



In this issue:

50th AIA Anniversary Conference at Bath & Bristol; Pitchcroft Limestone Mine; The Soho Manufactory, Birmingham; AIA Grant updates for Hudswell Clarke locomotive and Britannia Sailing Trust; Kidwelly Industrial Museum; AIA Conference details for 2024.

INDUSTRIAL ARCHAEOLOGY NEWS

The Newsletter of The Association for Industrial Archaeology

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Chair's Letter to Members

Dear Members

A very Happy New Year from us to you and welcome to IA News issue 206 with excavation updates, restoration stories, the riveting relaunch of 108-year-old *Britannia* and a write-up of our 50th Anniversary Conference bash at the University of Bath. A huge thank you to Dr Michael Nevell, our IA News editor for getting this together over the festive period, to David de Haan who keeps the wheels in motion, and to all Council members for their time and commitment to the Association.

2024 brings lots of exciting things for the AIA, including a brand-new Digital membership for only £22 per year. It's 'Online-only'; with all the same great benefits and discounts – just without the paper. If you would like to opt for this new membership you can do so via our website or by contacting Taylor & Francis directly.

We'll also be hosting a variety of tours with *Heritage of Industry*, offering grants of up to £30,000 for restoration projects and celebrating emerging academics with our dissertation prizes. Following on from last year's success, we will again be collaborating with the Ironbridge Gorge Museum Trust to celebrate the Festival of Archaeology, a national event run by the Council for British Archaeology who celebrate their 80th anniversary in 2024. The festival runs from 13-28 July with events across the UK.

For anyone booking their 2024 diary, our annual Conference will be held in October in Cardiff, with guided tours and visits planned for those wishing to enjoy an extended weekend. Check out page 13 to get a flavour for the themes we cover. If you haven't joined us at Conference before, we hope you'll consider in future as it is great to get together with a like-minded bunch to share knowledge and be sociable. If you would like to help with our events or if you have suggestions on what we can do to make AIA events work for you, please let us know! chair@industrial-archaeology.org

We do hope you enjoyed being a member of the AIA in 2023, and that you will continue to do so in 2024. Your support is essential, sincerest thanks.

Zoe Arthurs

In this Conference Special Issue

Industrial Archaeology & Heritage Society News - pg3
Current IA & IH Research - pg3
AIA Restoration Grants Updates - pg10
AIA 50th Anniversary Conference in Bath – pg13
Association News - pg18
The Back Page: Kidwelly Tinplate Works Museum - pg24

Cover Story: Fairbairn steam crane, from c. 1840, Bristol Docks. Part of the AIA 50th Anniversary Conference visits. Copyright: Bill Barksfield.

Back Page: Steam engine at the Kidwelly Tinplate Works. Copyright: John Copping

Devizes IA Conference 2023 Report

Doug Roseaman writes: The 2023 Devizes IA conference, run by the Wiltshire Archaeological and Natural History Society, was a great success with over 80 people from all over the South West attending. Whilst there was no particular theme for the day, Bath stone, canals, railways and roads were intertwined in the talks.

Mike Stone spoke on the building of Georgian Chippenham. After coffee Tim Bryan, Director of the Brunel Institute, spoke about the varied work of Brunel in 'Iron, Stone and Steam'. That is also the title of his latest book published by Amberley in November. Following this we had a very different talk from Stuart Burroughs, Director of the Bath at Work Museum, on the activities of the Arts group in Bath who had been instrumental in the preservation of workers housing in the City. They also championed renewable energy and recycling long before the main stream caught on and held several internationally attended exhibitions. After lunch John Farrow gave an update on the restoration of the Wilts and Berks Canal. To start on a Wiltshire theme the initial photos showed some of the many reproduction 'Stonehenges' he had found on a recent trip to America. The Conference was rounded

off by John Chandler who spoke on 'Taking to the road in Georgian Wiltshire'. He explored how the road system in the County developed and how the stage coach trade grew with road improvements and then declined with the coming of the railways.

Planning for the 2024 Devizes conference, to be held on Saturday 26th October, is underway with two speakers already booked. The theme will be 'agriculture' and any offers to speak or suggestions of speakers will be welcomed – Contact the IA Committee secretary Doug Roseaman either at the Museum 41 Long Street, Devizes SN10 1NS or via email – dandj@roseaman.co.uk



Current IA & IH Research

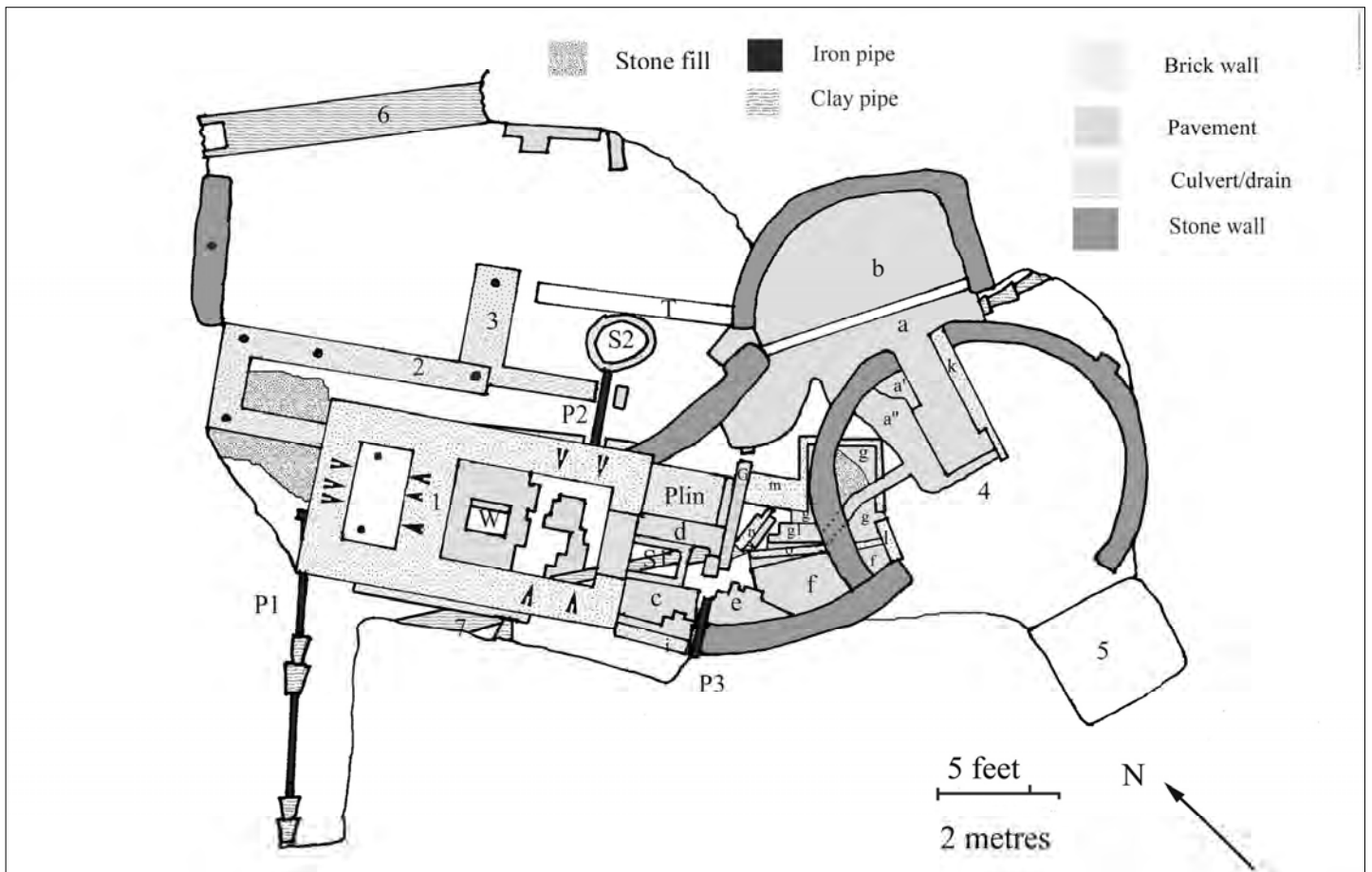
Excavations at Pitchcroft Limestone Mine, Church Aston

David Poyner and Kelvin Lake of the Shropshire Caving and Mining Club write: For around 10 years, beginning in 2009, the Shropshire Caving and Mining Club investigated the site of a limestone mine at Pitchcroft (SJ 739172), Church Aston, near Newport in east Shropshire. Regular accounts of progress appeared in *Below*, the club journal and a report was also published following the National Association of Mining History Organisations' Conference in Aberystwyth in 2013. A final account of the investigations is in preparation. The work was initiated and led by the late David Adams, founder and president of the club; David was born and lived in Newport all his life and had a deep knowledge of the local limestone workings.

Pitchcroft is on a band of carboniferous limestone bordering the East Shropshire Coalfield. To the south, around Lilleshall, the limestone was worked

by quarries, but at Pitchcroft underground extraction was necessary. Working in the parish was underway by the late 17th century with the earliest mines at Blackberry Bank (SJ 730164), due west of Pitchcroft. In 1794, these mines and the site of Pitchcroft were leased by the Lilleshall Company. This was one of the major iron-producers in the East Shropshire Coalfield; they needed limestone as a flux for their blast furnaces. The Church Aston limestone was taken to their furnaces by the Donnington Wood canal. Activity at Pitchcroft probably started around 1826, by which date a branch of the canal was open to the site of the mine. The Church Aston tithe map of 1843 shows what are likely to be winding and pumping engine houses at the mine. Mining was brought to an abrupt end in 1860 when an underground aquifer was struck and attempts to pump the mine dry failed.

By the middle of the 20th century, all that was visible on the site was two shafts on top of a spoil tip, some holding-down bolts which were probably from a winding engine and a third shaft, presumed to be for pumping. The initial aim of the club was to uncover the foundations of the winding house and record it



Pitchcroft Limestone Mine - excavation plan of the winding house complex.

before back-filling. It was assumed that the bolts would be no more a meter in length and so the work would take no more than a few weekends hand-digging.

It actually took around five years to fully uncover the winding house and associated buildings; the bolts were around 3 meters long and it was not possible to completely uncover them. The engine house was a substantial brick building with walls between 45cm and 70cm thick, standing up to 2 meters high. It had two rooms; the larger of these had an entrance and a brick-lined oval well. To the north of the engine house were further walls, which probably housed a flywheel and a spool-type winding drum. To the south-west was the base of a haystack boiler adjacent to a robbed-out chimney. Between the engine house and the boiler base were a series of brick pavements, low walls and drains, bounded by stone retaining walls. There were two brick culverts to the north and south of the site, aligned at 45° to the other remains.

