

INDUSTRIAL ARCHAEOLOGY NEWS

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INDUSTRIAL ARCHAEOLOGY NEWS 184 Spring 2018

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The revised AIA Programme for 2018

To simplify administrative arrangements the AIA Council have decided that it would be preferable to develop the AIA Members' Weekend arranged for September in Nottingham into the annual AIA Conference and to provide an additional programme of visits extending the meeting to Wednesday 5 September.

The AIA will be supporting the Conference in Caithness (Friday 22 June until Wednesday 27 June) which will be run by the AIA affiliated Scottish Industrial Heritage Society, with the Scottish Vernacular Buildings Working Group and Historic Environment Scotland who will deliver the commitments to local groups and those who have booked travel and accommodation. The programme has been subject to some revisions: the excursion to Orkney has had to be arranged to take place on Sunday 24 June to avoid clashing with giant cruise ships. The talk by Geoffrey Stell will be on Saturday. Full details and a booking form for this event are enclosed.

The research seminar organised for Friday 31 August will be held at Nottingham, as planned, on the subject of – 'Steaming Ahead: Researching Industrial Archaeology and Heritage in the 21st Century'. On Sunday morning there will be the AGM followed by the Rolt Lecture when Geoffrey Stell will be speaking on 'Science and Engineering at War: Scapa Flow, 1939-45'. The Annual Dinner will be on Saturday 1 September.

An outline of the extended September programme is printed opposite and full details, together with the booking form, are also enclosed with this edition of the IA News. As these changes have caused a delay in distributing this edition please return the booking form as soon as possible.

European Year of Cultural Heritage

The aim of the European Year of Cultural Heritage (EYCH) is to encourage more people to discover and explore Europe's rich and diverse cultural heritage, and to reinforce a sense of belonging to a common European space.

Any cultural group (civic, education, heritage etc) can participate and reap the benefits of an increased profile that attracts a wider audience, with opportunities for sharing learning and best practice with others. Promotion as part of EYCH could lead to 'twinning' and collaboration with similar organisations across Europe, ultimately creating the environment for securing European funding for your project. (Yes, even post-Brexit.....)

To participate, your activity must have a European dimension, raise awareness of the importance and value of cultural heritage and engage with people. Don't worry however if you haven't yet made cross-border links, it's still remarkably easy to get your industrial heritage activity branded as part of the 2018 European Year for Cultural Heritage. Perhaps you'll be giving your steam engine a test run before Easter? Do this during the weekend of 17 & 18 March and invite the neighbours in – this would qualify as a transnational EYCH event, under the umbrella of E-FAITH*'s March 'themed month', celebrating energy and power. Fly the flag for industrial heritage by floodlighting your factory chimney in May. If you are organising a tour around your local town, looking at terraced housing, water towers or pumping stations, then make sure it takes place in June and it will fit with the E-FAITH theme for that month: 'the urban environment'. Organising a 'summer special' weekend to attract children and families onto your heritage narrow gauge railway? Then that's likely to meet the criteria for 'travel and transport' in July and August. Don't plan too much for October, so that you can come to the AIA's Creative Re-use seminar in Manchester on 12 October.

You'll find out more about EYCH in general on the UK webpage: european-heritage.co.uk. To get an application form for participation via E-FAITH, contact the AIA's E-FAITH liaison officer, Kate Dickson (email director@creative-heritage.net or telephone 01298-77774). Assuming the E-FAITH Secretariat approves your proposal, you don't need to get your activity endorsed by the UK EYCH Coordinator or send a dossier to Brussels. You'll get a branding pack and further information within days of submitting your application.

Here's a reminder of the E-FAITH themed months

March : Energy, power and prime movers – from mills and steam to nuclear energy.

April : Coal, iron and steel: mining and quarrying

May : Factory chimneys

June : The urban environment – the industrial town, housing, and urban services such as water distribution and sewers

July & August : Travel and transport, how people and goods were moved on land, water and through the air.

October : Adaptive re-use of and new functions for old industrial buildings.

Both the AIA Industrial Landscapes weekend in April and the Annual Conference in Nottingham have been registered as events within the European Year of Cultural Heritage.

*E-FAITH stands for the European Federation of Associations for Industrial and Technical Heritage

COVER PICTURE

Ferrybridge on a quiet day, 26 September 2014
photo: Historic England

Nottingham 2018 — 31 August to 5 September

Hugh Stewart Hall, University of Nottingham.

Research Seminar,

Friday 31 August

'Steaming Ahead: research strategies and research frameworks in industrial archaeology'

This year's seminar will compare current approaches to research strategies in industrial archaeology in England, Scotland, Wales and Ireland. Historic England are currently reviewing their existing strategies and Dan Miles will discuss the review of research frameworks for the historic environment in England, with case studies from north-west England and the East Midlands, led by Mike Nevell and David Knight. Stella Jackson from the University of Liverpool will talk about HistBEKE, a project aiming to provide a knowledge exchange network for the historic built environment. The project to revise research frameworks in Scotland, ScARF, is being led by the Scottish Society of Antiquaries and one of their staff will talk about this, while from Wales David Gwyn will discuss the strategy for the current bid for the Slate Industry of North Wales to be recognised as a World Heritage Site. Finally, Colin Rynne from Cork will provide the Irish perspective.

This promises to be an exciting and informative day, and attendance can be booked either as part of the AIA conference or separately for day delegates.

AIA Conference

Friday 31 August

Evening: Lecture on the IA of the East Midlands. (Marilyn Palmer)

Saturday 1 September

am: Gavin Kinsley (SLR Consulting Ltd) and David Knight (Trent & Peak Archaeology) 'Industrial caves in Nottingham', including fly-through video footage based on their 3D survey of Nottingham caves.

Steve Miles – Koepe/Friction winding in UK collieries with reference to Clipstone Colliery

Kieran Lee (Sustrans) – Bennerley Viaduct and the Erewash Valley

Bill Pemberton (Leicestershire Industrial History Society) – The Leicester and Swannington Railway Today: a photographic journey along a historic railway line.

pm: award winners, members' contributions etc followed by the Annual dinner.

Sunday 2 September

am: AGM; Rolt Lecture by Geoffrey Stell, 'Science and Engineering at War: Scapa Flow, 1939-45'.

pm: Choice of coach tours to Wollaton Hall and Industrial Museum.

Nottingham Lace Market and Canal.

Nottingham caves (Many of the caves had industrial uses), Green's windmill and the Science Centre Sneinton.

Evening Professor John Beckett, University of Nottingham. 'Laxton: England's only surviving open field village.'

Monday 3 September

Tour D. Coal Mining and water supply. Papplewick Pumping Station (superb Victorian water pumping station in working order, with two James Wyatt and Co beam engines and intricate wrought iron decoration, stained glass windows. **Bestwood Colliery Winder and colliery village** A company village founded by the Bestwood Iron and Coal Company, with a surviving vertical winding engine. The tour will be led by a retired miner and will include a buffet lunch. **Pleasley Pit** A colliery with two horizontal winding engines, winner of one of the Angel Awards.

Tour E. Maltings, breweries and a river port. Newark-on-Trent. An important town on the River Trent with surviving remains from its important malting and brewing industry. The day will include a two hour trip on the River Trent in our own private boat (with bar on board). Return via **New Clipstone** near Mansfield to view the sole surviving Koepe colliery winding engines in the UK.

Evening Chris Pickford: Bell Founding with special reference to on Taylors Bell Foundry, Loughborough.

Tuesday 4 September

Tour F. The Erewash Valley: ironworks, two canals and the Bennerley Viaduct The tour will begin in the Erewash Museum in Ilkeston, with important exhibitions on the Stanton and Staveley Ironworks and a talk from the Collections manager on the ironworks. Lunch near the Nottingham Canal, followed by a walk of about two miles along the Erewash and Nottingham Canals with a tour of the important wrought iron Bennerley viaduct by their Community Engagement Officer for Sustrans, who are hoping to restore the Viaduct as part of a walking and cycle trail.

Tour G. Bells, Steam engines and a railway tunnel. A tour of Taylors Bell Foundry, Loughborough, now the sole survivor in Britain; Abbey Pumping Station in Leicester with its four massive Gimson rotative beam engines. Lunch in Glenfield, followed by a guided tour by members of Leicestershire Industrial History Society into Glenfield Tunnel on the Leicester-and Swannington Railway of 1830, designed by Robert Stephenson. It may be possible to end the day at the incline on this railway which is maintained by the Swannington Heritage Trust.

Evening Wine reception in the Museum of Archaeology, University of Nottingham, with film on framework knitting.

Wednesday 5 September

Tour H. A half-day visit to **Ruddington Framework Knitters Museum**, just south of Nottingham, combined with a visit to the northern end of the Great Central Railway facilities at Ruddington, which include a Model Railway, Miniature Railways, a Heritage Transport Collection and railway workshop with full engineering facilities, as well as a cafeteria and gift shop.

Booking forms are included with this edition and are available on the AIA website.

Electricity from coal – the end of an era

Friday 21 April 2017 was a landmark day in the history of electric power generation in the UK – the first 24 hour period when none of the electricity supplied via the National Grid came from a coal burning power station. A few years ago this would have been unthinkable – coal was always the predominant fuel.

Ian Mitchell

With the exception of a few small hydro-electric and waste burning facilities, coal was the only significant source of energy for public electricity generation from the industry's beginning until the middle of the twentieth century. After 1945 the nationalised Central Electricity Generating Board (CEGB) sought to diversify its supply base by building nuclear and oil burning power stations, but coal remained the principal fuel. With the rapid expansion in electricity demand in the 1950s and 1960s, there was a major programme of coal power station construction, mainly in the East Midlands and Yorkshire, on sites along large rivers close to the coalfields.

During this period the size of the power stations and of the individual steam turbines within them grew ever larger. By the 1960s the CEGB had standardised on 500MW turbines, usually grouped four to a power station. Typical examples were Ratcliffe in Nottinghamshire, Eggborough in Yorkshire and Fiddlers Ferry in Lancashire. These were enormous installations, typically consuming five million tons of coal a year, which was delivered in 'merry go round' trains which unloaded on the move as they drove slowly around a circuit of track.

The 500MW turbines were the largest and most powerful machines ever constructed, and the UK was a world leader. By 1977 there were more units of this size in service in the UK than in the whole of the rest of Europe. However, there were teething troubles due to the ambitious construction programme: 45 of the new turbine design were ordered from four different manufacturers before the first one entered service.

The most prominent visual feature of these power stations were the enormous concrete cooling towers. These were essential to dissipate the waste heat from the power station without overheating the river from which cooling water was extracted. Instead of returning hot water to the river, water was evaporated by the air flow through the cooling towers, giving the power station its distinctive plume of clouds. As evaporating water absorbs much more energy than heating it in the liquid state, the volume of water taken from the river was contained to an acceptable level. The hyperbolic shape of the cooling towers gave a large surface area for evaporation and enhanced the natural updraft of air. The shape also contributed to the structural strength, allowing a 115 metre structure to be constructed with relatively thin reinforced concrete shell. Again, there were some teething troubles, most notably when three cooling towers



Ferrybridge 26 November 2010

photo: Historic England

at Ferrybridge in Yorkshire collapsed in high winds in 1965 – this resulted in the shell thickness increasing from 127mm to 178mm for later designs – still only 0.15% of the height of the structure.

By the early 1970s these power stations were established as the backbone of the electricity supply, running 24 hours a day on 'base load' with smaller and older less efficient power stations drawn upon only during peak demand periods. However, the rapid growth in electricity demand had moderated due to the dominance of North Sea gas in domestic heating and the beginnings of concern about energy saving as a result of the oil crises at the start of the decade. Closures, and loss of the UK's lead in another field of technology.

When power station construction revived again in the 1990s following privatisation of the industry, natural gas was in plentiful supply, and a new generation of combined cycle gas turbine power plants were constructed that used a combination of gas and steam turbines to achieve higher levels of efficiency. There was also increasing concern about some of the pollutants emitted by burning coal, particularly sulphur dioxide, and several of the large coal burning power stations were fitted with flue gas desulphurisation equipment. This used limestone to trap the sulphur, producing gypsum as a by-product.

Of course, since coal is mainly carbon, the major emission from a coal power station is carbon dioxide. In the twenty-first century climate change due to increasing carbon dioxide levels in the atmosphere is now a major concern, and decarbonisation of the electricity supply industry is a government objective. There are now incentives for renewable energy resources such as wind and solar, and penalties for generation from coal. In

this last few years this has started to have a major impact, with many of the remaining coal power stations closed or mothballed, and others operating for only a few hours a day in winter. The stated objective is for all coal generation to finish by 2025, but the end may come sooner. In any case the remaining coal power stations mainly date from the late 1960s, so they are now 50 years old and beyond the end of their intended lives.

The implication of this is that we are going to lose one of the key industry building types of the twentieth century – described by Sir Neil Cossons as 'great temples to the carbon age'. The enormous scale and specialist nature of the 1960s structures makes preservation or adaptive re-use even less likely. With this in mind, Historic England has produced guidance to the energy industry on the appropriate and proportionate level of recording of redundant power plants for posterity. This document and a useful research report on post war power station development are available as free-to-download PDFs from the Historic England web site.

While preservation or re-use of a complete power station is clearly unrealistic, it should be possible to preserve a cooling tower (ideally a group of them) as a monument in the landscape. This might be a significant I.A. cause to fight for in the 2020s. In the meantime we should be raising awareness of the significance of what we are losing. As a contribution to this, the next East Midlands Industrial Archaeology Conference will be on the theme 'Electricity from Coal' – hosted by the Derbyshire Archaeological Society at Long Eaton in Derbyshire on 19 May 2018. Local speakers will cover electricity production in the Trent Valley from the early municipal suppliers to the CEGB, and Wayne Cocroft from Historic England will give the national perspective.

Cannington Shaw Bottle Making Shop St Helens



Elevation from the south east 2015

photo: MA Handley

The Cannington Shaw no.7 Bottle Shop in St Helens, Merseyside, is a Scheduled Monument, Listed Grade II and is on Historic England's Heritage at Risk Register. Built about 1886, it is the sole remains of what claimed in the late nineteenth century to be the largest manufacturer of glass bottles in the UK. The factory introduced automatic bottle making machinery in 1897 and the no.7 bottle shop closed in 1914. It was used as a store and, during WW II, as an air raid shelter. Trading as United Glass, most of the factory was demolished in 1982 and finally closed in 1999.

Maurice Handley

The building housed an early version of the Siemens regenerative tank furnace which was 'apsidal' in plan i.e. a modified rectangle with one semi-circular end. Although the furnace has been removed, much of the remainder of the building survives in a ruinous state. Above the furnace space a brick ventilation cone stands on cast iron columns and beams similar to those found in nineteenth century warehouses and textile mills. At its base, the cone section partly follows the shape of the tank furnace but with increasing height it transforms into a flattened ellipse achieved with complicated brickwork strengthened by tie bars. A system of ducts and 'tunnels' lie beneath the furnace and supplied it with air and producer gas. The hot exhaust gases from the furnace passed through chambers containing a honeycomb of refractory bricks which act as regenerators. The incoming combustion air and gas is pre-heated by passing through the honeycombs which have been previously heated by the exhaust gases. After half an hour the flows are switched so that the cold air and gas pass through the heated bricks. This alternating system improves the thermal efficiency of the furnace. The furnace level is

surrounded by a working floor where up to fifty men worked in teams operating the furnace and mouth-blowing the bottles in moulds recessed into the floor. The working area is also apsidal (or 'chapel shaped') with openings in the curved wall to ventilate the hot area around the furnace. Annexes to this structure contained annealing furnaces and storage rooms; other ancillary structures are later twentieth century additions.

The Cannington Shaw no. 7 Bottle Shop differs from the later Pilkington's cone building which now forms part of the World of Glass museum in St Helens. This building produced sheet glass and is less compact than the Bottle Shop arrangement. The Cannington Shaw building has been described as of outstanding significance by Oxford Archaeology North and it has been included in the Victorian Society's 2017 Top 10 Endangered Buildings list. It is possibly the only late nineteenth century bottle making workshop with a surviving cone structure and elements of the regenerative tank furnace patented by Siemens in 1879. The derelict Bottle Shop lies in the corner of a Tesco supermarket car park close to the Saints rugby league ground. Planning permission for the site was granted in 2008 and the owners produced a management plan in 2010. So far that has not been fully implemented but in late 2017 the local council's planning officers and Historic England inspected the site and, it is hoped, will expedite the plan. The Friends of Cannington Shaw have formed a Preservation Trust which plans 'to advance the education of the public in the historical, architectural and industrial significance of the buildingthrough the preservation and maintenance of the site and its related memorabilia'. The no 7 Bottle Shop is a unique remnant of St Helens' significant industrial heritage and it forms a historic part of the glass industry for which the town is famous.

