

ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY
ANNUAL CONFERENCE 2018

TOUR NOTES



NOTTINGHAMSHIRE

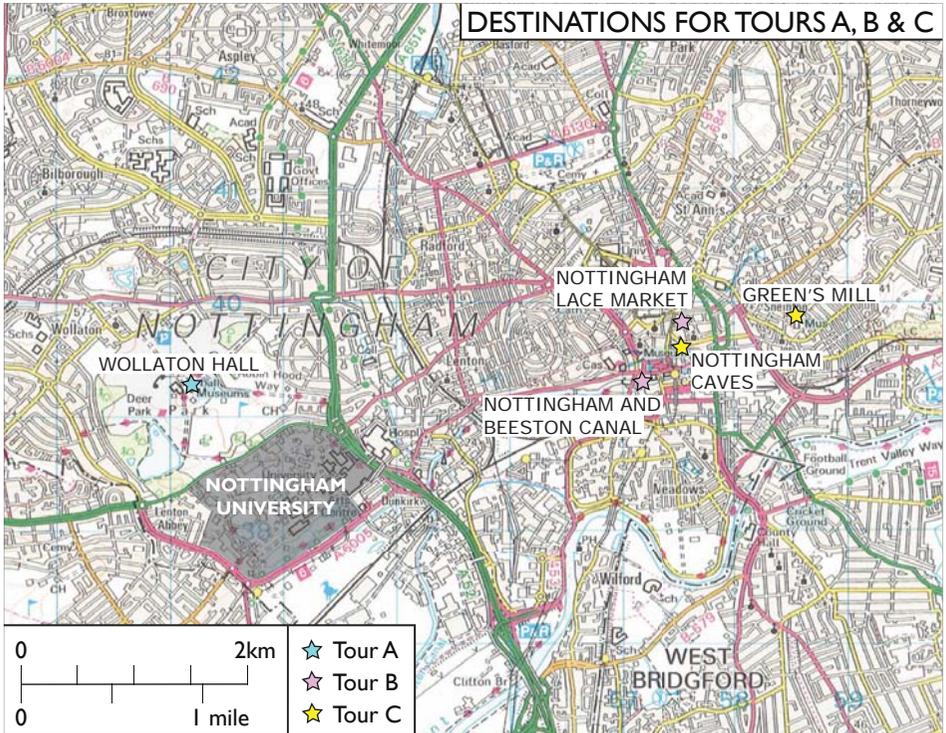


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CONTRIBUTIONS BY AMBER PATRICK

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INTRODUCTION

This conference explores parts of the county of Nottinghamshire, with short excursions into neighbouring Leicestershire and Derbyshire. The settlement pattern of the region is generally one of market towns and nucleated villages rather than scattered hamlets, since open-field farming survived longer in Nottinghamshire than elsewhere, and the county is proud of the survival of Laxton, the only remaining working open-field village still farming on this ancient system. Parliamentary enclosure tended to consolidate the 'village' landscape and intensified the development of rural industry as displaced small farmers – and their families – diversified into activities such as framework knitting, the mainstay of much of the East Midlands economy until the late 19th century. The probable birthplace of William Lee, inventor of the knitting frame in 1589, is Calverton in Nottinghamshire, and Nottingham became an international centre for machine-made lace.

The geology of the county, however, led to a different landscape. The Triassic sandstone was honeycombed with caves in Nottingham itself, providing spaces both for living and working in a town that remained confined by its open fields until the mid-19th century. Resting on impermeous clay, this also formed an aquifer to the north which was extensively tapped for Nottingham's water supply once the town began to grow. The

county also had large resources of clay, coal and ironstone; the shallower seams in the west have been worked since the late Middle Ages, with the coalfield moving eastwards as deeper seams were tapped. Clipstone, with its surviving Koepe winders, was one of the last pits to be worked. The River Trent provided an outlet to the east coast, through the important port of Newark-on-Trent, and the network of canals linking the coalfield to this major river began with the Erewash Canal in 1779. Horse-drawn tramways provided links to the canals, but the first locomotive railway in the area was the Leicester and Swannington in Leicestershire, opened in 1832 and prompted by the access that the Soar Navigation and the Nottinghamshire canals had provided for Nottinghamshire rather than Leicestershire coal. The last mainline railway to be built before the 21st century high-speed lines was the Great Central Railway, opened to London in 1899 and now the UK's only double-track steam-powered mainline heritage railway, which will hopefully soon run all the way from Ruddington in Nottinghamshire to Leicester.

University Park Campus, Nottingham, was opened in 1928, when the entire university was housed in the Trent Building. D.H. Lawrence, born in nearby Eastwood, wrote in his collection of poems, *Pansies* – really *Pensées*, thoughts – that:

*In Nottingham, that dismal town where I went to school and college,
they've built a new university for a new dispensation of knowledge.
Built it most grand and cakeily out of the noble loot
derived from shrewd cash-chemistry by good Sir Jesse Boot.*

The campus has its own history and some interesting walks around its landscaped grounds. There are two walks, one looking at the geology of the site, www.nottingham.ac.uk/sustainability/documents/geologyguide.pdf, while the other walk takes in the historic buildings and gardens of the campus, www.lakesidearts.org.uk/SiteData/Root/File/Visit%20us/heritageguide.pdf

Further reading on the industrial heritage of the region (mostly out of print but obtainable from specialist booksellers):

Barton, B. 2016. *Civil Engineering Heritage: East Midlands*, Institution of Civil Engineers' Panel for Historical Engineering Work (Ruddocks)

Beckett, J.V. 1997. *A Centenary History of Nottingham* (Manchester University Press)

Griffin, A.R. 1981. *The Nottinghamshire Coalfield 1881-1981: A Century of Progress* (Moorland Books)

Hadfield, C. 1970. *Canals of the East Midlands* (David and Charles)

Leleux, R. 1976. *A Regional History of the Railways of Great Britain. Vol. 9, The East Midlands* (David and Charles)

Mason, S.A. 1984. *Nottingham Lace, 1760s-1950s* (Alan Sutton)

Palmer, M. and Neaverson, P. A. 1992. *Industrial Landscapes of the East Midlands* (Phillimore)

Palmer, M. 1984. *Framework Knitting* (Shire)

Smith, D.M. 1965. *The Industrial Archaeology of the East Midlands* (David and Charles)

Stocker, D. 2006. *England's Landscape: the East Midlands* (English Heritage)

Coaches for all tours will depart from Lenton Hall Drive to the rear of Hugh Stewart Hall. Please be prompt, as many of the tours are on a tight schedule. Remember to bring appropriate clothing and footwear with you. Maps showing the coach routes that we will take for Tours D-H can be found in the centre pages of this booklet; locations of the venues which we will visit for Tours A-C can be found inside the front cover.

These notes were compiled by Marilyn Palmer, with contributions from Amber Patrick. David Ingham has been responsible for the layout, typesetting and maps. Photographs are copyright to Marilyn Palmer except for those individually credited.