The most informative features on the sites were the remains of the boiler and associated culverts. Careful excavation showed that there had been a series of boilers overlying each other; the earliest had been on a different alignment to the rest. The culverts could be related to these and presumably had been used to take water away during boiler wash-outs. There was some evidence for changes

to the structure of the engine house but these were harder to interpret. It was however clear that the walls of the house cut through a culvert belonging to the earliest boiler. The engine would seem to have used a beam to drive the winding spool, but it was not possible to unambiguously work out the drive arrangements.

Subsequent work investigated the ground next to the presumed pumping site. This revealed the site of a probable cylindrical boiler, with associated culverts. Interpretation was made difficult as a substantial part of the site had been destroyed, perhaps when materials were recovered after closure in 1860. A probable flue was discovered, leading to the robbed-out base of a chimney. Around 3 meters below the boiler was the floor of the pumping engine house. The walls had been levelled to the foundations, but enough survived to identify the bob wall next to the shaft. A condenser pit was identified between this and the shaft, but it had been carefully backfilled with clay, suggesting some major change in the engine. Next to the shaft itself was a horseshoe-shaped retaining wall, giving access both to the top of the condenser, and via a window in its lining, the shaft itself. This also had been filled with clay but space had been left for a pipe to connect between the window and the surface. The reason for this is unclear, but it again speaks of modifications to the pumping arrangements.



The remains of the winding house at the Pitchcroft Limestone Mine, with the boilers in the background.

The excavations have shown that a single mine, which operated for around 35 years, underwent significant alterations during this time. Whilst reconstruction of boilers might be expected, the rebuilding of the winding engine house and a substantial reordering of the pumping engine go well beyond routine maintenance. In spite of this, the Lilleshall Company, one of the leading companies in

the coalfield, found it worthwhile persisting with a low-pressure winding engine with steam supplied by a haystack boiler. Perhaps this suggests a pragmatic approach by the company to investment in new technology. Whatever the reason, the work shows what excavation can reveal about what might be considered to be a simple site.

The floor of the pumping house.



The condenser pit next to the pumping shaft.

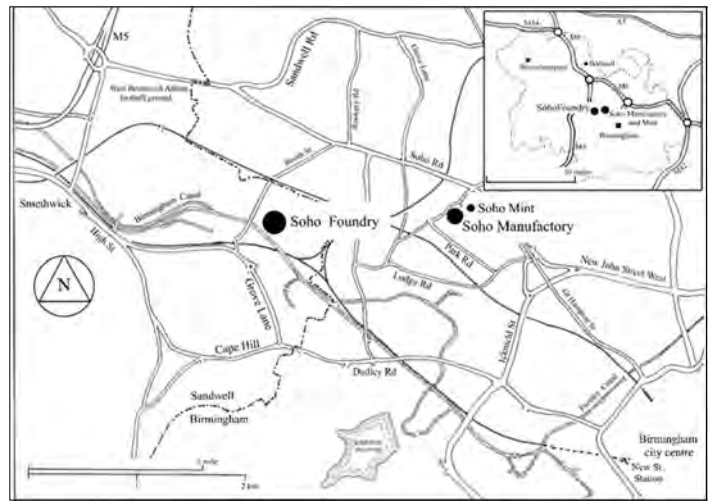


The Soho Manufactory, Mint and Foundry, West Midlands: Where Boulton, Watt and Murdoch made History

George Demidowicz, winner of the Peter Neaverson award for scholarship in 2023, writes about his latest book: This volume, published by Historic England and Liverpool University Press in February 2022, provides a comprehensive analysis of the ground-breaking historic industrial complex, created to the west of Birmingham in the 18th century and associated with Matthew Boulton, James Watt, and William Murdoch. The Soho Manufactory (1761-1863) and Soho Mint (1788-early 1850s) were both situated in the historic parish of Handsworth, now in the city of Birmingham. The Soho Foundry (1795-1895) lay in the historic township of Smethwick, now within Sandwell Metropolitan Borough (see right). Together they played a key role in the Industrial Revolution, achieving many world 'firsts': the first working Watt steam engine, the first steam-engine powered mint and the first purpose-built steam engine manufactory (the Soho Foundry), which was the first factory to be lit by gas, to name but a few. Existing literature focuses largely on the biographies of the people involved in the venture, primarily Boulton and Watt, or the products they manufactured. The place - the Soho complex - has attracted comparatively little attention. This volume is the first to concentrate on the buildings themselves, analysing not only their physical origins, development and eventual decline, but also their water and steam power systems. An interdisciplinary approach has been employed combining archival research in the magnificent Soho Collection at the Library of Birmingham with the results of archaeological excavations. The volume is profusely illustrated; over 290 figures altogether include 70 original reconstruction plans and drawings by the author and a great deal of archival material, most published for the first time.

A detailed analysis is beyond the scope of this article and a way of selecting some of this material is to describe how the research came about, evolved and how certain discoveries were made.

My research began many years ago with the Soho Manufactory. Having initially been commissioned by Birmingham Museum to research for an exhibition on the water mills on the River Cole on which their branch museum, Sarehole Mill, is located, my interest widened to include watermills elsewhere in Birmingham. I was intrigued by the fact that the Soho Manufactory on the Hockley Brook, associated with Matthew Boulton and James Watt had a water wheel operating almost to the end of its life in the 1850s. The well-known illustration of the



Location plan of the three Soho industrial sites

Soho Manufactory, with the majestic Palladian silver and plated works (the 'principal building') dominating the view blocks the view of the water mill located in the main complex of industrial buildings to its rear. The steep slope and pool that can be seen to the right, however, hint that there was potentially the reservoir and head of water that all such mills needed.

The famous partnership of Boulton & Watt was forged initially to sell the rights to erect Watt's improved engine and then after 1795 to manufacture the complete engines themselves. But Matthew Boulton's immediate motivation in persuading James Watt to leave Scotland and join him at the Manufactory was to solve the normal problems suffered by water mills: floods, drought in the summer and winter freezes. Any of these could stop the mill from operating.

James Watt's first working steam engine in the world is well known, but not within the Soho context; it graces the steam engine gallery at the Science Museum where it has been a prize exhibit since the 1860s. What was not common knowledge before this research began is how this water pumping engine was employed at the Soho Manufactory. There is no extant documentation that describes its function. It was only through examining various maps and plans of the Manufactory, and in particular, the bodies of water that were a significant feature of its layout that it was deduced that the engine was located to intercept the mill's tail race and pump its water back to the head race. James Watt's Kinneil engine, brought to Soho in 1774, was in fact a water-returning engine aiding the primary source of power at the Manufactory at the time – a water mill. In 1774 its 18-in cylinder was replaced by a 33-in cylinder and became affectionately known as 'Old Bess'.

The Soho Manufactory has many more images than complete plans of its layout (of which there are only two). With views of the front and rear, I thought it was worth attempting a 3-D reconstruction for about

the year 1805 when it had reached its maximum extent. This was drawn as an axonometric projection raised on a composite plan compiled from several sources (see below).

The resulting axonometric was useful in its own right as a graphic representation of the lost Soho Manufactory, completely demolished by 1863, but it also best illustrates the water circulation system that integrated Soho Mill with the James Watt steam pumping engine.

Water was taken in the normal way as a head race from the mill pool and passed under a road into a 'canal' that was both an aesthetic as well as a functional feature lying below the terrace fronting the principal building. A culvert in the terrace wall carried water below the principal building and its rear yard and over a major break of slope, which I have called the 'Great Bank' for convenience, and then along a timber trough (pentrough) to the water wheel. The water left the wheel, having completed its work by means of potential energy, travelling along a culverted tail race below the lower yards. About 60m from the wheel the water was intercepted at right angles and led along a culvert to the bottom of the pump operated by the James Watt engine, which lifted the water through 24 ft (7.3m) to a channel that ran along the end of the principal building to connect with the 'canal' thereby completing the circuit (see below).

The Great Bank was obscured by buildings that were one-storey high facing the rear of the principal building and three storeys high towards the lower yards. The break of slope is visible at the interconnecting steps, with its distinctive semi-circular form at the top.

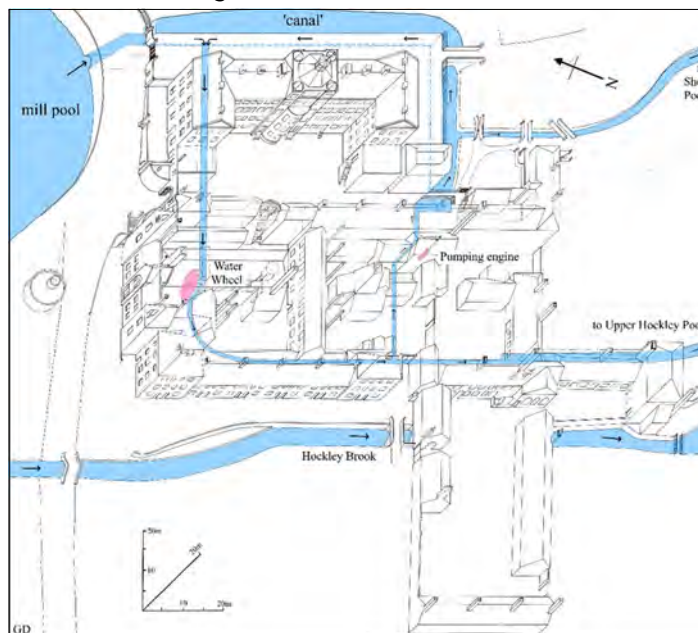
The Soho Mint, the first steam-engine powered mint in the world, was positioned about 110m from the Manufactory's principal building, hidden deliberately within Boulton's garden buildings for secrecy. The mint, originally constructed in 1788-9 by Boulton,

was substantially altered in 1798-9 so that the presses were no longer powered by the engine mechanically but by vacuum power generated by the steam engine. It was this mint that produced the national coinage, the famous cartwheel pennies and twopences.

