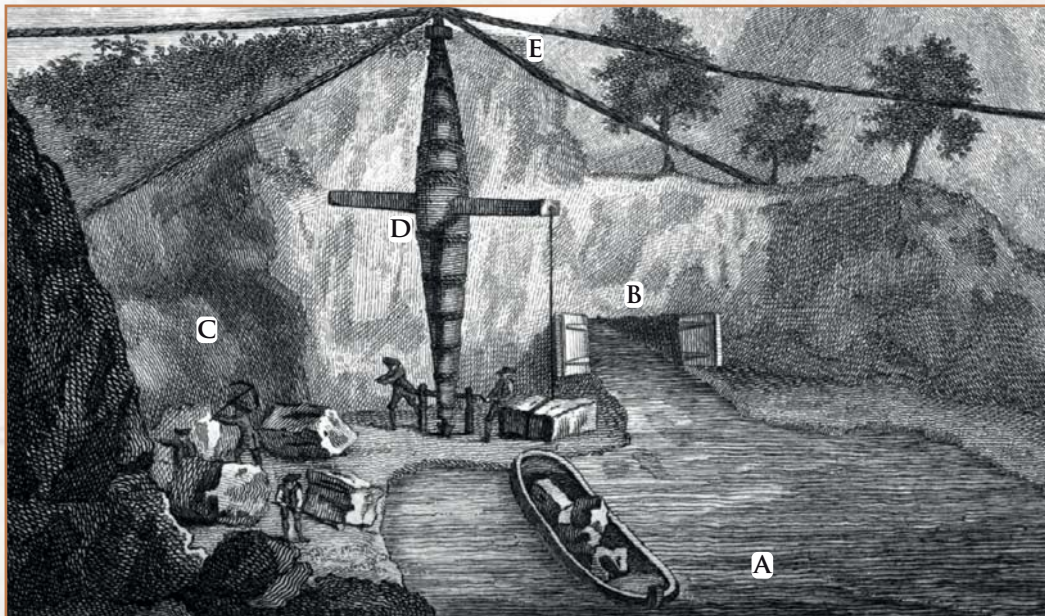
Surveying the quarry face with a laser scanner in 2018

It seems likely that stone was quarried from the south side of Worsley Delph, at the closest point to Worsley Road, where the sandstone outcrop still bears evidence of pick marks and sockets that may have housed wooden scaffold posts. The quarry was transformed in the mid-18th century into the entry basin to the underground canal system, and the quarry floor may have been lowered as part of these works to bring it to the same level with the Bridgewater Canal. The first entry portal was driven into the quarry face in 1757, and this ultimately provided access

to the underground canal system. Whilst its adaptation to a canal basin required Worsley Delph to be flooded with water from the coal mines, it continued to be used as a quarry during the first years of the canal's operation to provide materials for the extension to Runcorn.

The earliest illustration of the quarry and the entrance tunnel to the underground canal is provided by Arthur Young, who visited Worsley Delph in 1769 to inspect the Duke of Bridgewater's remarkable canal. This drawing features 'a crane of curious construction' loading boats with stone that was being actively quarried, and shows the rock face rising vertically above the single tunnel entrance that is fitted with twin-leaf timber doors. Young noted that the entrance tunnel was 6½ft wide (1.98m) and 7½ft high (2.29m), which included a depth of water of 3ft 4in (1.02m), leaving just over 4ft (1.27m) of headroom.

Arthur Young was also struck by the 'excellent and spirited appearance of active business' of the workshops adjacent to Worsley Delph, comparing it to a 'river environ of London'. He described a very large timber yard that was 'well stowed with all sorts of wood and timbers for framing buildings, and building boats, barges and all kinds of floating machines', together with a mason's yard that contained a vast stockpile of dressed stone blocks ready 'to convey to any part of the navigation where they may be wanted, either for building or repairing bridges, aqueducts, wharfs, warehouses, etc'.



- A. THE NAVIGATION
- B. THE MOUTH OF THE TUNNEL, WITH LARGE DOORS
- C. THE QUARRY
- D. A CRANE OF A VERY CURIOUS CONSTRUCTION, FOR HEAVING THE STONES OUT OF THE QUARRY INTO THE BARGES
- E. ROPES THAT KEEP THE CRANE IN ITS PERPENDICULAR POSITION

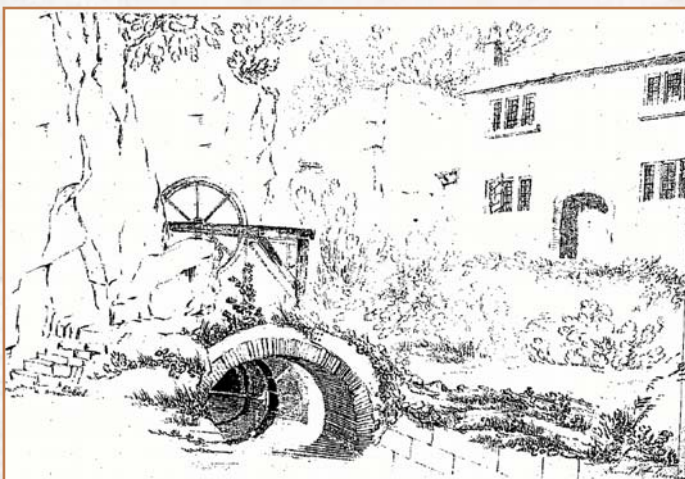
Worsley Delph depicted in a drawing by Arthur Young in 1769

The construction of a second entrance tunnel into the Navigable Level had commenced by 1760 in an attempt to ease congestion. This lay approximately 30m to the west of the original portal, and extended for nearly 460m before converging with the eastern tunnel at the location of a shaft known as Ingles Pit. The second portal opened in 1771, an event that may also have marked the end of quarrying activity at Worsley Delph, and enabled a one-way system for boats using the underground canal to be introduced. It is likely that the second channel connecting Worsley Delph with the main canal was also created at this time.



A view of 'Waters Meeting' where the two entrance tunnels converge

The original entrance tunnel is captured in detail on a series of pencil sketches drawn by John Claude Nattes in 1807, which show it to have comprised three successive stone arches with vertical slots in between. A large wheel housed in a timber frame above one of these slots almost certainly controlled the flow of water from the underground canal. Nattes' sketches are supplemented by an account written in c. 1810 by Abraham Rees, who described a large door that was drawn up to allow boats to pass, noting that the water level in the tunnel was 'three or four inches higher than it stood in the canal'. The surge of water released when the sluice was lifted presumably assisted the movement of boats exiting the underground canal, and will also have helped to flush out silt and other debris.



Sketch produced by John Claude Nattes in 1807, showing the sluice gate mechanism that served the eastern tunnel

The western tunnel was similarly equipped with a sluice gate, which is captured on historic photographs of Worsley Delph. Elements of this mechanism were uncovered during the archaeological work in 2018, including a vertical slot that had been cut into the bedrock at the foot of the quarry face on the western side of the tunnel portal. This may have been intended to house one of the vertical supports for the timber frame that appears in historic photographs.

The remains of the timber sluice gate were also uncovered in 2018. This comprised four intact timber planks, each 2.70m long and 220mm wide, together with the remnants of a fifth plank. The planks were fixed together with biscuit joints and braced with steel fittings, betraying the sluice gate's origin as a 20th-century replacement. The careful removal of the sluice gate, however, exposed an iron frame that was set into the sandstone bedrock, possibly representing the vestiges of the original mechanism.



Operating the sluice at the entrance to the western tunnel



Vertical slot cut into the quarry face



The remains of the sluice gate removed for renovation

Another vertical slot was recorded on the opposite side of the canal channel, set into the masonry wall that retained The Island, the 25m-wide spit of land situated between the two entrance portals. The waterlogged remains of a large wooden post survived in the slot, and had presumably formed part of the timber framing that had housed the sluice gear. It seems likely that the post had been replaced in the 19th century, as several bricks had been inserted into the slot as packing material. A short section of a post of similar dimensions with two timber batons fixed to one face was uncovered during archaeological work on The Island in 2014. It seems possible that these batons formed a recess to guide the sluice gate as it was raised and lowered.

The restoration works in 2018 involved the removal of topsoil from across The Island, and the excavation of a foundation trench for the installation of a replica crane, modelled on that shown in Arthur Young's drawing of 1769. The foundation trench measured 5m by 5m, and was excavated to a depth of 1m through the material deposited on The Island in the 1960s and 1970s, revealing a layer of rubble containing fragments of crushed brick and stone beneath the 20th-century overburden. This rubble probably derived from the waste generated during the excavation of the tunnels, which was dumped on the quarry floor to form an area of raised ground. The edge of The Island then appears to have been retained by a stone wall exposed during the restoration works.

The Island is likely to have been used to marshal the boats entering and exiting the underground canal, although it also appears to have been a key control point for a remarkable network of culverts that passed beneath the canal basin. A deep, rectangular chamber that contained a clack-valve mechanism, discovered during the works to The Island in 2018, formed part of this system.



The vertical slot set into the stone revetment wall of The Island



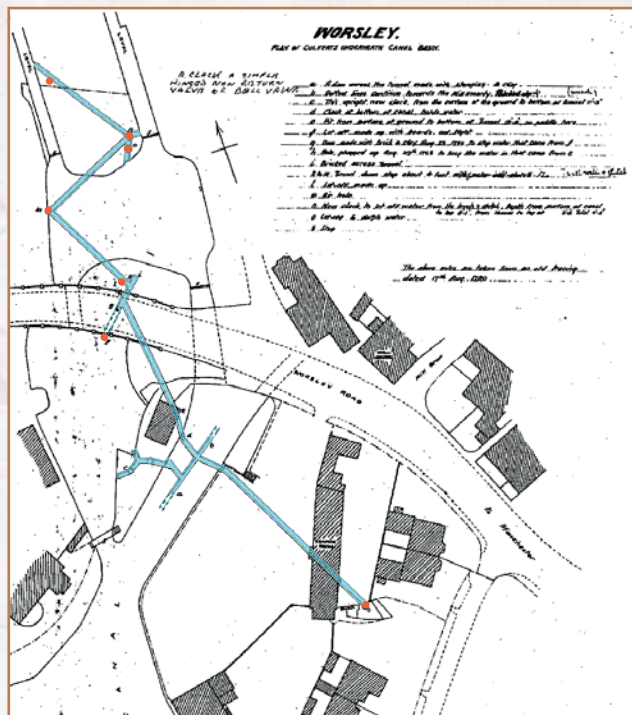
Section of a post with guide batons

The route of the culverts beneath the canal basin is shown on a plan that was produced in 1780. This shows a culvert running from the western tunnel to connect with a short drain from the eastern tunnel. A clack valve at the junction of these culverts helped to control the water level in the tunnels. A short culvert immediately to the south, via a second clack valve that was exposed during the restoration works, provided a means of draining the canal basin.