Cover photograph: Cylinder head for one of the Papplewick beam engines

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WOLLATON HALL AND NOTTINGHAM INDUSTRIAL MUSEUM**Site conditions**

The tour of Wollaton Hall involves some steps down to the basement and Admiral's Bath. The route to the Prospect Tower involves 67 steps and a narrow circular staircase, but it is possible to omit this part of the tour if so desired. There are some steps down to the Stable Block where the Industrial Museum is located. Toilet facilities are available at both sites, and tea will be served in the Industrial Museum.

Wollaton Hall Tudor Kitchens and Prospect Tower: c. 2 – 3pm

The coach will take us into Wollaton Park, just to the north of the University. The Hall is a visually stunning building which was designed by the architect Robert Smythson and built for Sir Francis Willoughby in the late 16th century, but was partially modernised by Sir Jeffrey Wyatville in the early 19th century. By the 1880s, the Willoughby family had decided that the house was too near the smoke and busy activity of a large manufacturing town, and it was let to tenants until vacated by 1881. It was bought by Nottingham

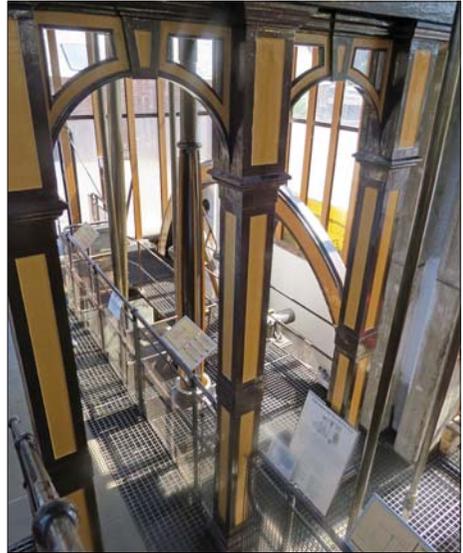
Council, and opened as a museum in 1925, largely housing natural history. It re-opened in April 2007 after being closed for refurbishment. The gallery of the main hall contains Nottinghamshire's oldest pipe organ, thought to date from the end of the 17th century and still blown by hand. Beneath the hall are many cellars and passages in the sandstone, and a well and associated reservoir tank, in which some accounts report that an admiral in the Willoughby family took a daily bath. The Tudor Kitchen is also in the basement. The climb to the Prospect Tower is rewarded by a tremendous view over the park and the city of Nottingham.



Wollaton Hall

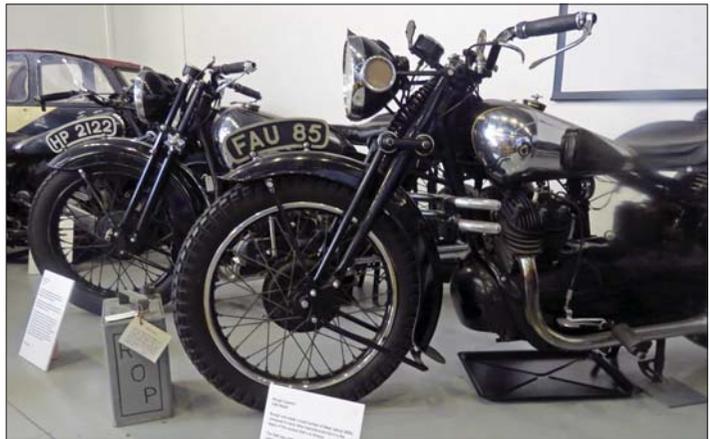
**Nottingham Industrial Museum:
c. 3:15 – 5pm**

The museum is situated in the courtyard of the splendid stable block below the Hall. This dates from the 18th century and is built of red brick with an elaborate ashlar south façade and portico. The museum opened in 1970, partly to house one of the two 60hp compound beam engines by R and W Hawthorn of Newcastle upon Tyne, dating from 1857, which came from Basford Pumping station when these were replaced by electric pumps. Nottingham was fortunate in having Sir Thomas Hawksley, a far-sighted engineer who was born in the city, as its water engineer for half-a century, as well as the wonderfully named Marriott Ogle Tarbotton as Borough Surveyor. They were also responsible for Papplewick Pumping Station (see Tour D). The Basford engine was placed in a purpose-built steel and glass building in 1972-4 and is regularly steamed. The museum has collections illustrating Nottingham's industrial history, including a variety of lace machines, bicycles made by Raleigh and Humber, as well as motor bicycles made by Brough's. There is also an interesting telecommunica-



Basford pumping engine, Nottingham Industrial Museum

tions gallery, a horizontal mill engine from a local brickworks and a number of tractors and other road vehicles. Like many such museums, the City Council withdrew funding in 2009 and it is now run by volunteers. Sadly, the horse gin from Pinxton Pit in Mansfield has disintegrated and is likely to find a new home at the Lancashire Mining Museum at Astley Green.



*Brough's motorcycles,
Nottingham Industrial
Museum*

THE NOTTINGHAM CANAL AND THE LACE MARKET

Site conditions

This is a walking tour on pavements and the paved canal towpath. It will be about three miles in total, taken very slowly. There are some steps down from Weekday Cross to the canal and along the towpath.

The coach will leave the University at 2pm, drop the group at the Weekday Cross in Nottingham and collect the group from the converted Nottingham Low Level Station at 5pm. Toilet facilities are available in the Broadmarsh Centre halfway through the walk.

Nottingham Lace Market: 2 - 3:30pm

This part of the walk is being led by a member of the Nottingham Civic Society and will begin at Weekday Cross, originally on the site of various markets but demolished and re-erected by the Civic Society in 1993.

The Lace Market, centre of the commercial side of the Nottingham

lace industry, is sited at the original heart of the city on a sandstone hill riddled with various caves. The street of High Pavement contains the impressive church of St Mary and the original law courts, now the Museum of Justice. Formerly a prestige residential area, many of the residents moved out to the newly built Park Estate in the mid-19th century as new warehouses for the sale and finishing of lace were built. Many of these have a distinctively glazed top storey where lace mending took place. In Short Hill, some of the original Georgian houses remain with additional inspection attics added when they became warehouses. Of particular note is Broadway, a short curved street flanked by tall warehouses and laid out by the Nottingham architect T.C. Hine in 1853-4. On the north corner of Barker Gate is a later warehouse with a glazed turret and pepperpot towers designed by another prominent local architect, Watson Fothergill. The grandest of all the lace warehouses was that on Stoney Street, the five-storey E-shaped block built for Adams and Page in 1855. As well as mending attics and a showroom for lace on the top floor, this incorporated a tea room, library and workers' chapel where services were held



Broadway, Nottingham Lace Market



*Watson Fothergill Building Barker Gate,
Lace Market*

every morning – Thomas Adams was a noted local evangelical Christian and philanthropist. The warehouse is now part of New College. The Lace Market became a conservation area in 1969, although changes have taken place to accommodate new business and housing.