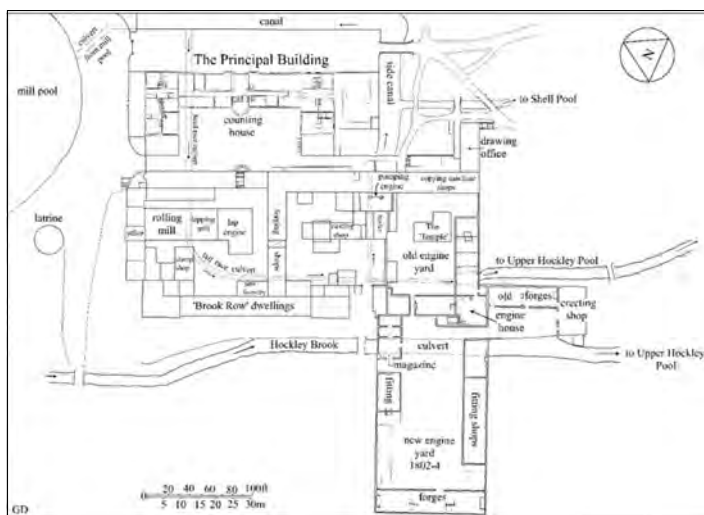
Boulton's son, Matthew Robinson Boulton, radically reorganised the mint between 1824 and 1826. Detailed plans of the main mint building exist, but not of the complete layout, which included a new trapezoidally-shaped coin cutting out room. I could not originally locate this room in the old mint buildings. The documentation revealed that an underground drive shaft of about 60m (196ft) in length had been installed. Along with four coining presses it was to be driven by the new steam engine. Pencil additions to one of the cross-section drawings of the altered mint building showed where the main pulley on this drive was located. A leather belt from a pulley on the steam engine wrapped round the pulley positioned below ground in an adjacent yard. The orientation of this narrow yard pointed north-westwards to the central bay of a redundant crescent-shaped building once used for making a flexible buckle that could be moved from shoe to shoe, known as a latchet. The central bay of the Latchet Building was trapezoidal in shape and in an instant the location of the new coin cutting out room was revealed!

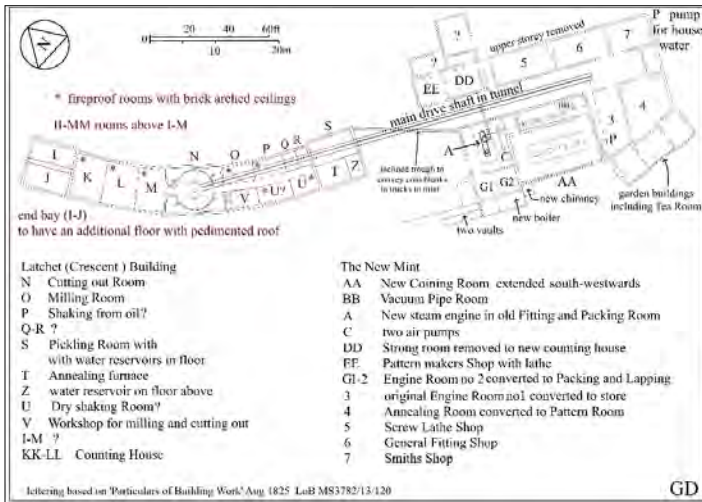
Without an extant overall plan of the mint, this deduction, although logical, could not be proved correct. Only archaeological investigations on site could accomplish this, but this would depend on the Soho Mint surviving below ground in an area which had been developed by housing in the 20th century. There was no prospect, however, of excavations taking place here as a condition of planning permission to redevelop. Time Team, the Channel 4

Axonometric projection of the Soho Manufactory c.1806, showing the mill water circulation



The composite plan of the Soho Manufactory c.1805.





The Soho Mint 1824-6 showing the underground drive shaft leading from the steam engine at A to the new Cutting out room at N in the former Latchet Building.

archaeological programme, appeared to be the only means by which a research excavation with such an aim in mind could take. The programme was initially very reluctant to take it on for in three seasons to date (1996) they were more used to open green fields providing great flexibility to open up trenches elsewhere, if a particular location failed. This was the first time that they would be digging in inner-city back gardens, but equally rarely the Soho archive was on hand to compensate and indicate where the buildings and structures were roughly located. With good local community engagement, gardens were identified which could be dug up with owners' permission. The results proved to be beyond expectations, uncovering three separate sections of the brick drive shaft tunnel, leading from the steam engine to the cutting out room (see bottom left and above). Remarkably a small section of the latter's outside wall was found below patio slabs.

Apart from confirming the position of the underground drive shaft and its termination in the coin cutting out room, the excavations also fixed precisely for the first time the location of the Soho Mint and the Crescent (Latchet) Building (see above). In addition a small excavation uncovered the southern end of the front wall of the principal building at cellar level. It was limewashed on the interior but the cellar floor at considerable depth was not reached for health and safety reasons.

The third Soho site, the Soho Foundry, did not come to my attention until soon after the Time Team excavations in 1996, just over a century since Averys, the weighing machine manufacturers had taken over the site. There were rumours that the surviving buildings there were threatened by demolition to be extended into the scrap metal yard immediately adjoining to the west. Joining a site visit organised by the new Lunar Society, then recently formed, I was immediately struck by the sight of early Boulton & Watt buildings still standing high.

The view before me could not have contrasted more with the image I retained of our digging in residential back gardens only a few weeks earlier to find remains of the Soho Manufactory and Mint where nothing survived above ground.

Before this time there was no understanding that the very earliest fabric of the main foundry building dating to 1795-6 still survived. Fortunately its significance was quickly recognised and together with the massive erecting shop with its early cast iron and wrought iron roof constructed by Boulton & Watt in 1847 was spot-listed Grade II in June 1996. These buildings were regraded the following year to II* along with the Boulton & Watt pattern stores which mainly date from 1809 with the wider area being designated a scheduled monument. Demolition had been averted and there was now

The drive shaft tunnel excavated by Time Team, Easter 1996. At the far end of the trench a massive stone block can be seen, one of four originally that supported the main pulley connected by leather belt running in the offshoot tunnel to the left leading to the steam engine. Another section of the excavated tunnel can be seen in the adjacent garden beyond. Excavations for sand in the early 20th century destroyed the major part of the mint building including the coining press room and steam engine room.





The site of the Soho Mint lies in rear gardens of houses in South Road, Handsworth.

time to divert attention from the Soho Manufactory and Mint towards researching the history of the Soho Foundry from its modest beginnings in 1795-6 to its maximum extent in the late 19th century and demise as a steam engine works in 1895 (see below). This led to Sandwell Council commissioning a documentary and archaeological study, completed in 2002. The history section of this report forms the Soho Foundry chapter, the longest chapter in the book.

In 2008 a temporary roof was erected over the main foundry building jointly funded by the then English Heritage (now Historic England), Sandwell Council and Avery Weigh Tronix, the owners of the site. This is a distinctive sight on a journey by train from Birmingham to Wolverhampton.

This article cannot do justice to the fascinating history of the buildings and power systems of the first purpose-built steam engine manufactory in the world and the reader is referred to Chapter 7 of the book. Its publication has been timely for at long last a buyer of the site has come forward and feasibility studies and proposals for the reuse of the buildings have been prepared. But it is early days...and any reuse of the buildings, including, it goes without saying, heritage interpretation will need considerable funding, and commitment to the regeneration of a much wider area.

I have space to draw here on one significant aspect of the Foundry's history. It was the first industrial building in the world to be lit by gas (see above). Much has been written about Matthew Boulton and James Watt, but I have a considerable regard for the third more neglected member of the Soho triumvirate – William Murdoch. It is for this reason that his name appears in title of the book. Murdoch was persuaded to return from Cornwall in 1798 where he was erecting engines on behalf of the firm to help rescue the failing boring mill. He had experimented with gas lighting at his home there. In his own words:

'In the year 1798 I removed from Cornwall to Messrs Boulton and Watt and Co's works for the Manufacture of Steam Engines at the SF and then constructed an apparatus upon a larger scale [than in Cornwall] which during many successive nights was applied to the lighting of their principal building.'

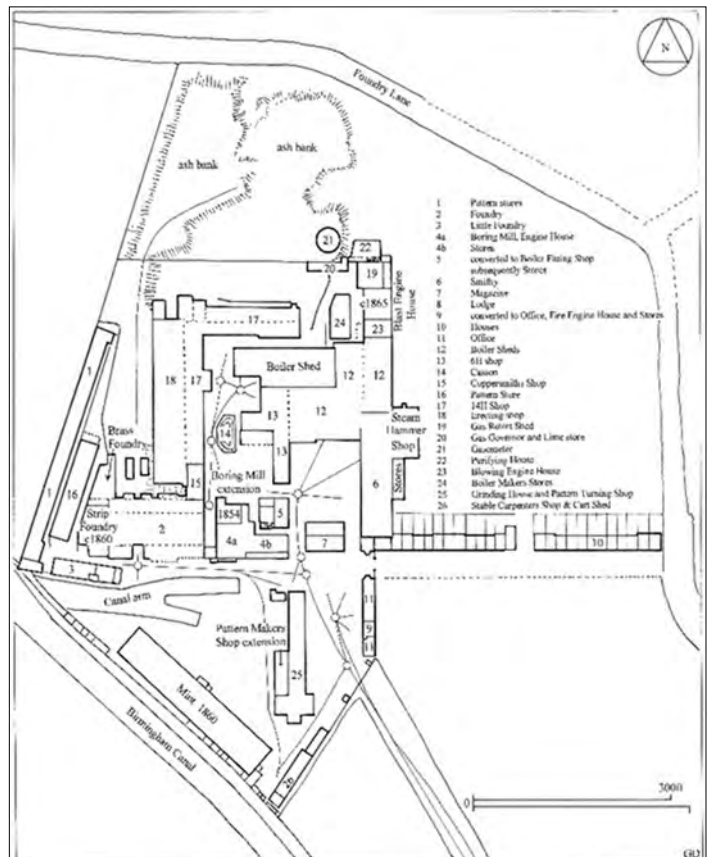
James Watt Jnr provided more detail when recalling events in 1809: 'William Murdoch constructed a retort of iron with a tube from it of about 30 or 40ft in length and to the end he applied burners of various dimensions and gave light during the night time to one of the buildings of the SF.'

There are significant additional details in an 1805 memo: 'Murdoch managed to have small gas retorts set up in the SF Laboratory and these were fitted on 12 Dec 1798.'

The Laboratory was listed in an inventory as being 'in Arch under Foundry for furnaces' and in later inventories arches were described as being 'near the Laboratory'.

The brick arches or vaults, originally five in total, still exist at lower ground level on the north side of the main Foundry building and are accessible. The

The Soho Foundry 1854-1895. Reaching its maximum extent in the latter half of the 19th century after James Watt and Co, took possession in 1848, a partnership with no Boulton or Watt connection, the site was sold to Avery's in 1895, bringing exactly a century of steam engine production to an end.