Work starts on the Iron Bridge

Work has started on vital repairs to the Iron Bridge. English Heritage's extensive surveys and investigations have shown that the Iron Bridge is under threat from cracking due to stresses in the ironwork dating from the original construction, ground movement over the centuries, and an earthquake in the nineteenth century which pushed the sides of the gorge closer together, putting severe pressure on Abraham Darby's 378 ton masterpiece.

With an enormous scaffold in place around the bridge, work will now start to clean and conserve, repair and – where necessary – reinforce the different elements of the bridge: the iron radials and braces holding the bridge together, the deck plates and wedges, as well as the main iron arch itself. The bridge will also be repainted to protect it for the future.

At £3.6m, Project Iron Bridge is English Heritage's single largest conservation project since it became a charity in 2015. A very generous €1m donation from the German Hermann Reemtsma Foundation has gone a long way to ensure that this industrial icon will continue to inspire generations to come.

To help fund the project English Heritage embarked on its first crowd-funding campaign and raised £47,545 from more than 900 donors. This well exceeded their initial target of £25,000.

Kate Mavor, English Heritage's Chief Executive, said: "The Iron Bridge is one of the most important – if not the most important – bridge ever built. It sits in the cradle of the Industrial Revolution and is open to everyone to visit, for free, every day of the year.

Jochen Muennich of the Hermann Reemtsma Foundation said: "We immediately recognised the value of English Heritage's project to conserve the Iron Bridge, an outstanding example of the late eighteenth century engineering skills pioneered in Great Britain and subsequently adopted and developed throughout Europe. Not only do we admire the Iron Bridge as an important technical landmark, but we also see it as a potent reminder of our continent's common cultural roots and values.

"This is the foundation's first funding venture in the UK, a signal of our strong attachment to Great Britain in general, and to the mission of English Heritage in particular. In the current climate it seems more important than ever to raise awareness of the links in our industrial heritage and our broader cultural bonds."

The Hermann Reemtsma Foundation is a private and not-for-profit foundation promoting cultural and social projects in Germany and Poland. It is also a funding partner for the preservation of heritage. The Foundation especially likes to support projects in the start-up phase.

VISIT THE AIA WEBSITE

www.industrial-archaeology.org

England's major civil engineering achievements

This is a review of the civil engineering heritage of England, one of the series of national profiles being published by the Institution of Civil Engineers in their quarterly Engineering History and Heritage and republished here by their kind permission. It discusses engineering structures of heritage importance, including the following, all built before 1900: Eddystone lighthouse; Iron Bridge, the first major structure of cast iron; Ditherington Mill in Shrewsbury, the first multi-storey building using beams and columns of cast iron; Saint Katherine's Docks by Thomas Telford; the Thames Tunnel, the first tunnel constructed under water; the Royal Albert Bridge by I. K. Brunel; the Palm House at Kew Gardens; and numerous Victorian railway stations.

Bill Addis PhD, Chair of Editorial Panel for Engineering History and Heritage and Visiting Professor, Swiss Federal Institute of Technology, Zurich, Switzerland

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The origins

England was the first country to establish the profession of the civil engineer, as distinct from military engineers who undertook civil works when not attending to military projects. This evolved in the mid-eighteenth century; John Smeaton was the first practitioner to use the title 'civil engineer', founding the Society of Civil Engineers in 1771. This was an important step, creating an alliance of mature engineering figures. However, it ultimately failed to offer enough to aspiring young engineers, and this prompted a separate group to form the Institution of Civil Engineers (ICE) in 1818, stressing the need for education and electing the eminent engineer Thomas Telford as its president in 1820. England's major civilian engineering works in the seventeenth and eighteenth centuries were mainly associated with the taming of water. Large areas of wetlands were drained and reclaimed for agricultural use and roads, drawing on the experience of engineers from the Low Countries such as Cornelius Vermuyden. Much of this work is still in evidence. Many harbours and docks were improved and enlarged in ports such as London, Dover, Bristol and Liverpool, although these works were largely replaced or enhanced in the nineteenth century and are consequently largely invisible today. Smeaton's lighthouse, built on the Eddystone Rock 12 miles (19.3 km) south of Plymouth, was completed in 1759. It was notable for being the first significant English structure to use hydraulic cement. It was dismantled and replaced in the 1880s and rebuilt on Plymouth Hoe, where it can still be visited.



Caen Hill flight of locks, 1819. Engineer: John Rennie

photo: Robert Powell

A new generation of bridges was constructed in England on a larger scale than existing mediaeval ones. In London, for example, new structures were built at Westminster (by Swiss engineer Charles Labelye), Blackfriars (by Scottish engineer Robert Mylne), Battersea, Kew and Richmond. While most of these have been replaced, notable examples that remain include Coldstream Bridge across the River Tweed by Smeaton and Over Bridge near Tewkesbury by Telford.

Canals

The most visible engineering works from the eighteenth century are the many canals (over 2000 miles (3200 km) between the mid-eighteenth and mid-nineteenth centuries) and their associated structures, such as lock bridges and aqueducts. Some notable structures that are listed include the Bridgewater Canal near Manchester by James Brindley, which opened in 1761; the Lune aqueduct on the Lancaster Canal by John Rennie (1797); the Tardebigge flight of 30 locks on the Worcester and Birmingham canal, completed in 1815, raising narrow boats 67 m in a horizontal distance of 3.6 km; the flight of 29 locks on the Kennet and Avon Canal at Caen Hill by John Rennie, raising boats by 72 m in 3.2 km, completed in 1810 (Figure 1); and the Bingley five-rise (18 m) and three-rise (9 m) locks on the Leeds and Liverpool Canal by John Longbotham, opened in 1774. An alternative means of dealing with level differences in the canal system was the inclined plane, up and down which boats were moved on tracks. The Hay inclined plane near Iron Bridge linked the Shropshire Canal with the River Severn 63 m below and operated for over 100 years following its completion in 1792. A smaller inclined plane (15.2 m) linking the Weaver Navigation with the Trent

and Mersey Canal was opened in the 1790s and operated for some 70 years before it was replaced in 1875 by the Anderton lift by Edwin Clark, operated originally by hydraulic power and converted to electric power in 1904. It was refurbished in 2002 and is still in operation.

Bridges

Just as the Eddystone lighthouse was a pioneering structure in stone, so civil engineers continued to use masonry in major bridges, finding more efficient forms and better means of construction. The deep arches of the seventeenth century became shallower and more slender in the eighteenth century and viaducts became taller. Smeaton's Coldstream Bridge (1763) is an important example of engineering development, while other notable masonry structures include Telford's crossing at Bewdley in Hereford and Worcester (1795); Rennie's Serpentine Bridge in London (1828); and Robert Stephenson's Royal Border Bridge in Berwick-upon-Tweed (1847), a viaduct of 28 spans. The zenith in the use of masonry was Brunel's Maidenhead Railway Bridge (1837), built with the longest and flattest brick arches in the world. From the 1770s, many engineers in England began using cast iron as a structural material. The Iron Bridge spanning 30m over the River Severn in Shropshire was the world's first (1777–1781), soon followed by others, such as Buildwas Bridge by Telford (1796), near the Iron Bridge, and the Wearmouth Bridge at Sunderland (1796) by Thomas Paine (both lost). Telford's elegant Alford Bridge over the River Dee in Cheshire (1824) survives and is one of a number of bridges he built by using what was effectively a standard design (Figure 2). Cast iron arch bridges survived well into the railway age, and many, such



Alford Bridge, Cheshire, 1824. Engineer: Thomas Telford

photo: David Kitching

as the Castlefield Bridge (1849–1850) in Manchester, still carry main line trains. Wrought iron was used for several suspension bridges in England from the late 1810s. Samuel Brown's Union Bridge (1820) across the River Tweed in Northumberland survives. At 137 m span, it was the longest of its type when completed and is still in use for road traffic. Marlow Bridge (1832) across the River Thames, by William Tierney Clark, and Horkstow Bridge (1836) in north Lincolnshire by Sir John Rennie also survive from this period. James Dredge patented a forerunner of the modern cable-stayed bridge and his Victoria Bridge (1836) in Bath has been recently refurbished. During the late nineteenth century, few suspension bridges were built in England since they were not suitable for carrying trains and there was a lack of suitable sites. The two notable exceptions are Brunel's Clifton Suspension Bridge, completed in 1864 after his death using the chains from his suspension footbridge built over the Thames in London (1845) that was dismantled in 1860 to make way for the new Charing Cross station, and Hammersmith Bridge (1887) by Sir Joseph Bazalgette, built on the foundations of the previous bridge (1827) by William Tierney Clark to carry larger loads. The 1840s saw a number of innovative railway bridges that combined cast and wrought iron. Robert Stephenson's remarkable High Level Bridge (1849), originally carrying road and rail with six bowstring trusses of 38m, some 37m above the River Tyne, still dominates the Newcastle skyline. On a more modest scale (12–18m span), the first Warren truss (1849–1851), constructed by P. W. Barlow, survives at Joiner Street beneath London Bridge station. During the 1850s, wrought iron, being ductile and having greater tensile strength, became the material of choice for railway bridges. Following the construction of the Conwy and Britannia tubular bridges in North Wales (1845–1850), by Robert Stephenson and William Fairbairn, Brunel constructed his unique Albert

Bridge (1854–1859) between Plymouth and Saltash with two spans of 139 m, 30 m above the River Tamar. Such structures, using riveted wrought iron plates, were very costly and lattice and truss bridges were used for smaller spans. While Brunel had used a 62 m lenticular truss at Windsor Railway Bridge (1849), parallel-chord lattice trusses soon became the norm. Many of these, such as the Grade II*-listed rail crossing of the Manchester Ship Canal and River Mersey at Runcorn (1868) with three spans of 93m (Figure 3), still carry main line railway services.

Tunnels

Several major tunnels were constructed on the canal network in the eighteenth century, many of which are still navigable. Eleven were more than 2.5 km long, and the longest was the Standedge Tunnel (1795–1811; 5.2 km) on the Huddersfield Narrow Canal, constructed by Benjamin Outram.

Marc Brunel's tunnel under the Thames (1825–1843; 400 m) was the first in the world to be constructed under water and now carries the East London line. In the nineteenth century, several dozen rail tunnels over 3 km long were constructed, of which the Box Tunnel, between Swindon and Bath (1838–1841; 3 km; I. K. Brunel); the Severn Tunnel linking England and Wales (1873–1886; 7 km; John Hawkshaw); and Totley Tunnel near Sheffield (1888–1893; 5.7 km) are particularly notable for their length and difficulty of construction.

Dams, reservoirs and pumping stations

The first large reservoirs were constructed at the very end of the eighteenth century to feed the canals passing through and over the Pennines in northern England – for example, the Rudyard dam (1977–1979) built by John Rennie to feed the Caldon Canal, west of Congleton in Staffordshire, and the Blackstone Edge reservoir (1801) for the Rochdale Canal by William Jessop. They also served, of course, to provide water supplies for the growing populations of the mill towns. In the mid-1820s, Thomas Telford constructed the Rotton Park (now Edgbaston) reservoir to feed the Birmingham canal network and the dam was raised and lengthened, as were many of the early dams, in the 1830s to increase the capacity of the reservoirs. After the boom years of canal construction had declined in the 1830s, a new series of large dams and reservoirs in England were built to provide water for the growing industrial cities in the Midlands and north of England. John Frederick Bateman engineered a new water supply for Manchester between the 1840s and 1880s. At completion, this 'Longdendale Chain' consisted of a sequence of six reservoirs on the River Etherow in the Longdendale Valley. Thomas Hawksley is credited with the world's first two uses of pressure grouting to control water leakage under an embankment dam at Tunstall reservoir (completed 1876) in Weardale in County Durham and at Cwm reservoir (1877–1878), north of Rochdale in Lancashire. The Abbeystead dam (1878–1881),



Runcorn Railway Bridge, 1868. Engineer: William Baker. In the background is Grade II-listed Runcorn–Widnes Road Bridge, 1961. Engineer: Mott Hay & Anderson
photo: Peter I. Vardy



Newcastle Central station, 1850. Engineer: Robert Stephenson

photo: Terry Whalebone

south-east of Lancaster, by James Mansergh, was one of the earliest stone-faced concrete dams in the country and probably the highest of its type when it was built. Virtually all of these nineteenth-century dams and reservoirs are still in use, although many were substantially reconstructed to increase their capacities. In areas of the country that could not rely on gravity to provide adequate pressure, pumping stations were an essential part of the water supply and, indeed, the sewage industry. As with much of the country's essential infrastructure, original equipment and buildings have had to be updated to cope with greater demand and improved levels of hygiene. Fortunately, some outstanding examples survive and are listed. In London, the Abbey Mills pumping station (1865–1868) by Joseph Bazalgette is now almost as good as new after recent restoration and Thomas Hawksley's pumping station at Ryhope in County Durham (1868) is preserved with its original beam engines and splendid brick chimney and is still in working order as a museum. Sadly, most of the spectacular buildings and equally spectacular chimneys have been lost.

Gasholders

From the first decade of the nineteenth century, gas lighting began to be installed in English cities and the gasworks all needed gasholders to store the gas and maintain pressure to ensure constant supply. Twelve of these quintessentially Victorian structures have been listed by Historic England (see Historic England (2017)) – for example, several from the 1860s near King's Cross station in London. However, many have already been removed, and gas companies are planning to remove many more to release inner-city land for new development – plans that several campaigning groups are determined to frustrate.

Buildings

Although not the first country to use iron in buildings, England pioneered the widespread structural use of iron in multi-storey buildings and for long-span roofs – first using cast iron, from around 1790, and then wrought iron from the

1810s. William Strutt was the first to use 'fireproof construction' in his six-storey mill at Derby and warehouse at Milford (both 1792–1773, now lost). These consisted of cast iron columns, timber beams (protected by iron sheet and clay) and floors made with brick jack arches. The five-storey Ditherington Flax Mill in Shrewsbury by William Bage (1796) used Strutt's system and enhanced it by replacing the timber beams with cast iron. It is thus the world's first multi-storey building with an internal load-bearing structure of iron. This system was repeated many thousands of times in similar buildings up to the end of the nineteenth century. The main significant development in the design of such factories after Strutt and Bage was the work by Eaton Hodgkinson and William Fairbairn in the 1820s to determine the most economical form for a beam of cast iron. Their 'rational beam' was first used in Orrell's Mill in Manchester (1834, now lost) but can be seen in other Fairbairn mills, such

as Salt's Mill near Bradford (1853). The other exploitation of iron in buildings in which English engineers excelled was the long-span roof. These were developed for three main types of building – the glass house, as exemplified by the conservatory at Syon House (1827, Charles Fowler) and the Palm House at Kew Gardens (1847, Turner); the covered slips which gave shelter for ship construction and repair, in particular for Naval use, such as the later enclosures found at Chatham Dockyard, dating from the 1840s; and the many Victorian railway stations dating from the 1830s, such as Liverpool Lime Street (1849, Richard Turner and William Fairbairn), Newcastle (1850, Robert Stephenson) (Figure 4), Paddington (1854, Brunel), and St Pancras station in London (1878, William Barlow and R. M. Ordish), which, with a span of 75 m, height of 30 m and length of 210 m, was the largest station in the world when completed.

Twentieth century

Relatively few engineering achievements in the infrastructure and buildings of the twentieth century have yet attracted listing. The Grade I listed Severn Suspension Bridge (1961–1966, Freeman Fox) is a rare example of such a major engineering structure, listed for its innovative inclined hangers and aerodynamically shaped deck of steel-box construction, which made it by far the lightest structure of its type and span (Figure 5). Other listed structures include skeletal frames such as the Warrington Transporter Bridge (1915) and Jodrell Bank radio telescope (1957) (Figure 6) and the iconic reinforced concrete bridges on the M1 motorway by Owen Williams (1959) (see The Motorway Archive (2017)). In buildings, the cast iron columns and beams naturally became wrought iron and then steel, but the main engineering innovations of the late nineteenth and early twentieth centuries were in



Severn Bridge, 1966. Engineer: Freeman Fox

photo: Nilfanion



Lovell Telescope at Jodrell Bank, 1957. Engineer: Charles Husband

photo: Mike Peel

the development of flooring systems. The deep jack arches of the mills evolved into shallow, patented filler-joint systems for offices, which were soon codified, and then reinforced concrete arrived in buildings. While the majority of listings of buildings during the last century are those of architectural significance, the Ritz Hotel in London (1906) is included largely in recognition of the innovative load-bearing steel frame by Swedish-American engineer Sven Bylander. Other listings with engineering interest include several 1930s art deco buildings in reinforced concrete, such as the Highpoint flats in London (1935–1938) by Ove Arup and the Boot's factory buildings in Nottingham (1930–1938) by Owen Williams. However, there are clear gaps, particularly when technological advances are concealed below the surface: the development of plastic design theory for steel frame structures developed by Lord Baker and Jacques Heyman in the 1950s was a world-class breakthrough in engineering efficiency, yet none of the pioneering structures so designed are listed.