Nottingham and Beeston Canal Walk: 3:30 – 5pm

Although Nottingham was built on the River Trent, navigation upstream of the city had always been difficult. The Nottingham Canal was built in 1796 during the period of canal building from the Nottinghamshire and South Derbyshire coalfield to transport coal to the towns and cities of the region. It was engineered by William Jessop and many places further north paralleled the Erewash Canal, with which it was in direct competition (see Tour F). The canal was 14.75 miles (23.7km) long, and rose through 19 locks, 14 of these being concentrated in a flight at Wollaton, with a long, level section beyond that to Langley Mill in Derbyshire. During its construction, the Trent Navigation Company built a second canal – the Beeston Cut – to bypass the river from Trent Lock to Lenton, where it joined the

Nottingham Canal. Much of the Nottingham Canal was drained and infilled in the 20th century, but the section through the city, incorporating the Beeston Cut, still gives access to the River Trent.

The walk along the canal will start back at the Weekday Cross and head down Middle and Low Pavements, with some interesting buildings to be seen, to Lister Gate. We then pass through the Broadmarsh Centre, cross Collin Street and continue down to Canal Street, where we turn westward towards the Castle and in front of the Fellows Morton and Clayton warehouse of 1895. We will turn up Wilford Street and after crossing the bridge over the Nottingham Canal (1792-6, closed except for this section in 1937) we will go down onto the towpath on the south side of the canal. We will walk towards Tinkers Leen, noting a good view of Nottingham Castle and a typical red brick factory with large iron-framed windows and a now-truncated chimney. It may have been for the textile industry, but map evidence also suggests it may have been a print works. Here is the Castle Lock, the only one on this section of the canal. We will then retrace our steps and walk under the Wilford Street Bridge with its rosette-panelled balustrades, noting the overseer's bollard of 1869. There are now modern buildings including the county archives on the south bank, replacing a demolished grain warehouse of 1880s date which had an arm from the canal going in a tunnel under the boundary wall of the National Carriers Yard. It was also served by railway sidings. On the opposite bank is the substantial red brick former British Waterways Board warehouse of a 20th century



Former Fellows Morton and Clayton warehouse, Nottingham Canal

date. Then we come to the canal side of the Fellows Morton and Clayton Warehouse with its barge arm under the building. This was converted to a canal museum in the 1980s but is now a popular pub.

We then pass under the Carrington Street Bridge, constructed in 1842 to provide access to the original Midland Counties Railway Station. Carrington Street leads to the present Midland Railway station of 1904,



Nottingham Railway station, Carrington Street

with its splendid terracotta work and Art Nouveau wrought-iron gates to the original carriage entrances. The station was built by another prominent local architect, A.E. Lambert. Next we walk beneath the new bridge for the trams. Originally there were a variety of industrial buildings on the south side of the canal here, and the modern buildings on the north side replace a variety of warehouses including more grain warehouses. We then pass under London Road and round the corner to the stretch of canal which goes down to the River Trent. At the roving bridge we climb up to road level and turn down the Great Northern Close to look at the front of London Road Low Level station – an elegant building designed by T.C. Hine and constructed in 1857. The iron-framed roof structure or the platform canopies can just be seen from the canal towpath. Originally it was the Nottingham terminus of the Great Northern Railway, but was superseded by the Nottingham Victoria station, and the last passenger service ran in May 1944. The station remained open as a mail depot for troops during the Second World War but became a parcels depot in the 1970s, and is now a gym.

GREEN'S MILL AND NOTTINGHAM CAVES

Site conditions

Green's Mill is a classic tower mill with internal stairs, but it is possible to remain on the ground floor to study the Science Centre. The coach will take us to the Museum of Justice in High Pavement, from where we walk down steps into the Broadmarsh Centre. The City of Caves is accessed down a short spiral staircase with handrail. There are uneven floors in the caves and a short staircase to exit the caves. The tour lasts about an hour.

*The coach will leave the University at 2pm and return by c. 5:30pm. Toilet facilities are available at the Mill and in the Broadmarsh Centre. **NB** the Broadmarsh Centre is in the process of redevelopment and we may have to take a different route.*

Green's Mill, Sneinton:
2:30 - 3:15pm

The Mill was built shortly after 1807 by the father of 19th-century mathematical physicist George Green,



Green's Mill, Sneinton

whose name was also George Green. It is located on the site of a previous post mill and there were at least two other mills on Windmill Lane in Sneinton. On his father's death in 1829, the younger Green inherited the mill but was able to use some of his father's wealth to pursue his studies at Cambridge. He had had limited schooling but graduated in 1838. He had previously written *An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism*, and was able to continue to work on hydrodynamics and optics. He returned to the mill only to die in 1841. The George Green Library at the University of Nottingham is named after him.

The mill was still in use until the 1860s, after which it was abandoned and gradually fell into disrepair. In 1923 a copper cap was fitted at the top to make the building watertight, and this survived until a fire destroyed it in 1947. It was acquired by Nottingham City Council in 1979 and was renovated between 1984 and 1986 by Thompson's, millwrights of Alford, Lincolnshire. The mill is still

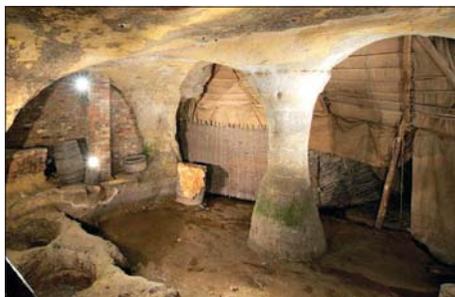


Green's Mill Science Centre. © Green's Windmill

operative and produces organic flour. The Science Centre, which commemorates the work of George Green, was also opened in 1986. By 2012, The Friends of Green's Mill began to take over management of the windmill and science centre on behalf of the City of Nottingham.