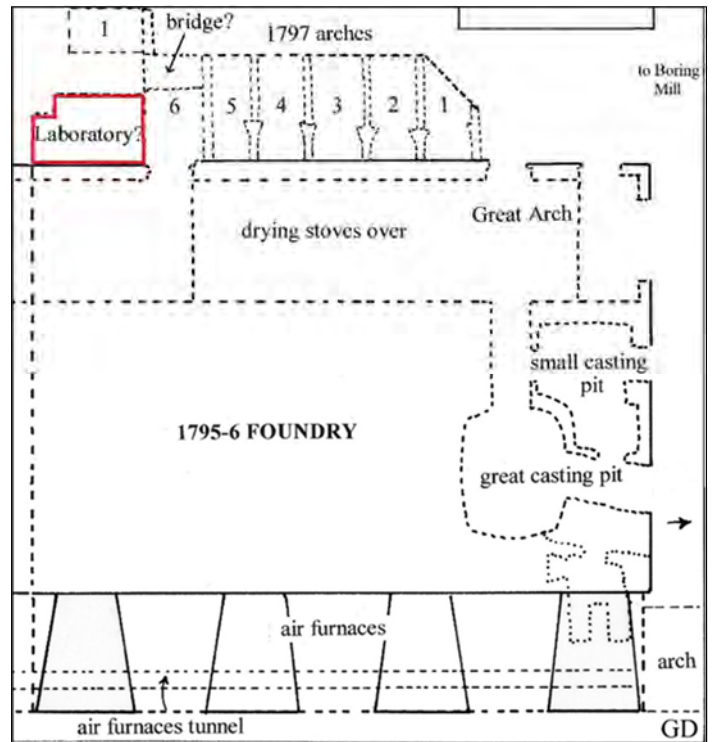




The main foundry building 1996.

latter had been built on a north-south slope so that its casting floor lay at upper ground level on the north of which were located the drying stoves. The top of the brick arches formed an exterior platform at upper ground level for the ash to be removed from the rear of the drying stoves. A map of c.1800 shows that immediately to the west of the five arches was a single arch orientated east-west rather than north-south (see right). It is suspected that this arch or vault might have been William Murdoch's laboratory in which a retort was placed in 1798 with a pipe leading from it into the foundry to light it on that historic December day.

The location of this vault has been identified, but it is presently inaccessible, buried beneath the sand of the main casting floor, but could be excavated archaeologically. It could also be reached from lower ground level but a wall would need to be broken through to do so. If it is the laboratory, was the small gas retort left in there?



A possible position of William Murdoch's laboratory installed in 1798.

This article first appeared on the Liverpool University Press website as part of its publication partnership with Historic England. Many thanks to George Demidowicz and HE for allowing its reproduction.

AIA Restoration Grants Updates

Restoring the Hudswell Clarke no.1539 'Derek Crouch'

Nathan Wilson writes: This report covers the restoration of the Hudswell Clarke no.1539 'Derek Crouch' based at the Nene Valley Railway, being overhauled by The Small Loco Group. The AIA very kindly awarded us with a £20,000 grant towards the restoration of the locomotive, and this note details what the grant was spent on and how it has helped the restoration of the locomotive.

To start with, the grant covered the initial boiler inspections of the locomotive once the boiler had been removed from the frames and had the tubes removed. Non-Destructive Testing was also carried out and a scope of works devised for the overhaul of the boiler undertaken from the findings. During the stripping of the boiler, the chimney was removed and was in a poor condition, apart from the bottom

casting which attaches the chimney to the smokebox, so a new cylinder was ordered for the stack section, and a new chimney top casting was ordered. Luckily a pattern already existed and with thanks to our friends at the Mid Suffolk Light Railway, the pattern was loaned to us and with some slight modifications to ensure that the casting gave us a long-life span and increased strength around the fixing points internally the new casting was ordered.

One of the major jobs the locomotive required was machining work to the wheelsets. All the tyres needed re-profiling due to wear, and the axle journals which the axleboxes are fitted to were also badly tapered. The wheelsets all went away and have received new profiles to all tyres, and the journals have all been re-machined parallel. Initial fitting of the bronze axleboxes to the journals show a much better seating of the box to journal face as they should be. The wheelsets have since been stripped and repainted and await final fitting of the axleboxes before the locomotive can be re-wheeled



A volunteer working on repairing the boiler of the Hudswell Clarke locomotive.

in the near future.

The biggest job the locomotive has required is the fitting of a new cylinder block due to considerable wear and damage to the original, with a major crack running through one bore and the back face of the block, and heavy wear and corrosion making a repair unviable. There are three classes of this locomotive left in preservation, and through all three owners working together, we have managed to borrow a pattern from the owner of 'Julia' based at Ruddington, who had the pattern made and a new cylinder block cast a few years ago. I then contacted the North Norfolk Railway and M&GN Society who

Installing the new cylinder block on Hudswell Clarke locomotive.



The restored wheelsets for the Hudswell Clarke locomotive.

own 'Wissington', and we came together to get two sets of castings made, one set for 'Derek Crouch', and one for 'Wissington', utilising the patterns made for 'Julia'. We worked alongside the South Lincs Foundry to get the castings produced and upon arrival at Wansford they were shortly dispatched to Riley & Sons in Bury for machining work of each half such as mating faces, stud holes, cylinder bores and valve rod guides. The two halves were then fitted together and bolted up and then dispatched back to Wansford. A test fit showed the new block fitted the frames perfectly. It is now awaiting the production of fitted bolts so that it can be final fitted to the frames. This part of the project not only benefitted us, but two other locos – 'Wissington' now has a new block in store ready for fitting at the next ten yearly overhaul, and the owner of 'Julia' is now in contact with us, and we have been able to share information and advice for aspects of that locomotives overhaul. Without the grant funding from the AIA, it would have made the overhaul of 'Derek Crouch' a much harder project to undertake.

We have also been able to purchase materials for making new pins and bushes for the spring gear and brake gear, which production will start on shortly. We have also purchased material for machining rivets for riveting up the bufferbeam angles and doubler plates on the locomotive.

Finally, we have also purchased the material to fabricate a new ashpan for the locomotive. This has recently seen the majority of the fabrication completed with just the new damper doors and hinges to fabricate. Once these are complete, we can utilise the cast hinge brackets from the old ashpan and bolt them onto the new one so that the doors can be fitted. This will then allow the ashpan to be stored ready for when required to be fitted to the boiler.

We are extremely grateful to the AIA for the awarding of the grant to 'Derek Crouch', without the funding the project would be a lot further back than the position we are in, and we are on course to have the locomotive steaming in time for its centenary

year next year. We have been able to use the grant to have many components made, from rivets to a new cylinder block, as well as pass on new skills and training to volunteers within the engineering department, especially some of the younger volunteers, which has then helped us on other projects as well such as riveting up the boiler of our other Hudswell Clarke locomotive, no.1800 'Thomas'. Being able to pass on these skills, especially to younger volunteers can really help make the Engineering Department at the Nene Valley Railway sustainable for years to come, and we are extremely grateful and thankful for the support of the AIA.

Britannia is Relunched

Vicki Samuels Writes: Britannia was first launched on April 10th, 1915. Each year, we celebrate her 'birthday' on that day, marking the moment when her stem first kissed the water. But we recently marked another important date in Britannia's history. On the 24th September 2023, we celebrated her relaunch – marking her return to the water after almost a decade ashore being restored. We have previously thrown many parties, open days, get-togethers and shindigs in Britannia's honour, but this occasion was different. More than just a celebration, it was a ceremony honouring thousands of years of maritime tradition – the ritual marriage of ship and sea.

Due to the logistical concerns of returning a 108-year-old sailing vessel to the water, the launch itself was a private affair, attended by staff, volunteers and trainees of Britannia Sailing Trust. It was a tense moment as the ship – craned onto a truck in Winkleigh and transported 23 miles overland to Exeter harbour – was lifted off of the transport lorry. All eyes were on her as all 24 tonnes of her dangled

The Britannia being lowered into the water by crane.



in slings above the hard concrete. The team that had put so much into restoring her – I think it's right to call them her crew - watched anxiously as the sum of their collective hard work was lowered into the waiting water.

Thankfully, everything went as well as could be hoped. The ship immediately began to take on water, but this was very much expected: the bone dry planks, both old and new, still needed to take up (swell with water) in order for the hull to become properly watertight. The pump did its job well before the ship was lifted out again and the team of boatbuilders busied themselves affixing tangles (lead patches) on the hull to help stop up the worst of the influx. When the Britannia was lowered back in, the leaking had been slowed and she was ready to float. Over the next few days, the hull took up beautifully in time for her relaunch celebration. On the 24th, Britannia was the centre of attention. The festival was organised by Exeter Canal and Quay Trust and in particular the Heritage Harbour Group, chaired by Jon Bell. It was dubbed 'Rise Up Again, Britannia' - named after the shanty written in her honour by Mariners Away shanty group. Cannons were fired by the Trafalgar Gun Company as the TS Exeter Sea Scouts warped her along the quay. Meanwhile, the Mariners Away stood on the stern, singing rousing traditional songs, with the finale of "Rise up Again Britannia".

The event was especially emotional for Britannia's former owners, Sam and Vicki Samuels, who now play a key role in Britannia Sailing Trust. In 2013, after rediscovering Britannia all but abandoned on a mooring in Brixham, they vowed to dedicate their retirement to putting her back to rights. And, by Jove, they've done it. Or at least, the first and biggest hurdle has been cleared. Britannia's condition has been stabilised and, now afloat, she and the Trust are ready for the next exciting chapter in her history. Britannia will now be based in Exeter Heritage Harbour for the foreseeable future and we will soon begin work on re-rigging, fitting out down below and more. We have lots of exciting plans for the near future, so we hope you will continue to follow us on our journey and pay the ship and her team a visit on the quayside if you can.

Thank you to everyone who attended the event and also all those who supported our immensely successful crowdfunder campaign. We raised £8,850, all of which will go towards the ship and her immediate needs. We want to thank our funders who believed in us and supported us financially, in particular: The Association for Industrial Archaeology who have actually given us two restoration awards in the last five years; Exeter Canal and Quay Trust and Exeter City Council; The Headley Trust; National Lottery Heritage Fund; and The Swire Foundation.

AIA 50th Anniversary Conference, Bath, 2023: Report

Michael Messenger, Geoff Wallis, and David Perrett write: The Association's Annual Conference, our 50th, was held at the University of Bath in September. More than 110 people booked to attend and in a new departure 18 of these attended the weekend virtually. After four years of disruption it was good to see old friends again but also to welcome some new faces. We also welcomed attendees from Canada, the USA and Japan as well as Europe.

We started on Friday with the Seminar, this year run by the Young Members Board, as before this was a day-long seminar. An interesting programme was put together by the YMB. Following the introductions Joanne Kirton introduced the Council for British Archaeology's Young Archaeologists Club, which is a UK-wide club where 8–16-year-olds participate in 'real' archaeology. It has 10,000 members but we were informed they cover little IA. Council member Juan Sanchiz's zoom presentation focussed on HE training or the lack of it in Europe and China. The two editors who deal with the AIA's publications by Taylor & Francis told of the difficulties of producing journals, newsletters and books of a high academic standard were many bodies now look to open access publishing. Two IA success stories followed. A group representing the winners of the AIA Community Project Award, Dawes Twineworks in West Coker gave an entertaining talk that told how a unique if derelict twine works had been both restored by local people and turned into a thriving community hub. Vanessa Ruhlig told of her early career in IA and her work on the massive but derelict Fox's 1772 Toneworks mill in Wellington, Somerset. Parts of the mill are being opened to the public at selective dates this year. The afternoon finished with Zoe Arthurs, now AIA chair, leading a round table on getting new/young people into AIA. During Friday an archive display in the Library highlighted the collections of Angus and Brenda Buchanan and George Watkins, now housed at the University. In the evening welcome drinks were provided by the President, Professor Marilyn Palmer and her husband, while an extensive display of documents and memorabilia showed the work of the AIA over the past 50 years.