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A Royal Gas Works

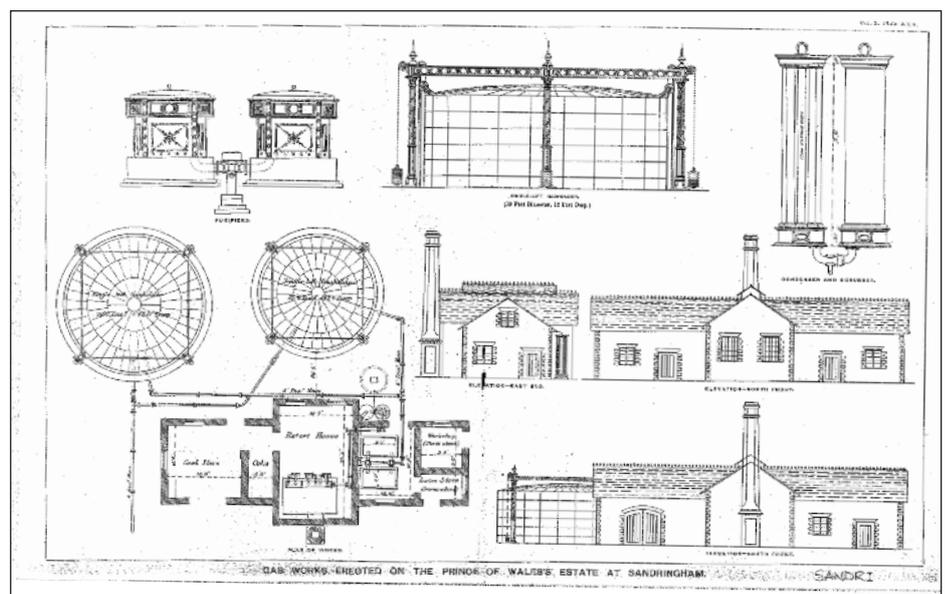
In 1856 the Peter Street, Westminster Gas Works of the (London) Gas Light & Coke Company, was visited by the young Prince Albert Edward and his tutor. It was the first of many Royal visits to gas works. The prince came of age in 1862 and, shortly afterwards, the Sandringham Estate in Norfolk was purchased for him and his new bride, Princess Alexandra of Denmark. The then existing mansion was soon judged too small, and work began on the Sandringham House we know today. A Gas Works to light the house and estate was part of the project, completed in 1870. It was at Home Farm, the present Visitor Centre, and was built by C. & W. Walker, better known to gas engineers for their gas holders and purifier installations. The farm and gas works were about half a mile east of Sandringham House, and downwind beyond the walled kitchen gardens and a belt of trees. There were originally six stop-ended retorts with room for two more, and two holders, one 25 feet in diameter and one of 30 feet. We are lucky to have a detailed description, with plans, in *King's Treatise on Coal Gas*, published in 1879, which assures us that, "Wherever possible, and the rules of neatness and good taste would admit of it, the ironwork is enriched by such ornamental additions as were found appropriate". The buildings were certainly neat, and faced with rough 'Carr Stone', a kind of iron ore, found chiefly in small detached pieces in Norfolk. Outdoor cast iron, notably the two purifiers and holder guide frames were 'enriched' almost to the standards of a Victorian drawing room. All the works mains were four inch cast iron, as was the cross-country main to the House. Ordinary gas works had their lives detailed in the annual volumes of *Gas Works Directory and*

Statistics but it comes as a surprise to find Sandringham's included, albeit in outline only. The annual make was 'about 10,000,000' cubic feet in 1900 and the same in 1915. There were 60 public gas lamps, first mentioned in 1908, which seems remarkably high, to put it mildly. The illuminating power of the gas was high at 20cp, evidently made from cannel, just as the young prince had seen at Westminster 50 years before. In 1900-1908, J. McClaren managed both the gas and water for the Estate. By 1915 he had been replaced by Charles E. Prince. A few other essentially private gas works were included in the public statistics, probably because they also provided a limited public supply in a nearby

village. Perhaps this happened at Sandringham also, which might partly explain the '60 public lamps'. An alternative reason for including Sandringham in this Directory could be the publisher's pleasure in entering, under 'Owner' the name 'H.R.H. The Prince of Wales', later updated to 'H.M. The King'.

John Horne

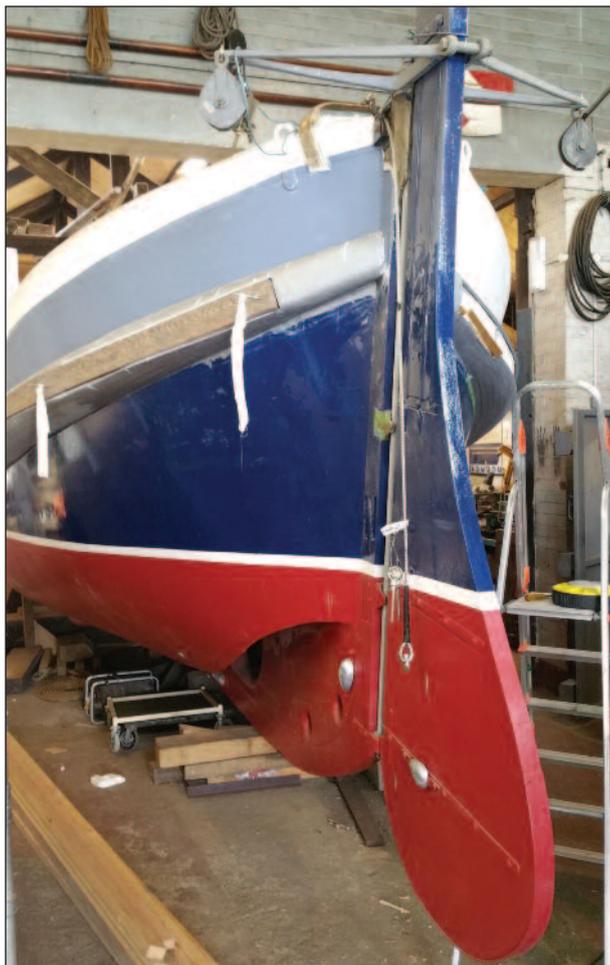
This article was originally published in the *Historic Gas Times*, Issue 93, and reproduced here with the kind permission of the editors John Horne and Russell Thomas.



Gas works on the Sandringham Estate

Restoration Projects Report

The Henry Frederick Swan



The freshly painted Henry Frederick Swann

In 2015 the AIA awarded a grant of £20,000 to the North Eastern Maritime Trust towards the restoration of the LNRI lifeboat *Henry Frederick Swan*. This was to cover various needs including providing new main and mizzen masts. This is a modest but important part of the whole work which has involved a great deal of joinery as well as a replacement and rebuilt engine – similar to the original but slightly taller, requiring alterations to the engine bay. The engine has had a lot of work and preparation carried out on it; indeed we have had it running on a jig in the workshop! It runs beautifully thanks to our talented volunteers especially Chris and Arthur. As the new engine is slightly taller than the original, the engine bay coaming has to be heightened to accommodate this. We have already lowered the boat down onto rollers so we can later manoeuvre her rearwards in order to have enough headspace to hoist the new engine in.

Overall, the work is now approaching completion although there are still many small jobs to be done by the team of volunteers. Joinery work needed includes the engine bay coaming and doors, bench seating, helmsman platform, deck valve mounts, whaleback handrails, mooring/tow posts and the mast support crutch amongst others.

The finishing work and painting is proceeding apace and the Trust is confident that the *Henry Frederick Swan* will be back in the water this year. They have sent the AIA a detailed description of the whole project which illustrates the time consuming and complex work that these restoration projects entail.

The *Henry Frederick Swan* was built during the First World War at Cowes. Her first recorded rescue was in the winter of 1920 when she went to the assistance of a steam trawler, the *Current*, that had run aground on the Black Middens. She eventually passed into the reserve fleet in 1939 but in 1941 an air raid destroyed both the RNLI and Tyne Lifeboat Society boathouses at North Shields, together with the boats *John Pyemont* and *James Young* that were inside them. The *Henry Frederick Swan* consequently returned to service and during the war assisted several vessels, including the submarine *Tuna* when she ran aground south of St Mary's Island in 1943.

Eventually the old lifeboat was replaced with a new one, the *Tynesider*, and was subsequently acquired by local Sea Scouts, passing into private ownership and then to the NE Maritime Trust.

Helston Railway Preservation Society

William Murdoch is a 0-4-0 steam engine built in 1949 by Peckett and Sons of Bristol – one of the finest examples of this little work-horse still operating in England. Originally owned by Portsmouth Council who used it at their gas works, when it finished its working life it was transferred to the care of the GWR Preservation Group.

Peckett locomotives were the backbone of many industrial rail complexes and the company has a long history of building robust engines. In 1864 Fox, Walker and Company in Bristol began building four and six-coupled saddle tank engines for industrial use. They also built stationary engines and pioneered steam tractors with most of their output being exported. They were taken over by Thomas Peckett in 1880, becoming Peckett and Sons, Atlas Engine Works, Bristol. By 1900 the two companies had built over 400 locomotives.

The company continued producing a variety of small industrial and shunting engines at their factory located between Fishponds and



William Murdoch

Kingswood in Bristol. They became specialists in the field, with very precise specifications and standardization of parts.

The AIA grant of £14,000 will provide for a boiler repair, the fitting of vacuum brakes and the re-assembly of the engine to enable operation

by the Helston Railway Preservation Society. External engineers (funded by GWRPS) will undertake the certified work while much of the labour will be provided by Helston Railway Preservation Society volunteers.

Steam Launch *Lady Elizabeth*

The Lakeland Arts trust who took over the Windermere Steam Boat Museum in 2007 were awarded a grant of £20,000 to conserve the steam launch *Lady Elizabeth*. She is believed to have been built by the Monarch Company of New York State in about 1900 and transported to England soon after. Just eighteen feet long, built with a vertical bow and counter stern she has a single cylinder steam engine with Stephenson's valve gear. The boiler is a Lune Valley type fired by paraffin and was built by Lune Valley Engineering in 1910.

SL *Lady Elizabeth* was salvaged in 1955 by George Pattinson, who set up the Windermere Museum in 1977. The boat had sunk in a few feet of water off Cockshott Point at Bowness, where it had been abandoned by its previous owner. Pattinson restored the *Lady Elizabeth* to use adding the steam plant and boiler. He used to troll for char, a fish from the salmon family believed to have been stranded in Windermere at the end of the ice age and now a delicacy local to Windermere and other lakes.

She will be conserved by the AIA grant of £20,000 with as little intervention as possible.



Lakeland Arts Museum, Windermere Jetty, under construction

The interior will be carefully dismantled and stripped back to leave the hull planking and frames bare. This will then be treated with preservative to ensure there is no moisture in the vessel before repainting and re-varnishing and then this elegant little vessel will be on static

display in the boathouse, with occasional demonstration trips out on the lake.

Lakeland Arts new £16m museum Windermere Jetty is currently under construction and it is hoped it will be opened this year.



Britannia Sailing Trust

Britannia is a 60 foot gaff rigged cutter and the last of her kind. She is registered with National Historic Ships UK, has a rich well-documented history and is a fine example of Britain's maritime industrial heritage. Built in 1915 as a sailing vessel without an engine, she was employed initially fishing as part of the whelking industry, out of Kings Lynn, her home port and where she was constructed. She was built by the Norfolk Brothers of Kings Lynn from Russian redwood for her planking and her frames were fashioned from grown oak crooks, especially chosen by the builders who had rights to timber from Sandringham forest. Unusually for a whelker she was fine and deep-drafted, unable to dry out on the sandbanks, which was normal practice for the Wash boats which were generally shallow drafted enabling them to go aground, catch the whelks and then sail off on the next tide. *Britannia's* style was to carry an open boat on deck, anchor off the sandbanks, put the boat over the side for the men to catch the whelks and then they could get back on board before the tide was full, and sail at speed back to port to sell the whelks at market. First back got the best price!

The whelking industry steadily declined in Lynn and eventually *Britannia* was the last whelker left sailing out of the Port. She was sold on to Boston in the 30s and later fitted with a large Marine engine, and used for power trawling. There is no record of her after this until in 1968 when, working as a powered fishing boat, she ran aground on a spit whilst returning home to Boston, and the steepness of the bank caused her to capsize and sink. She was pumped out and raised, but the owners could not afford to put her back in working order and she was sold.

She was rescued in 2013, after she had been neglected and left on a mooring for six years. The Britannia Sailing Trust, which was set up as a registered charity in 2014, now owns the vessel and four years later she has been stabilised, and is safely under cover in a boatyard in Gweek, Cornwall. The Trust's purpose is to save, restore and preserve the unique hundred year old vessel for future generations. The AIA grant of £18,700 will be spent on a new main mast, bowsprit, wire rope rigging and dead-eyes to bring the boat back to sailing condition.

The Murtoa Stick Shed – a very big tin shed



The Murtoa Stick Shed in 2013

photo: Wimmera Mail-Times.

Members who joined the Heritage of Industry tour of New South Wales in 2015 will remember the grain silos at Port Kembla. This article, taken with kind permission from the Engineering Heritage Australia, January 2017, describes a very different storage solution and a remarkable conservation project. The capacity of the eight large silos on the new wharf at Port Kembla with the nine smaller ones is about the same as the huge shed described here.

but that is another story. During World War II there was a wheat glut around the world and Australia couldn't sell its wheat. To make matters worse German U-boats were disrupting Allied sea trade and Britain, previously a major consumer of Australian wheat, started to obtain its wheat from the United States as the North Atlantic was a shorter route to Britain than the long haul from Australia. A consequence of the glut was that

which is a lot of loaves of bread. The construction of the building is quite simple. The uprights consist of 560 un-milled Mountain Ash (Eucalyptus regnans) poles planted directly in the ground. The roof structure is a light, timber construction clad with the traditional Australian rural material – corrugated galvanised iron. The structure is braced with diagonal steel rods and finished with a 100 mm thick concrete floor. Grain is delivered to the store by a central conveyor belt running the full length of the building at the highest point under

Ed
Some of my earliest memories, when I was about four years old, were around the wheat harvest. I lived on the family farm in Western Victoria. Everyone pitched in during the harvest and it was the highlight of the year. The wheat was still harvested by Sunshine harvesters hauled by horses but the farm did own an ancient Chevrolet truck from the late 1920s. The truck was used to take the wheat, in bags, to the silo at the railway station at Nhill. My father and his two brothers, under the strict direction of their father, worked the farm. The 'boys' hefted the wheat bags from the platforms of the harvesters to the back of the truck – thousands of them each year. The 'boys' had all served in the Air Force during World War II. Two of them had flown Catalina flying boats in 'The Islands' and all three had returned without too much damage but some 'hairy' experiences. Lifting wheat bags was another thing, and they all suffered terrible back problems throughout the rest of their lives.



A man stacking bags of wheat at a railway station in the Mallee in 1922 photo, Bill Boyd Collection

I remember a big event at Nhill when I watched the early stages of a revolution in grain handling as a tip truck dumped a whole load of bulk wheat into a brand new hopper at the silo. Wheat bags were on their way out. Bulk handling was the new way to move wheat. At about the same time, the horses were replaced by tractors,

wheat storages in Australia, and particularly in the Victorian Wimmera/Mallee area and the south-west of Western Australia were overflowing. In response, a number of unusual large wheat storage facilities were built. The first of these was at Murtoa in 1941, just north of Horsham in the Wimmera. Soon after, a second wheat store was constructed at Murtoa, one at Dunolly 50 km west of Bendigo, one at Parkes in New South Wales and several in Western Australia. The buildings were immense. The last surviving example, at Murtoa, is 280 m long, 60 m wide and 19 m high at the longitudinal ridge. The capacity is 3.4 million bushels, a close to meaningless measure today, but it amounts to about 102,000 tonnes of wheat –



Dragging poles into position with an early caterpillar tractor, 1941 photo, Culture Victoria.

the ridge and removed by conveyors near ground level at the side of the building. To the average farmer in 1942, working with elevators, conveyor belts, trucks and railways was very modern indeed.