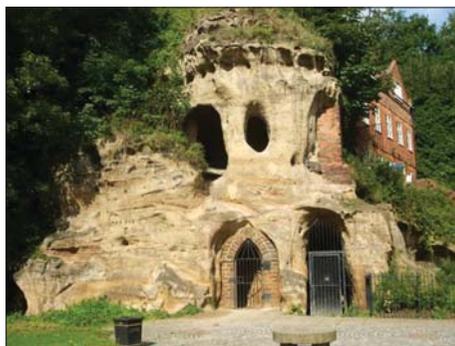
Nottingham City of Caves: 3:45 – 5pm

The city of Nottingham sits on a sandstone ridge which is honeycombed with caves, none of them natural but all dug out to serve as dwellings or places of work. The built-up area of Nottingham could not expand outside its medieval bounds because of the rights the burgesses of the city held over the open fields around the city. This resulted in the notorious cellar dwellings where many of the local framework knitters and lace-makers



Nottingham cave used as tannery

lived and worked, but also led to the expansion of the numbers of caves until the St Mary's Enclosure Act of 1845 which banned the renting of cellars and caves as homes for the poor. Some were used for industrial purposes, including a tannery which is on the route for our afternoon's exploration. Others served as air raid shelters during the Second World War. More than 800 caves are known and many were mapped during the Nottingham Caves Survey, run in 2012–2014 and led by Trent and Peak Archaeology. This built on the work of the British Geological Survey from nearby Keyworth in the 1980s and made use of a 3D laser scanner to produce a fully measured record of all the caves which could be physically accessed. In addition, Nottingham's City Archaeologist Scott Lomax has been identifying about 100 more caves every year since 2014. The caves we shall be visiting are those accessed from the Museum of Justice in High Pavement and extend under the Broadmarsh Shopping Centre, but there are several other sets of caves, some of which can be seen directly below Nottingham Castle. Nottingham's famous pub, Ye Olde Trip to Jerusalem – reputedly Britain's oldest – is partly built into these caves.



Nottingham caves below the Castle

STEAM ENGINES FOR WATER SUPPLY AND COAL MINING

Site conditions

Papplewick Pumping Station is an extensive site and there will be an opportunity for small groups to travel by minibus to see the underground reservoir. Inside the engine house, there are cast iron stairs with handrails to the various floors. Bestwood Colliery winding engine house has a lift to the top floor. Pleasley Pit has few steps but is essentially a pithead site and care needs to be taken. Very limited toilet facilities are available throughout the day.

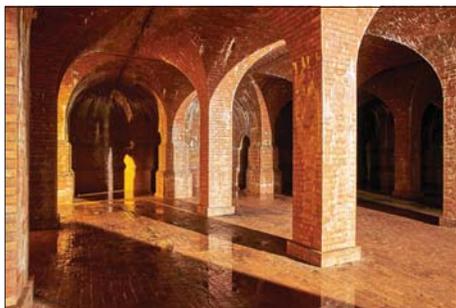
There is a very packed itinerary for this day! The coach will leave the University at 8:45am, travelling first to Papplewick Pumping Station. We will leave there by 11:15am in order to drive to Bestwood Colliery village and winding engine, where a buffet lunch will be served. We leave there at 2pm for Pleasley Pit, returning to the University c. 6pm.

**Papplewick Pumping Station:
9:30 - 11:15am**

Nottingham grew rapidly as an industrial centre during the 19th century, and drawing water from the Rivers Leen and Trent was no longer sufficient. In 1845, three private water companies which had been involved in these enterprises amalgamated under the Nottingham Water Act to form one company, the Nottingham Waterworks Company. This company sunk wells and later boreholes to the Bunter Sandstone north of the city, which is an excellent aquifer. Their engineer was Thomas Hawksley, who

was born in Arnold near Nottingham. He did not invent the principle of a permanent water supply under pressure but was the first engineer to apply it to the problems of supplying a large industrial town. Pumping stations at Basford, Bestwood and elsewhere were established, all with architect-designed buildings. Hawksley built the covered reservoir at Papplewick in 1880 but was already involved in a large number of water undertakings in other British cities and elsewhere, such as Bombay. After a long period of negotiation, Nottingham Corporation bought out the water companies in 1880, and the Borough Engineer, Marriot Ogle Tarbotton (see Tour A), was elevated to the position formerly held by Hawksley. He completed the pumping station at Papplewick in 1882-4.

The engine house contains what are thought to be the last beam engines produced by the Soho firm of James Watt and Co. in 1884. The two single-cylinder 140hp engines lifted water from the 200ft deep well to the covered reservoir on the hill behind



*The covered reservoir at Papplewick.
© David Edge*



Interior of Papplewick Pumping Station

the station, and so by gravity to parts of Nottingham. There are six Lancashire boilers, of which three were normally fired for steam for the two engines, which pumped 1,500,000 gallons per day. The glory of the

engine house, though, lies in its ornamentation: terracotta on the exterior and stained glass windows featuring water plants on the interior, together with four square pillars ornamented with wrought-iron water plants and brass fish, and capitals featuring water birds. The building is listed Grade II* and much of the site, including the ornamental cooling pond, is also either listed or scheduled. When it became known that the pumping station was to be replaced by submersible electric pumps in the 1970s, using the same pilot well sunk to establish the viability of the site in the 1870s, a Trust was rapidly established to save the building from deterioration and a second organisation created to maintain and steam the engines. The first steaming was in 1975, and further restoration took place between 2003 and 2007. The engine house is now licensed for weddings, which take place around the cylinder heads! Other static local engines can be seen in the workshops behind the engine house.



The landscaped grounds of Papplewick Pumping Station

Bestwood Colliery Village and Engine House: 11:30am – 2pm

Bestwood colliery was sunk in 1875, and was followed in 1881 by an ironworks, eventually comprising four blast furnaces. The Bestwood Coal and Iron Company (BC&IC) built a number of terraces for their workers, the first in 1876, with their monogram in brick on the facades. The company also built its offices, with distinctive clock tower, on Park Road. The coalmine was one of the most successful mines in the Nottinghamshire coalfield and at its peak employed 2,000 men, before closing in 1967.

The surviving engine house contains a rare example of a twin-cylinder vertical winding engine. It was constructed in 1874, and is notable for the early use of structural concrete, which was used externally for the moulded plinth and rusticated basement, and internally for the engine bed and to support the frames of the winding drum. The engine was

supplied in 1875 by the Worsley Mesnes Company of Wigan and is a vertical twin-cylinder, non-condensing steam winding engine. The cast-iron drum is on the second floor, and ropes from this pass through holes in the west wall and travel over wrought-iron supports to the headgear. By the 1960s, the shaft from which the engine wound had been superseded by a drift mine and the engine was maintained on standby. The colliery closed in 1974, but the engine survived and is maintained by a team of volunteers. The area has become a country park maintained by Nottinghamshire County Council.