A clack-valve chamber uncovered on The Island

Another culvert extended beneath the basin from the first clack valve to another placed at the foot of the quarry face on the western side of Worsley Delph, from where it turned through a right angle and continued back beneath the basin to the pass between the arches of Worsley Road Bridge. Continuing to the south-east, and beneath the corner of the nail-maker's workshop, the culvert connected with another network of drains that ultimately appear to have discharged into the Worsley Brook. Whilst the full extent of this elaborate network of culverts remains uncertain, it is evident that they were important to the drainage of the mine and the operation of the canal. It appears to have enabled the tunnels and the canal basin to be drained independently, without effecting the flow of water draining from the mine. It also seems likely that it would have provided an effective means of carrying silt away from the site and into the Worsley Brook.

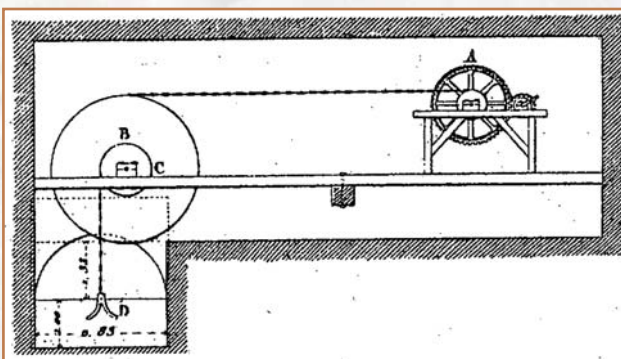


Plan of the culvert system at Worsley Delph based on a survey of 1780

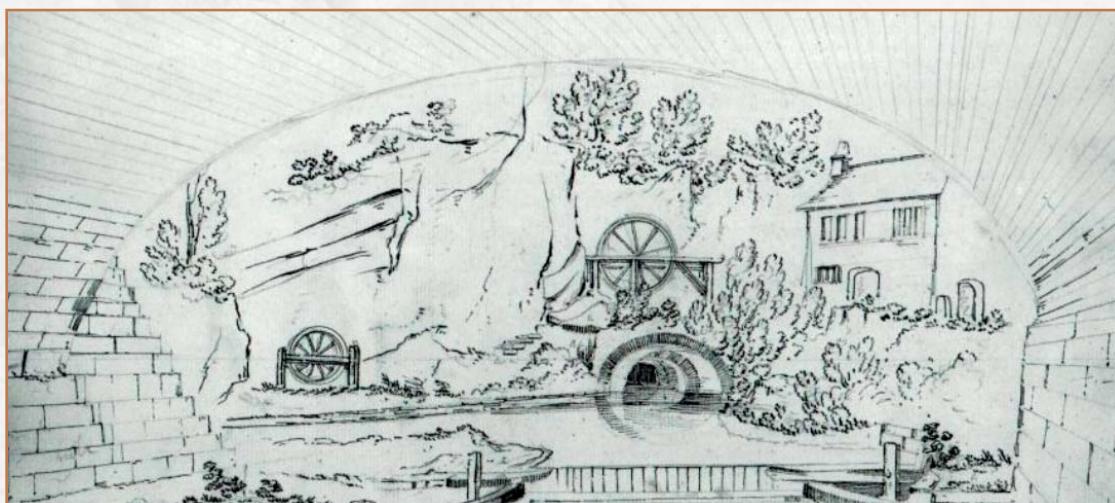
The removal of modern material deposited across The Island also revealed part of an iron winch. Its date is uncertain, although it bears some resemblance to the type of geared crab winch that was drawn by a visitor to Worsley Delph in 1844. This shows a sluice gate in a frame that was raised by a chain that passed over a small diameter drum mounted on the axle of a large pulley wheel. The drum was rotated by another chain that was connected to the winch. The sluice gate appears to have been designed to act as a weir in one of the culverts that regulated the level of water in the tunnels, allowing water to flow over the top and thus not impeding drainage whilst the sluice gate was lowered. A similar mechanism is shown in the centre of The Island on another sketch produced by John Claude Nattes in 1807. A metal grille across the canal arm is shown in the foreground, presumably intended to trap debris.