Stick Shed pole placed in its hole prior to backfilling, 1941 photo: Culture Victoria



Demonstrating a McKay's all horse powered Sunshine Harvester at work somewhere in the Mallee, probably in the late 1920s photo: Ferguson/Haughton Collection © M. Doring.

The construction is described as of architectural significance as an expression on an unusually grand scale of the Australian rural vernacular corrugated-iron tradition and the outside appearance, although impressively large, is superficially similar to any other tin shed. The interior space is, however, in quite a different

league. The vast interior with its predominant theme of verticality, generated by the veritable forest of poles, presents perhaps the most impressive interior space anywhere in Australia. Whatever comparison one applies, the interior space is extraordinarily atmospheric and superlatives like 'breathtaking' and 'amazing' seem quite inadequate. Finding a use for this massive space, 16,800 sq m, since its retirement as a grain store, has been an ongoing challenge. Nevertheless the sheer majesty of the space suggests a high level use, as the space would lend spectacle to any exhibition or event held there. The building is certainly in the same class as the Crystal Palace in London (now sadly gone) and the Royal Exhibition Building in Melbourne. The Stick Shed remained in use as a grain store until the 1989/1990 wheat harvesting season after which, because it could no longer be kept pest and insect free, it was judged non-viable for grain storage, and was becoming very expensive to maintain. The last grain in it was cleared out and it was left empty and purposeless and probably under threat of demolition. But it was still owned by the Victorian Government and considered to have great heritage significance, so in November 1990 the Stick Shed was added to the Victorian Heritage



The interior of the Stick Shed photographed in 1992, soon after it was emptied for the last time. Scale is indicated by the tiny figure at lower left photo: Culture Victoria.



Pulling a rotten pole stump with a forklift. The upper pole has been moved aside and is held by scaffolding photo: Martin Zweep, January 2011

Register under VHR number H0791. In 1992 the government owner, the Grain Elevators Board appealed to VCAT (the Victorian Civil and Administrative Tribunal) to have the shed removed from the Heritage Register, but failed. Many people in the district considered the Stick Shed to be an eyesore and a blot on the landscape, and supported the move to demolish the shed, but there were a few who valued its unique properties and they had formed a group to defend it at VCAT. One of the defenders was a newcomer to Murtoa in 1990 – Leigh Hammerton. He was immediately struck by the Stick Shed and has since become something of a local voice (and authority) for it – publicly defending its validity and potential, even in its darkest hours. Hammerton, and other locals, have been arguing and lobbying ever since to encourage rehabilitation and re-use of the shed. In the mid 1990s the Victorian government instrumentality that owned the shed, and the whole site, was privatised. This company, (VicGrain, later Graincorp) didn't want the Stick Shed, but it bought all the surrounding land, leaving the still government owned Stick Shed marooned on an island to slowly rot away with no maintenance and no easy access. Things came to a head when bits of

roof started flying off in a storm, and the changes in the building could not be disguised.

Unfortunately, over time, without a use or user to pay for and undertake necessary maintenance works, the building began to deteriorate. In 2008 the Victorian Heritage Council became concerned about the condition of the building and the unlikely potential for a new owner in the immediate future, and felt that action needed to be taken to repair the building before it was lost. A survey was completed in 2008 and concluded that the building was repairable. The Heritage Council secured a grant, and with an initial budget of \$1.2 million of Heritage Council money, repair works started in early 2009. The reclaiming of the Murtoa Stick Shed from imminent demise had begun and was completed in 2013. The hunt for an ongoing permanent solution for the use of the building continues.

The nature of the repairs is worth a quick review for the benefit of those who are unfamiliar with the story.

Greg Owen's investigations revealed that the primary problems were around the poles. They had originally been planted about one metre directly into the ground and there was a high water table in the area. This had led to rot and termite attack, particularly of the in-ground part of the poles, and to termite migration to the roof structure with consequent damage to the poles and roof members. The solution to this problem was to temporarily lift the poles individually, cut off the

rotten lower portion and build a reinforced concrete footing in the original hole. The pole was then placed back on the new concrete footing and connected to it by plates embedded in the footing to resist uplift forces. With some of the shorter poles, a somewhat less intrusive method was adopted whereby the poles were lifted to the correct height and a fabricated steel cross member was added, bolted through the pole and to the floor. In a few cases the poles had deteriorated too badly and were replaced altogether with steel poles. Poles which were wasted due to the deterioration of sapwood, reducing their effective diameter, were fitted with bow trusses constructed around the existing poles using steel spreaders and cables. Once the poles were repaired, the roof sections which had sustained damage were repaired, connections re-made and new members installed where necessary. New sheeting was then applied to the roof to patch areas which had collapsed. Diagonal bracing was repaired and termite infestation treated. The building was now watertight and its structure restored to something like its original condition. The repair of the Murtoa Stick Shed was seen as a considerable achievement by the wider heritage community. Locally, much of the population had thought that the shed was an eyesore and was doomed by its deterioration. They were greatly surprised by the relatively easy repair which had been achieved and their attitude to the building was transformed to one of pride and support. Along the way the shed maintained its protection under the Victorian Heritage Act and later, in 2014, the shed was added to the National Heritage Register.

Owen Peake



The modern way but it does need a very big sheet – on a still day!

Now, when temporary large scale grain storage is required horizontal bunkers are constructed, sometimes almost on the scale of the stick shed, by building a low bund around a long rectangular stretch of levelled ground and then covering the grain with an enormous sheet.

Ed

The Railway Heritage Trust 2017

The Trust receives income, largely from Network Rail, which is used to support projects on the rail network which could not be justified on purely commercial grounds.

In 2016/7 the Trust supported 60 projects with grants totalling £2m. The grants funded repair and restoration work carried out on the heritage aspects of buildings and structures in Network Rail's ownership. In addition, the grants drew in £3.5m of external funding.

The largest grant, of £250,000, went towards work on the Grade II Morpeth Station, part of which will be converted to a business centre. Another very large grant went towards further work at London Bridge. Here a series of most unusual 'warren truss'- style part cast-iron girders, which support the tracks where they pass over the main subway, have had drainage and electrical services removed. The trusses are now a major feature which complements the reorganization of the retail premises by Network Rail who have removed the retail 'pods' to reveal the brick side arches. This has transformed the subway to make it a positive feature.

Grants of over £50,000 each were made for:

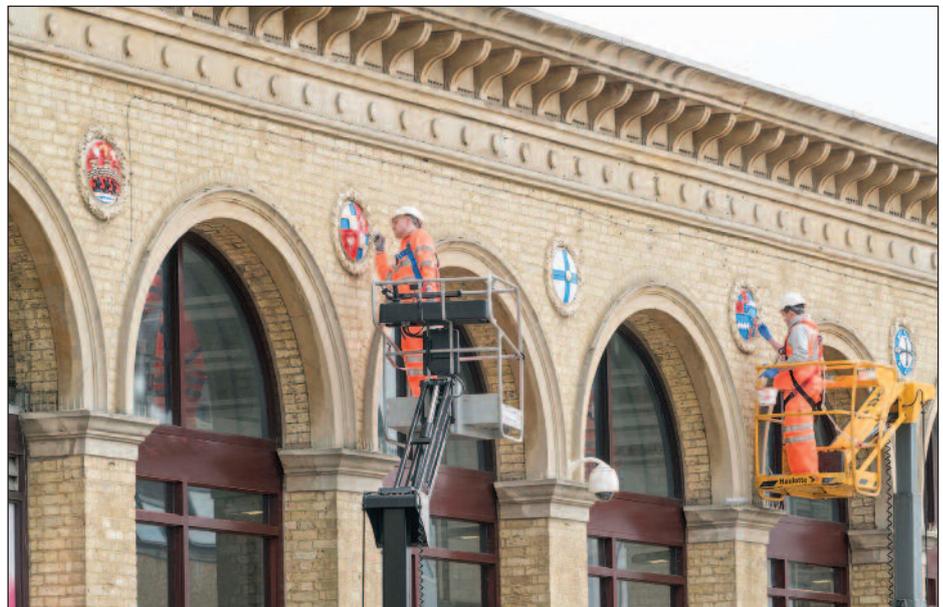
Morpeth Station: Restoration of station as business centre	£250,000
London Bridge Station: Restoration of heritage features	£240,000
Ingatstone Station: Restoration of heritage features to buildings and footbridge	£151,000
Stamford Station: Provision of a new canopy to eastbound platform and building	£150,000
Cambridge Station: Conversion of former parcels office to a restaurant	£131,000
Wakefield Viaduct: Works to open viaduct as a cycling route	£125,000
Bennerley Viaduct: Substructure repairs and analysis	£75,000
Leeds Station: Dark arches – new road surface	£70,000
Bournemouth Station: Heritage works	£57,000

The smallest grant was of £350 for a water and drainage survey at Garelochhead Station.



Restored canopy at Bury St Edmunds Station

photo: Paul Childs/RHT



Repainting the roundels at Cambridge Station

photo: Paul Childs/RHT

All Party Parliamentary Group on Industrial Heritage

Following the General Election in June, the AGM of the APPG IH was held on 18 July 2017. At this meeting the APPG was reconstituted under the Chairmanship of Nick Thomas-Symonds (Labour MP for Torfaen) until the next general election, whenever that may be! There were a good number of MPs and Peers in attendance supporting the Group; many were Nick's colleagues from South Wales. The Chairman reiterated the next steps he wishes the Group to take, starting with two Evidence Sessions which would take place on mid-October 11 and 12 October. At each session there was a panel of invited speakers, consisting of up to eight people. All four UK countries were represented, including

Historic England, Historic Environment Scotland and RCAHMW. Canal & Rivers Trust and Heritage Railway Association were represented, as were a number of industrial museums such as Chatham Historic Dockyard, Big Pit, Ironbridge Gorge and Sheffield Industrial Museums. Funders represented were HLF and the Architectural Heritage Fund. The AIA was represented by its President, Marilyn Palmer, Chairman, Mike Nevell, and immediate past-Chair Keith Falconer.

Each speaker was asked to introduce themselves and then give a short presentation on 'three of the main challenges faced by industrial heritage'. The Chair then asked the panel to answer a number of questions exploring the

value and benefits of the industrial heritage, buildings and sites at risk, models of preservation, good practice, funding sources and future actions. All the sessions were recorded and these have now been transcribed, with financial assistance from Historic England and the AIA. Written submissions have also been made.

Over the winter a report will be drafted based upon the recordings and written submissions. It will be published and launched in the spring of 2018, mainly available electronically. It will be circulated throughout Parliament, to local authorities and to the industrial heritage sector.

Tony Crosby

Heritage Lottery Fund – Industrial, Maritime & Transport Group

The latest of HLF's bi-annual Industrial, Maritime & Transport Heritage Group (IM&TG) meetings was held on 7 December 2017 at the London Museum of Water and Steam, Kew Bridge. There were 14 people at the meeting, three of whom were HLF staff; I represented the AIA. The morning session was taken up with my report on the APPG IH Evidence Sessions held in October; a presentation by Shane Kelleher on the In Industriada Festival of industrial heritage in Poland; and a presentation on HLF's Resilience Grant Programme. The afternoon was taken up with feedback from the various organisations represented at the meeting:

The launch of the European Year of Cultural Heritage (EYCH) took place on the same day and so merited a mention; Graham Bell is the UK co-ordinator; permission to badge events as EYCH can be obtained by filling out an online form which would go to Graham; E-Faith thematic months were mentioned.

DCMS published their Heritage Statement 2017 on 5 December and it can be downloaded from their website – search – heritage statement 2017.

HLF have now agreed the process for consultation on their new Strategic Funding Framework to be published in early 2019. The recent DCMS review of the HLF has strongly endorsed HLF and its transformative work. In January 2018 HLF will begin a consultation to inform their approach and priorities from 2019, hoping all partners across the UK will respond. During this planning phase, HLF's Board has agreed that the next financial year 2018/19 should be a transitional year, with a focus on consultation, trialling some new ways of working and types of funding, while giving applicants and HLF time to plan for the new Framework. Immediate changes include:

Those seeking grants for Parks, Townscapes and Landscape Partnerships to apply under the Open Programmes – e.g. Heritage Grants, They will not fund 'major grants' (Heritage Grants over £5m) in 2019, so there will be no application deadline in 2018,

Other funding streams – such as Young Roots and First World War: Then and Now – continue, but some will draw to a close as 2019 approaches,

The grant budget for 2018 will be £190m, a lower amount than in recent years,

The budgets for smaller grants, which are decided locally, should be protected as far as possible.

Fuller details can be found on their website – search – HLF changes in grant making

Tony Crosby

Gasholders at opposite ends of the earth



Brisbane Gas Holder in 2015

photo: Peter Hall

In Brisbane, Australia at Newstead Gasworks, 70 Longland Street, Teneriffe, there was a water-sealed gasholder of the British type. In June 2005 the remnants of No.2 gasholder and guide frame were listed and placed on the Queensland Heritage Register with the guide frame becoming a feature in a new park. This holder had had a long life: dating from 1873, it was in use storing natural gas until 1996.

Initially set in open surroundings, the gasholder is gradually being swamped by new high-rise blocks. Despite being at the opposite end of the earth this scene is remarkably

reminiscent of St Pancras – King's Cross in London – in fact, with the events advertised on the hoarding, uncomfortably clone like.

We must expect that with preserved gasholders subsequent development will surround them with new buildings. They are being kept as a feature and in Brisbane, Gas Works apartments were to be included in the development. The listed gasholder guide frame at the Oval cricket ground in London dating from 1877-79 will no doubt soon be similarly surrounded by apartment blocks.

Robert Carr

Interim protection for buildings under threat

This petition under the banner of Change.org is open for support: 'I urge the UK government to amend the law to ensure that vulnerable historic buildings in the rest of the UK have the same protection as those in Wales'. Please add your name.

The petition is a response to the recent loss of a Jacobean ceiling in Bristol, which was deliberately destroyed whilst the status of the building was still under consideration – but this sort of vandalism affects heritage of all ages and types.

The Heritage Statement from the Government presented by Heritage Minister, John Glen, on 5 December explicitly refers to the campaign for interim protection, saying, 'There has – rightly – been concern recently over loss or damage to buildings while they are being considered for listing. This is unacceptable and I recognise that we need to protect our heritage

while the formal process of listing is in progress. So we are working with our partners to identify the best way to provide appropriate protection while respecting the rights of owners and developers.'

The Heritage Statement itself also directly refers to this issue at the bottom of page 15 – Search – Heritage Statement 2017.

This is still far from being a firm commitment to amend the existing law, or introduce new legislation. Historic England will ultimately advise the government on the best way to improve the law – but we need to continue to demonstrate a strong demand for change. Please write to your MP or write to Historic England and support the petition

The Heritage Alliance is collating examples of demolition during consideration for listing so they can better make the case for interim protection. Please send any examples to policy@theheritagealliance.org.uk.

AIA Council Meetings 6 and 7 October 2017

A discussion meeting on the 6th was concerned with 'The future direction of the AIA'. Council examined what we do (and what we don't do), who we do it for and why we do it. We also looked at what had changed since we were established, and whether our aims are likely to attract a younger membership. Council considered the question: If the AIA ceased to exist, what impact its loss would have on the wider society? The meeting was remarkably consistent in its replies, namely that society would lose our role as advocates for industrial archaeology and our knowledge base.

A mission statement resulted from the discussions, and we should consider how best to develop it:

We use and develop our knowledge and expertise in the most accessible ways possible to advocate the value of industrial heritage/archaeology and help others (i.e. the public) to do so.

The Council meeting proper took place on 7 October. In summary:

Treasurer John Jones reported that at the end of September we had a surplus of £1,779 on our operating funds; this was despite a loss of £1,258 on the annual conference.

Restoration Grants. It was noted that we have now awarded around half a million pounds. It was agreed that there was scope to increase awareness through AIA-generated publicity and Marilyn Palmer agreed to do a brief piece for *Heritage Update* linking with a press notice. Mark Sissons was thanked by Council for all his hard work on administering the Awards.

Secretary David de Haan noted that Council needed to identify a Vice Chairman to handle meetings if the Chairman was not available, also that the Association was lacking both a Publicity Officer and an Affiliated Societies Officer, both key roles. Bruce Hedge had circulated a report showing that at the end of September AIA membership had recovered from last year, and now stood at 506.

Conference Report. John McGuinness noted that the Moulton conference had been a great success and thanked Marilyn Palmer and local organiser David Ingham for their hard work.

An AIA Practical Day has been organised by Marilyn Palmer at Magpie Mine, Derbyshire, for 7 to 8 April 2018. Booking in due course will be via Eventbrite.