Pleasley Pit: 2:30 – 4:30pm

The site is 152m above sea level to the north of the River Meden, and was a skyline feature until new housing was recently constructed below the pit. Its foundation is linked to the Stanton Iron Company (see Tour F) which in 1872 was granted a lease to extract coal from the Top Hard Seam by William Nightingale, father of



Bestwood winding engine house

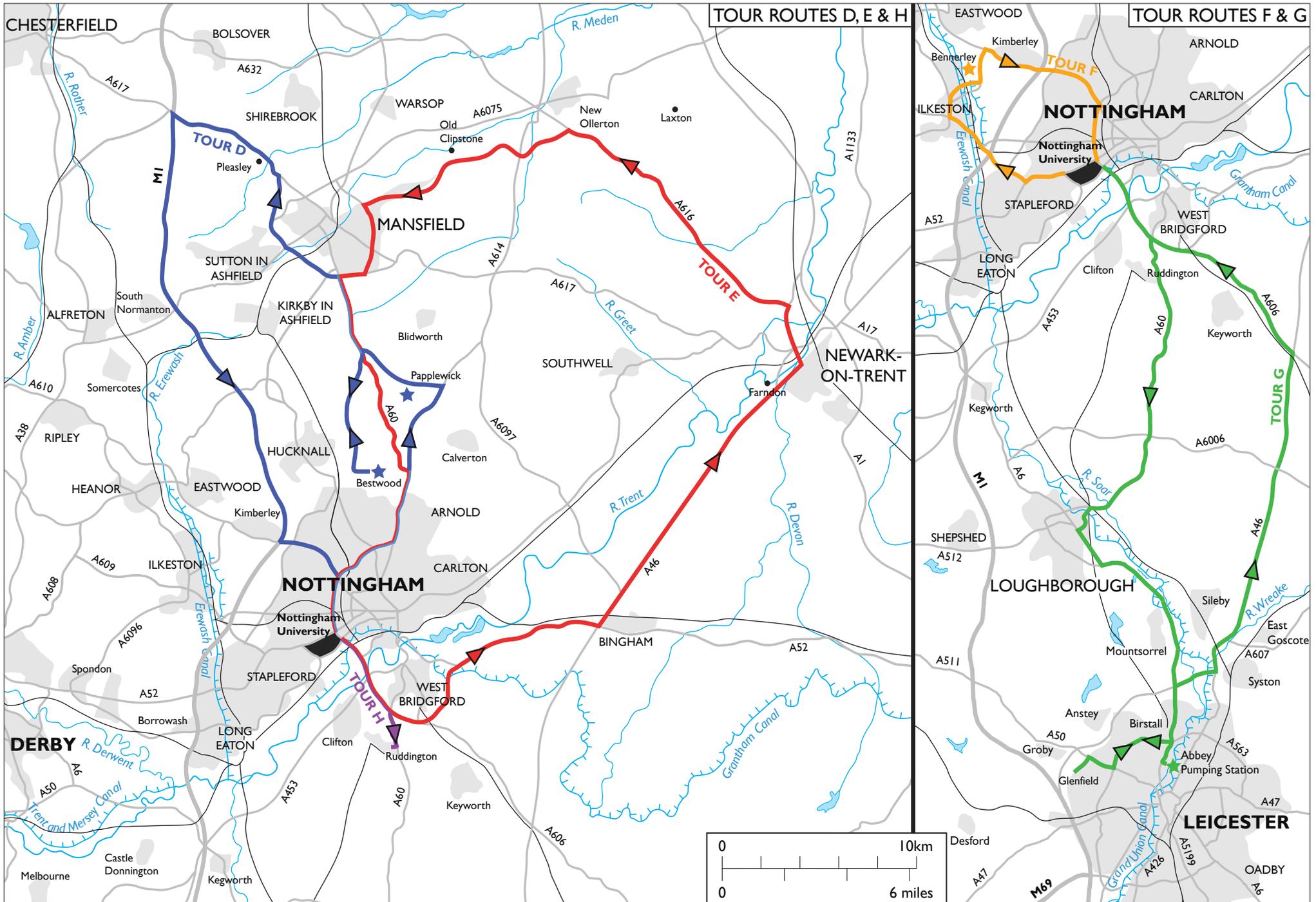
Florence. The sinking of the pit was delayed by large quantities of water found below ground, but production commenced in 1879. The winding house was located between the two shafts and was originally designed to house two Worsley Mesnes steam winding engines, positioned back-to-back, and each serving one shaft. Production increased rapidly and the engines had to be replaced, with both shafts being used for winding. The present winder at the North Shaft was manufactured by the Lilleshall Company and installed in 1904, while that at the South Shaft was made by Markham's of Chesterfield and installed in 1922. By 1890, with output averaging 1,000 tons per day, the underground haulage of coal from most of the workings by ponies had become unsustainable and a 60hp electrically driven underground rope-haulage system – the first of its kind in the world – was installed near the downcast pit bottom to haul coal up the 1 in 12 roadway from the North workings. During the next seven years, a further four electrically driven rope haulages were installed, freeing up 44 horses and raising output to 1,700 tons per day. The headstocks were built in 1898 and 1904 and are of steel construction on a concrete substructure.

Once the pit closed in the 1980s, the upcast shaft was converted to supply air to coal workings at nearby Shirebrook for several years. The demolition work involved in filling the downcast shaft and removing the baths, washery, screens etc. all took time, enabling the local authority to have the headgears and engines listed (Grade II) just before they were due for demolition in 1986. The preservation group Friends of Pleasley Pit was

formed in 1995 and began restoration, which still continues! The Colliery was Scheduled as an Ancient Monument in 1996 and has won several regional and national awards including the first of the Angel Awards in 2011. Although the original boilers were removed when the pit closed, one of the engines can now be operated with electric power. The interior of the engine house and ancillary buildings give a good idea of a former pithead layout. The surrounding area, like many former colliery sites, is now a nature reserve. A lot has happened since this site was visited by AIA conference delegates in 2005.



Pithead Gear, Pleasley Colliery



MALTINGS, BREWERIES AND A RIVER PORT: NEWARK-ON-TRENT

Site conditions

A walk of about one-and-a-half miles around the streets and riverside of Newark-on-Trent in the morning. Independent lunch. Two-hour cruise on the River Trent in the afternoon, with refreshment facilities and toilets on board. Coach trip to the village of Clipstone for viewing (at a distance!) of the headstocks and powerhouse of the former Clipstone Colliery.

The coach will leave the University at 9am. The river cruise is at 2pm from the Castle Wharf below the Castle, through the Town Lock and out to the village of Farndon. We then make our way back to the coach and return to Nottingham via Clipstone, arriving back about 6pm.

Newark: 10am – 2pm

Newark was in a good region for growing barley, and as malt is lighter in weight than barley, good transport facilities – initially the navigable river Trent and then in the mid-19th century two railway lines – meant it could be produced economically in the town and exported. The malting industry together with other agricultural industries also encouraged the

development of iron works. The town was dominated by breweries and maltings, many of which have now been converted for residential purposes.

We start in Castle Gate, by the medieval castle which was dismantled after the English Civil War. It was restored in the 19th century, first by Anthony Salvin in the 1840s and then by the corporation of Newark who



*Kiln Warehouse
Trentside, Newark*

*Warwick and
Richardson's maltings,
Newark*



bought the site in 1889. We can note where we will go down to the river for the afternoon's boat trip, before taking a look at the Corn Exchange of 1847 by Henry Duesbury in the Italian baroque style. We will then walk along Castle Gate to Beast Market Hill where we will see, on the northern side of the road, the Ossington Coffee House, of 1882 by Ernest George and Peto. It was financed by Lady Ossington of the Bentinck family to promote temperance and encourage coffee drinking. Below it is the Town Wharf, where goods such as coal were unloaded for the town. On the far side is the former Trent Wharf brewery, although more recently the building has had a number of different uses. We will then walk across Trent Bridge noting the little building on our left, now the WI County House but originally a toll house of 1725 and rebuilt in the 19th century using the old bricks. Trent Bridge was constructed in 1775 by Stephen Wright and was for a few years the lowest bridging point of the River Trent. It takes the old Great North Road across the river and therefore has always been an important bridg-

ing point, until the construction of the Lincoln bypass in the late 20th century. The present ironwork dates from 1848/9. On the west bank of the river and to the north of the bridge are the remains of Nicholson's Trent Ironworks of the 1860s.