Saturday morning saw a series of excellent presentations from Europe on aspects of industrial archaeology, most presented by Zoom which worked very well. The afternoon was devoted to award winners who spoke about their work and in the evening Awards were presented at the Conference Dinner. The AGM went the way of most AGMs on Sunday morning and was followed by tributes by Keith Falconer, Professor Marilyn Palmer and Sir Neil Cossons to the late Professor Angus Buchanan, one of the leading pioneers of Industrial Archaeology and our President for many years. The



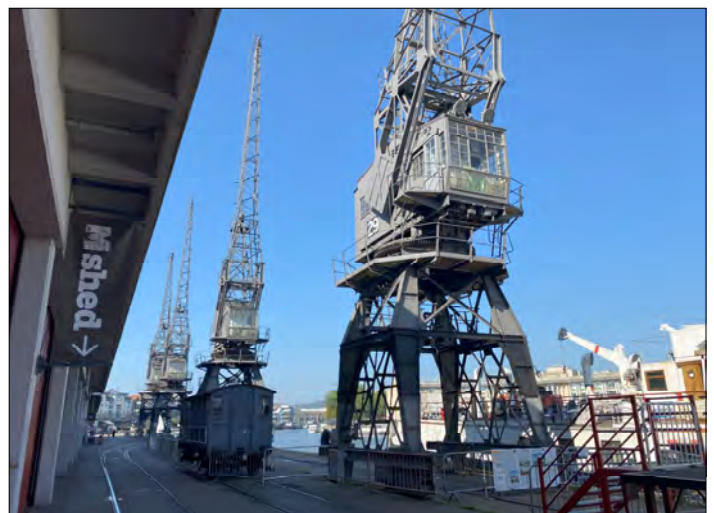
*Part of the equipment for making carbon dioxide for fizzy drinks at the Museum of Bath at Work.
Copyright: Bill Barksfield.*

afternoon saw us visiting the Museum of Bath at Work, with refreshments provided by Professor David Perrett and his wife, and where the Mayor of Bath, Councillor Dine Romero, evidently enjoyed our company. See her Facebook page!

Our aim with the tours and visits was to try to give members something different, bearing in mind many had been to the area before. Some places were too good, and important, not to visit again but we were successful in finding new sites, despite the impact of modern health and safety. What was especially pleasing was the helpfulness and welcome of most places we wanted to see.

Monday's two tours both went to Bristol; Geoff Wallis taking a party to Bristol Docks while Michael Messenger's took in more suburban sites. Bristol Docks date back to at least the 13th century but between 1804 and 1809 William Jessop constructed the Floating Harbour to avoid ships grounding during the 14m tides. Brunel modified this further in the 1830s and 1840s and further improvements were made in the 1870s. With increasing sizes of

Bristol Docks cranes. Copyright: Bill Barksfield.



vessels most commercial traffic now uses Avonmouth and Portishead Docks whilst Bristol Docks has been redeveloped for housing and leisure uses but still retains many heritage features.

The Docks tour started at L & M Sheds, transit warehouses now housing Bristol Industrial Museum. Four electric cranes by Bath manufacturer Stothert and Pitt dating from the 1950s survive in working order, the largest collection of listed working cranes in UK. Beside them a steam-powered 'Fairbairn' crane built in 1878 by Stothert and Pitt is in working order. Moored beside the Museum is 'Mayflower' the world's oldest tug built in Bristol in 1861, 1934 fire-pumping boat 'Pyronaut', and 1935 tug 'John King'. All are part of the Museum's collection, maintained in working order, and operated by volunteers. We were privileged to have conducted tours around the passenger ship 'MV Balmoral', currently undergoing full restoration by volunteers. Built by J. I. Thornycroft & Co Limited of Southampton and launched in 1949 as flagship of the Red Funnel Fleet, Balmoral served on the Southampton to Cowes route as a car ferry. She was then adapted for passenger service, carrying up to 784 people. She is 203ft 6in long, 32ft beam and has a gross tonnage of 736. Her working days came to an end in 1980 when she was sold and had an unsuccessful period as a floating pub in Dundee. In 1985 Balmoral was bought by the Waverley organisation and after major renovation triumphantly re-entered service. In 2003 further major work was carried out with support from the Heritage Lottery Fund, which included fitting new engines. Sadly at the end of 2012 Balmoral was withdrawn from service and laid up in Bristol. Her future appeared uncertain until a small group of supporters got together to restore her to operational service. The Balmoral Trust is currently seeking a NLHF grant of £250K to dry-dock the ship in Bristol, in the hope of returning to sea next year. We were conducted around the ship in well-organized groups by the ship's volunteer crew and we wish them well in their bid to save this wonderful piece of maritime heritage.

Underfall Yard

The old course of the Avon was dammed by Jessop but his weir caused silting problems, so in 1834

*The MV Balmoral at Mardyke, Bristol Docks.
Copyright: Bill Barksfield.*



Hydraulic engine house, Underfall Yard. Copyright: Bill Barksfield.

Brunel drove culverts through the dam so that mud could be sluiced out to the tidal river. His 'underfall' system is still in use. Port of Bristol workshops were built here at the Underfall Yard in the 1880s and still contain a fine collection of machine tools, a multiple-hearth forge, and a twin-cylinder horizontal Tangye steam engine. Steam-powered hydraulic engines were installed in 1887, superseded by electrically-operated ram pumps in 1907 which were demonstrated for us. They work on 'Bristol voltage' of 365 Volts.

Cumberland Basin and Brunel's Swivel Bridge

Despite temperatures above 30°C we walked around Jessop's Cumberland Basin where ships waited to enter the locks. Adjacent the North Entrance Lock we viewed Brunel's Swivel Bridge of 1847, far older than the Suspension Bridge, and Bristol's only abandoned Brunel structure. It features innovative 'balloon-top' girders with internal post-stressed tie-rods, and is an important structure. It was copied several times, and there is even one in St. Petersburg dating from 1856. Originally the Bridge was turned by a hand-operated crank similar to that used on old railway turntables. In 1901 Armstrong Whitworth hydraulic rams were installed, powered by 750psi water supplied from Underfall Yard. The Grade II* Listed Bridge is on English Heritage's Buildings at Risk Register having been abandoned when the Plimsoll Swing Bridge was completed in the mid 1960s. Volunteers led by Geoff Wallis have been working to halt the decay for the past ten years, and have restored it to a turning condition, although much work remains to be completed.

The other tour went first to Bristol Temple Meads station where Tim Harris, one of Networks Rail's civil engineers, took us on a tour of some of the more obscure parts of Brunel's station and gave us a glimpse into the original train shed, now inaccessible to visitors. At Temple Meads we were joined by Mark Bonson and Steve Grudgings who gave us the benefit of their excellent local knowledge. On to Brislington and the 1914 tram depot, still in use for transport purposes. David Martyn, Bristol's Senior Conservation Officer, told us of what had gone on here in the past, including building motor buses. Lunch was taken at Warley Waiting Room, a former Midland Railway station, and where the Friends of Warley Signal Box had kindly opened the Grade II box for us. After a look around the fascinating collection at Kingswood Heritage Museum, housed in a former brass and zinc mill, we went to Brandy Bottom Colliery, a Scheduled Ancient Monument on the outskirts of the city. The two groups of buildings include a Cornish engine house, a vertical engine house, a heapstead and a distinctive chimney. Despite the sweltering heat a very knowledgeable tour of the remains was given us by Hamish Orr-Ewing, Mark and Steve.

Clifton Suspension Bridge

The most popular tour on Tuesday was that to Clifton where the first stop was the Suspension Bridge. Julia Elton and the Bridgemaster, Trish Johnson, had given us an excellent talk on the structure the night before. Brunel's first proposals for the bridge met with complete rejection by Telford when adjudicating competitors' schemes but his modified design was eventually accepted. Work on the abutments, started in 1836, was abandoned a few years later through lack of funds. Only after Brunel's death was the 630ft span of Clifton Gorge finally completed, again slightly modified, as a memorial to him. After its 1864 opening this spectacular bridge soon became one of the best-known symbols of Bristol. We toured the Visitor's Centre and viewed parts of the Bridge's archives, including photographs of men walking up the chains to inspect or paint them. For the less confident, a 'sissy stick' with a roller to jam between the chain links, was used to provide a modest degree of stability. By special arrangement we were then privileged to tour the cathedral-like vaults inside the Leigh Woods abutment. Discovered by accident in 2002, twelve chambers contain thin stalactites up to 6m long formed by water leaching lime mortar from the joints of the vaulted roof.

Clifton Observatory

At Clifton Observatory we lunched and viewed the 1828 Grade II* Camera Obscura which projects an image of the surrounding countryside on a circular table. Built in 1766 as a corn wind-mill, it was later converted to the processing of snuff which ceased after a disastrous fire in 1777. Staircases under the tower lead to the Giants Cave with spectacular views over the Avon Gorge.

Clifton Rocks Railway

Also owned by the Observatory is the Clifton Rocks Railway. Opened in 1893, the hydraulic water



The Clifton Rocks Railway. Copyright: Bill Barksfield.

balance inclined railway operated until 1934. The current owners are restoring the structure and we visited the small museum of artefacts found in the tunnels dating from WW2 when they were used as an air-raid shelter and BBC emergency studios.

A slightly smaller group travelled into Bath, firstly to Sydney Gardens where Keith Falconer led us along the Kennet & Avon Canal to the foot of the Widcombe flight of locks. From here we went to Claverton where we were delighted to find the pump working, the fractured water-wheel having been repaired just a week or so beforehand. Julian Stirling told us in detail of the wheel, its working and history. The coach dropped us near Rennie's fine Dundas Aqueduct and after admiring that we walked the short length of the re-excavated spur of the Somersetshire Coal Canal to lunch. From here we made our way to Saltford Brass Mill, grateful for the air-conditioning of the coach, where we were glad to find former AIA Chairman Mike Bone. On the way Keith took us to Weston Cut on the river Avon.

Kennet & Avon Canal Dundas aqueduct at Winsley. Copyright: Bill Barksfield.





*Brandy Bottom Colliery engine house and chimney.
Copyright: Bill Barksfield.*

Opened 1727 it is one of the oldest river locks in the country. Salford has the most complete remains of the brass industry in the Avon Valley, especially its annealing furnace. Five water wheels were here, driving battery mills, rolling mills and a grinder. It is now a Scheduled Ancient Monument in the care of the Avon Industrial Buildings Trust.