At a date to be arranged in October 2018 (probably 12 October), there will be a Creative re-use seminar as part of the AIA's contribution to the 2018 European Year of Cultural Heritage.

Planning Casework Report. Amber Patrick reported on the problems experienced with the CBA database from which data is gleaned on industrial sites. This had resulted on our not commenting on a case in Hull. In the period June to September there were four cases on which comment had been necessary. That significantly

understates the amount of casework required. The four commented on were:

Croft End Mill, Edenfield; Hollins Mill, Todmorden; Greenwich Peninsula Gas Holder and Darley Mill, Niderdale. Interestingly, only one of the above was actually generated via the CBA database, which should be our main source of notifications. A new database has only been fully functioning for a few weeks, so it is too early to gauge its success.

Publication Editor's Report. A revised contract with Taylor & Francis, publishers of *Industrial Archaeology Review*, had been circulated. The new contract, the terms of which were agreed at the meeting, should result in savings to the Association. Among other significant changes it will include the printing and distribution of *IA News*.

The question of alerting archaeology contracting groups to the potential for publishing in *IA Review* was discussed. It was commented that there was usually an allowance in a contract for publishing.

Field Visits Report. Bill Barksfield announced Heritage of Industry's Spring Tour to Saxony, 14 to 20 May, for which 22 people have registered an interest so far. A revised Heads of Agreement with Heritage of Industry was discussed and approved for signature.

There were four successful 'Country House Comfort & Convenience' tours last year, and two more planned for 2018, the North West (a repeat) and East Yorkshire (new).

Website Report. Bill Barksfield is also the Association's web-master and he produced statistics showing that we receive between 80 and 100 hits per day. 'Characteristics and Forms of Road Transport' is still receiving much interest so a link to *IA News 142* (2007) has been set up.

E-Faith Report. Kate Dickson reported that new statutes have been signed for E-FAITH so that the organisation is now incorporated as an Association giving limited liability to trustees and directors. Individual members from the UK can join as associate members. An EU website is being finalized that will allow smart phone users the ability to connect to five pages of information when visiting certain museums and heritage sites (translated into a number of European languages as appropriate) and placement on an EU-wide map. Search – industriana.mobi

2018 European Year of Cultural Heritage. The Industrial Heritage monthly themes, agreed by the E-FAITH board, were listed and our Practical Weekend in April on mining fits the theme well, as does the October meeting on Creative Re-Use.

Industrial Heritage Support Officer's Report. Shane Kelleher reported on his activities since the June Council meeting, which included 'clearing house' provision; information, advice and/or support has been provided to a number of sites/organisations during this period. The IHSO

has also been undertaking a 'mapping and gapping' exercise into the reach of the clearing house facility since the beginning of the project. Training delivery was carried out at five locations on five different themes.

Development, Networks and Partnerships: Work continues on the North West Stationary Steam Engines Training Programme bid, and also with organisations from the North East to develop a formal industrial heritage support network in the region. Advocacy work continued with Historic England and the Association of Independent Museums. Finally, the IHSO project co-hosted (with ABTEM) the Industrial Heritage Networking Lunch at the AIM Annual Conference at Chatham Dockyard on 17 June.

Bruce Hedge

WANTED

The AIA needs a PUBLICITY MANAGER

A vital part of the AIA is to campaign for a wider understanding of the importance of our Industrial Heritage and never has it been more important to speak out.

If any member could help with this please get in touch with David de Haan or any member of the Council

New Members

A very warm welcome to our new members:

Johnny Crawford, Caldicot
John Ditchfield, Bridgwater
Ian Haynes, Ashton-under-Lyne
Anthony Jones, Cambridge
James Stepleton, Saint Louis, USA

VISIT THE AIA WEBSITE

www.industrial-archaeology.org

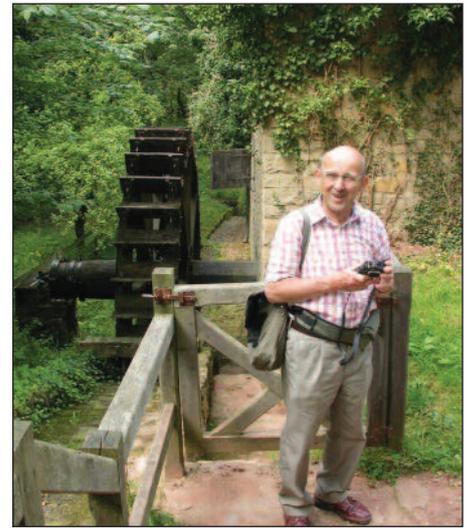
David Crossley

David Crossley, Honorary Reader in the Department of Archaeology in the University of Sheffield, who died on 3 December 2017, was one of the first generation of industrial archaeologists although he would not have described himself as such. Having read history at Keble College, Oxford, he began his academic career as an economic historian in Sheffield, where he published with Sidney Pollard in 1969 *The Wealth of Britain, 1085-1966*. He turned his attention to archaeology but retained his interest in the crucial importance of documentary sources for the later periods of archaeology. He was a founder member of the Society for Post-Medieval Archaeology and served on its Council for many years.

Like many of us in the 1980s, he ran evening classes in industrial archaeology and many of his group took part in the production in 1989 of *Water Power on Sheffield Rivers*, using both historical documents and fieldwork on some of the rivers which formed the original basis of Sheffield's iron and steel industry. He remained faithful to the Sheffield area until his death, organising the documenting and recording of the remnants of its cutlery trade and serving on the Council of the Sheffield Industrial Museums Trust. David was also a Trustee of the Ironbridge (Telford) Heritage Foundation and the Association for the History of Glass, as well as chairing the Industrial Archaeology Advisory Panel of English Heritage for six years before he retired from that position in 2011. He worked extensively on the

excavation of iron and glass furnaces, writing with Henry Cleere a definitive study in 1985, *The Iron Industry of the Weald*, published by Leicester University Press. At one time he edited both *Post-Medieval Archaeology and Historical Metallurgy*, and wrote *Post-Medieval Archaeology in Britain in 1990*, again published by Leicester University Press and really the first book of its kind on this period of archaeology in the UK.

David was very keen that industrial archaeologists should regard excavation as part of their skills portfolio. In a review of the Historical Association pamphlet by Michael Rix which first popularised the term 'industrial archaeology', David wrote in 1967 that: 'there is a growing feeling that much is being lost in industrial studies by the inability or unwillingness of Industrial Archaeologists to appreciate the benefits which a training in excavation techniques would bring them'. He was a pioneer in the scientific excavation of iron-working sites, and his work in 1967-68 with the Wealden Iron Research Group on the iron blast furnace at Panningridge, in the Sussex Weald, showed how it should be done. To say that David was proud that his excavations were fully published and their archives deposited would be overstating the case. However, the speed of production and thoroughness of his reports, and his inclusion of scientific investigation of finds in a period when that was unusual, are an example that others would do well to follow. Many of his publications were ground-breaking and helped to set standards and define new areas of interest across a range of disciplines and periods. They will



David Crossley at the open air museum at Kommern in the Ruhr, Germany
photo: Justine Bayley

continue to be used and quoted – a fitting tribute to a man who was approachable, well-organised and quietly competent in all he did. He will be sorely missed by his many friends.

His Rolt Memorial Lecture for the AIA in 1995 was a study of the records of 'The Fairbanks of Sheffield: surveyors' as a source for the study of regional economic development of the eighteenth and nineteenth centuries' (published IAR 19: 1997, 5-20). He was still working on these invaluable historical documents in his last years, and will be sadly missed both in Sheffield and nationally.

Marilyn Palmer and Justine Bayley

John Selby

Many of the regular delegates at AIA conferences will remember John Selby, who died on Boxing Day 2017. He was among the graduates from my first Certificate in Industrial Archaeology group at Vaughan College Leicester, in the 1970s, and maintained his activity in industrial archaeology until his death. He was very interested in waterways and particularly in the Hillmorton Wharf on the Oxford Canal – his Christmas cards were always snowy canal scenes.

His last member's contribution was at the Moulton Conference in 2017 (when he was 92) on the subject of the party held in 1837 at Dun Cow, Dunchurch, by George and Robert Stephenson, to celebrate the near completion of the Kilsby Tunnel on the London & Birmingham Railway.

He also played a part in the work on the reconstruction of the replica of the Iron Bridge at Blists Hill in 2001, having recognised that the watercolour sketch by Elias Martin probably indicated how the bridge was built, and took part in the subsequent Timewatch programme, 'The Mystery of the Iron Bridge', in January 2002.

John was a founder member of the Warwickshire IA Society, serving on the Committee for over 25 years, and persistently flying the AIA flag in Warwickshire with great



Erecting the Iron Bridge, watercolour by Elias Martin
courtesy Skandia Group, Stockholm

enthusiasm, his research on the Fenny Compton tunnel and brickyard led to an article in AIA Review, and some of his early investigations of the ironfounders of Warwick and Leamington Spa proved to be a valuable foundation for a current WIAS project on the subject. He was an enormously well-respected member of WIAS and will be sorely missed.

Our sympathies go to his wife Valerie, who also attended conferences regularly.

Marilyn Palmer and Martin Green

Authors Needed

Rob Shorland-Ball, museums and heritage consultant, is currently looking for authors for a new series of industrial heritage and transport books which he is editing. It will have the title of 'Engines of Change' and will be published by P & S Books. Subject to discussion, P & S can offer each author £1,250 to deliver 30-40,000 words and around 80 images. The series would be paperback and priced at no more than £14.99. Proposed themes include:

Coal mining

Agriculture

Slate mining

Textile mills

Flour mills

Woodworking, including wheel-wrighting, ship-wrighting, carpentry and under-taking

Organ building

Mechanical and Civil Engineering

Roads, from dirt tracks to motorways

Harbours, dockyards and shipyards

If you are interested in contributing or can think of a potential author/subject please contact Rob directly – robsb@wfm.york.demon.co.uk.

Crossness v Woolwich Arsenal

I have just read the article by Robert Carr in *IA News 183* about the Royal Arsenal at Woolwich.

I am a volunteer at the Crossness Pumping station. This is at the end of Joseph Bazalgette's Southern Outfall Sewer and used to share its eastern boundary with the Arsenal.

When it was being built in 1860 (it opened in 1865), a minute of the Metropolitan Board of Works mentions, that "on two occasions during the past month, shot from the new practice ranges in Plumstead Marshes passed over workmen employed in constructing the Southern Outfall Sewer. The Royal Engineers were immediately appraised of the fact.... They appear to think that no precautions that they could rake would render our Outfall Works perfectly safe as at present situated, and have suggested their removal to some other position."

Letters went back and forth until one from the War Office, dated 7 December 1860 said, "on the subject of the protection of the men engaged on the Main Drainage works from the artillery practice in the Woolwich Marches, and to inform you, for information of the Commissioner of the Metropolitan Board of Works, that instructions have been forwarded to the authorities at Woolwich, to the effect that no more firing in the direction of the drainage works is to take place for the present."

It goes on to say that "Mr Herbert has decided as a permanent measure to change the direction of the line of fire in the practice range, and for this object he is communicating with the Lords Commissioners of Her Majesty's Treasury, with a view to obtaining funds for the purchase of the additional land required."

Another point that Robert Carr mentioned was about a grid-iron being installed to facilitate the loading of large gun barrels at the Arsenal. Something similar was built at Crossness. In 1894 the London County Council had proposed that the sludge vessels that had been introduced as a result of the treatment of the sewage which arrived at Crossness could be serviced by direct labour if a grid-iron was built in the river at the works. In addition, it could be used to service the Woolwich Ferry boats although new workshops and machinery would also be needed. The grid-iron was built along with the extra facilities.

The grid-iron is not there today but when it went is not known. The sludge vessels ceased in 1998 when the discharge of sewage into the Thames was banned and an incinerator is now used to deal with the sludge.

A grid-iron was built just downstream from the Woolwich Ferry terminal on the south side of the river, I came across it some years ago. When this was built is not known or even if it is still there. Could this have been the one referred to by Robert Carr?

The old pumping station has been preserved and one of the engines, *Prince Consort*, is steamable, although at the moment we can't open the engine house because asbestos has been detected in one of the other three unrestored engines. It should be open again in March 2018 – check our website – crossness.org.
David Dawson

Hot water street lamps

I recently acquired a copy of the 1899 edition of the Sunlight Year Book. In the scientific section is the description of a 'Hot Water Street Lamp'. It was claimed that it could 'supply a gallon of hot water for a halfpenny on the 'penny in the slot' system; and for another penny 'a compressed slab of cocoa or tea, compact with condensed milk and sugar'.

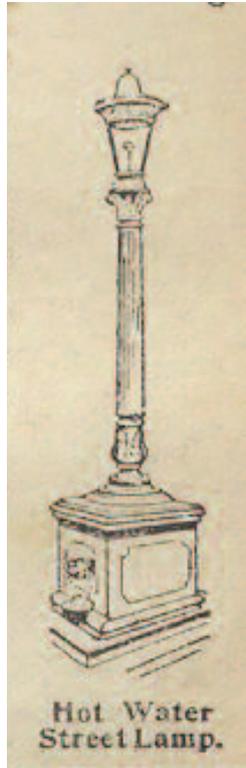
The lamp post was said to hold thirty to fifty gallons of water, supplied from the mains. The water was heated by 'a small quantity of water carried through a spiral pipe round the lamp flame several times and then into a little boiler right at the top, which turns it into highly-heated steam, and the steam passing down again boils a gallon of water in a small tank.'

'When the halfpenny is paid, and the handle pulled, the gallon tank of boiling water is emptied, and when the handle is closed the tank is refilled from the large tank, and down comes the superheated steam and boils it in about three minutes, and so on all day long.'

It was stated that 'the first lamp of this kind was erected in Queen's Buildings, a block of model dwellings in Southwark, in April, 1898.'

I wonder how many other such lamps were installed and how effective they were. Does anyone know of any others or if any still exist? I should be pleased to hear from anyone with further information on this or similar devices for the public provision of hot water.

John McGuinness



Scotch derricks

Most readers will remember the Scotch derrick. They were so commonplace, one saw them everywhere, particularly in timber yards and quarries. Alongside the Thames in London and further down river there were very many. There were also examples along the River Lea. One by one they have disappeared leaving very few survivors. It would seem that in the whole of Greater London, an area of about a thousand square miles, there are probably less than half a dozen.

The Scotch derrick crane was developed in the 1860s by the Scottish engineers Andrew Barclay and John Fyfe of the Kemnay granite quarry near Aberdeen. The first examples of this crane were steam powered – more recent derricks have usually been electrically driven, or perhaps diesel. In the twentieth century the majority of manufacturers were Scottish, including John M Henderson & Co Ltd of Aberdeen; Butters Brothers & Co Ltd, Govan; and Anderson Grice & Co Ltd, Carnoustie. Were any ever made in England?

In the early 1980s, the enlightened London Docklands Development Corporation together with the London Borough of Southwark, had a policy of preserving things which were related to the docks – as monuments to give new residents a sense of place. A good example was the Scotch derrick preserved on the riverside to the east of Odessa Street at TQ 366795. This crane, a standard Butters Brothers design with a 120 ft jib rebuilt 1969, was just to the north of the Greenland entrance to the Surrey Commercial Docks and had been used to unload timber from ships and barges. Sadly, despite a very vigorous protest campaign, it was reported in August 2017 that this rare survival had been cut up. The photograph shows this derrick shortly before the end of its life.



Odessa Street crane July 2016

photo: R Carr

Are there any more Scotch derricks left? There may still be one just to the east of Dock Road, Brentford, at TQ 178773. At Bulls Bridge there was a small example by the canal, possibly preserved, at TQ113788. Until recently there was another example in Gravesend to the north of Gordon Promenade East at TQ 657743. Can you find any survivors? You may be more fortunate.

Robert Carr

Prior Park or West London?

My note in *IA News 183* suggested that the puzzle picture in issue 182 shows Ralph Allen's Tramway at Prior Park, near Bath. I based my identification on its close similarity to the famous lithograph of Prior Park published by John Bowles in 1752. In both pictures a railway is the focus of interest. I have since had an opportunity to examine another version of the print, which bears a title on the mount, claiming it as 'A View Upon the London West End Railway, an Extension of the Birmingham, Bristol and Thames Junction – from Knightsbridge looking westward and passing North of Brompton Square' and names the lithographer as J R Jobbins. Mr Jobbins shot to fame in 1840 when he published a sensational (and inaccurate) engraving of Edward Oxford's attempt to assassinate Queen Victoria, which was profitable enough to enable him to open a popular gallery on the proceeds.

This seems to put my identification out by 100 years and 100 miles but there are problems.