We will then take a look at the Castle Station on the Midland Railway (Nottingham – Lincoln line) of 1846, by I.A. Davies and Italian in style. It is constructed of yellow brick with stone dressings, and has been very sensitively converted into a café. Also visible is the red-brick goods shed to the north of the station. We cross to the rear of the South Block of the Trentside maltings, also known as the Kiln Warehouse. It is the earlier of the two mass concrete maltings, and, following severe fire damage, has been reconstructed internally, visible at the rear, but retaining its mass concrete shell. We will look at the North Block from its riverside frontage. It has been converted to residential use but retains some semblance of its original roof lines. We then cross the river via the footbridge, with views to the south,



Castle Brewery, Newark, before conversion

and walk along the path to Warwick and Richardson's brewery. The first building we see is the semi-Greek style maltings of an 1864 date but sadly still awaiting re-use. The brewery is now fully re-used, with residences on the upper floors and in the new build, but with commercial use at ground floor level. The bottling plant was demolished and the site of it is under the Northgate Retail Park, as is the site of Peach's and Baird's maltings. Our walk then takes us in front of the Queen Anne style brewery offices of 1890 by William Bliss

Saunders, to the south of which are almshouses, and beyond them the site of another of Newark's foundries, the Wellington Foundry. Our next stop is George Street, which had maltings on both sides, all now converted to residences. The long walk up Appleton Gate takes us past the main museum, which deals primarily with the Civil War, and so to the centre of Newark. Ahead of us is Hole's Castle Brewery Offices of 1882, designed in the French Renaissance style by the eminent brewing and maltings architect/engineer, William Bradford. The red-brick brewery buildings to the rear of the offices were built slightly later and have been converted to residences.

River Trent boat trip with the Castle Line: 2 – 4pm

After lunch our boat trip will take us through the Town Lock. The old one of 1772-3 was the only one in the town until 1952. Thorpe's Warehouse, formerly Newark Egg Packers, lies on the east bank, and beyond that the Trent Navigation Warehouse of 1870. We continue under the Mill Lane bridge, with the Trent Brewery (originally a tannery) on the east bank, and the Newark Navigation



Newark Town Lock



*Headstocks and
Powerhouse,
Clipstone Colliery*

company's Longstone Bridge of 1819 along the west bank. We will go as far as the village of Farndon. There were maltings on the east bank, while on the west bank was Staythorpe A Power Station, coal-fired and operational from 1950 until its closure in 1983. Staythorpe B Power Station was also coal-fired, operational from 1962 until 1994. Finally, Staythorpe C Power Station is gas-powered and was built on the site of the other two, becoming operational in 2010.

Clipstone headstocks and powerhouse: 4:30 – 5pm

Our return route to the university will cross the Trent – noting the concrete silos of the Kelham sugar beet plant – to Clipstone. No evidence survives of the coal mines once so visible in the landscape, except for some of the rail lines to the collieries, now used as foot/cycle-paths. Clipstone Colliery dates from the early 20th century, when a new excavation was begun by the Bolsover Colliery Company to exploit the 'Top Hard' coal seam in the vicinity of Clipstone village – the same seam as at Pleasley Colliery (see Tour D). The sinking of the pit

shaft was interrupted by World War One, and development of the colliery site did not resume until 1919. The new colliery was operational by 1922, and went on to become one of the most productive pits in Britain, delivering 4,000 tons of coal per day by the 1940s. Two headstocks linked by a central powerhouse were completed in 1953, to the designs of architects Young and Purves of Manchester. The engines were 'Koepe' winders, a system of friction winding developed by the German mining engineer Frederick Koepe in the 1870s, and first installed at the Hannover Colliery in Westphalia in 1877. The Koepe system was particularly well suited for use in deep mines, as it permitted winding from increasing depths as a colliery developed, as at Clipstone. The colliery ceased production in 2003, and the site has now been cleared of all the colliery structures and transportation systems except for the winders, headstocks and powerhouse. This part of the colliery site was listed prior to closure, and now stands surrounded by security fencing within the recently remodelled colliery landscape, no new use yet having been found for it.

CANALS AND RAILWAYS IN THE EREWASH VALLEY AND THE BENNERLEY VIADUCT

Site conditions

Some stairs in the Erewash Valley Museum in Ilkeston. A two mile walk after lunch around the two canals and the Bennerley Viaduct, all on good paths, with a bridge over the Midland Railway line.

The coach will leave the University at 9:30am and coffee will be served at the museum. There are toilet facilities there. Lunch is provided at the Bridge Inn, Cotmanhay before the walk: drinks are available to purchase. The walk brings us back to the Bridge Inn where there are toilets. If time and traffic permit, we will spend a short time at the Great Northern Basin at Langley Mill – canalside towpath. Return to the University by 6pm.

Erewash Valley Museum, Ilkeston: 10 – 11:30am

The Erewash Valley to the north of Nottingham is a classic example of a post-industrial landscape. Coal was mined here from the 13th century onwards, but in the 19th century expanded into iron and steel-making. Stanton Ironworks was established in the 1840s with furnaces built alongside the Nutbrook Canal, an offshoot of the Erewash Canal. The Franco-Prussian War of the 1870s created an enormous demand for iron products



Stanton and Staveley manhole cover



Stanton Ironworks Ladle, Erewash Museum

and new furnaces were established alongside the Erewash Canal. The company was eventually taken over by Stewarts and Lloyds Ltd and merged with the Staveley Iron and Chemical Company, based near Chesterfield, to form Stanton and Staveley. This firm became the country's largest provider of iron pipes and later manhole covers – it is difficult to go far in any East Midlands town without seeing an example of one of these. Large numbers of people were employed by the firm, and company housing was built. Little remains of this once vast indus-

trial site, but the curator will give us a short talk in this small local museum. Ilkeston itself was a considerable centre for both lace and hosiery production, and many now disused lace factories can still be seen.