One tour on Wednesday concentrated on the Somerset coal industry. Having seen one end of the Somersetshire Coal Canal on Tuesday we started at the other end, visiting the Paulton and Timsbury Basins. This is now an extremely rural location, cows moving out of our way as we crossed the fields, but once was intensely industrial, with collieries and foundries, and several tramroads running to the canal. During the first half of the nineteenth century it was very active. Shane Gould, who spoke the previous night, met us there and told us that all the archaeological evidence is still there beneath the surface. At Timsbury basin there is a dry dock, the largest in the country. Nearby members of the SCC Society were rebuilding the buttresses of a canal bridge, having re-instated that over the entrance to the dry dock.

*Radstock colliery monument and museum.
Copyright: Bill Barksfield.*



*AIA delegates aboard the Wickham Trolley.
Copyright: Bill Barksfield.*

Our visit to Shepton Mallet Prison was cancelled at very short notice, but we received a warm welcome from the Somerset & Dorset Heritage Trust, operating from Midsomer Norton station. They are restoring the site to its 1960s appearance and are acquiring rolling stock to match. There is a good museum on site, in the former stables, and the presence of a pill box gives them the opportunity to have a fine display of material relevant to that. It was a non-operational day for the railway but one unique feature that many members took advantage of was the chance to ride up the mile or so of track on a Wickham gangers' trolley.

From there we went in to Radstock where in view of the heat Shane took us on a truncated walk around part of the town, pointing out the features from its industrial past. We then adjourned, gratefully, to the Radstock Museum where the theme is Somerset Coalfield Life. The café was very welcome but there were many excellent and informative displays to explore. Despite being indoors the heat was very oppressive and the final return to the University was welcomed by all.

A great privilege for the other group that day was to visit Air Salvage International at Cotswold Airport where the founder of the company, Mark Gregory, showed them around the dismantling facility. After twenty years most airliners are time-expired but almost all of the planes can be recycled. From the airport the party went to the Science Museum storage facility at Wroughton, called a Care Collections Centre. Not yet open to the public we were privileged to be treated as a 'test run' and view the 18 miles of shelving and the wonderful collection of artefacts held there.

AIA 50th Anniversary Conference Award Winners

Prof Marilyn Palmer writes: Members who attended the Bath conference in September 2023 were treated to a considerable range of presentations by our award winners on the Saturday afternoon. In some cases, there were two awards in a category as it was not possible to present all the awards at the Liverpool weekend last year.

There were two awards made for the **Peter Neaverson Award for Outstanding Scholarship**. That for 2022 went to David Pollard for his book on *Digging Bath Stone*, published in 2021. Sadly, David died in 2017, but he had been involving his chosen publisher, Neil Parkhouse of Lightmore Press, in his endeavours for some years, and Neil has been able to bring this work to publication in a masterly fashion. David had developed a fascination for the stone quarries around him whilst an apprentice at the Swindon Railway works, which led him in later life to working as an industrial archaeologist, founder and curator of the Bath Stone Quarry Museum and owner of a working quarry, brought back into production in 1999. Over more than 50 years, he amassed a huge amount of knowledge and material relating to an industry that has importance beyond its immediate vicinity, as its product remains a prized and valued building material used all over the world. A massive book, the heart of which is a chapter, 190 pages in length, that provides details of all the known Bath Stone Quarries, numbering well over 100. These are illustrated with copious historic and modern black and white photographs; the photographs of the underground workings are particularly valuable, providing an insight into a world few people will ever see.

The **Peter Neaverson Award** for 2023 went to another massive book, *The Soho Manufactory, Mint and Foundry, West Midlands*, by George Demidowicz. The subtitle of the book, 'Where Boulton, Watt and Murdoch made history', is, if anything, an understatement. The complexity of these sites and of Boulton and Watt's business structures, together with the huge volume of archive material in the Boulton and Watt collection at Birmingham Libraries, make a comprehensive study a daunting task, and this book is the distillation of several decades research by the author. The Manufactory and Mint buildings were demolished in the mid-19th century, whilst the surviving parts of the Soho Foundry site, subsequently taken over by weighing-machine manufacturers Avery, are in a perilous state, listed Grade II* and on Historic England's Heritage at Risk Register. Had more substantial remains of Boulton and Watt's enterprises survived, there would surely have been a case for inscribing them as a World Heritage Site. The quality and quantity of the illustrations, and the overall production, at least match the standard that has won the publishers – Liverpool University Press, on behalf of Historic England – so many Peter Neaverson Awards in recent years. In his review of this book in issue 44/1 of *Industrial Archaeology Review*, James Douet makes an unusual case in favour of the e-book version, describing it as 'a wonder of functionality' with images 'capable of being blown up to show endless details'. The award was received by Neil Parkhouse in the presence of David Pollard's widow, Nina.

A second **Peter Neaverson Award** for 2023 was presented to Geoffrey Timmins for his book, *The Built Environment Transformed: Textile Lancashire during the Industrial Revolution*, also published by Liverpool University Press, on behalf of Historic England. The author has been involved in work on

Lancashire's textile industry for many years, particularly on the distinctive housing of textile workers in both towns and attached to rural farms. In this book, he examined the broader landscape, dealing with a number of case studies which exemplified changes to the landscape, including the harnessing of waterpower, housing both the workers and the better off and the transport links that were so essential to the industry. Unfortunately, Geoffrey was unable to accept his award in person due to industrial action over the conference weekend.

The 2023 **Publications Award** was presented to Patrick Grattan for his book, *Oasts and Hop Kilns: A History*, again published by Liverpool University Press, on behalf of Historic England. Amber Patrick, our renowned expert on the buildings of the brewing industry, said in her review of this book that it was 'an essential source for anyone studying or interested in oast and hop kiln buildings and their development in the two main regions. Since relatively few unaltered oast and hop kilns survive it is also a record of the buildings of this rural industry. It will also enable those who decide to convert an oast or hop kiln to have the necessary information as to how they functioned and therefore what features should be retained'.

Special mention was also made of another book, *Fascinating Industrial Landscapes in Britain*, written by Professor Masaaki Okada of the Department of Civil and Environmental Engineering in Kindai University, Japan. Written in Japanese, this book has an amazing collection of colour images of the remains of the British industrial past, especially smaller items like water pumps, troughs and fountains. Professor Okada and his wife were present at the conference and has provided an English translation of the book's contents.

Two **Dissertation Awards** were made in 2023. The first was to our hard-working Conference Secretary, John McGuinness, for his PhD, 'A study into the progressive incorporation of technology and the consequence use of space in "Low Status" housing in England and Wales, 1914 to 1975', presented by the University of West London. John had had a very strong interest in the industrial archaeology of recent times, and was also able to utilise his professional expertise in building construction in this outstanding piece of work.

The second **Dissertation Award** went to Anthony Annakin-Smith for his work on *The Neston Collieries 1859-1855: an Industrial Revolution in Rural Cheshire* published by the University of Chester Press. This book, together with a detailed commentary justifying his approach to the subject by means of microhistory, was presented to the University of Portsmouth to gain him a PhD by publication. It was an interesting approach, enabling him to examine the minutiae of the lives of miners and their families as well as the more archaeological aspects of the coal mine.

All award winners were presented with their prizes, certificates, and free membership of the AIA for a year. We hope that they enjoy their time with us and will continue to be members.

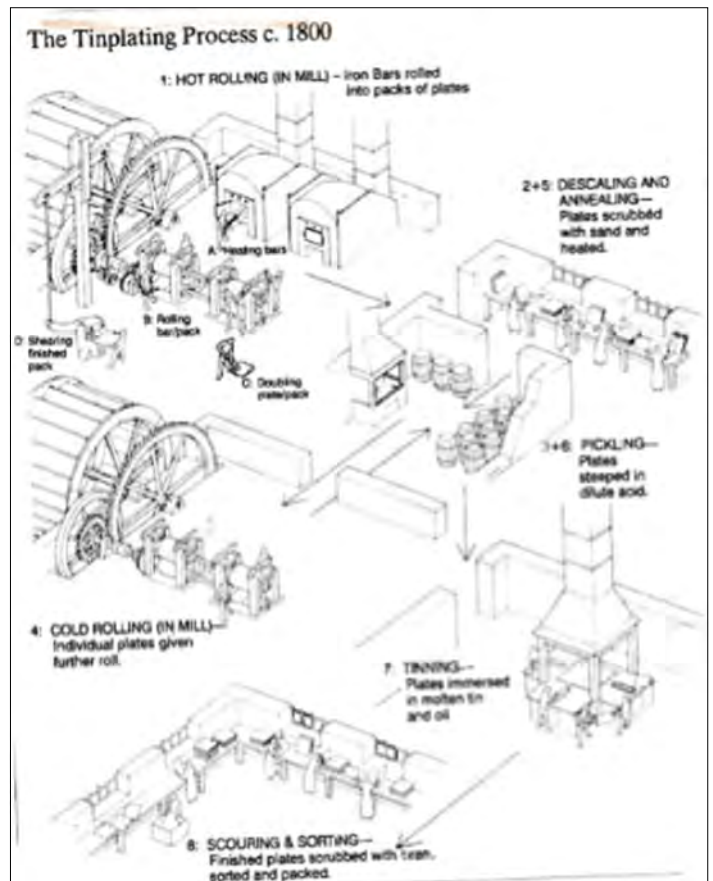
AIA Visit to the historic Tinplate Works at Kidwelly, Carmarthenshire

John Copping Writes: It is a feature of Heritage of Industry tours to offer unusual perspectives, but to arrive at a site, be asked to don a flak jacket and hard hat, and then be herded into the pitch darkness of a large industrial workshop was a first. The Kidwelly Tinplate Works, that industry's most significant UK site, was being re-opened exclusively for our visit. Rather than to describe what we saw, the opportunity is taken to present this visit report as a perspective of the site's heritage values and the strategic options for its future conservation as an important site within our sector. Few of 2023's visitors were aware that the then Kidwelly Tinplate Museum had been awarded the AIA President's Award during its 1988 conference in Swansea, following its opening by the then Prince of Wales in 1980.

History

In a paper made accessible to the group, N D Ludlow records that, founded in 1737, the Lower Works at Kidwelly was the second tinplate rolling-mill established in Britain and was powered solely by water until the 1860s. It closed down in 1896, to be subsequently totally demolished. Tinplate production was however maintained in the substantial steam-powered Upper Mill, established in 1879 on a virgin site 100m upstream. This in turn closed in 1938 and has since formed the core of what became in 1980 the Kidwelly Industrial Museum. Sadly, having run the museum for decades, growing pressures have caused the trustees to close it for the time being under the protection of Carmarthenshire County Museum service. Options are to be considered for a further

The Grade II listed engine house at the Grade II* listed Kidwelly Industrial Museum. Image copyright: John Copping.*



A diagram of the tinplating process.

phase of conservation for the site and its related artefacts preparatory to its reopening as a viable heritage attraction. Chris Delaney's paper assesses the production plant and all the materials within the site as a 'collection' within the context of the sheet-metal industry of its era.