The remains of the winch uncovered by the eastern tunnel



A geared crab winch drawn by a visitor to Worsley Delph in 1844

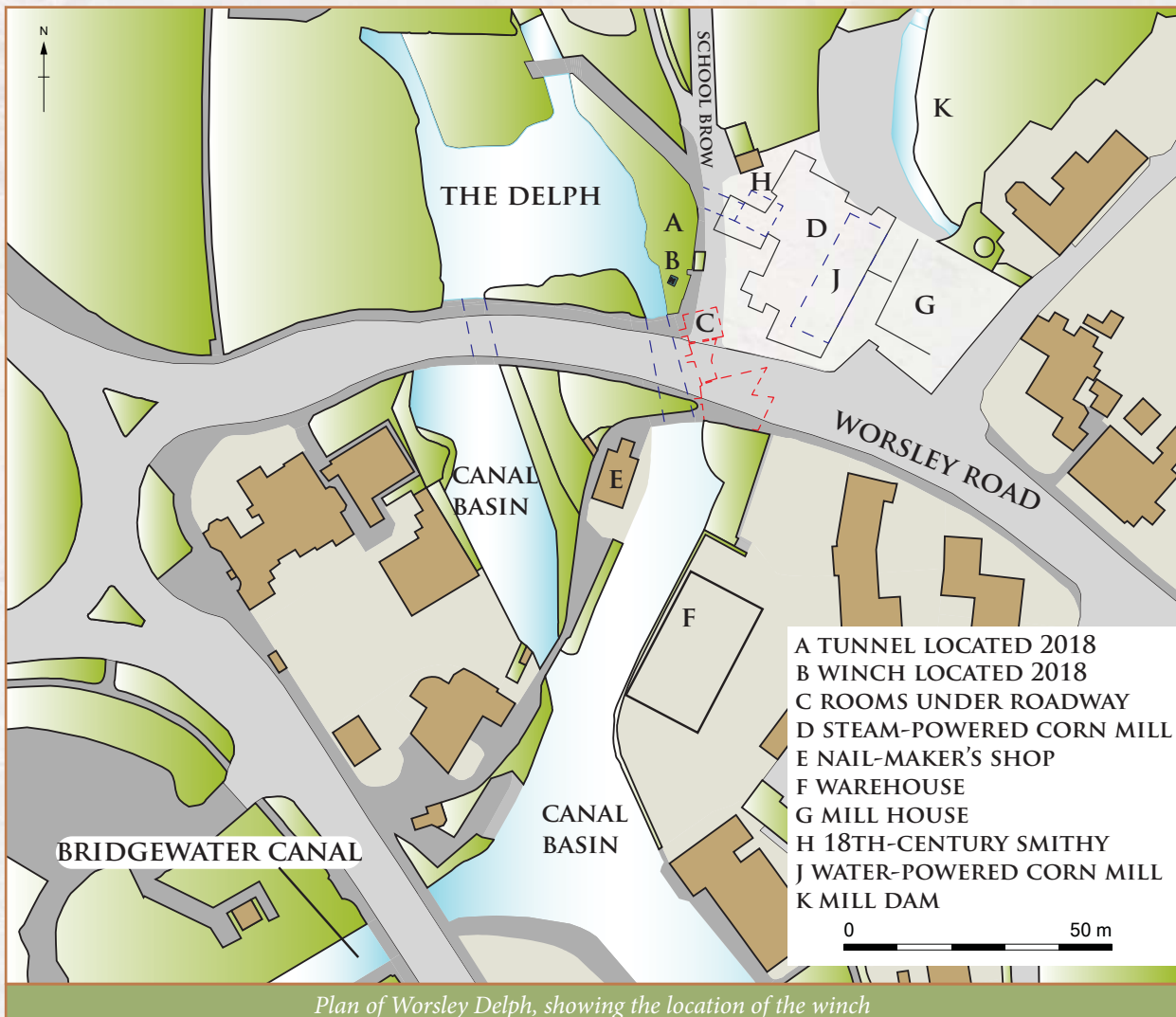


Nattes' sketch of The Island from the east arch of Worsley Road Bridge in 1807

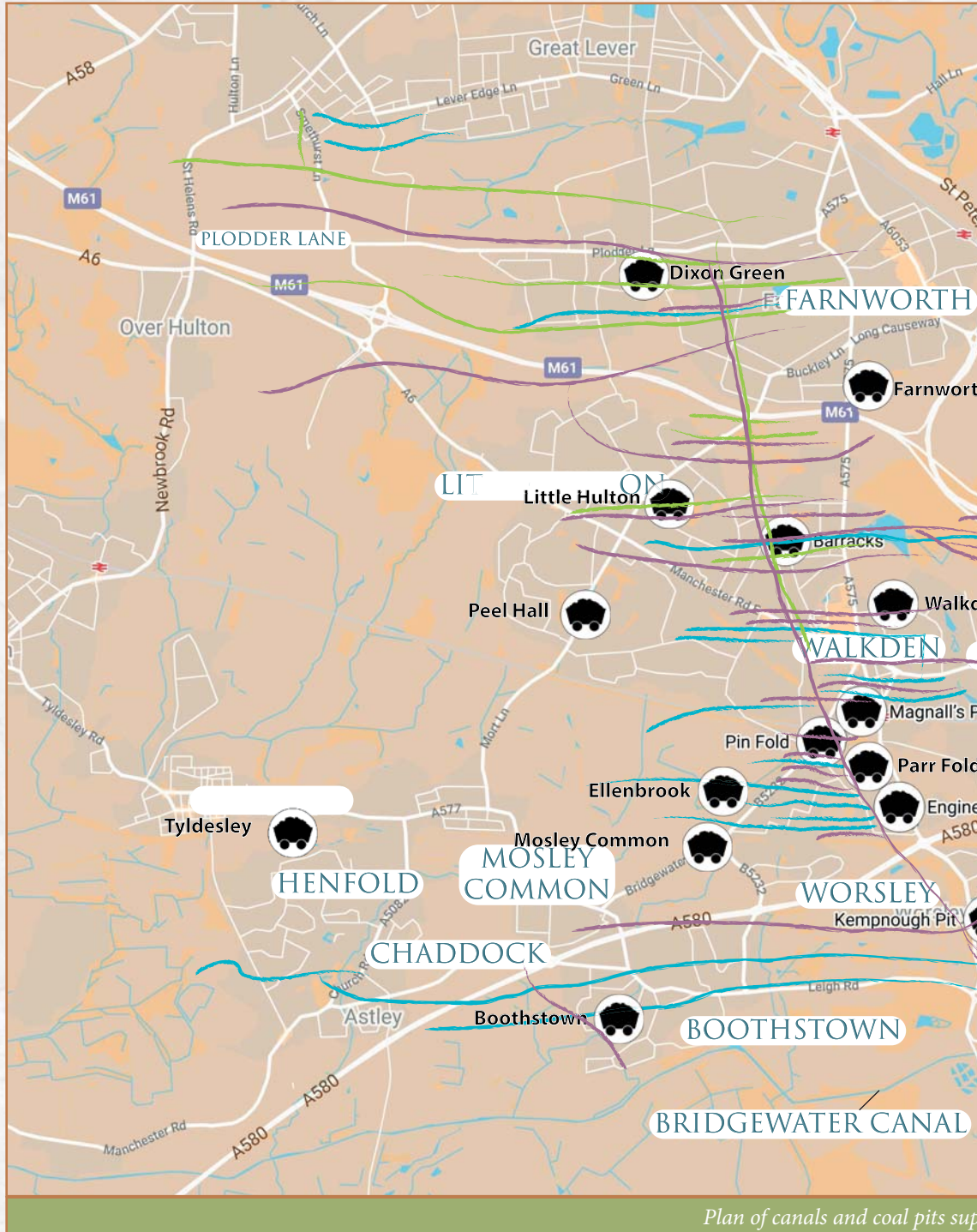
A largely complete crab winch of a type that was mass produced in the mid-19th century was unearthed during the clearance of redundant structures and made ground on the eastern side of Worsley Delph, prior to the construction of a new interpretation and viewing platform. The winch had been fixed to a solid base that appeared to form part of a quay adjacent to Worsley Road Bridge, and its position suggests that it may have been used for hauling boats under the bridge, although this is far from certain. Alternatively, it may have been part of the control mechanism for the network of culverts that pass beneath Worsley Delph.



A crab winch discovered on the east side of the canal basin



Plan of Worsley Delph, showing the location of the winch





Map superimposed on Google map

WORSLEY ROAD BRIDGE

The southern edge of Worsley Delph is formed by the bridge that carries Worsley Road over the two arms of the canal basin, replacing a slightly earlier bridge across the Worsley Brook that was authorised as part of a Turnpike Act in 1753 for improving the road between Salford and Warrington. The current bridge has been subject to several archaeological surveys, which have highlighted its importance as a key component of the Worsley Delph complex. The eastern half of the bridge is the earliest element, and its construction was probably contemporary with the creation of the canal basin in Worsley Delph during the late

1750s. This part of the bridge comprises two brick-arch spans with piers and abutments that utilise a combination of the sandstone bedrock, stone ashlar and brick.

The easternmost arch spans dry land, although it seems from early photographs that boats could at least approach the southern side of the arch, and perhaps allowed cargoes of grain to be delivered to the cellar of the corn mill on the east side of the bridge. This arch housed a row of three compartments that were used as workshops.

Access to Worsley Delph for boats in the eastern canal basin was afforded via the second arch of the bridge, which also had a narrow towpath on both sides of the canal. An early 19th-century sketch of this arch also shows a large aperture in its crown, which was probably intended as a means of allowing materials to be transferred between boats and the road on top of the bridge.



A postcard view taken in 1907, showing the eastern arches of the bridge in front of the half-timbered building that replaced the corn mill in c. 1903

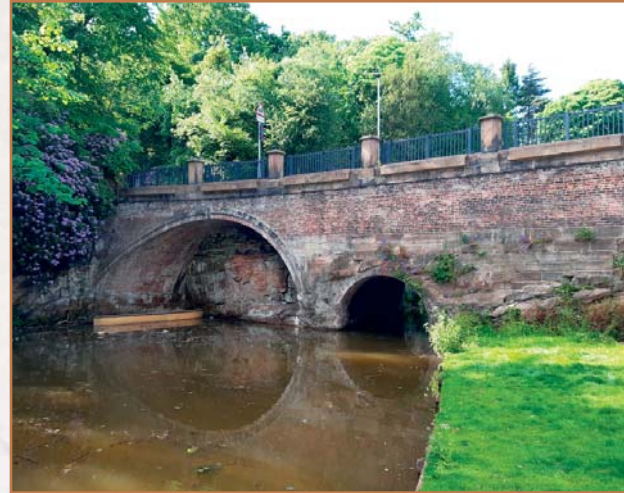


The blocked-up aperture for the hoist in the bridge arch

The pier that separates the eastern part of the bridge from the western arches is formed by the sandstone bedrock left in place at the end of quarrying activity in Worsley Delph. This section of the bridge may have been added at slightly later date to the eastern part, probably when the second entrance tunnel to the underground canal was opened in the early 1770s.



The tunnel from the western canal basin



The south-facing elevation of the western arches, showing the canal tunnel hewn through the bedrock

The canal arm that linked the western canal basin to Worsley Delph passed through an unlined tunnel that was hewn through the bedrock, with no provision for a towpath. Beyond this tunnel is the final arch of the bridge, which comprises a brick-built cantilever carrying the bridge footpath, with the solid bedrock visible below the arch.



0 10 m

vegetation metal railings
bedrock stonework

Measured survey of the Worsley Road Bridge

The western canal basin is also likely to have been created as part of the engineering works to build the second entrance tunnel in the early 1770s. It was partly infilled with silt that was removed from Worsley Delph during the landscaping works carried out in the mid-1970s. This was cleared as part of the restoration works in 2018, which returned the western basin to its original extent. The remains of a boat that had been sunk in the basin were revealed during the course of this work.

The western basin is somewhat larger than the original basin to the east, and may have served as temporary moorings for empty boats awaiting entry into underground canal, or loaded boats ready for their onward journey to Manchester. It is unlikely that the eastern basin will have had much mooring capacity for the coal boats, as it formed a quay for the Duke's warehouse.

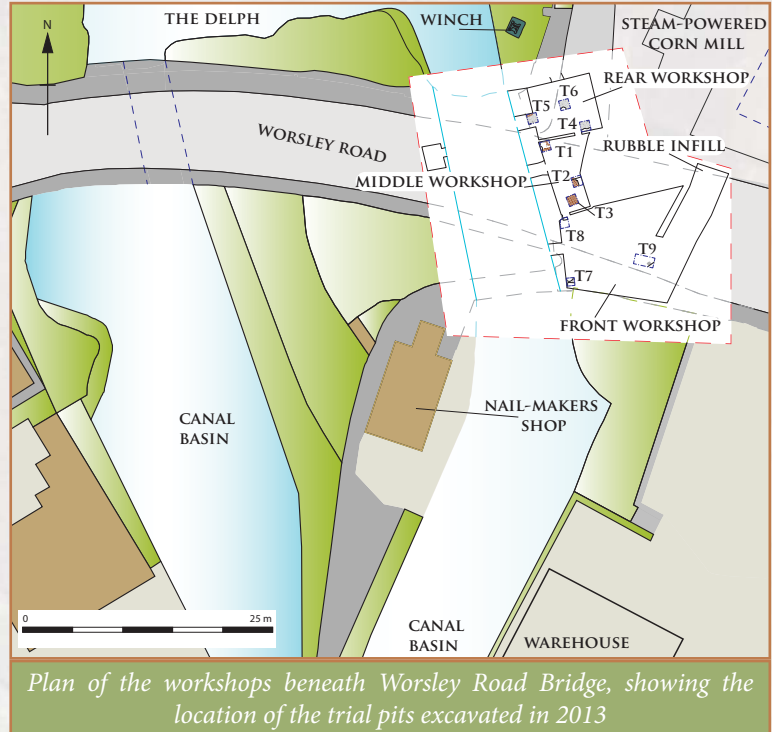


View across the western basin from Worsley Road Bridge in 2018, showing the remains of a sunken boat being exposed during the removal of silt

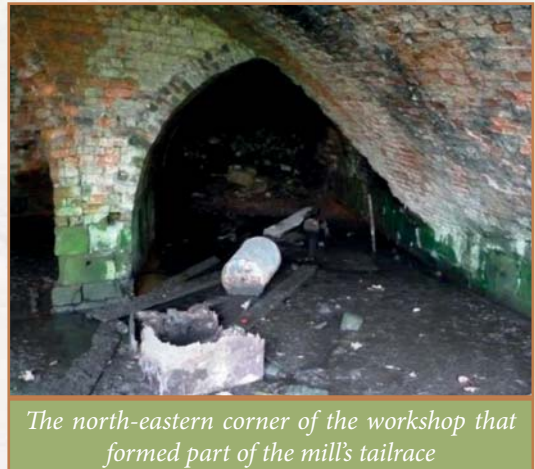


View of the eastern basin through the second arch of Worsley Road Bridge in 1807, showing the Duke's warehouse, the narrow towpath and the doorway into a workshop beneath the adjacent arch

The easternmost arch of Worsley Road Bridge houses a row of three chambers that were used as workshops, separated by brick-built partitions. All three workshops had small openings through the west pier of the arch, affording access onto the canal towpath that passed under the second arch. These workshops were the subject of several phases of archaeological investigation, including the excavation of nine trial pits that were opened in 2013 to establish the character of any floors that survived beneath the silt that had been dumped in the arch during landscaping works in the 1970s. A survey was also carried out with a laser scanner as part of the archaeological work.



The excavation of the trial pits revealed well-preserved remains of a cobble surface in the central workshop, which was 7.5m long and varied in width from 3m to 5m. A blocked circular aperture, approximately 1m in diameter, was cut through the western pier of the bridge at towpath level, and doorways through the brick partitions provided a connection with the adjacent workshops. The rear workshop had a brick floor and a large blocked opening on its north side, large enough to allow a horse to pass through, together with a low opening to the towpath. The southern end of the front workshop was open to the eastern canal basin and the Duke's warehouse, whilst a doorway through the bridge pier afforded access to the towpath, as shown on the sketch of 1807. This workshop also incorporated the arches from the mid-18th-century turnpike bridge in its north-eastern corner, one of which formed part of the tailrace from the corn mill that lay immediately to the north-east.



