INDUSTRIAL ARCHAEOLOGY NEWS

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THE BULLETIN OF THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

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ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY AIA

INDUSTRIAL ARCHAEOLOGY NEWS 113 Summer 2000

COVER PICTURE

The Newcomen-type pumping engine from Caprington Colliery, Ayrshire, reconstructed inside the Museum of Scotland

Photo: by kind permission of the Trustees of the National Museums of Scotland

Industry in the National Museums of Scotland

This article describes in particular the industrial collection displayed in the galleries of the new National Museums of Scotland, opened officially by HM The Queen in November 1999. The author is Curator of Engineering and Industry, National Museums of Scotland.

John Crompton

The National Museums of Scotland (NMS) were formed in 1985 by Act of Parliament which amalgamated two long established museums, the National Museum of Antiquities dating from 1780, and the Royal Museum of Scotland, itself the successor to the Industrial Museum of Edinburgh which was one of three museums established in 1854 with surplus funds from the Great Exhibition of 1851.

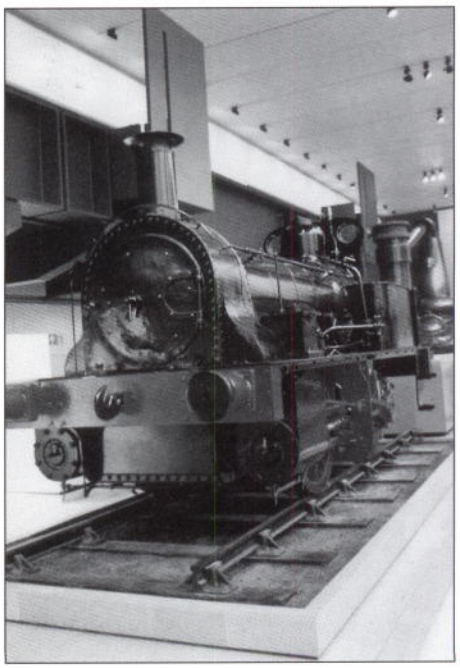
Intended to attract and educate the working man (with late-evening opening and a bar!), the Industrial Museum was quick to acquire collections showing manufactured objects from raw materials to finished product. It acquired the university's natural history collections, and other distinct disciplines emerged as specialised collections were built up in archaeology, applied art and geology. A model-making workshop was established in the 1860s and for many years the Technology Department of the Royal Museum was famous for the quality of its motorised models of locomotives and marine engines. Over the decades the Department of Science and Technology built up important collections of telegraph and radio equipment, scientific instruments, lighthouse equipment, ship models, cycles, and domestic and office technology. From 1973 a collection of aircraft was developed at East Fortune, now the Museum of Flight, and in the late 1970s the department joined with the Historic Buildings Division of the Scottish Office (now Historic Scotland) to conserve and interpret the small gas works at Biggar.

The 1985 amalgamation brought many changes, one of which was to be the building of a new home for the Antiquities collections. But finance was not immediately available, and only in 1993 did building work begin on the Museum of Scotland, next door to the Royal Museum in Chambers Street. The familiar technology galleries were cleared to allow building work and still, in 2000, await funding for the development of new exhibitions. The Museum of Scotland tells the nation's story from earliest geological times to the twentieth century, as depicted by objects in the collections of every department. For the industrial collections the project was an opportunity, therefore, to interpret objects for their historical, economic and social impact as well as their technological significance.