First, a particular difficulty with the title is that there has never been a 'London West End Railway' company. The Birmingham Bristol & Thames Junction Railway *did* exist, but was a pretty disreputable undertaking, and never ran a train under its own name. It secured its Act of Parliament in 1836, but struggled to build its 2½ miles of line. Shareholders defaulted, contractors went unpaid and in 1840 the company had to go back to Parliament for a new Act to increase borrowing powers. Its reputation was such that investors were not inclined to lend, and the directors personally had to advance money. A passenger service started at the end of May 1844, but was abandoned in November the same year. Directors resigned and replacements were hard to find. It stretches credulity to believe that the air of quiet efficiency the lithograph seeks to convey, with neat trains passing on impeccable tracks through a carefully tended mature landscape, could be anything like the reality of such a shambolic operation. This is advertising, not factual recording.



All in the imagination?

Then, looking at the details of the track and trains, further serious questions arise. First, the permanent way. As the West London Railway, the line was leased jointly by the Great Western and London North Western Railways. This joint operation instantly raises the question of rail gauge: Brunel or Stephenson? H.P. White, in his *Greater London* volume in the David & Charles series of *A Regional History of the Railways of Great Britain* is categorical in describing, on p.123, "a 2.5 mile single line of mixed gauge", and other sources concur. In the picture we see double track, and no trace of a third rail.

Next, the rolling stock. The vehicles at the head of the two trains are particularly hard to understand. The artist knows that steam engines have chimneys, so has provided caricature funnels, placed on unlikely oval return-flue boilers, behind which lurk the shadows of what might be single engine men. There are no indications of cylinders, cranks, safety valves, running plates or couplings and no provision for storing fuel. All in all, it seems very unlikely that the man who drew the picture of the 'West London' line had ever seen the real thing.

What is going on? The most plausible guess is that the print had a promotional purpose: an attempt to raise capital during one of the line's financial crises. A charming prospect of a busy railway passing serenely through a prosperous and fashionable landscape might bring in those new subscribers who were so desperately needed. The Prior Park print, safely out of copyright, displayed those qualities perfectly. The urgency of the company's predicament might override concerns about topographical accuracy, and a quick modification of an already available image could offer a useful short cut. Mr Jobbins might have been just the publisher to get the new picture out quickly to the widest possible audience.

Gavin Watson

Maas Grain Silo Rotterdam



Maas Silo vacuum pump

The account in *IA News 183* of the 2017 AIA tour of the Randstad omitted to make any mention of the Maas grain silo, visited immediately before the day's final entertainment aboard the *SS Rotterdam*. This is an interesting and important concrete building dating from 1911, with extensions of 1930 and 1951, but its use for grain storage ended in July 2003.

Although now in use for various other purposes, we did see, in the oldest section of the buildings, a line of five vacuum pumps, side-by-side. They presumably date from about 1911, but annoyingly I failed to make a note of the maker, which I think probably appears on the rear end of the pump cylinders (the unreadable wording appears in one of my photographs!). Can anyone help with this?

Colin Bowden

Sandfields Pumping Station

Lichfield Waterworks Trust have been awarded an Architectural Heritage Fund Viability Study grant. Another big step towards saving one of the most important pieces of industrial heritage in the midlands #Sandfields

Persimmon Homes Ltd have granted an extension of the licence for a further six months. This is good news as it gives the trust time to conduct the viability study and also shows that Persimmon are comfortable with the work we are doing.

The work groups are continuing with their sterling work on the building and the engine. Even the small items that appear insignificant can help build a richer picture of the past history of the site. By doing this, we remove the need to make assumptions and fill in gaps in our knowledge, something we see all too often in heritage sites. Capturing these details now, we leave a trail and a record of events will help future generation gain a fuller understanding of the past events.

Work cleaning the engine is showing some remarkable progress as a reward for a lot of hard and dirty work. The bid team are working hard to put together a grant application for a feasibility study and have now submitted a first draft. Real progress is now being made.

Running out of steam? – A future for Industrial Archaeology Public Forum

The last two editions of I News published some interesting exchanges on the future of industrial archaeology. The discussions continued at a public forum at the Museum of Bath at Work last November attended by forty representatives of IA societies in Bristol, the midlands, south west and London.

Stuart Burroughs, the Director of the Museum, explained that in the cultural city of Bath the edges of industry and commerce are blurred and industries must be presented in their social and economic contexts. Industrial history is not just 'process and product' but part of life's wider story, which the Museum aims to tell in an engaging and responsive way. Stuart felt that the term 'archaeology' is unhelpful in communicating this story.

Andy King, Senior Curator of Industrial and Maritime History at Bristol Museum's M Shed questioned whether the nineteenth century 'research society' model for local groups is still relevant or should be updated to reflect current needs. He suggested local societies should make fuller use of modern information technology to widen participation, should communicate and collaborate better with their local museum, capture private archives, and update on-line sources such as Wikipedia and Graces Guides. He felt we could be more outward-looking and welcoming, involve young people to publicise activities to their contemporaries through social media which they do more effectively than older people can.

Shane Kelleher from the Ironbridge Gorge Trust pointed out that the fourth industrial

revolution, the digital age, had brought about a crisis in industrial heritage. 60% of England's industrial sites are managed by trusts or volunteers, so we need to engage better by participating in motivational and training initiatives such as Tomorrow's Engineers, the HLF's Heritage Ambassadors, the Chartered Institute for Archaeology's New Generation Group, the SPAB's Young Millers' Club, or the IEEC History Centre. We can engage via Goosey Goo, Twitter's @IHSOengland and many other online options. Local societies could set up clubs and activities especially for younger people.

Shane felt that the future of our industrial heritage sites may lay in attracting those interested in health and well-being, green and environmental agendas, adventure and adrenaline activities, and the arts.

Geoff Wallis, President of the Bristol IA Society, offered three propositions for sustainability;

- 1 Engage with modern industries. Britain is good at manufacturing, it is interesting to the majority of people, and is where history is being made. Geoff suggested we should celebrate our industry and record it directly with companies or through universities, colleges, professional bodies and industry-focussed organizations such as the Royal Aeronautical Society or the Institution of Engineering Technology.
- 2 Popularise and publicise industrial sites. Nowadays the customers' experience is crucial, and expectations are high, so

'industrial history experiences' must compete on quality and service. People expect to be enthused, educated and entertained perhaps through 'celebrating industry' events, lively presentations, and award schemes. We can become a STEM Ambassadors and work in schools and colleges, or support initiatives such as the SSSGB/Brunel Institute's 'Future Brunels'.

- 3 Rejuvenate our voluntary organizations. Local societies need to support heritage sites including advocacy for threatened sites, practical conservation, and sharing volunteers. Societies should invite younger people to join management committees and encourage them to take on officer-roles. Constitutions must be revised and governance modernized where this would help the society, both of which may be painful but are vital to rejuvenation.

Geoff proposed that we should abandon 'archaeology' in our title in favour of 'industrial heritage' to avoid the image of 'dirt archaeology' currently created in the minds of non-specialists.

If we are to achieve rejuvenation we must be innovative, bold, and exercise strong leadership. Above all we must be optimistic and persistent. We may thereby start a new, vibrant 'grass roots' movement to develop like that which gave birth to 'industrial archaeology' half a century ago.

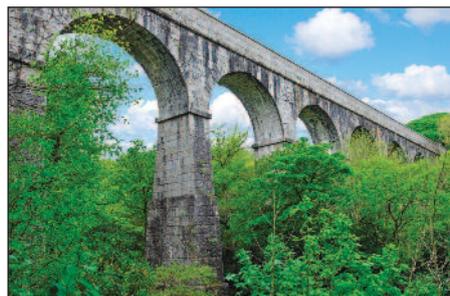
Treffry Viaduct and Luxulyan Valley set for major conservation

The Luxulyan Valley is set to benefit from a £3.6 million National Lottery funding injection to restore and conserve the Valley's physical and natural environment. The HLF grant was awarded to Cornwall Council, in partnership with Cornwall Heritage Trust after years of work to secure the funds.

The Luxulyan Valley is part of the Cornish Mining World Heritage Site, as designated by UNESCO. It contains a complex system of leats which delivered water essential for the efficient working of some of central Cornwall's most important copper mines. Water from the Valley was also conveyed by leat to the copper ore and china clay shipping port at Charlestown, and via a purpose built canal to the mineral harbour at Par.

The National Lottery funding will be used to restore the two leat systems within the Valley and also its 'jewel in the crown'; the spectacular Treffry Viaduct, built between 1839 and 1842.

Cornwall Council will fund a separate hydro-electric turbine at Pons Mill, reusing water from the restored leat systems. The electricity generated from the turbine will be sold to the national grid and fund the ongoing conservation of the Valley.



Treffry Viaduct crossing the Luxulyan Valley

The viaduct is an imposing granite structure which carries the Carmears Leat and tramway high above the Valley floor. At 27 metres tall, over 200 metres long and with 10 equal span arches, this all-granite structure is an amazing feat of engineering.

To promote the Luxulyan Valley there will be a permanent exhibition at Wheal Martyn China Clay Museum, and walking guides and information available online.

The Friends of Luxulyan Valley have been helping to develop an activity programme, which includes engaging with new audiences and

training and volunteering opportunities. Cornwall Council has been working with the Friends of the programme to ensure the restoration proposals fit with local aspirations.

In total, more than £5 million will be invested in the Valley, providing a boost to the local economy and creating new jobs and learning opportunities.

Julian German, Chairman of the Cornish Mining World Heritage Site Partnership, said: "We are delighted that Heritage Lottery Funding will be used to protect Luxulyan Valley's valuable heritage assets. The award will also contribute to reducing CO₂ emissions by restoring the leat systems which will feed into the new Hydro Electric Turbine at Pons Mill. This is a great example of partnership working for local communities."

Cornwall Council and Cornwall Heritage Trust will now develop further detailed plans so the scheme can start and be delivered over the next three years.

The Luxulyan Valley is situated just outside the village of Luxulyan, approximately three miles from the Eden Project and is a key component of the Cornish Mining World Heritage Site.

Renovation of Cromford Mills— Building 17 honoured

The outstanding rehabilitation of Cromford Mills' Building 17 was celebrated at its premises on 19 October. The Duke of Devonshire and President of The Arkwright Society, the small voluntary organisation that initiated and carried out the project, received the EU Prize for Cultural Heritage / Europa Nostra Award 2017 from Peter Collins, Council Member of Europa Nostra and Chairman of Europa Nostra UK. Some 80 participants, including representatives from the main organisations involved in the project, and children from the South Darley Primary School, attended this special ceremony.

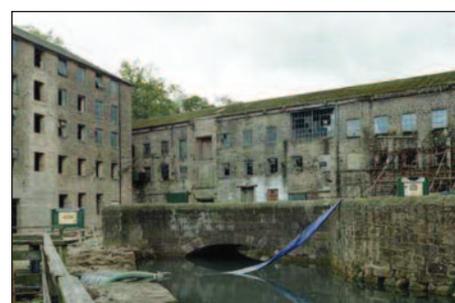
"The rehabilitation project of Building 17 represents a good adaptive reuse of a notable site of industrial heritage and is a key component of an important ensemble of buildings. Had it been demolished or left to further deteriorate, it would have been a scar on this World Heritage site", stated Peter Collins, quoting the Awards' Jury citation.

The Arkwright Society secured substantial funds through a Heritage Lottery Fund grant of £4 million and a European Regional Development Fund grant of £1 million to redevelop Building 17. The scheme has created a ground-floor visitor centre for the Derwent Valley Mills World Heritage Site and office space for tenant businesses on the upper floors in an environment designed to encourage creativity and innovation.



Building 17 rehabilitated

"All credit to the Arkwright Society for their fabulous work over 40 years revitalising Cromford Mills. The project shows the great potential for regenerating redundant industrial sites through adaptive reuse – the recognition by the European Union and Europa Nostra is much deserved," emphasised Matthew McKeague, Chief Executive Officer of the Architectural Heritage Fund.



Building 17 before work started

The Heritage Angel Awards 2017

The Historic England Angel Awards were presented at the Palace Theatre in London on 20 November. It was fronted, as usual, by Andrew Lloyd Webber who was accompanied this year by historian Bettany Hughes together with Duncan Wilson, Chief Executive of Historic England and Meredith Childerstone, Chairman of Selectaglaze.

This year there was less industrial archaeology than in 2016 but the following awards are worth picking out.

The Award for the Best Craftsperson or Apprentice on a heritage rescue or repair project went to Kenny Brunskill for his consolidation of the Corbridge bottle kilns in Northumberland. Kenny has established a niche for himself in conservation as a mason capable of working at great heights – a skill highly sought after. At Corbridge he and his team 'devised a way to carry out repointing and brick replacement using a mixture of rope and spider crane'. This has safeguarded the bottle kilns' immediate future.

The Best Rescue, recording or interpretation of a Historic Place award went to Nigel Ford for the repair, restoration and reinstatement of milestones in the County of Norfolk. Nigel Ford has made it his personal mission to rediscover, repair and paint the

probably hundreds of milestones still surviving across Norfolk, most of which date from the early 1800s. Nigel worked tirelessly to recover every accessible milestone in the county, whether concealed by brambles or lying in ditches, broken or buried. So far over 150 individual markers have been restored to good order.

For the Award for the Best Rescue of a Historic Building, one of the shortlisted entries was three derelict weavers' cottages at 20–22 Horsefair, Worcester.

In 2000 this terrace was listed Grade II – but the battle to save the cottages has been protracted. The Worcestershire Building Preservation Trust devised a scheme that would 'save some of Kidderminster's early history' and came up with a practical design to convert the three weavers' cottages into present-day dwellings. Finding a way to bring that about, despite the end use being an unusual project for Heritage Lottery Fund support, was considered remarkable.

The Best Rescue of a Historic Building award went jointly to Claire Slattery and Rich & Marc Moore. Opened in 1779 the Piece Hall in Halifax is the last remaining cloth hall in the UK. It was built for handloom weavers to trade their wares. In restoring this beautiful Grade I listed Georgian building, Claire, who works for Calderdale Council, has 'returned this inspiring building to the people of West Yorkshire'. The Piece Hall

closed for redevelopment in January 2014. It reopened to the public in August last year.

Rich & Marc Moore also received the Historic England Followers' and Telegraph Readers' favourite award. The Moore brothers transformed the derelict Victorian White Rock swimming baths in Hastings into an indoor BMX park. It is hard to imagine a more playful rescue of a historic building. Marc Moore said 'everything we do comes from just wanting to have fun on our bikes,' and the brothers' wish to share this passion for BMX riding – and skating – has created 'a unique facility for people from all over the world in the heart of Hastings, East Sussex'.

In addition to her award for Best Rescue, Claire Slattery was declared the Overall Winner for the remarkable work she did at the Piece Hall in Halifax. She undertook a complex project to restore this Georgian building and return it as 'a place of pivotal importance in Halifax'. Claire successfully secured funding to safeguard the future of the Piece Hall and in 2012 restoration work began. She played a key role in developing heritage spaces within the building, where visitors can learn about what has made the Hall so special throughout its history and experience its atmosphere as a trading hall. Thanks to the dedication of Claire and her team, the Piece Hall has been reopened to thousands of visitors.

Robert Carr

Leigh Spinners Mill engine turns again

In November Historic England announced a grant of £252,000 to Leigh Spinners mill in Lancashire.

The Preservation Trust, which owns the steam engine and engine house, is in the process of securing match-funding so that, using Historic England's expertise, vital roof repairs can be started to ensure the Grade II* listed building is wind and watertight and fit for future use.

Leigh Spinners Mill is listed Grade II* and is often described as the finest late era mill in the UK. It is an extremely rare survival of a double mill with two engine houses, two boiler houses, a lodge and chimney. Initially constructed in 1913/15 and designed by Bradshaw, Gass & Hope, the No.1 mill was supplied with a cross compound mill engine by Yates and Thom, while the textile spinning machinery was supplied by Platt Brothers of Oldham. The mill prospered and the second part of the original double mill design was started. The second No.2 mill was finally constructed and manufacture began in 1925. The mill was a mirror image of the No.1 mill, albeit slightly larger again featuring a Yates and Thom engine.

Both mills worked together until the 1960s when the No.1 mill engine suffered a catastrophic failure by hydraulic locking in one of the cylinders resulting in a large fracture in that cylinder. The engine was dismantled and never ran again.

Mirroring the industry nationally, the mill's output was gradually in decline. Fortunately the company has survived, but more importantly the No.2 mill engine has survived too.

It is an 1800 HP horizontal cross-compound built in 1925 at a price of £7000 and was the largest and one of the last stationary engines the company produced. The flywheel is 24ft in diameter with 33 grooves and weighs about 75 tons.