Railways and Canals in the Erewash Valley: 12 – 3pm

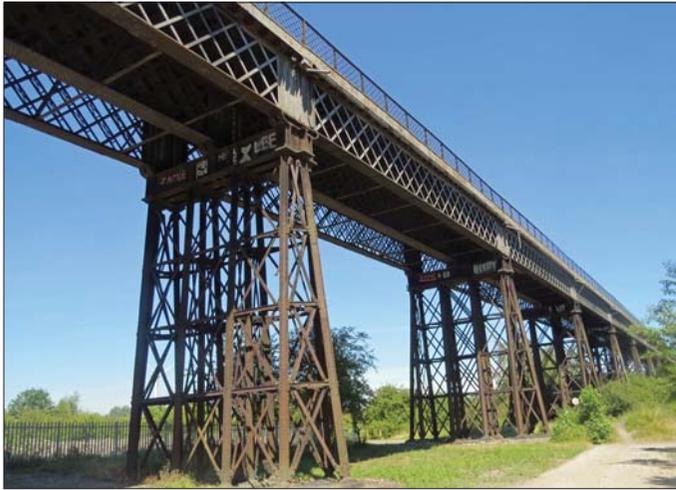
The canals in this area were constructed to move coal out of the region. Once the River Soar to Loughborough had been improved for navigation southwards from the River Trent, manufacturers in Loughborough and Leicester were anxious to obtain cheaper coal than that produced in Leicestershire. The Erewash Canal was built in 1778-9 for c. 12 miles between the River Trent, joining this almost opposite the junction with the improved River Soar, and Langley Mill in Derbyshire. With 14 wide-gauge locks to accept the Upper Trent boats of 70ft by 40ft, and collieries, ironworks, brickworks and foundries lining its banks, it was one of the most prosperous canals and, for example, paid its shareholders a dividend of 74% in 1826. The Nutbrook Canal, 4½ miles long, brought in further trade after 1792 and was surveyed by Benjamin

Outram. This became derelict as a result of mining subsidence and there is little left, but volunteers have maintained the Erewash Canal since 1968 when it was declared closed to navigation. The Nottingham Canal, which parallels the Erewash Canal in many places, was built in direct opposition in 1796, engineered by William Jessop. It was just over 14 miles in length from the Trent to Langley Mill, but passes through Nottingham (see Tour B). Much of this is not open to navigation, but has been upgraded in sections for recreational purposes.

The railway networks in this valley were equally complex. Once the Leicester to Swannington railway had opened in 1832, the Erewash Valley coal owners feared losing their trade southwards along the canal system. There was already a tramway from Mansfield to Pinxton, but efforts to raise funds to extend this southward were unsuccessful. However, their efforts prompted the construction of the Midland Counties Railway between Derby and Nottingham in 1839 and southwards to Leicester and Rugby in 1840. Then, as the Midland Railway, they built the line up the Erewash Valley from Nottingham — not completed until 1847 — and onwards to Chesterfield by 1862. The Bennerley Viaduct carried a branch of the Great Northern Railway for its Nottingham to Derby connection and dates from 1876/7. Since the area was subject to mining subsidence, lighter wrought-iron supports were chosen instead of the more usual brick. The viaduct was designed by the GNR's resident engineer, Samuel Abbott. The 433m long structure was built by Benton and Woodiwiss with wrought-iron components produced by Eastwood and Swingler of Derby,



Bridge Inn, Erewash Canal



Bennerley Viaduct

and carried the line over the River Erewash at a height of over 18m. The viaduct remained in use until 1968 when it was closed to freight traffic, and appears to have escaped demolition because of the difficulty of dismantling a wrought-iron structure with conventional metal-cutting equipment. It is listed Grade II*. The similar Meldon Viaduct in Devon was refurbished in 1996 and is now part of The Granite Way, a cycling and walking path, but efforts by Sustrans to achieve the same future for Bennerley have so far not met with success.

We shall walk from the Bridge Inn at Cotmanhay over the Erewash Canal, picking up a section of the Notting-

ham Canal and returning under the viaduct and over the Midland Railway.

Langley Mill Canal Basin: 3.30 – 4pm (if time and traffic permit)

The Great Northern Canal basin at Langley Mill was constructed by William Jessop in 1796 at the junction of the Erewash and Nottingham Canals with the Cromford Canal. This was restored by the Erewash Canal Preservation and Development Association in 1972-3. Only the Erewash Canal is currently in water, but there are plans to re-water the full length of the Cromford Canal. Unfortunately, retail development in the area has made the Basin difficult of access.



*Great Northern Basin,
Langley Mill*

BELLS, STEAM ENGINES AND A RAILWAY TUNNEL**Site conditions**

Stout shoes or boots are necessary for this visit, and a warm jacket is advised for the tunnel visit. Taylor's Bell Foundry is a working site and although casting will not be in progress that day, care must be taken. Glenfield Tunnel involves a walk into 400 yards of the tunnel, sometimes on muddy ground. Although there is basic lighting in the tunnel, a torch would be an advantage. Abbey Pumping Station is a museum, with cast-iron stairs to the beam floor in the engine house.

The coach will leave the University at 9am. Lunch will be taken in two sessions at The Railway Inn in Glenfield as the group will need to split into two for the tunnel visit. The day will end with the visit to the Abbey Pumping station and return to the University by about 6pm.

**Taylor's Bell Foundry,
Loughborough: 9:30 – 11:30am**

John Taylor & Co. continues a line of bell founding dating back to the 14th Century, when Johannes de Stafford, once a mayor of Leicester, was a bell founder. Since 1784 the business has been operated by members of the Taylor family, and in 1839 it moved to its present position in Loughborough, and is now the only working bell foundry

in Britain. The Foundry has a museum of bells and bellfounding which is the only one of its kind in the UK. The restoration of the foundry buildings after a period of financial difficulty began with the re-opening in 2012 of the foundry's own Campanile, which contains the most-pealed bells in the world. It is one of the few Victorian purpose-built manufacturing sites still being used for its original purpose although funding is still



Engraving of Taylor's Bell Foundry in the 1870s – the spire of the ringing tower no longer exists



Engraving of the Great Paul bell on its 1887 journey from Loughborough to Oxford

badly needed for the restoration of further buildings on the site. With modern computer profiling, Taylor's can cast and tune bells to the shape of any previous bell founder. They also produce carillons for a worldwide market.



Taylor's bell tuning

**Glenfield Tunnel, Leicester and Swannington Railway:
12 – 2:15pm**

Glenfield Tunnel is one of the few surviving features from the Leicester and Swannington Railway, one of the earliest British railways to make use of locomotives, the first section of which opened in 1832. Construction

of the railway was linked to the rivalry between coal owners in the East Midlands, and was intended to deliver coal from west Leicestershire to the factories of Leicester, who were then being supplied from Nottinghamshire via the Soar Navigation and the Erewash Canal (see Tour F).