Further elements of the infrastructure associated with the corn mill were revealed during the removal of silt and the construction of a new viewing platform across the eastern part of Worsley Delph as part of the restoration works in 2018. The most remarkable discoveries included an undocumented paved wharf that extended from Worsley Road Bridge to the eastern entrance tunnel to the underground canal, and a large, brick-arched tunnel that extended south-eastwards from Worsley Delph towards the former corn mill. The tunnel was at least 12m long, 3m wide



The tunnel and the small quay that were uncovered during the restoration works in 2018, showing the half-timbered building that replaced the corn mill in the early 20th century

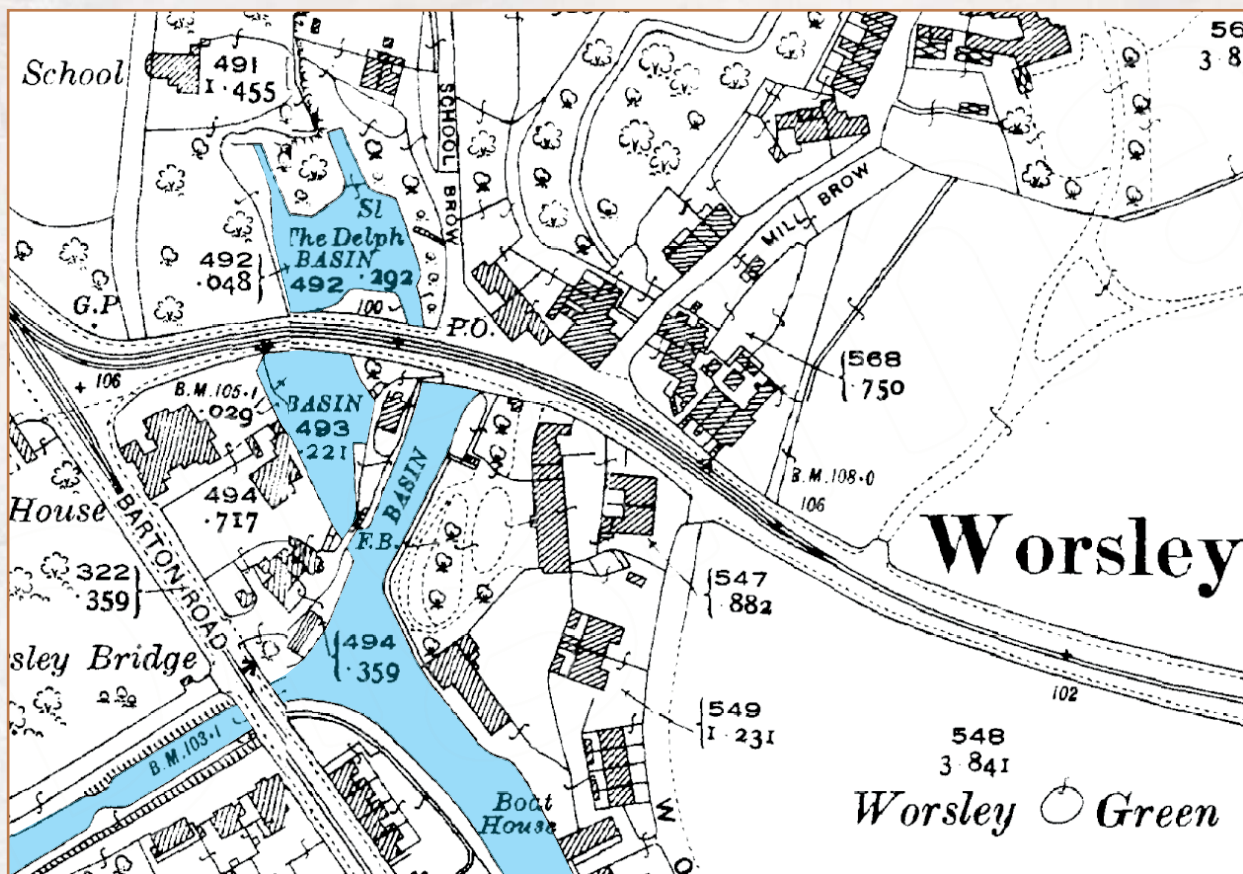
and over 2.5m high, and was thus large enough to take a horse and cart. A smaller branch tunnel was identified near its southern end, although this had been blocked off and was inaccessible.



Interior of the tunnel between Worsley Delph and the former corn mill

The tunnel does not appear in any of the sketches drawn by John Claude Nattes in 1807, and is therefore likely to have been constructed at a later date. Its intended function is not entirely certain, although it may have provided a means of transporting coal from Worsley Delph to the boiler house in the basement of the corn mill, which had developed from a small water-powered mill supplying a local community to an enlarged steam-powered factory serving a regional client base by the early 19th century.

Correspondence between the Trustees of the Bridgewater Estate and Lancashire County Council in the early 20th century chart a discussion for a scheme of improvements works to Worsley Road Bridge. The Council sought to widen the bridge to create 'a clear span of 40ft to make its width uniform with the main road on either side of it', and noted that the iron railings on the bridge needed replacing. It was also proposed that a new tram line from Swinton was laid across the bridge to connect with a line from Boothstown to Barton. Whilst the County Council had considered the bridge to be the private property of the Duke of Bridgewater, the Trustees denied all responsibility for the proposed works. The Council managed to secure a contribution from the South Lancashire Tramway Company, and accepted responsibility for the bridge in 1921. The new tram line was evidently laid subsequently, as it is shown on the Ordnance Survey map of 1929, although it appears to have been short-lived as it is absent from the next edition of mapping that was published in 1936.



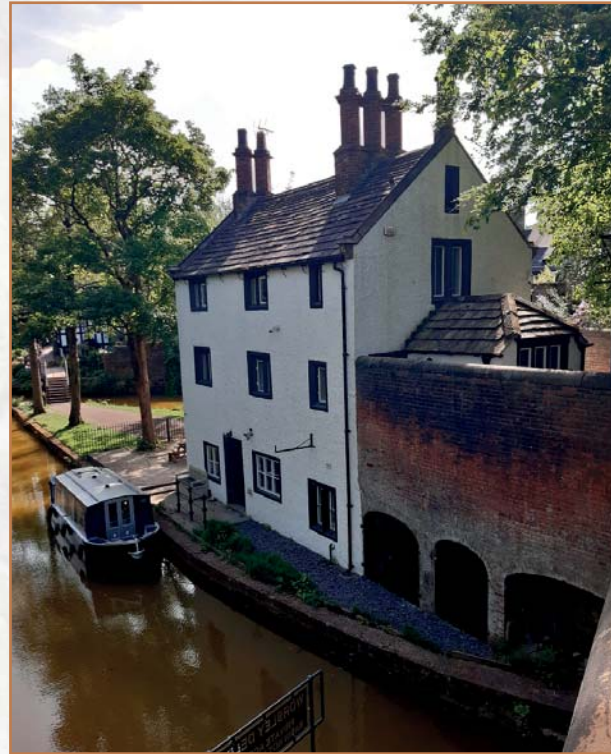
The Ordnance Survey 1:2500 map of 1929, showing the new tram line across Worsley Road Bridge

BEYOND THE DELPH

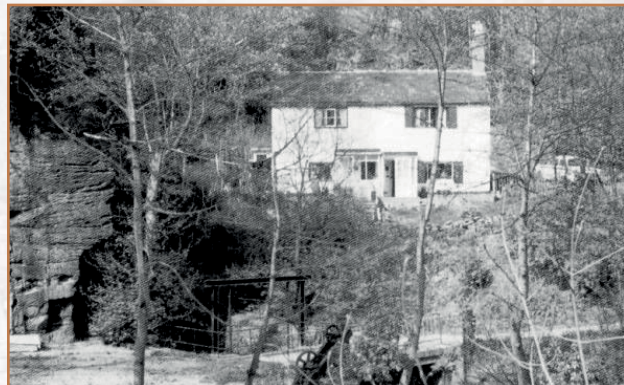
The immense historical and archaeological importance of the village extends beyond Worsley Delph and the Bridgewater Canal, as is reflected in the wealth of listed buildings that survive in the immediate vicinity, collectively representing an early industrial settlement and inland port centred around one of the most incredible engineering feats of the Industrial Age. Most of the historic buildings are focused around Worsley Delph, and strategically positioned to assist with operations at the mine and canal system.

The earliest surviving building in the village is reputedly No 3 Worsley Road, also known as the 'nail-maker's house'. This three-storey building was erected in the early 18th century prior to the construction of the canal and Worsley Road Bridge, occupying a prominent position adjacent to the Warrington turnpike. It has been used variously as a nail-maker's shop, a smithy, a library, a reading room, and is now a private dwelling.

The house on the northern side of Worsley Delph, above the eastern entrance tunnel to the underground canal, provides another example of cottage-based industry in the village. Dating to the 1760s, this building incorporated a stonemason's workshop on the ground floor with domestic accommodation on the first floor. Whilst the building has been extended and converted into two private dwellings, its industrial origins are betrayed by the blocked remains of a large, elliptical-arched opening in the eastern wall.