Primary processes of tinplate manufacture

Tin-plate is a thin sheet of iron or steel coated with tin. Initially the process involved dipping the iron sheet into molten tin. Until the eighteenth century a water-powered tilt-hammer was used to beat out an iron bar, which was flattened, doubled over, re-flattened and then re-doubled to produce a pack of thin sheets. However, it was very difficult to produce sheets of even thickness. The process of water-powered rolling of bars into plate emerged around 1697, eventually producing thin even sheets twenty times faster than hammering. Today tinplate is made using an electrolytic process. The hand-milling method of sheet production remained basically unchanged from the early eighteenth century until superseded in the 1930s by the hot strip mill, but it became increasingly complex and mechanized. Ludlow summarizes the processes as follows.

Wrought iron bars, heated in the 'reheating' furnace, were repeatedly passed between pairs of rollers to produce thin sheets. These 'black plates' were obtained by successive heating, rolling and 'doubling' (see diagram, left) until it was an eight-

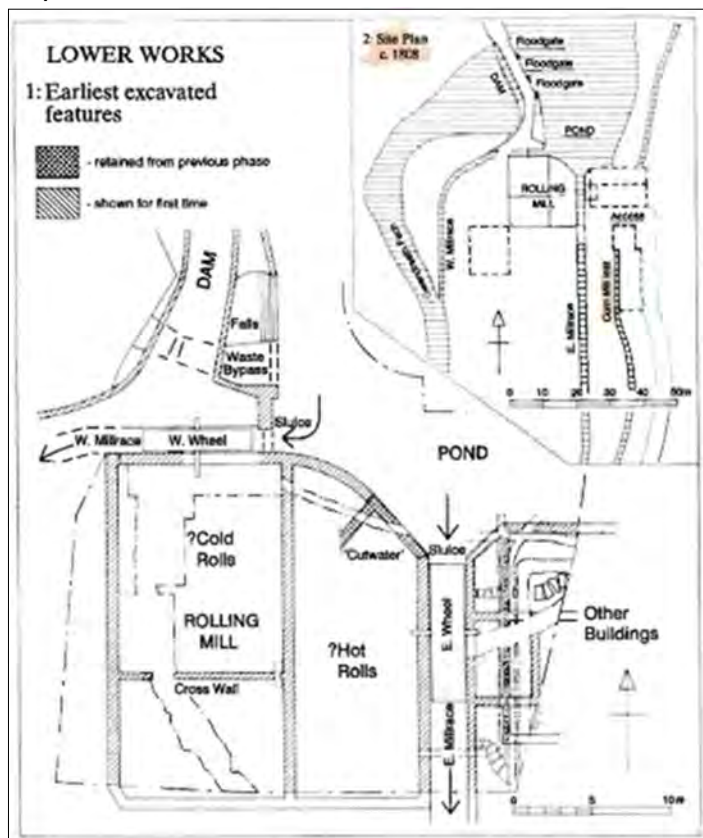
thick pack, then the edges clipped off with powered shears. At first the plates were then merely 'descaled' by scrubbing with sandstone and 'pickled' by steeping in a dilute acid ferment in preparation for tinning. But from the mid-c18 onwards the plates were 'cold-rolled' between a different set of powered rollers. In preparation for this they needed to be 'black annealed' by heating to a particular temperature in a suitable furnace. Cold rolling made the plates brittle so they were this time 'white annealed' and once again 'white pickled'. Pickling and annealing normally took place in a separate building, as did 'tinning' itself. A cast iron pot heated by a fire contained molten tin within which the sheets were immersed. An even coat was obtained by the dipping the plates into the 'wash-pot' of cooler tin and finally into the 'grease-pot' containing hot oil. After a scrub with bran the finished plates were separated, inspected and packed in boxes ready for shipment and use.

These basically manual processes were gradually mechanized as far as was possible, reflected no doubt in the plant and equipment still surviving at Kidwelly. Of the key items of plant, Delaney records that, of production plant, just two elements are missing – bar cutting and plant for black pickling. He adds, with limited subtlety, that the rotary 'black' pickling plant at Trostre is now the sole surviving example.

Significance

Those bodies potentially offering funding for heritage projects need to present the perceived value of the site for future generations. Grant applications are expected to assess a heritage asset

A plan of the lower works at Kidwell, after Ludlow.



for its historic, architectural and/or artistic and its archaeological significance. A survey of lottery users by the National Lottery Heritage Fund identified community engagement as one of their desired aims when granting funds. The visit, subsequent study of the two referred papers and informal chats within the group prompt the following thoughts.

The site lies north-south accommodating the mill pond some 300m long by 100m wide, on the eastern side of which is the Upper Works of similar dimensions. At the southern end are the dam, weir and millraces serving the earlier Lower Mill, but its buildings are no longer standing. The archaeology and the surrounding topology of any watermill site are significant, as many such sites have accommodated mills since pre-mediaeval time. Ludlow draws attention to a long tradition of water powered activity along the Gwendraeth Fach, supporting since the Middle Ages a dense concentration of mills for corn and for fulling fabric; also, significantly, an iron forge immediately upstream. He refers to a Dr John Lane who founded an ore-stamping mill on the site in 1721, but it had foundered and lay in ruins by 1737. Surrounding ground archaeology might further illuminate the history before that date.

There has been an extensive and detailed archaeological study of the site of the main workshop at Lower Mill, identifying its layout and surroundings as at 1808 (see plan of Lower Works to the left) and 1846, offering extensive evidence of the several phases of development described by Ludlow. His study incorporates information from 58 listed sources, including many historic documents, to present the history, both physical and commercial, of the sequence of undertakings at the site. He reports for instance that a blacksmith's forge south of the mill was equipped by 1857 with a blower driven by a 20-30 hp Cornish expansion engine. He expands also on an informed history of new business enterprises failures, attempted recoveries and changes of ownership, so the social history is impressive.

The architecture of some industrial buildings can, as at several Victorian pumping stations, be quite significant. The equipment within, as often in such buildings, may offer value also in what may be thought of as architectural or artistic terms. There is something triumphant in the mass and symmetry of heavy industrial equipment - particularly when only sensed to be present in a silent sepulchral workshop. Several members studied the various collections of artefacts marshalled in storerooms or other protected spaces about the site. Some commented on the artistic features of the 1930s, when the site eventually closed, or earlier decades. It would be easy to undervalue the significance of these artefact groupings – kit such as production related hand tools, machinery, handcarts, trolleys, fire pumps, cranes and a locomotive, but also material relating to the people involved – occupational costume, food containers, pay checks, tokens, worker's welfare, education, training or social life, wall displays and signage, plus



Machinery in the boxing room at Kidwelly Industrial Museum. Copyright: John Copping.

photographs and paintings of workers, together with portraits of owners. These relate to the people - young and old, male and female - who worked at the Works, the forebears of a number of the present population of today's Kidwelly and the surrounding area. The second source, Delaney, speaking of the 'collection', concludes that the equipment and machinery at KIM is unique and historically of immeasurable value. Along with the historic and archaeological value of the original Lower Mill, the site, a capsule largely protected from the modern world by its low-lying and wooded position (see image bottom left), presents both an impressive heritage significance but also potential for refreshed value to its community.

The way forward – the likely need

The current custodians, Carmarthenshire County Council, will need and may reasonably expect the support of the local community in creating a viable and sustainable plan for the conservation of the site and its related assets, fixtures and fittings, plus the huge range of movable artefacts available for display and interpretation. The substantial costs of a project to reactivate the site will require substantial grant funding, as well as contributions from CADW and other Welsh and UK bodies, such as AIA, in a position to provide wider support. The conservation management plan assessing the history and significance of the site will need to contribute towards a plausible and commercially viable business plan. That itself will be influenced and

determined by reconfiguration and interpretation of the various assets and resources available to maximize community engagement, visitor numbers and income-generating activity.

There was talk within the group of the potential to make use of the land, woodland, and possibly the foreshore of the lake to the north of the main buildings – the initials H and S were of course mentioned. It was noted that groups such as the scouts have need of access to such places under appropriate supervision. Some of the group attending the AIA tour to Portugal (see IA News 205) noted the class or two of young children enjoying their trip on a model steam-train during their visit to an open-air museum. Further conversation about modern media and the interpretation of heritage mentioned working models, video and the use of sound or indeed of smell, as in the horse stables on board the museum ship SS Rotterdam in that city.

It is perhaps the key need of any newly structured industrial heritage site to capture the imagination of its local community. Kidwelly certainly did that for the more widely-spread community of industrial heritage buffs. They offer thanks to all those involved in the preparation and the visit.

Acknowledgements

The author records the indebtedness of the group to Morigan Mason of Carmarthenshire County Council and her helpers for hosting and guiding the visit.

AIA's 2024 Conference Events

David de Haan, AIA Hon Secretary, writes: In a change from the past, for 2024 we are running three separate elements for our annual conference, which will be spread across the year. There will be an on-line Continuous Professional Development day in January, a three-day study visit in early July, and a one-day annual conference in early October with two half-day visits. We hope you will find this interesting and will join us for one, two or all three of the elements. Further details are on the AIA website at <https://industrial-archaeology.org/conferences/service001/>.

Professional skills

The first event, if you get this on time, is a one-day on-line CPD meeting on 27th January 2024 on the Conservation of Ironwork, led by Geoff Wallis of Dorothea and aimed at young professionals. Geoff is a regular lecturer on this subject and has a lifetime of practical experience in industrial heritage. This is a Zoom event and the price is only £15 to AIA members and £60 to non-members, so for non-members it will actually be cheaper to join the AIA for the year (where the current adult membership is £40 and £26 for Young Members). More details can be found at <https://industrial-archaeology.org/conferences/service004/>.

3-day Study Tour in the North East

The second event is a study tour from 5th to 7th July based in and around Newcastle, and aimed at AIA's traditional conference-goers. Organised by 'Heritage of Industry' it will be held in the first week of July, so before the school summer holidays. Bed, breakfast and dinner will be at a hotel in central Newcastle. Lunches will be part of the tours. Visits start on Friday morning, 5th July, so an after-dinner talk at the hotel has been arranged for the previous evening by Michael Bailey on the Stockton & Darlington Railway's 'Locomotion No 1'. Optional visits are planned to include the Stephenson Railway Museum in North Tyneside, a Newcastle bridges walk, and Cragend Farm (William Armstrong's farm with machinery still in place), and perhaps Cragside itself, particularly for the dynamo house and other aspects of Country House Technology. Other destinations include Beamish Open Air Museum (recipients of Restoration Grants in 2009 for a chaldron wagon and in 2021 for a bus shelter) with a behind-the-scenes tour, Derwentcote Steel Furnace, the Tanfield Railway and Causey Arch, or Ryehope Pumping Station in Sunderland. On the last day we will visit 'Locomotion' at Shildon,

Tees Cottage Pumping Station, Darlington, and finally the Middlesbrough Transporter Bridge. At the end of the tour our coach will take us to a nearby mainline railway station for those returning south, and then back to Newcastle for those wishing to stay on for a few days in the area.