The No.2 engine stopped driving the mill machinery in 1966, when the machines were converted to electricity. However, it was put back to service in the early 70s providing electricity for the machines in the mill during the miners' strikes.

The management of Leigh Spinners sought to adjust to the changes in the industry and economy and from 1969 the company started to diversify by manufacturing carpets alongside their spinning. The mill discontinued its spinning operations and switched completely to carpet manufacture and latterly artificial turf.

Despite being out of use since the early 1970s the engine was in surprisingly good condition because, upon decommission, it was initially maintained by the NMES (the Northern Mill Engine Society – the organisation behind Bolton Steam Museum) to keep the engine and its house well maintained. Eventually, in the 1990s, access was restricted due to the presence of asbestos. This then led to the engine being allowed to deteriorate for 20 years. Over those years the roof began to leak and pigeons gained access.

The Trust took possession of the engine house in 2014 and after major building and cleaning

works costing £356,000 it was possible to begin work on the engine in 2015. We were fortunate in that the engine was virtually intact. The efforts of rust removal, cleaning, lubrication and repairs have allowed the engine, in November 2017, to be turned by the barring engine, which had been restored with the help of an AIA restoration grant, running under compressed air.

The engine turned freely and, with no noises out of the ordinary; it is now proposed to have occasional 'turning days'.

The idea of running the engine on steam is the next major step. This is still a long way off as a suitable boiler will need to be obtained, as well as the necessary pipework, and the restoration of the condenser plant.

Progress to date includes

The release of eight jammed Corliss valves.

Cleaning the drum which we thought was painted black but we found that it was just heavily stained with oil which we have removed. It is apparent that the wood underneath is in excellent condition.

Removal of the residual asbestos.

Extensive oiling of the whole engine over a two year period and so that oil has reached all parts of the engine.

Early refurbishment of the barring engine which we were able to operate last November. Servicing and refurbishing the engine house crane which is now accredited to 8 tonnes – less than its original but this is a result of the failure of the concrete floor fixings and not the crane.

To our great delight we have been able to turn the engine using the Baring engine.

Beginning to develop a scheme for steam operation.

Next steps

We have secured the promise of an operational steam boiler and will need to:

raise funding to secure its removal and transport;

arrange a location within the mill close to the engine.

We have secured access to additional areas of the mill and will develop these for an engineers' workshop and storage, thereby freeing up space within the engine house for visitors. Part of the additional area secured will also be developed as visitor space.

We have secured funding for the repair of the entirety of Mill 2 and will shortly take a lease on this following the grant from Historic England.

London gasholders update

The company which owns the historic East Greenwich gasholder says it needs to demolish the structure for 'safety and security reasons'.

SGN Ltd told Greenwich Council last week that it plans to demolish the structure, which has stood for 130 years.

The council now needs to decide whether SGN should apply for planning permission to take the gasholder down.

SGN's agent Firstplan says, "retaining the decommissioned structure would represent a significant maintenance expense to SGN, which is considered unreasonable and unjustified given that they no longer serve a purpose. The gasholder also constitutes a significant security and safety liability to SGN."

The report also claims removing the structure is "a necessary requirement for any future site development", and adds there is "significant policy support" for the move. English Heritage has also stated that the site cannot be listed for five years after SGN asked for a certificate of immunity.

However, in November Greenwich Council planners stated that the gasholder should remain. In a new planning brief for the site, the council said "development should build on the heritage value of the gas holder to enhance the character and distinctiveness of the area".

The gasholder, which predates the Blackwall Tunnel, was part of the huge East Greenwich Gas Works, which dominated most of the Greenwich Peninsula until its closure in 1976.

Despite the gasholder's eventful history – it was also damaged in the 1917 Silvertown explosion and World War II – it was not considered worth listing by English Heritage because it was too similar to an earlier structure on the Old Kent Road, which was also constructed by the South Metropolitan Gas Company.

Indeed, the historic damage to the gasholder may have counted against it, as English Heritage also cites the large number of repairs made to it, while the loss of the surrounding gasworks means it has "lost its context". However, Greenwich Council can still place the structure on its own local list of buildings of historic interest.

In October, Lewisham Council placed the gasholders at Bell Green, Sydenham on its local list before refusing an application to demolish them and replace them with an Aldi store.

Bob Carr

Fulham Gasworks No2 gasholder, newly upgraded to II*, has been added to the Heritage at Risk Register. Built in 1830, this gasholder dates back to the pioneering days of the gas industry and is by far the oldest surviving gasholder in the world; it is the last standing example of its kind. A remarkable feat in design, it was thought to be the largest in the world in 1830, breaking new ground in size and capacity as it was twice the diameter of most gasholders at that time. The triangular shaped uprights were the forerunner of those we recognise from many later surviving gasholders and the innovative structure of the bell (gas vessel) includes wrought-ironwork which was essentially hand-made by a blacksmith. The gasholder's condition is deteriorating due largely to vegetation growth.

Europa Nostra short lists Grimsby Ice Factory for the '7 most endangered sites' in Europe

The Grimsby Ice Factory is understood to be the earliest surviving ice factory in the United Kingdom. Designed by the engineer W. F. Cott, the Factory dates from 1900 and is a substantial Grade II* listed red brick industrial building. The site is arguably the most prominent physical reminder of Grimsby's fishing and maritime heritage, the largest fishing port in the world at the start of the twentieth century. The Factory has been in a state of serious decline since its closure in 1990. The roof is now severely damaged allowing water into the interiors, and much of its metal work and electrical fittings have been stolen. Moreover, there have been threats of demolition. The Factory has remained in private ownership. A mixed use development proposal initiated by the Great Grimsby Ice Factory Trust, estimated to potentially create upwards of 125 jobs, has so far been unsuccessful in securing funding, resulting in the future of the Ice Factory remaining uncertain. The nomination for the 7 Most Endangered programme 2018 was made by SAVE Britain's Heritage.

Two other industrial sites are included in the list – the Coal Preparation Plant in Beringen, Belgium and the Aerial Cableway Network in Chiatura, Georgia. Some of the 12 sites shortlisted are in danger due to neglect or inadequate development, others due to a lack of resources or expertise.

The 12 monuments and sites were selected taking into account their outstanding heritage and cultural value as well as the imminent danger that

they are facing. The engagement of local communities and the commitment of public and private stakeholders to saving these sites were also considered crucial. Another main criterion was the potential of these sites to act as a catalyst for sustainable socio-economic development.

"2018 is the year to celebrate Europe's unique cultural heritage and to highlight its key role in promoting our common identity and building a more inclusive Europe. Raising awareness and mobilising widespread efforts to save endangered heritage sites across Europe is another objective of the European Year of Cultural Heritage 2018. What better occasion for Europa Nostra and the European Investment Bank Institute to implement a new edition of the 7 Most Endangered programme, with the support of the EU Creative Europe programme," stated Denis de Kergerlay, Executive President of Europa Nostra. "This shortlist is, first and foremost, a call to action. We urge public and private stakeholders at local, national and European levels to join forces to rescue these heritage gems which tell our shared story and which must be saved for future generations," he added.

"Saving these 12 sites will not only benefit the cultural heritage monuments alone. The investment will also generate socio-economic benefits at the local, regional and national levels", said Francisco de Paula Coelho, Dean of the European Investment Bank Institute. "Well prepared and well implemented investment in cultural heritage pays

off in terms of social, economic and cultural development, and it is important to spread this message during the European Year of Cultural Heritage 2018", he added.

Nominations for the 7 Most Endangered programme 2018 were submitted by civil society organisations or by public bodies which form part of Europa Nostra's vast network of member and associate organisations from all over Europe. The 12 sites were shortlisted by a panel of experts in history, archaeology, architecture, conservation, project analysis and finance. The final list of the 7 Most Endangered heritage sites in Europe will be selected by the Board of Europa Nostra and announced on 15 March.

The 7 Most Endangered programme was launched in January 2013 by Europa Nostra with the European Investment Bank Institute as founding partner and the Council of Europe Development Bank as associated partner. It was inspired by a successful similar project run by the US National Trust for Historic Preservation. The 7 Most Endangered is not a funding programme. Its aim is to serve as a catalyst for action and to promote "the power of example". It has the support of the Creative Europe programme of the European Union, as part of Europa Nostra's network project 'Sharing Heritage – Sharing Values'.

Northern Mills

Historic England engaged Cushman & Wakefield and Lathams Architects to review and develop best practice in the regeneration of textile mills. The West Yorkshire study was published on 30 June 2016 and the North West study was published on 20 November 2017.

The studies comprise the following key elements:

- A review of best practice mills conversions;
- Assessments of re-use potential of under-used/vacant mills;
- Key lessons learned and recommended next steps.

Search 'Engines of Prosperity' for this report.

In 2016 Historic England commissioned the University of Salford to review the survival of mills in Greater Manchester to update a previous survey of the late 1980s. It was found that in the last 25 years there has been a loss of 45% of historic textile mills. The condition of the surviving 540 mills is variable, with 20% considered to be at high risk of complete loss and a further 28% vulnerable to change or loss. However, just over half of surviving mills are in good order and make a positive contribution to the economy. Ninety of

the most significant mills have been given statutory protection as listed buildings. It has been calculated that there is two million square metres of vacant floor space in textile mills across Greater Manchester and Lancashire.

Search 'Historic Textile Mills Greater Manchester' for this report.

Historic England and YouGov also asked the public for their opinions and found that 90% of adults in England believe that historic mills are an important part of the country's heritage, story and character. 85% of England's population says they are against demolition and replacement of mills, with 70% saying they should be considered for new housing, offices and public amenities before constructing new buildings, and this number rises to 79% among those from the North of England.

Search 'Public support for saving England's Mills' for this report.

EU funding agreed until 2020

UK arts organisations can now push ahead with Creative Europe funding applications after the Government reached a financial settlement with the European Union on the terms of its departure.

Applications to the EU's 1.46bn culture programme will be accepted until December 2020

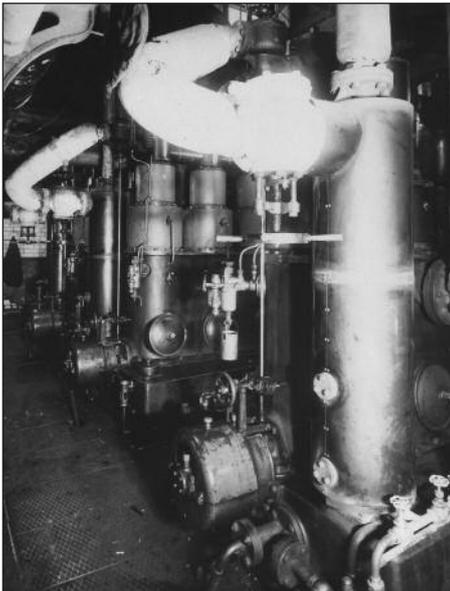
The news comes as the EU formally launches the European Year of Cultural Heritage 2018, which will see thousands of events and celebrations take place across EU member states to raise awareness about the social and economic importance of cultural heritage.

Lottery takings down

Camelot, the operator of the National Lottery, has announced that ticket sales for the first half of the 2017/18 financial year were down by 3.2% compared to last year's figures. As a result of this 'disappointing sales performance' Camelot's direct returns for good causes fell by 4.7% to £746.6m. This will have an effect on the amount of funding available for the Heritage Lottery Fund.

Historic Willans and Robinson engine moves to Wales

On 20 June last year, a historic Willans and Robinson central valve steam engine moved from GE's Willans Works in Rugby to the Internal Fire Museum of Power in Wales. The engine was supplied by Willans & Robinson to Maple and Co. in Tottenham Court Road, London in 1901. It was one of four identical size HHH three crank compound central valve engines installed in the Maples power house to provide electricity. The



picture shows three of the four engines installed in the Maples powerhouse.

The four engines remained in service together with two earlier central valve engines until they were removed in 1957. One of the earlier engines No. 660 and one of the later engines (no. 3226) were returned to the Willans Works in Rugby where they had been made. The engines were initially displayed in the works yard, but in 1976 the earlier engine was moved to the Birmingham Science Museum and the later engine was put on display, together with an early Willans and Robinson steam turbine in a museum area inside the factory. In 2011 the engine was given an Engineering Heritage Award by the I.Mech.E. in recognition of the role that the Willans central valve engine played as a prime mover in the early power stations.

Last year, sixty years after the engine was taken out of service, GE placed the engine on long term loan to the Internal Fire Museum of Power in Wales where it is now displayed in their new Stationary Steam Engine Hall alongside other stationary steam engines, including a Hathorn Davey inverted triple expansion engine and an 1879 John Penn & Sons twin cylinder oscillating steam engine, originally installed in the paddle steamer *Empress*. There is an interesting connection between Willans & Robinson and John Penn & Sons because Peter Willans worked there between 1872 and 1876 before he set up Willans and Robinson. There is also a connection



Central Valve engine in Internal Fire Museum of Power

between Peter Willans and Hathorn Davey as Peter Willans joined Carrett and Marshall of Leeds, in 1867, as an apprentice before he moved to John Penn and Sons. This company became Hathorn Davey in 1876.

Alain Foote

The Museum of Electricity

The Museum, in Christchurch Dorset, was set up by Southern Electricity and was stocked by surplus equipment and items donated by local people.

The museum closed in 2012 but the SSE Archive is working to fully list the photo and document collection. All the items which have been through this process are searchable in the online catalogue.

Search – sseheritage.org – where more information is available.



Grimsby to be Heritage Zone

Grimsby, once the largest fishing port the world has ever seen when at its peak in the nineteenth and early twentieth centuries, has been declared a Heritage Action Zone. The Kasbah area, built in Victorian times, contains the largest collection of fishing related buildings found anywhere in the country, but it is in poor condition following lack of investment after the industry's decline.

North East Lincolnshire Council – with Historic England's support – aims to conserve Grimsby's fishing heritage, which has been a priority for several years, and its efforts have intensified following the controversial demolition of buildings on Fish Dock Road.

North East Lincolnshire Council has also recently designated the Kasbah as a Conservation Area with support from the owner Associated British Ports.

Vicky Hartung, Chair of The Great Grimsby Ice Factory Trust said, "GGIFT is delighted that the Kasbah will have the protection of conservation area status at last. There are nearly 90 buildings within the historic dock area that have over the years fallen into disuse and disrepair (not to mention the Ice Factory itself), so viewed as a heritage project this is a huge challenge. But GGIFT is ready to play its part in working with ABP, NELC/Engie, and other heritage partners and funders on a long-term plan to reintegrate these buildings into the life of the port and the town."

As well as the Ice Factory Grimsby's Smoke Houses are of particular interest. Before the introduction of freezing, unsold fish was preserved by curing. As the fishing industry grew in nineteenth and early twentieth centuries Grimsby became a centre for the development of this process. It resulted in a variety of different chimney styles and curing practices often unique to the individual premises. Grimsby now has the only surviving cluster of traditional 'smoke houses' in England, six listed examples can be found within the Kasbah.

For generations smoked fish was referred to as 'cured', but with the advent of mechanical kilns traditional smokers adopted the term 'smoked' to emphasise that their process was entirely dependent on smoke. However, Kiln curers also adopted the term 'smoked' for their process to mask the difference between the two products. This has made it necessary for the original process to be known as 'traditionally smoked'.

Stockton and Darlington Railway

The Stockton and Darlington Railway has been declared a Heritage Action Zone. The line, 26 miles long, operated from 1825 to 1863 and was the world's first public railway to use steam locomotives. This Heritage Action Zone scheme

will help to restore some of the historic features, such as bridges and railway buildings, along the line with the aim of boosting tourism and creating jobs – all in the build-up to its 2025 bicentenary.

Temple Mill Leeds

The historic Temple Works building could be the centrepiece of the regeneration of the whole South Bank area of Leeds, according to Leeds Civic Society. The society has welcomed Leeds property developer CEG's surprise announcement on Wednesday that it had agreed terms to buy the Grade One listed building. The privately-owned former flax mill, on Marshall Street in Holbeck, had been due to be one of the lots at an auction at Leeds United's Elland Road ground yesterday.

Leeds Civic Trust director Martin Hamilton, said: "CEG is a serious developer, with significant interest in Leeds including a scheme they are working on nearby. Their commitment to good design and prior experience working in heritage settings, augurs well for this site. Temple Works could be the centrepiece of the regeneration of



Temple Mill awaits a saviour

photo: Mark Watson



Temple Mill Entrance

photo: Mark Watson

the whole of the South Bank. We now look to CEG to move quickly to undertake any necessary urgent works on the buildings, and work with interested parties to secure the long term future for this nationally important asset."