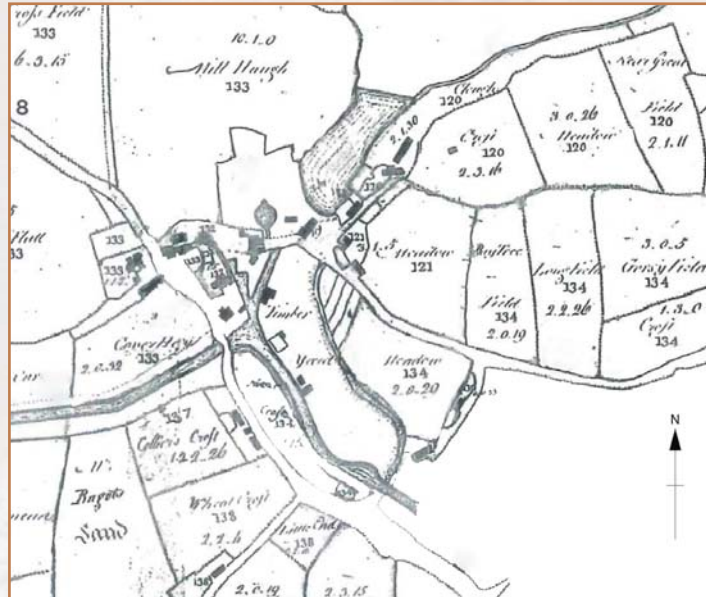
No 3 Worsley Road, a Grade II listed building dating to the early 18th century



The stonemason's cottage in the 1960s, prior to the addition of a large extension in 1986

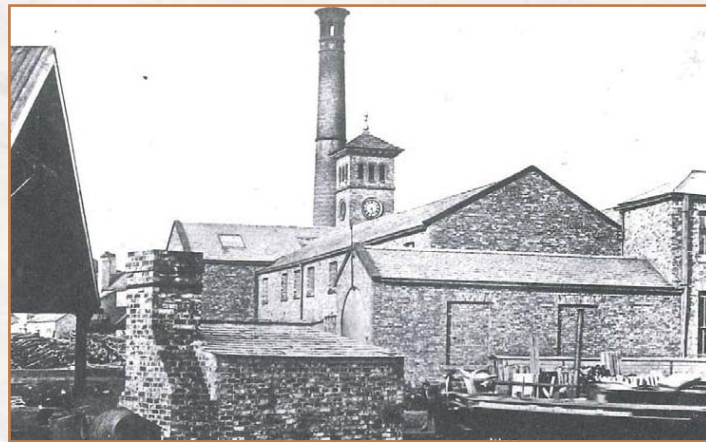
THE DUKE'S YARD AND THE MANOR HOUSE

The focus of village industry in the late 18th century lay to the south-east of Worsley Delph, centred on the Duke's Yard. This incorporated workshops for a suite of craftsmen that served the canal and mining operations, leading Arthur Young to liken Worsley to a 'river environ of London' during his visit in 1769. The early layout of the canal-workshop complex is captured on a survey of the Worsley estate dating to 1764, which identifies the large plot of land as a 'timber yard'. A plan produced by John Foulkes in 1785 (see Page 3) shows the industrial infrastructure to have grown considerably, with the addition of saw pits, workshops for carpenters, wheelwrights and basket makers, a brick shed, a large warehouse, three docks and a boat shed, together with a forge, a mortar mill, a machine shop, limekilns and what is likely to have been coke ovens on the southern bank of the canal. This plan also shows a building that is likely to have been the manager's cottage, known as the 'Manor House'.



Extract from a plan of the Worsley estate in 1764

The extent of further development is shown on the Ordnance Survey map of 1848, which shows more buildings to have been added to this industrial complex. Further details can be gleaned from mid-19th-century trade directories, which list wheelwrights, coal merchants, blacksmiths, boat builders and tin-plate workers all having businesses in the area. The Duke's Yard was served by a network of horse-drawn tramways by that date, and benefitted from a connection to the railway system in the early 1870s.



View of the Duke's Yard from the south in the late 19th century

The canal workshops were moved to Monton in 1904, and all the buildings were cleared to allow The Green to be established as part of a scheme to transform the area into a garden village. The site of the workshops and the Manor House, however, were the focus of a community-led archaeological project that was carried out in 2018-19. This commenced with the excavation of several trial pits across the footprint of the Manor House by the Salford Archaeology & History Society in 2018.



The Manor House in c. 1900



Excavating a trial pit across the site of the Manor House



The foundations of the Manor House exposed in a trial pit (courtesy of Dr M Nevell)

The stone-built foundations of the Manor House were unearthed at a shallow depth in the initial trial pits, implying that further intact remains of the building were likely to exist across The Green. This was tested in 2019 via the excavation of a series of trenches by members of the Greater Manchester Archaeology Federation, including Salford Archaeology & History Society, Tameside Archaeological Society, the South Trafford Archaeological Group and the South Manchester Archaeology Research Team, with support provided by archaeologists from the University of Salford.

A trench placed across the site of the outbuildings to the west of the Manor House concluded that the area had been used as a dump for kitchen waste, which included fragments of 18th- and 19th- century pottery, together with some fragments of slipware vessels dating from the late 17th or early 18th century. Two trenches excavated within the footprint of the house revealed that both of the southernmost

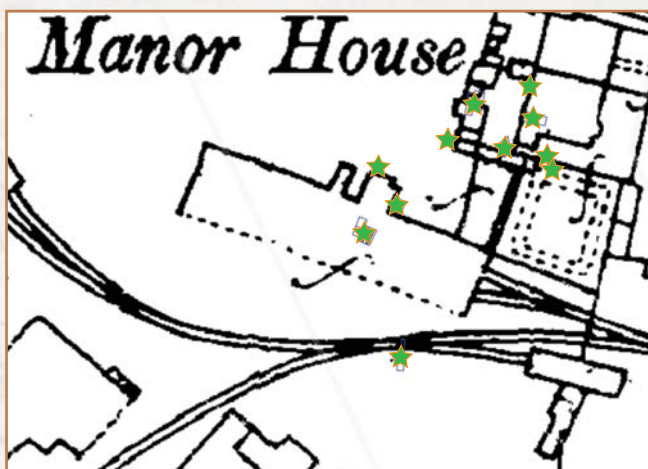


Trench excavated across the outbuildings to the Manor House in 2019 (courtesy of Dr M Nevell)

rooms were cellared. The largest trench measured 4m by 5m, and revealed the brick barrel-vaulting and stair access into the cellar in the south-western corner of the building.



The excavated remains of railway sleepers laid over a demolished gas holder (courtesy of Dr M Nevell)

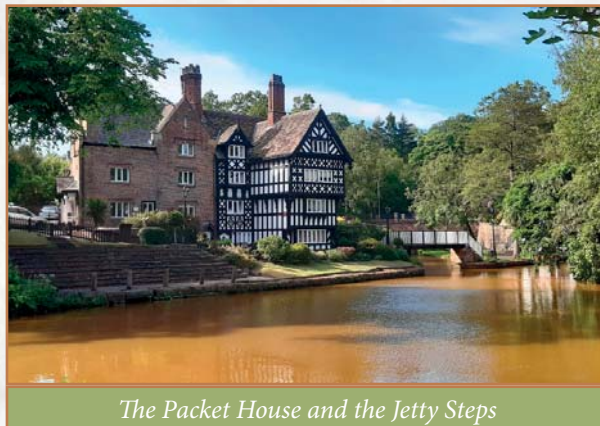


Location of the trenches opened across The Green superimposed on the Ordnance Survey 1:2500 map of 1893

A trench placed across the site of an opened-sided railway workshop to the south of the Manor House exposed a c. 0.2m-deep clay bed that retained the impression of two railway sleepers. This overlay a thick levelling layer of ash and clinker, which had possibly derived from the demolition of a gas holder that had occupied this part of the Duke's Yard until the mid-19th century. Two trenches opened to the north revealed an internal floor covered in iron-working waste, implying that there had been a forge in this part of the building.

CANAL PASSENGER SERVICE

Situated on the opposite side of the canal to the Duke's Yard is the Packet House, which was the starting point for a passenger service on the canal that the Duke of Bridgewater launched in 1769. This original four-storey brick-built structure was erected in the early 1760s, together with a flight of nine long stone steps, known as the Jetty Steps, that enabled passengers to board the 'packet boats'. The black and white timber-framed wing was added by the 1st Earl of Ellesmere in c. 1850, betraying his passion for this mock-Tudor style.



The Packet House and the Jetty Steps

The passenger service from Worsley to Manchester took 2½ hours, with scheduled stops at Patricroft and Barton. In 1791, passenger traffic on the canal brought in receipts of £3781, while sales of coal totalled £19,455 and nearly £13,000 was earned from other cargoes. The vessels that carried passengers were also known as 'fly boats', and were given priority over other canal traffic. One such boat was the *Duchess Countess*, which was built in 1871 and was the last packet boat in regular service on the Bridgewater Canal.

BRIDGEWATER CANAL
SWIFT PACKETS.
 WORSLEY, PATRICROFT, BARTON, AND MANCHESTER.

Fares between Patricroft, or Barton and Manchester.

Best Cabin - - - - -	2d.
Steerage - - - - -	1d.

Between Worsley and Patricroft, Barton or Manchester.

Best Cabin - - - - -	3d.
Steerage - - - - -	2d.

The following will be the times of sailing until further notice.

FROM WORSLEY TO MANCHESTER -
 7½ A.M. and 2 P.M.

FROM PATRICROFT AND BARTON TO MANCHESTER -
 8 A.M., 10½ A.M., 2½ P.M., 4½ P.M.

FROM MANCHESTER TO BARTON AND PATRICROFT -
 9 A.M., 12 Noon, 3½ P.M., 6 P.M.

FROM MANCHESTER TO WORSLEY
 12 Noon, 6 P.M.

Bridgewater Canal Office, Manchester, October 12, 1849.
 Math, Barnes, and Blackley, Printers, Bezaemee street, Manchester.

Handbill printed in 1849



The Duchess Countess under tow after her days as a packet boat



The front elevation of Rock House

Adjacent to the Packet House on the west side of the canal basin is another Grade II listed building, known as Rock House. This two-storey, double-depth property was subject to an archaeological survey in 2013-14, which concluded that it dates to the early 1760s, although it was originally just a single-depth building. It probably served as a farmhouse originally, but was rebuilt to a larger plan form in late Regency style during the first half of the 19th century. The earliest name associated with the property in the documentary record is John Cook, who is mentioned in the inventory

accompanying the 1764 estate map as a tenant who leased the house and 12 acres of fields between Barton Road and Worsley Hall.

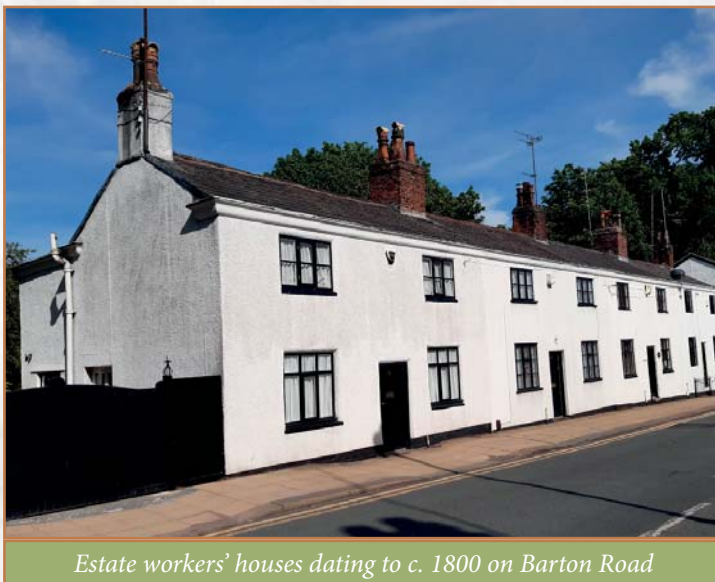
Situated across the canal from Rock House and the Packet House was the Duke's Warehouse, which is first shown on the estate map of 1764. The warehouse was a brick-built structure rising four storeys above canal level. Historic photographs depict a large crane secured to the corner of the building for loading and unloading goods. The warehouse was one of the first of its kind in the world, and a precursor to the impressive canal warehouses that still dominate Castlefield Basin at the Manchester terminus of the Bridgewater Canal. The Duke's Warehouse was demolished in the early 20th century and the site landscaped, leaving no visible trace of this once important building.