Our Annual Conference in Cardiff

The final element of the year. Our base is the Radisson Blu, a central Cardiff hotel within walking distance of the railway station. On Friday afternoon 4th October our coach departs the hotel for the Waterfront Museum in Swansea and a tour looking at the Lower Swansea and Neath Valleys to see the Neath Abbey Ironworks, the remains of the Hafod Morfa copper works. Back to the Cardiff hotel for dinner. On Saturday 5th October is our annual conference in Cardiff with the AGM and lectures, awards and dinner with prize-giving. On Sunday morning 6th October we depart Cardiff by coach to Blaenavon where there is a choice of visits to Big Pit or the Ironworks. After lunch the coach returns to Cardiff.

Newsletters and Bulletins (paper and e-format)

- Greater London Industrial Archaeology Society Newsletter 327, August 2023.
- Greater London Industrial Archaeology Society Newsletter 328, October 2023.
- Freshspring Magazine, No. 36, Autumn 2023.
- Leicestershire Industrial History Society Newsletter, Issue 60, Autumn 2023.
- Manchester Region Industrial Archaeology Society Newsletter, No 172 (Michaelmas 2023).
- Midlands Wind & Water Mills Group, Newsletter 136, August 2023.
- North East Derbyshire Industrial Archaeology Society e-Newsletter No. 92, November 2023.
- Northamptonshire Industrial Archaeology Group, Newsletter 168, October 2023.
- Somerset Industrial Archaeological Society, Bulletin No. 153, August 2023.
- Suffolk Industrial Archaeology Society e-Newsletter No. 162, August 2023.
- Sussex Industrial Archaeological Society Newsletter, No. 200, October 2023.
- Sussex Mills Group Newsletter, No. 200, October 2023.
- The Trow, No. 201, Autumn 2023

Journals

- Irish Railway Record Society Journal, No. 212, October 2023.

Please send future Journals, Newsletters, and Bulletins to Dr M Nevell, 3, Baxter Road, Sale Cheshire M33 3AJ, or electronic copies to ianews@industrial-archaeology.org

A Warm Welcome to the Following New Members

Ross Aitken of West Coker
Anthony Annakin-Smith, Neston, Wirral
Ian Barclay, Bovey Tracey
Emma Bennett, London
Kyle Bloedorn, Lyons, Michigan
David Carder, Halifax
Andy Carter, Brandon
Joanna Dabal, Gdansk, Poland
Patrick Grattan, London
Deryk Green, Shrewsbury.
Steve Grudgings, Whitchurch, Hants
Karl Hanson, Norwich
Chris Hawksworth, Kilwinning
Maggie Heisterkamp, Ramsey, Minnesota, USA
Stan Lawler, Oxenhope, Keighley
David Rollinson, Carmarthen

Paul Yunnie 1942-2023

Michael Messenger writes: It is with sadness we learnt of the death of Paul Yunnie in February, in Australia. His health had deteriorated slowly over the past couple of years. Until personal matters prompted a move to Sydney about 2006 Paul was an active member of AIA, serving briefly on Council. He was a regular attender at our annual Conference which he regarded as a highlight of the year.

His particular interest was in boilers. He was managing director of Andrews Water Heaters and as a result for many years they sponsored our Conference folders. He was vice-chair of the Chartered Institute of Building Services Engineers Heritage Group from 1985 until 2006, was on the Institute of Gas Engineers Panel for the History of the Industry and chaired the Historical Committee of the American Society of Heating Refrigerating and Air-Conditioning Engineers. In Australia he served on the NSW National Trust's IA panel. He also

Paul Yunnie (right) in conversation with our late AIA President, Prof Angus Buchanan (1930-2020) at the 2005 conference. Image Copyright: Peter Stanier.



produced a number of modest books on aspects of heating, culminating in a history of Gurney boilers, produced during lockdown.

Paul was also interested in the arts. After he left for Australia he often sent items he thought of interest, or funny or absurd, and we kept up an email correspondence until a month before his death. He was a gregarious and friendly person with great enthusiasm for IA, always generous in sharing his knowledge. He did miss the UK – a Union Flag was very prominent in his study – and visited once or twice a year to see friends and family and we were always pleased to be included in his tours of friends, if only for a night or two.

Elain Hardwood 1958-2023

Robert Carr writes: It is with great sadness that we report the sudden unexpected death of Elain Harwood on 19 April this year at the early age of 64. We have lost someone who brought recent architecture into focus and made some despised examples more popular. Initially an architectural *enfant terrible* in the eyes of a conservative general public she became the heart and soul of the 20th Century Society. Elain worked for Historic England (previously English Heritage) from 1984 and remained with them until her death. In the last decade her output of books has been truly prodigious.

Brought up with the values of the welfare state she grew up believing they would last forever. In 1991 at English Heritage with colleague Andrew Saint, she published a guide to the buildings of London in the Exploring England's Heritage series, however as time went on she concentrated more and more on the period post-1945. In 1992 English Heritage set up a Post-War Listing Steering Group. Elain soon became an important member, visiting an enormous number of sites and buildings. Her obviously great knowledge and forceful personality were a great asset. The recommendations of the Group were to some extent controversial but she was instrumental in changing attitudes to modern architecture as she also embraced post-1945 buildings in traditional styles which helped to soften the opposition. Elaine was senior architectural investigator at Historic England, a post to which she brought immense scholarship and an amazing energy and determination. She had an extraordinary knowledge of interesting buildings in obscure or remote locations. For her books she would only include the best photographs, many of which were her own. The view of her from those at Historic England is that of a hard-working executive and a meticulous scholar.

Elain was born in Beeston Notts in June 1958 and studied history at the University of Bristol. In 1984-6 she studied building conservation at the Architectural Association (AA) in London and back in Bristol worked on her PhD on the buildings of

London's South Bank. This was completed in 2009 and she received her doctorate in 2010. In her opinion England's most significant post-war building was at Leicester University - the Engineering Building which is now 60 years old. Its architects were James Stirling and James Gowan with Frank Newby as structural engineer. The Engineering Building was listed Grade II* in 1993. In September 1971 the Leicester Engineering Building appeared on a Royal Mail 7½ p postage stamp. At that time British postage stamps depicting new British achievements were a novelty and H M The Queen looks so young; this was *The New Elizabethan Age*.

Elain showed an interest in *Arlington House*, a high-rise apartment building in Margate near the railway station. Nineteen stories high, *Arlington House* dates from 1964. Before 1926 another railway station, *Margate Sands* for the South Eastern Railway occupied the site; this railway station became *The Casino Dance Hall* but the dance hall burnt down in 1946 and the site was then just a car park. *Arlington House* was built to the designs of Russell Diplock; the ripple exterior gives every resident of the block a view of the sea. Close to Margate's seafront, this tall block has been the subject of local criticism. However it is now quite a popular place to live, the flats are spacious with good views and in 2022 flats in *Arlington House* had reached prices of about £150,000.

Elain Harwood was a prolific author. There is only space to mention some of her books published this century. In 2003 Elain published *England: A Guide to Post-war Listed Buildings*, this is a good introduction to the subject and a useful survey for readers interested in visiting buildings. Stirred by childhood memories she published the book *Nottingham* in 2008. Otherwise her books include *Chamberlin, Powell and Bon: The Barbican and Beyond*, came in 2011. Her *Space, Hope, and Brutalism: English Architecture, 1945-1975*, was published in 2015 and *Art Deco Britain: Buildings of the interwar years*, in 2019. Two years later she published *Mid-Century Britain: Modern Architecture 1938-1963*. Her last book, *Brutalist Britain: Buildings of the 1960s and 1970s*, was published in 2022.

Key Works

2022 *Brutalist Britain: Buildings of the 1960s and 1970s*.

2021 *Mid-Century Britain: Modern Architecture 1938-1963*.

2019 *Art Deco Britain: Buildings of the interwar years*.

2015 *Space, Hope, and Brutalism: English Architecture, 1945-1975*.

2011 *Chamberlin, Powell and Bon: The Barbican and Beyond*.

2008 *Nottingham*.

2003 *England: A Guide to Post-war Listed Buildings*.

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The views expressed in this newsletter are not necessarily those of the Association for Industrial Archaeology.

Final Copy dates are:

1 January, for February mailing

1 April, for May mailing

1 July, for August mailing

1 October, for November mailing.

The AIA was established in 1973 to promote the study of Industrial Archaeology and to encourage improved standards of recording, research, conservation and publication. It aims to assist and support regional and specialist groups and bodies involved in the preservation of industrial monuments, to represent the interests of Industrial Archaeology at national level, to hold conferences and seminars and to publish the results of research. The AIA publishes a twice yearly Review and quarterly Newsletter.

Notes for Contributors

IA News, being the main paper communication organ for the AIA, is issued quarterly. It covers the Association's activities, including the work of AIA Council and the Young Members Board and that of our Affiliated Societies, together with both regional and international news.

Items for inclusion should be emailed as attached **Word** documents. The number of words will naturally depend on the nature of the report. Typically, a short news item could be up to 250 words. A large report could be up to 1,500 words. If necessary a report will be edited to fit the space available. If an author feels that editing may detract from the substance of the report, please include a note to this effect.

Photographs accompanying a report should be sent as separate **jpg** files (for best quality printing). Please do not embed them in the text. Short captions should be provided. For copyright reasons the origin of all reports must be credited and, where appropriate, the author's name and position included. Photographs, too, should indicate to whom credit should be given.

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Website:

www.industrial-archaeology.org

Facebook:

www.facebook.com/groups/wearetheaia

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[twitter.com@industrialarch](https://twitter.com/industrialarch)

The Kidwelly Industrial Museum



Michael Nevell writes: Kidwelly Industrial Museum in Carmarthenshire, West Wales, is home to the oldest surviving tinplate works in Europe and the second oldest recorded tinplate works in the UK. Founded in 1737, it closed in 1941. This unique museum, which has free admission, is dedicated to the interpretation of the tinplate industry in general, and showcases the packmill process. The engine house is Grade II* listed whilst the chimney and

boxing room are Grade II. The wider landscape in this part of West Wales was once the home to half of the world's tinplate production. The museum runs on small grants from the local authority and donations from visitors. For further details see: <http://www.kidwellyindustrialmuseum.org.uk/>

Image: Foden rolling mill engine in the Grade II listed boxing room. Copyright: John Copping.