Leeds City Council leader, Cllr Judith Blake, said: It's a very positive step that new owners have been secured for Temple Works. We will look to work collaboratively with CEG to bring this important part of Leeds' heritage back into use and secure its long-term future."

CEG, the company behind Leeds's Kirkstall Forge development, said it would be exploring 'creative and innovative ideas' to bring Temple Works back into use.

Temple Works is near a site off Globe Road and Water Lane where CEG is seeking planning permission for a £350m mixed-use development.

Haig Pit Mining Museum artefacts

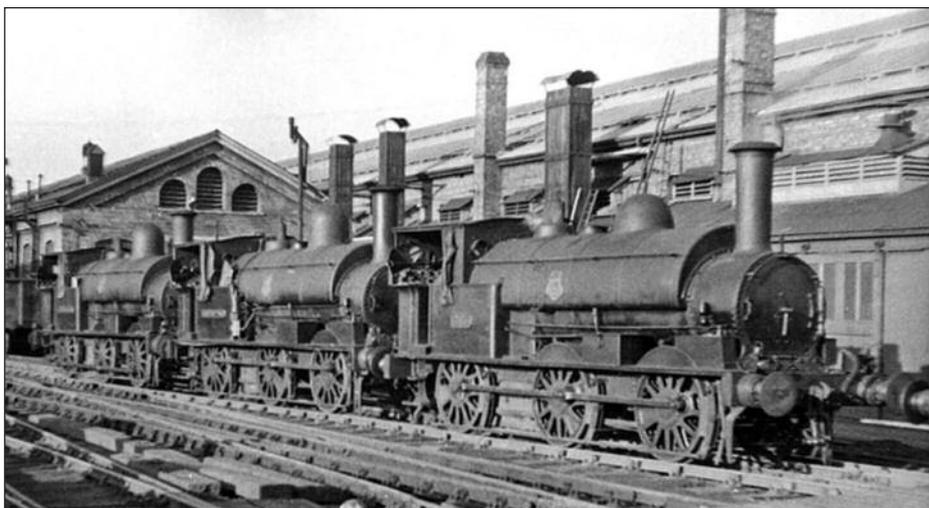
West Cumbria Mining is working to construct a £165 million undersea mine off the coast of St Bees to extract coking coal. In early 2016 the company moved its project offices into the former Haig Mining Museum at Kells.

Mark Kirkbride, the firm's chief executive, said they realised that the museum premises had a large collection of artefacts connected to the local mining history, much of which was donated by local people.

There were no easily accessible records for the museum's collection so a team of three staff were appointed to carry out a review, spending 14 weeks cataloguing and recording all the historical items on the site.

The team catalogued and photographed 4,526 photographs, objects, books and documents relating to the mining industry and have carefully packaged and stored them to reduce the risk of further deterioration.

Wolverton Works



Demolition of the Wolverton Works now seems certain after the MK Development Control Committee ratified their decision on 20 December to approve St Modwen's application to 'regenerate' the site. Here it is in another era.

AIA Mining Landscape Weekend 7 and 8 April 2018

The AIA Council has decided to give Ironbridge a rest for the Practical Day in 2018 and instead to organise a whole weekend devoted to the study of mining landscapes based in Matlock Bath in Derbyshire, an aspect of industrial archaeology about which we have not done very much lately.

We are very fortunate to have secured the services of John Barnatt, just retired from his role as Senior Archaeologist with the Peak District National Park and former winner of Britain's premier archaeology award, the Silver Trowel Award, for his work on the remains of the lead industry.

The weekend will include a visit to the splendid Peak District Mining Museum in Matlock Bath and its adjacent Temple Mine; the surface remains of Magpie Mine, run by the Peak District Mines Historical Society; and an exploration of other mining landscapes in the area, with an underground visit to one of the local caverns which were exploited for minerals, including the famous Blue John.

The visits will require quite a lot of walking, good footwear and outdoor clothing.

The total cost of the weekend, including a group evening meal on the Saturday, is £60 to include all entrance fees, guiding etc.

A link to make a booking for the weekend will soon be available on Eventbrite.

Delegates are asked to find their own accommodation, of which there is plenty in Matlock and Matlock Bath.

In the meantime any queries should be addressed to Prof. Marilyn Palmer at mai@le.ac.uk

The AIA website has links to help find accommodation.

Itinerary

Saturday 7 April:

10:00 Visit to Peak District Mining Museum, the Pavilion, Matlock Bath, introduced by Dr Lynn Willies, former Chairman of the Peak District Mines Historical Society. This will be followed by a short visit into Temple Mine opposite – no climbing involved.

Delegates to find their own lunch.

14:30 Share cars for visit to Magpie Mine (surface only), led by members of the Peak District Mines Historical Society, including their chairman Mike Luff, together with John Barnatt. This site has the best preserved surface remains of mining and lead dressing in the Peak District.

18:30 Group meal at The Fishpond, Matlock Bath, opposite the Pavilion.

20:00 Illustrated Lecture by John Barnatt on mining in the Peak District in the Pavilion, Matlock Bath.

Sunday 8 April:

10:00 Assemble at cable car station, Matlock Bath, for trip up to Masson Cavern, Heights of Abraham, and underground visit led by John Barnatt. Normal tourist route with additional information, no climbing involved.

Lunch available in the café on the Heights of Abraham.

Optional afternoon visit to Mandale Mine, Over Haddon. Half an hour's journey north of Matlock Bath. John has recently surveyed this and it would make a good finale to the weekend.

Cost

The total cost of the weekend, including a group evening meal on the Saturday, is £60 to include all entrance fees, guiding etc.

Transport and parking

The meeting point on Saturday morning is the Grand Pavilion in Matlock Bath. This is accessible by public transport. There is also pay and display parking a short walk from the venue. Please note that the venue car park is short stay only (2 hours). For more information please visit the Grand Pavilion website. On Sunday the event will start at the Cable Car Station in Matlock Bath.

Accommodation

Delegates are asked to find their own accommodation, of which there is plenty in Matlock and Matlock Bath.

Booking

Booking is via Eventbrite:aia-practical-weekend-2018.eventbrite.co.uk

Booking closes on 26 March 2018

Any queries should be addressed to Prof. Marilyn Palmer at mai@le.ac.uk

Heritage of Industry is pleased to announce the dates for its tours in 2018

Go to the Heritage of Industry website to book or register interest

12 – 15 April

We begin the year with an **Industrial Explorer tour in North Kent**. Based in Chatham, we will be looking at the River Medway from Maidstone to the confluence with the Thames. The lower reaches of the river have important maritime history and as well as the naval ship-building there were other boatyards in the area where Thames barges and other ships were built. We can also see evidence of the significant paper making industry and at Faversham we may see something of the gunpowder works.

14 – 20 May

May sees the **AIA Spring Tour to Saxony**. Planning is still underway on this tour and is taking longer than expected but we hope to be able to announce more details in the New Year. If you have not done so already you should register interest in joining us. Those who have already registered do not need to do so again – you have your place in the queue and will be the first to know.

4 – 8 June

June brings the newest addition to our **Country House Comfort & Convenience** series. This time Marilyn Palmer will lead us to East Yorkshire where we can enjoy finding out more about the introduction of technology to some Country Houses which you may not have visited before such as Burton Agnes and Burton Constable amongst others; and we may find time for a walk around Beverley as well. **Booking is now open**

3 – 6 September

In early September we are pleased to be able to repeat our **Country House Comfort & Convenience** tour in the North West. Ian West will lead us to some of the grandest houses in the region: Lyme Park, Dunham Massey and Tatton Park and we can spend some time at Styal Mill where we will be able to explore the gardens of the Greg's house and see the newly restored Victorian glasshouse. **Register interest** to be sure of hearing details as soon as they are announced.

19 – 23 September

And we close our season with an exciting **City Safari in Bilbao** on the north coast of Spain. From the beginning it was a port and a trading town where Castilian wool was sold and exported. But in the 17th century iron mining became important. As ships became larger the port moved downriver and factories and warehouses lined the river banks. There has been a move to rejuvenate the city in recent years and efforts are being made to adapt and re-use some of the factories and industrial sites. We shall visit the flagship building in this rejuvenation, the Guggenheim Museum built on the site of former wharves. We will also look at transport including a narrow gauge railway, a transporter bridge and a funicular.

I hope you find some of the above appealing and I look forward to welcoming you on the tours next year. Bill Barksfield

PUBLICATIONS

Local Society and other periodicals received

Abstracts will appear in *Industrial Archaeology Review*.

Bristol Industrial Archaeological Society Bulletin, 153, Winter 2017
Cumbria Industrial History Society Bulletin, 99, December 2017
Dorset Industrial Archaeology Society Bulletin 50, January 2108
Construction History, 32/2, 2017
Friends of St Aidans BE 1150 Walking Dragline Newsletter, 79, Autumn 2017
Greater London Industrial Archaeology Society Newsletter, 293, December 2017
Hampshire Industrial Archaeology Society Focus on Industrial Archaeology, 89, December 2017
Histelec News, 67, December 2017
Historic Gas Times, 93, December 2017
Merseyside Industrial Heritage Society Newsletter, 367, October 2017; 368, November 2017; 269, December 2017
Midland Wind and Watermills Group Newsletter, 119, December 2017
Norfolk Industrial Archaeology Society Newsletter, October 2017
Northamptonshire Industrial Archaeology Group Newsletter, 144, Autumn 2017; 145, Winter 2017
North East Derbyshire Industrial Archaeology Society Newsletter, 68, November 2017
Piers: the Journal of the National Piers Society, 125, Autumn 2017
South West Wales Industrial Archaeology Society Bulletin, 130, November 2017
Surrey Industrial History Group Newsletter, 216, November 2017
Sussex Industrial Archaeology Society Newsletter, 176, October 2017
Sussex Industrial History, 47, 2017
Sussex Mills Group Newsletter, 176, October 2017
Trevithick Society Journal, 44, 2017
Trevithick Society Newsletter, 177, Autumn 2017
WaterWords: News from the Waterworks Museum, Hereford, Autumn 2017

Welsh Mines Society Newsletter, Autumn 2017
Worcestershire Industrial Archaeology and History Society Newsletter, 51, October 2017
Yorkshire Archaeological Society Industrial History Section Newsletter, 101, Autumn 2017

TICCIH conference

The international heritage of the water industry

Museu Agbar de les Aigües
Barcelona, Spain
13 – 14 April, 2018

During the nineteenth century, modern infrastructure to supply water and to remove and treat waste was inserted in towns and cities across the world, pulling them back from a sanitary crisis which was threatening to make life intolerable. Faced with industrialisation, miserable living conditions and repeated epidemics, water supply and drainage networks were devised and incorporated into urban landscapes. The impressive quality of their engineering and architectural design show how important they were for the societies of the time, and many continue to make a vital contribution to living conditions today.

The TICCIH thematic conference on the heritage of the water industry will put the water industry infrastructure into its historic technological and social context, examine the origins of the technical solutions that were developed, and compare how they were applied in different industrial cities around the world.

Inscription will include the conference with lunch and refreshments, simultaneous translation (English/Catalan/Spanish), and the post-conference guided tour of historic water industry sites in Barcelona. Details from museuagbar.com.

Industrial Archaeology in the 22nd Century

Interest in the interstellar object Oumuamua, now on its way back into distant space, brings to mind the science fiction novel *Rendezvous with Rama* by Sir Arthur C Clarke. Published in 1973, the story is set in the 2130s. What is interesting from our point of view is that Sir Arthur predicted industrial archaeology would still be a popular preoccupation at the beginning of the twenty-second century, over eighty years into the future.

In Chapter 13 there is the following remarkable passage:- *It had happened thirty years ago, during a summer vacation in England. Largely because of another student (he could remember her face — but he had forgotten her name) he had taken a course of industrial archaeology, then very popular among science and engineering graduates. They had explored abandoned coal-mines and cotton mills, climbed over ruined blast-furnaces and steam-engines, goggled unbelievably at primitive (and still dangerous) nuclear reactors, and driven priceless turbine-powered antiques along restored motor roads.*

Not everything that they saw was genuine; much had been lost during the centuries, for men seldom bother to preserve the commonplace articles of everyday life. But where it was necessary to make copies, they had been

reconstructed with loving care.

And so young Bill Norton had found himself bowling along, at an exhilarating hundred kilometres an hour, while he furiously shovelled precious coal into the firebox of a locomotive that looked two hundred years old, but was actually younger than he was. The thirty-kilometre stretch of the Great Western Railway, however, was quite genuine, though it had required a good deal of excavating to get it back into commission.

Whistle screaming, they had plunged into a hillside and raced through a smoky, flame-lit darkness. An astonishingly long time later, they had burst out of the tunnel into a deep, perfectly straight cutting between steep grassy banks. The long-forgotten vista was almost identical with the one before him now.

Elsewhere in the book there are references to the technology of the early twentieth century, for instance square-rigged sailing ships and street tramways. In Rama there are tracks reminiscent of tram rails leading to buildings with closed doors.

The year 2017 was an appropriate one for an interstellar visitor – Clarke would have been 100 years old in December. The trajectory of Oumuamua is hyperbolic. When it leaves our Solar system it will not return.

Here is another example of the writer's predictions. The following section occurs in a book by Clarke also set in the twenty-second century, *The Fountains of Paradise*, 1978-9.

Only when there was some resounding technical failure, or a head-on collision with an environmental or historical group, did TCC emerge from the shadows. The last confrontation of this kind had involved the Antarctic Pipeline – that miracle of twenty-first-century engineering, built to pump fluidised coal from the vast polar deposits to the power plants and factories of the world. In a mood of ecological euphoria, TCC had proposed demolishing the last remaining section of the pipeline and restoring the land to the penguins. Instantly there had been cries of protest from the industrial archaeologists, outraged at such vandalism, and from the naturalists, who pointed out that the penguins simply loved the abandoned pipeline. It had provided housing of a standard they had never before enjoyed, and thus contributed to a population explosion that the killer whales could barely handle.

Science fiction often tells us more about the date it was written than the future it attempts to predict.

Robert Carr

**7 – 8 April 2018
AIA WEEKEND**

Matlock Bath, Derbyshire
Mining landscapes
See page 26

**13 – 14 April 2018
TICCIH CONFERENCE**

Barcelona
See page 27

**14 April 2018
SOUTH WEST AND WALES IA
CONFERENCE**

Hosted by SIAS, at the village Hall,
West Coker
www.sias.me.uk

**21 April 2018
SERIAC 2018**

The Windsor Boys' School,
Windsor
www.biag.org.uk

**14 – 20 May 2018
AIA SPRING TOUR TO
SAXONY**

See page 26

**19 May 2018
EMIAC 94**

Long Eaton
www.derbyshireas.org.uk

**21 – 24 June 2018
INTERNATIONAL EARLY
RAILWAYS CONFERENCE**

York
www.earlymainlinerrailways.org.uk

**22 – 27 June 2018
SIHS CONFERENCE**

Caithness
See page 2

**31 August – 5 September
2018**

AIA CONFERENCE
Nottingham
See page 3

**16-22 July 2018
ICOHTEC SYMPOSIUM,
Saint-Étienne, France**

**9 – 16 September 2018
TICCIH CONGRESS**
Santiago Chile
Industrial Heritage Making a
Sustainable future by understanding
the past
ticcih.org/ticcih-chile-2018-congress

**12 October 2018
SEMINAR – CREATIVE REUSE**
Salford University

**9 – 14 August 2019
AIA ANNUAL CONFERENCE,
SOMERSET**

Information for the diary should be sent directly to the Editor as soon as it is available. Dates of mailing and last dates for receipt of copy are given below. Items will normally appear in successive issues up to the date of the event. Please ensure details are sent in if you wish your event to be advised.

More Diary Dates can be found on the AIA website at www.industrial-archaeology.org

**The second International Conference on Early
Main Line Railways**

Thursday 21 to Sunday 24th June 2018

National Railway Museum, York

Among more than 20 speakers there will be —

Andy Savage of the Railway Heritage trust

Mike Chrimes on Joseph Locke

John Minnis on Railway Architecture

David Gwyn on the L&M Railway opening



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- 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 encourage improved standards of recording, research, conservation and publication. It aims to assist and support regional and specialist survey 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 an annual Review and quarterly News bulletin. Further details may be obtained from the Liaison Officer, AIA Liaison Office, The Ironbridge Institute, Ironbridge Gorge Museum, Coalbrookdale, Telford TF8 7DX. Tel: 01325 359846.

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



A sad sight particularly for those lucky enough to visit the Aga foundry during the Telford conference 2016.

For more pictures – search – 28dayslater coalbrookdale

Thanks to Chris Hodrien for this link