The Duke's Warehouse in c. 1900, with the chimney of the steam-powered corn mill in the background

ESTATE HOUSES

The success of the 3rd Duke of Bridgewater's pioneering industrial enterprise in Worsley was dependent upon a skilled workforce. With this in mind, John Gilbert implemented a vigorous recruiting campaign and visited established mining districts in Derbyshire, Staffordshire, Shropshire, Cumberland and elsewhere in search of experienced colliers and stonemasons, and cottages were built for estate employees in order to help attract workers to Worsley. In 1773, Josiah Wedgwood, the renowned Staffordshire potter, noted in a diary entry following a visit to Worsley that the Duke 'has



Estate workers' houses dating to c. 1800 on Barton Road

built some hundreds of houses, and is every year adding considerably to their number'. These generally comprised isolated terraces of two-up two-down cottages across the estate, although the main groupings were close to the Duke's Yard in Worsley, Walkden and Dixon Green.

A fine example of a row of four workers' cottages that were built in c. 1800 survive along Barton Road in Worsley, across the canal from the Duke's Yard. Each cottage is of two storeys, with a wing to the rear and a central boarded door flanked by three-light casement windows.

The Census returns indicate that these houses were occupied by a variety of skilled tradesmen during the 19th century, including blacksmiths, boat builders, wheelwrights, millwrights, joiners and saddlers, together with general labourers. One of the houses, No. 16 Barton Road, was occupied in 1841 by John Kent and his wife, together with their daughter and three sons, Thomas, George and Charles. The family is listed at the same house in the 1851 Census, which records John Kent and his youngest son as boat builders, almost certainly at the Duke's Yard, whilst Thomas was employed as a general labourer and George as a porter. It seems that Thomas Kent had taken over the tenancy of the No. 16 Barton Road by 1861, presumably following the death of John Kent, and continued to live there until the 1870s. The 1881 and 1891 censuses record Charles Kent, who was still employed as a boat builder, as the tenant of the house. This demonstrates that some people were employed by the estate for their entire working lives.

Several examples of 18th-century estate workers' cottages in the village survive on Mill Brow. The two-storey properties at the upper end of Mill Brow have a similar plan form to those on Barton Road, but without the rear wing. The occupations of the residents recorded in 1901 Census include a 'carter on the estate', a 'labourer on the estate' and a 'carpenter on the estate'.



Estate houses at the upper end of Mill Brow



Nos. 10-14 Worsley Road

One of the cottages at the lower end of the street, No. 4 Mill Brow, was converted by the Waifs & Strays Society in 1898 for use as the Worsley Home for Boys. It originally accommodated just six boys, up to the age of 11, and was one of the Society's smallest homes, until the neighbouring cottage was acquired in 1905 when capacity increased to 18. The home was closed in 1939 when all the boys were evacuated to Shap in Westmorland.

Other early cottages in the village include No. 5 and Nos. 10-14 Worsley Road, which all date to the mid-18th century. The former, known as Ivy Cottage, comprises a two-storey L-shaped range, with a small addition to the rear, mainly built in rough-cast brick topped by a slate roof. In contrast the other estate cottages, Nos. 10-14 Worsley Road are three-storey properties.

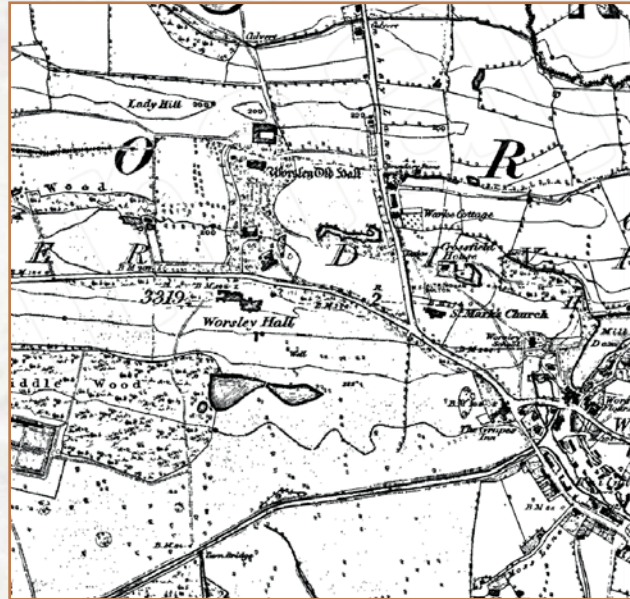


The lower end of Mill Brow in 1905, showing the houses that were converted to a boys' home

WORSLEY HALLS

Worsley Old Hall had been the local residence of the Earls of Bridgewater ever since Sir Thomas Egerton inherited the estate in 1598. When Francis Egerton succeeded to the title of the 3rd Duke of Bridgewater in 1748, however, he considered the Old Hall to be too small and soon commissioned a new manor house to be built a short distance to the south. Once it had been completed in the 1760s, Worsley Old Hall was used as estate offices.

The elegant new mansion, known as the Brick Hall to distinguish it from the timber-framed Old Hall, was built in the classical style and occupied a prominent position overlooking the Bridgewater Canal. John Gilbert was the first occupant of the new hall, although Francis Egerton retained a suite of rooms there for his own use when he visited Worsley.



Extract from the Ordnance Survey map of 1848, showing Worsley Old Hall and the Brick Hall, marked 'Worsley Hall'

The 3rd Duke of Bridgewater died in 1803, and in accordance with his will the Lancashire and Cheshire estates and coal mines, the Bridgewater Canal and his estate in Northamptonshire passed in trust to his nephew, George Granville Leveson-Gower. Under the terms of the will, he was to receive revenue from the estates, which were to be managed by the Bridgewater Trust. In 1833, the estate passed to Lord Francis Leveson-Gower, who then took the surname of Egerton and, in 1846, received the title of 1st Earl of Ellesmere. He immediately built a larger and grander residence than either of the two existing halls, and the Brick Hall was pulled down in 1846.

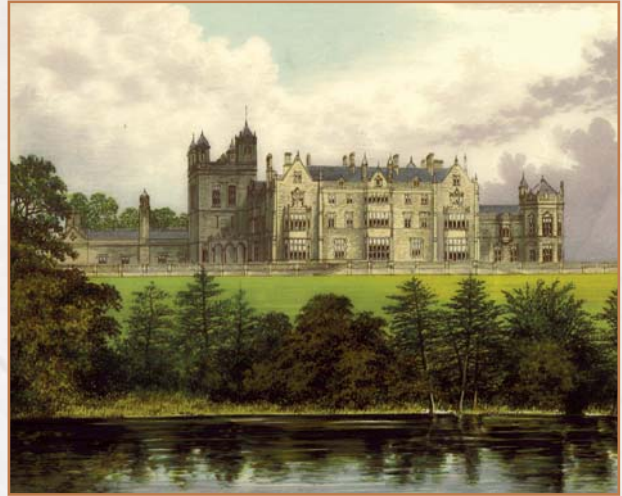


A stylised painting of the Bridgewater Canal in 1833, showing Worsley Brick Hall in the background

Worsley New Hall was designed by Edward Blore, an eminent landscape and architectural artist who had designed Great Moreton Hall in Cheshire in 1840-41, and gained renown for his subsequent work on Buckingham Palace and St James' Palace in London. The hall was built in Elizabethan Gothic style, and had a symmetrical three-storey main block, with a wing for the family on one side and a servant wing and a tower on the other side. It cost nearly £100,000, and was encompassed by magnificent landscaped gardens that were designed by William Andrews Nesfield.



The landscaped gardens designed by William Andrews Nesfield



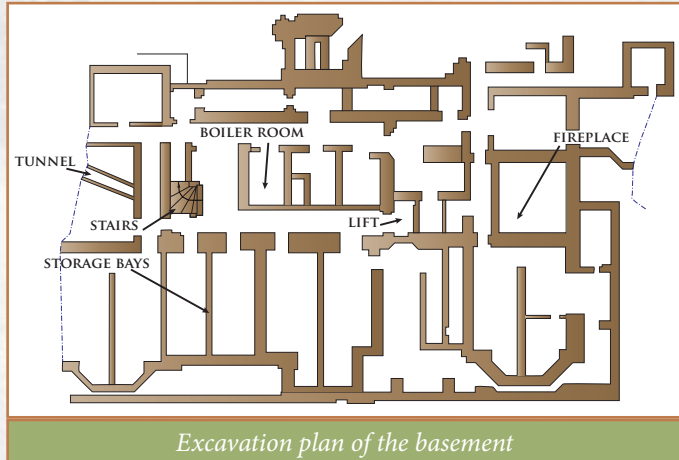
Worsley New Hall in 1868

John Egerton, the 4th Earl of Ellesmere, lent the hall to the British Red Cross during the First World War for use as a military hospital. The hospital closed in 1919 but the Egertons did not return to the hall, which was sold with the Worsley estate in 1923. The unoccupied building and the grounds were requisitioned by the War Office during the Second World War, and rapidly fell into disrepair. The hall was demolished in the late 1940s, although a former gatehouse originally situated in the woods near Worsley Hall Farm, was relocated to a site adjacent to the Jetty Steps by the Packet House, overlooking the canal.



The former gatehouse relocated to the Jetty Steps

The site of Worsley New Hall was the focus of a comprehensive archaeological investigation by Salford Archaeology in 2011-12, which culminated in the full excavation of the basement in the east wing. A very unusual vaulted cellar level was also discovered beneath the basement. This survived intact, and comprised a series of compartments formed by brick-built partitions between the substantial stone foundations for the building. With no laid floor and a maximum headroom of just 1.4m throughout, the cellar level does not appear to have been intended as a storage space, although it housed a network of water pipes and other services. Access was afforded via several hatches set into the basement floor.