The tunnel was at the time the long-



Interior of moulding shop, Taylor's Bell Foundry, with crane made by Herbert Morris, also of Loughborough



Western entrance to Glenfield Tunnel

est steam railway tunnel in the world at 1,796 yards (1,642m). It was designed by George Stephenson and its construction was supervised by his son Robert. The trial borings had suggested it was to be driven through clay and stone, but running sand meant the tunnel had to be completely lined in bricks and went considerably over budget! Large

numbers of bricks were needed and the tunnel was built using four working shafts, down one of which the contractor Daniel Jowett fell to his death shortly before the completion of the tunnel. On 17th July 1832 the official opening of the tunnel was marked by a special train for the Leicester & Swannington's directors and 300 guests. Hauling it was 'Comet', a locomotive built by Robert Stephenson's company and driven by his father George. Though possibly the stuff of legend, it is said that over-packing of the track caused the engine's tall funnel to strike the tunnel's roof, showering soot over those in open wagons. Passenger traffic ceased in 1924; the line closed altogether in 1966, and was bought by Leicester City Council in 1969. It has been used for several purposes since closure, including the testing of military lasers by Marconi whose factory is located nearby. Since the tunnel now runs under houses, a considerable amount of strengthening has taken place in recent years, with 38 concrete rings being installed.



Inside Glenfield Tunnel (by permission of LIHS)



Ventilation Shaft, Glenfield Tunnel

Leicestershire Industrial History Society has been instrumental in publicising the importance of the tunnel and in opening it to visitors several times a year. The horseshoe-shaped tunnel entrance is Listed Grade II.

Abbey Pumping Station, Leicester: 2:30 – 4:30pm

Like many other industrial towns, Leicester had to come to terms with sewage disposal in the 19th century. When piped water made water closets possible in the 1850s, Thomas Wicksteed, a noted civil engineer who had worked extensively in London, designed and built sewers leading to a treatment works on the edge of the town. However, limited capacity and high costs meant that a Pail Closet system continued to be used for



Abbey Pumping Station, Leicester.
© Ashley Dace

poorer neighbourhoods, the effluent from which was carried away in barges on the River Soar, which in turn became more and more polluted. The solution was to pump everything up to a new sewage farm on high ground at Beaumont Leys to the west of the city. The pumping station was opened in 1891 and the four massive steam engines were built in Leicester by Gimson; they survive as rare working examples of Woolf compound rotative beam engines. In 2014, all four engines were steamed at once, a rare event which attracted crowds from all over the country.

The building also houses a Museum of Technology, opened in 1972, but the engines are maintained, as elsewhere, by a group of dedicated enthusiasts. Displays in the museum change at intervals, but are generally concerned with the Victorian determination to provide clean water and dispose of sewage, as well as various historic transport exhibits.



Gimson beam engines, Abbey Pumping Station

RUDDINGTON: FRAMEWORK KNITTING AND TRANSPORT HERITAGE**Site conditions**

Ruddington is a large village to the south of Nottingham. The Framework Knitters' Museum is housed in three small buildings, and staircases with handrails lead to the first floor in each case. The Nottingham Transport Heritage Centre is a large open site, mostly gravelled, with several buildings to visit. Although not open to the public at the time of our visit, volunteers have agreed to open some of the workshops, which do need care on entry.

The coach will leave Nottingham University at 9am, returning from the Nottingham Transport Heritage Centre to the University at c. 2pm. Coffee will be served at the Framework Knitters' Museum and lunchtime snacks can be obtained in the café at the Transport Heritage Centre, which is being opened especially for us.

Ruddington Framework Knitters' Museum: c. 9:30 – 11am

Framework knitting — the manufacture of hosiery, gloves and other knitted goods — was one of the most important industries in the East Midlands from the 17th century onwards, and survived as a domestic industry until the late 19th century in

many places. The stocking frame had undergone many developments since its invention by William Lee in 1589, particularly being able to make wider fabric suitable for garments as well as more than one stocking or shawl at once. The wide frames were really the salvation of the industry, as there was less demand for men's hose once trousers replaced breeches for



Ruddington upper-floor frameshop

general wear. It was difficult to house these wide frames in domestic dwellings and so frameshops like the ones at Ruddington were built. This industry was a key factor in the growth and development of the village of Ruddington, with about 50% of all households in the village engaged in the industry in some way in 1851. In the late 1960s, the cottages and frameshops which now house the main museum site had fallen into disrepair and were about to be demolished. They were saved by the local community, and the main Framework Knitters Museum site opened to the public in 1971, followed by the Chapel, which was acquired in the 1980s. The frames themselves are not original to the site but were donated as other workshops ceased operation. On the top floor of one of the cottages is a collection of Griswolds, hand-operated circular knitters first patented in the USA in the second half of the 19th century on which socks could be made. These,



Ruddington Framework Knitters' Museum

like the knitting frames, are regularly demonstrated by the volunteers at the museum, which has won many awards.

Nottingham Transport Heritage Centre, Ruddington:
c. 11:15am – 2pm

Nottingham Transport Heritage Centre is situated within the boundaries of Rushcliffe Country Park. This had been the site of a filling factory for ammunition during the Second World War, being conveniently situated alongside the Great Central Railway between Leicester and Nottingham. After being decommissioned in 1945, the site was used by the MoD for auctioning-off redundant ex-military vehicles and equipment, and was finally closed in 1983. The site had been scheduled for housing, but after objections from the County Council, it was split into three. The majority was redeveloped as Rushcliffe Country Park, with the eastern side becoming a business park. The residual railway infrastructure and sidings on the other side were redeveloped as the Nottingham Transport Heritage Centre.

The Great Central Railway has been



Three-at-once knitting frame



Barton's buses at Nottingham Transport Heritage Centre

restored for heritage working between the outskirts of Leicester and Loughborough, and GCRN at Ruddington runs trains from its station to just north of Loughborough. An appeal is underway for bridging the remaining 500m gap by building a major bridge over the Midland Main Line at Loughborough, as well as bridging the Grand Union Canal. The result would be an 18 mile steam-operated heritage Main Line Railway between Leicester and Nottingham.

Trains will not be running when we visit, but it is a volunteer working day. The large site – of which the actual station is a small part – contains many other buildings housing various workshops. One is for various locomotives, both steam and diesel, such as the RSH 7761 'Ugly' No. 63 'Corby', built in 1954, together with wagons and carriages. Another is for the Nottingham Area Bus Society, which maintains and runs a collection of vintage buses, mainly those from the Barton Bus Company of Nottingham, which operated from 1908 until 1989. Some enthusiastic volunteers maintain a number of barn engines and are restoring a single-cylinder beam engine from a London brewery. The Ruddington Model Railway Club has a building with two magnificent layouts, including a large end-to-end O Gauge layout based on a GWR countryside station. A ride-on miniature railway works at weekends. See www.gcrn.co.uk



RSH 7761 'Ugly' No. 63 'Corby' at the Great Central Railway – Nottingham



Clockwise from top left: Bennerley Viaduct; Clipstone Colliery; grounds of Papplewick Pumping Station; Bestwood winding engine house; Taylor's Bell Foundry; Nottingham Lace Market