Excavation plan of the basement

A row of narrow store rooms at basement level, overlying the cellars, was accessed via a central corridor. A room at the western end of this corridor contained a domestic fireplace, with a narrow tunnel passing underneath the floor. A slightly larger room at the eastern end of the corridor also had a domestic fireplace, whilst a third fireplace was identified in a room occupying the north-western corner of the basement, which was accessed via a corridor that served the northern part of this level. Excavation in the central part of the basement revealed the mechanism for a passenger lift. This had been powered by electric, and had probably been installed in the early 20th century.



One of the store rooms, showing the top of the brick-vaulted cellar beneath the flagstones



Basement room with a fireplace and tunnel

The excavation also revealed that the hall had been heated by a variant of a system known as 'Price's Apparatus' that was developed in the late 1830s. Hot water heated in a coal-fired boiler was circulated via convection through coils of tubes set in brick chambers either side of the boiler. Fresh air drawn from outside was warmed by passing over these coils and was ducted to the upper storeys of the hall, where it exited via grilles in the floor or skirtings. Unusually, the boiler flue did not go straight upwards, but ran under the floor of the basement passageway for some distance.



The basement boiler room

The hall was clearly a 'state-of-the-art' building for the 1840s, reflected in the Gothic-style architecture and its plan form, which abandoned the desire for symmetry and classic styles, as seen in the earlier Brick Hall. Ancillary buildings and activities were set back from the main domestic range of the hall, leading to a semi-detached service wing that housed the kitchen.



The excavated remains of the east wing of Worsley New Hall

THE EARLS OF ELLESMERE



Portrait of the 1st Earl of Ellesmere by Edwin Longsdon Long

In addition to building Worsley New Hall in the 1840s, Lord Francis Egerton, the 1st Earl of Ellesmere, also implemented significant changes to the village. Despite the commercial viability of industry around Worsley Delph, and the importance of the local workforce, the village and its residents were, in Lord Francis Egerton's opinion, in need of reformation, commenting that 'the whole district was in a state of religious and educational destitution'.

The women working in the coal mines were withdrawn with immediate effect, and helped to maintain themselves until they could find more suitable occupations. The 1st Earl of Ellesmere then instigated the construction of churches and schools, repaired or rebuilt the estate workers' cottages and artisan's workshops, and established a lending library. He also erected a timber-framed court house that was built in the mock-Tudor style that he favoured. This was built in 1849 at the junction of Barton Road and Worsley Road, adjacent to Rock House, on the site of the old village stocks.



The Grade II listed Worsley court house, built in 1849

The last court leet was held at the court house in 1888, but the building continued to be used thereafter as a magistrates court. Night-school classes were held there for estate workers and tenants in the 1850s, and the building was used later as a village hall for social functions.

Another building erected in mock-Tudor style during the mid-19th century was the police house, situated opposite the estate workers' cottages on Barton Road. This two-storey, timber-framed building has a T-shaped plan, and bears an 1851 date stone on the porch. The building has three bay windows, and is now domestic in use.



The Grade II listed Worsley police house, built in 1851

The 1st Earl of Ellesmere also commissioned the erection of a large granary, overlooking the canal near the Duke's Warehouse, although it was used subsequently as an oil and powder store for the canal and mining operations; the large forge on the opposite bank of the canal to the dry docks had been converted for use as a granary by the end of the 19th century.

Built in 1852, the oil and powder store is T-shaped in plan and of two storeys with large segmental-arched openings on the ground floor of each of the seven bays, separated by weathered buttresses. The interior includes an impressive cross-vaulted floor of brick construction that was designed to minimise damage in the case of an explosion. Wings were added to the rear in 1986 when the building was converted for residential use.

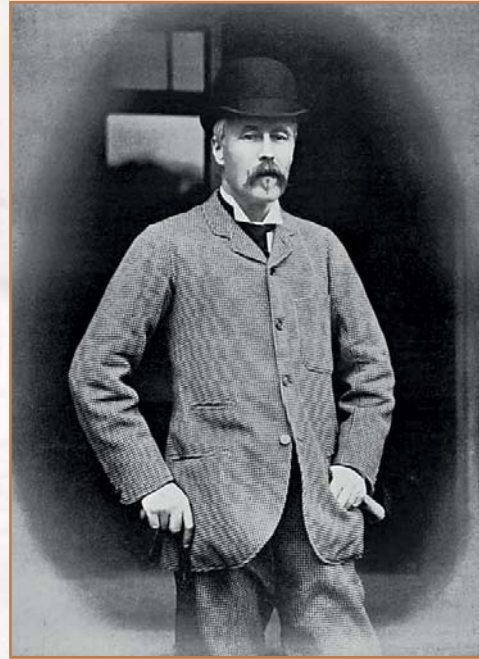


The Grade II listed oil and powder store built in 1852, and converted for residential use in 1986. Note the distinctive orange colour of the canal, deriving from the iron oxide that leaches out of the coal seams in the underground canal

Lord Francis Egerton died in 1857 and was succeeded by his son, George Granville Francis, who died in 1862. George's son, Francis Charles Granville Egerton, then succeeded as the 3rd Earl of Ellesmere at the age of 15. He pursued a military career, ultimately receiving command of the Duke of Lancaster's Yeomanry in 1891, and also had a great interest in horse racing, being described in 1895 as 'a staunch patron of the turf, and a distinguished breeder of thoroughbred stock'. However, he does not appear to have taken much interest in the canal and mining operations in Worsley, leaving their management to the Bridgewater Trust.

Worsley was connected to the national railway network in September 1864, when the Tyldesley Loopline was opened by the London & North West Railway Company to provide a link between Eccles on the Manchester and Liverpool line and Wigan on the main West Coast line. However, the Duke's Yard was not connected by rail until the early 1870s, when a short branch line was built.

The last coal was hauled out of the underground canal at Worsley Delph in 1887 and the lower coal workings were abandoned. However, coal from the other collieries on the estate continued to be trans-shipped from railway to canal at Worsley well into the 20th century.



The 3rd Earl of Ellesmere pictured on the cover of Racing Illustrated magazine in 1895



The Worsley coal chute



Worsley railway station, opened in 1864



Estate houses and the monument to the 3rd Duke of Bridgewater on The Green

In 1903, the Bridgewater Trust that had been set up under the will of the 3rd Duke of Bridgewater expired, leading the 3rd Earl of Ellesmere to create the Ellesmere Trust to facilitate the management of all his estates, including Worsley. In 1904, the Earl gave Captain Henry Hart Davis, Chief Agent of the estate, permission to demolish the Duke's Yard and create a grassed green, which was lined with 30 newly built estate houses by 1910. A memorial fountain commemorating the 3rd Duke of Bridgewater was also constructed from the stone and bricks salvaged from the chimney at the Duke's Yard.

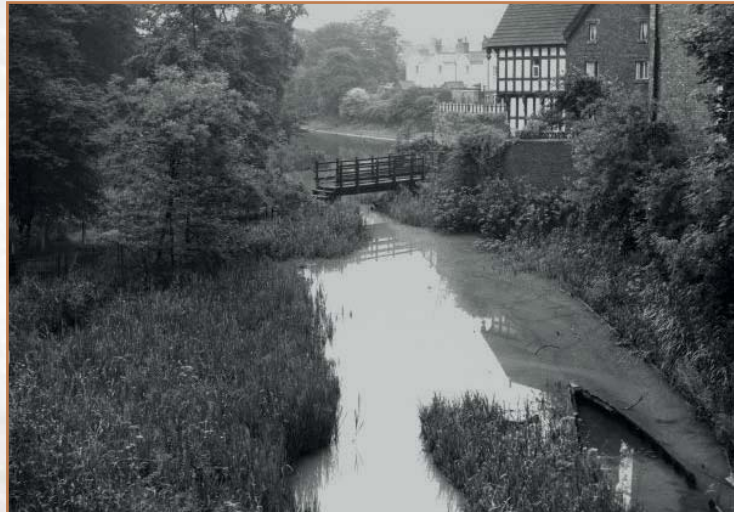
John Francis Granville Scrope Egerton succeeded to the title of the 4th Earl of Ellesmere in 1914, when a valuation of his properties was carried out for the purpose of establishing death duties, leading to the sale of a considerable amount of his land holdings. In 1921, the 4th Earl set up Bridgewater Wharves Ltd and Bridgewater Collieries Ltd to manage his coal-mining interests, although he sold his shareholdings in these companies, together with his Lancashire and Cheshire estates, to a syndicate of Lancashire businessmen two years later in return for a shareholding in the new Bridgewater Estates Ltd. In 1929, Bridgewater Wharves Ltd and Bridgewater Collieries Ltd were taken over by Manchester Collieries Ltd, which became the largest colliery amalgamation in Britain at that date.



The monument to the 3rd Duke of Bridgewater

RESTORATION AND ARCHAEOLOGY

The last colliery in the area closed in 1968, signalling the abandonment of Worsley Delph and the underground canal as a drainage sough. Commercial traffic on the Bridgewater Canal continued for a few years thereafter, with the last cargo of maize being carried from Salford Docks to the Kellogg's factory at Trafford Park in 1974. Whilst the canal began to be developed as an important leisure facility during the 1970s, forming a key section of the popular 'Cheshire Ring' cruising route, Worsley Delph was no longer accessible by boat and fell into dereliction.



Worsley Delph in the early 1960s, capturing the abandonment and neglect

Despite valiant attempts at restoration carried out by the Worsley Civic Trust in collaboration with Worsley Urban District Council and the National Coal Board in 1966-67 that involved creating the access path from School Brow and landscaping The Island, followed in 1974-75 by a programme dredging silt from the canal basin, Worsley Delph had again become overgrown and largely inaccessible by the end of the 20th century. Renewed attempts to revitalise the site were implemented by Salford City Council in the late 1990s with the 'Steam, Coal and Canal' project, which was followed by a series of archaeological surveys and limited investigations in the early 2000s, confirming that buried archaeological remains survived intact on The Island.

A significant step towards restoring Worsley Delph was achieved in 2011, coinciding with the 250th anniversary of the opening of the Bridgewater Canal, when Salford City Council adopted the Bridgewater Canal Corridor Masterplan that aimed to transform the 7.9km section of the Canal that passes through Salford into a world-class tourist and heritage area. In 2014, £3.6 million was awarded by the National Lottery Heritage Fund to revitalise the canal over the following four years, matched by a further £1.9 million from Salford City Council and major partners. This funding has enabled the delivery of towpath improvements, heritage interpretation, the restoration of the remains of James Brindley's famous Barton Aqueduct, together with significant improvements to Worsley Delph.

The restoration of Worsley Delph was concerned primarily with improving public access and providing interpretation befitting the immense historical importance of the area. The works necessitated the removal of scrub vegetation from The Island to enable new surfacing to be laid, dredging silt from the canal basin, conserving historic features, creating a new walkway and viewing platform along the eastern side of Worsley Delph, and installing interpretation panels to explain the cultural significance of the mining operations and the Bridgewater Canal.



Worsley Delph in 2017 following the clearance of scrub vegetation from The Island at an early stage in the restoration works



Photogrammetry and 3d laser scanning were used to record Worsley Delph in 2018. This is a 3d model that is made up of 70 photos taken from the ground

The restoration work was carried out in accordance with carefully designed plans that culminated from extensive consultation with various stakeholders, statutory bodies and the general public over a period of several years.



Restoring The Island in 2018



Dredging the canal basin in 2018

Heritage considerations were of paramount importance when the restoration proposals were being drawn up, not least as Worsley Delph is afforded statutory protection as a scheduled monument under the Ancient Monuments and Archaeological Areas Act of 1979, and is therefore considered to be of national significance. There are just two other scheduled monuments in Salford in addition to Worsley Delph: the Iron Age promontory fort to the west of Great Woollen Hall Farm, and Wardley Hall, a medieval hall and gardens on a moated island that lies c. 4km to the north-east of Worsley village. Any works proposed to these designated sites require robust justification and scheduled monument consent must be obtained from the Secretary of State, a process that is managed by Historic England.



Wardley Hall, the 16th-century manor house of Wardley, which became part of the 3rd Duke of Bridgewater's estate in 1760s

In addition, it has been acknowledged that the site of two lime kilns on the south bank of the canal, opposite the dry docks, is similarly of national importance and warrants the same protection in the planning system as a scheduled monument, despite being a 'non-designated heritage asset'. These lime kilns were built between 1764-85 for the 3rd Duke of Bridgewater to produce the lime needed for mortar and also as fertiliser for agricultural land across the estate. The importance of the kilns was endorsed by a programme of limited archaeological excavation in 2010, which confirmed that they survived largely intact at a shallow depth below the modern ground surface. The site has since been landscaped to protect the structures, and information panels erected to explain their importance.



The top of one of the 18th-century lime kilns excavated in 2010 (courtesy of GMAAS)

Advice was sought from Historic England's Inspector of Ancient Monuments for the North West at an early stage in the Worsley Delph project, who recommended the appropriate actions that needed to be taken to ensure that the proposed works were not in any way detrimental to the scheduled monument. This advice was provided in consultation with the Greater Manchester Archaeological Advisory Service (GMAAS), which also furnishes the local planning authorities in Greater Manchester with specialist opinion to help them in assessing development impacts on archaeological sites and historic buildings.



A rib from a starvationer boat



A chain

The scheme of archaeological works that was recommended by Historic England and GMAAS to accompany to restoration project included the surveys and excavations within Worsley Delph that are summarised in this booklet. In addition, a member of staff from Salford Archaeology was in attendance during any excavation works, including the removal of the silt from the canal basin to ensure any finds were recorded. Amongst the few finds that were recovered during the dredging operation were timber components of a starvationer boat, and part of a chain from one of the crab winches.

It was also a requirement of scheduled monument consent that the results obtained from the archaeological investigation were disseminated to the public in an appropriate format. This has been achieved via the installation of a new viewing platform along the eastern side of Worsley Delph that is furnished with several interpretation panels, and the production of this booklet.



The official opening of the new viewing platform in November 2019

TIMELINE

- 1206 A 'millbrook' in Worsley is mentioned in historical documents, probably referring to the corn mill
- 1676 Stone quarrying at Worsley Delph is first mentioned
- 1724 John Massey starts to construct a sough to drain Wood Pit for Scroop Egerton, the 1st Duke of Bridgewater
- 1737 Parliamentary consent gained to make the Worsley Brook navigable from Boothstown to Barton
- 1748 Francis Egerton succeeds to the title of the 3rd Duke of Bridgewater
- 1753 John Gilbert takes on the responsibility of managing the Worsley estate
- 1759 Act to build the Bridgewater Canal receives Royal Assent
- 1760 Second Act enables the revised route of the Bridgewater Canal to be built
- 1761 Bridgewater Canal opens between Worsley and Stretford
- 1764 Bridgewater Canal completed to Castlefield Basin in Manchester
- 1769 Duke of Bridgewater starts passenger services on the Bridgewater Canal
- 1771 Second entrance tunnel to the underground canal opens in Worsley Delph
- 1776 Bridgewater Canal connects with the River Mersey at Runcorn
- 1803 Francis Egerton, 3rd Duke of Bridgewater, dies on 8th March
- 1846 Worsley New Hall completed and the Brick Hall demolished
- 1887 Last coal hauled out of the tunnels at Worsley Delph
- 1910 The Duke's Yard at Worsley cleared to create The Green
- 1966 First phase of landscaping works at Worsley Delph carried out by the Worsley Civic Trust
- 1968 The Coal Authority and Mines Inspectorate carry out their final inspection of the underground canal
- 2011 Salford City Council adopts the Bridgewater Canal Corridor Masterplan
- 2018 Salford City Council commences with the restoration work at Worsley Delph

GLOSSARY

ALLUVIUM

a deposit of clay, silt, and sand left by flowing floodwater in a river valley or delta, typically producing fertile soil.

CLACK VALVE

a hinged valve that permits fluids to flow in only one direction and clacks when the valve closes.

COLLIERY

a coal mine with all the associated buildings and machinery.

COURT LEET

a criminal court in which a private lord assumed jurisdiction for the punishment of minor offences.

PIPE ROLLS

a collection of financial records dating from the 12th century to 1833, and maintained by the English Exchequer.

PIT

the shaft from the surface down to the workings.

PROMONTORY FORT

a type of hillfort, usually of Iron Age date, in which naturally defended sites are adapted as enclosures by the construction of one or more earth or stone ramparts and ditches placed across the neck of a spur in order to divide it from the surrounding land.

SOUGH

an underground channel for draining water out of a mine.

TAILRACE

a channel that carries water away from a waterwheel or other industrial application.

STARVATIONER

a type of boat designed specifically to be used on the underground canal at Worsley. Typically, these boats were narrow with protruding ribs.

FURTHER READING

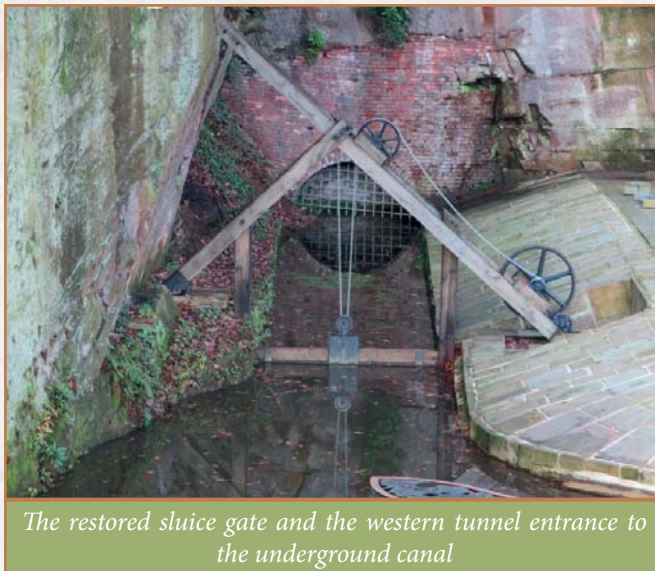
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- › M. Nevell, 2020 *Walking the Bridgewater Canal: Exploring Manchester's First Canal*, Salford

Copies of all the archaeological reports created from work carried out at Worsley Delph and Worsley New Hall have been deposited with the Greater Manchester Historic Environment Record.

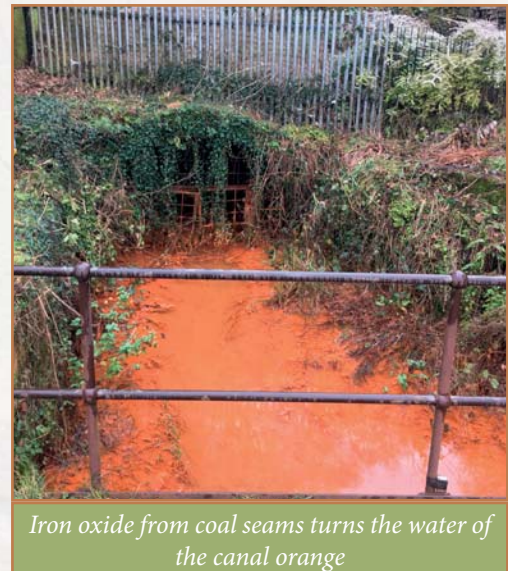
Publications in the Greater Manchester's Past Revealed series are available from GMAAS within the University of Salford, and digital copies of all the volumes published between 2010 and 2017 can be downloaded at <https://diggreatermanchester.wordpress.com/publications/>.

ACKNOWLEDGEMENTS

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The restored sluice gate and the western tunnel entrance to the underground canal



Iron oxide from coal seams turns the water of the canal orange

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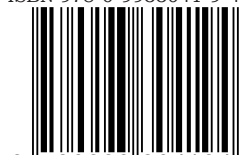
During the 18th century, Worsley was transformed from a quiet hamlet to a thriving inland canal port and one of the most famous centres of the Industrial Age. At the epicentre was Worsley Delph, a small stone quarry that was adapted for use as a basin that linked the Bridgewater Canal, the world's first true industrial canal, with an incredible network of underground canals that penetrated the coal mines owned by the 3rd Duke of Bridgewater. Archaeological investigations carried out by Salford Archaeology on behalf of Salford City Council in conjunction with a major scheme of restoration of Worsley Delph has provided a fascinating insight into the development of this remarkable village.



Front cover: View of Worsley Delph and The Island upon completion of the restoration work

Back cover: Portrait of the young Francis Egerton, the 3rd Duke of Bridgewater, with Barton Aqueduct to the rear (left), and the restored Worsley Delph at night in 2019 (right)

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