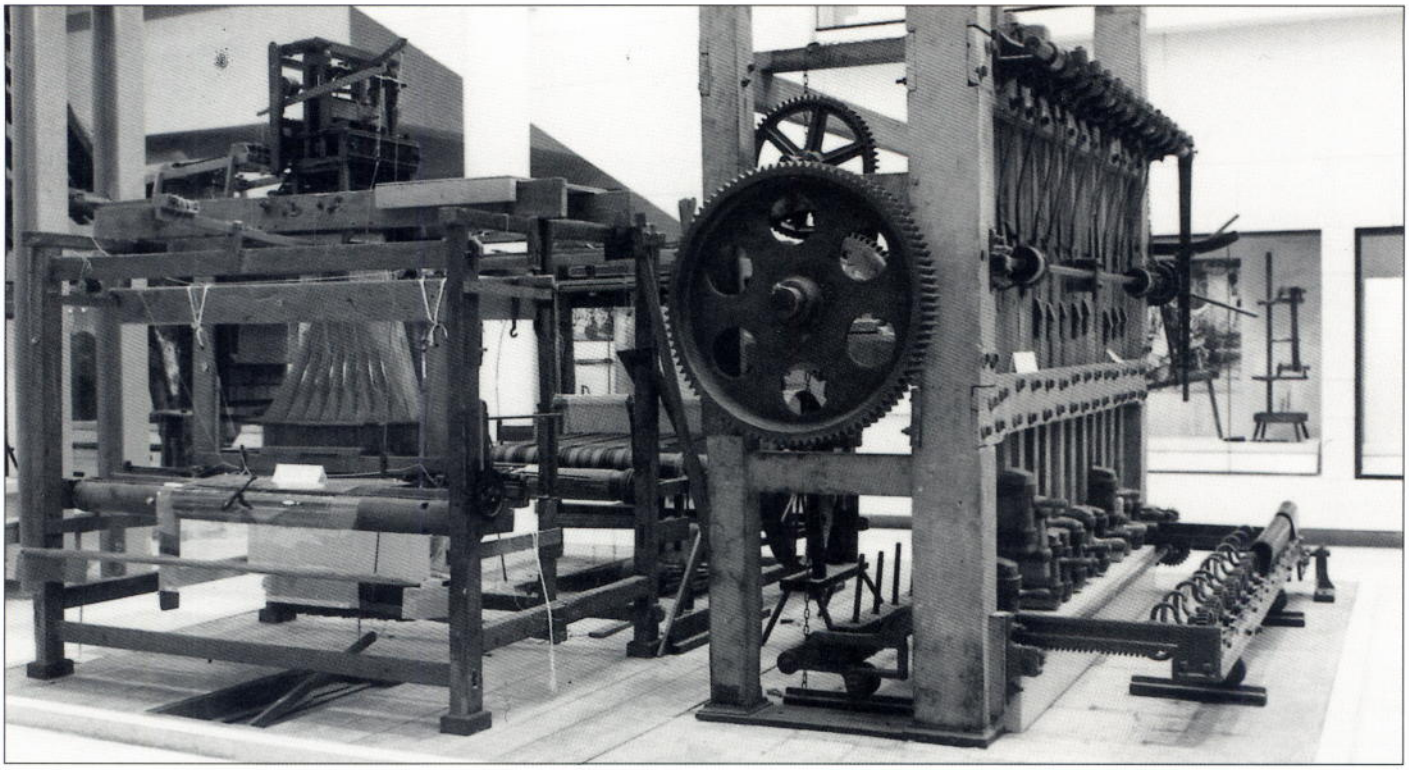
Writing history with objects presents several challenges, especially when the spaces and display case sizes have been largely determined in advance. For example, the collections contain a late atmospheric colliery pumping engine made and used in Scotland, and an early Boulton & Watt rotative engine used in London; there was room only for one, and a decision had to be made on their relative significance in terms of Scotland's history. The colliery engine won - in terms of technological achievement the decision might have been different.

The Museum of Scotland's seven exhibition levels tell the nation's story period by period, beginning at basement level with Scotland's ancient geology and the development of flora and fauna. This level also displays more than 13,000 archaeological objects, from dugout canoes and carved stones to treasure hoards and domestic implements, the tangible record of Scotland's early peoples. The ground and first floor levels cover the turbulent times from 1100AD to 1707, the Union under the English crown.

The Union provoked enormous changes in Scotland's economic development as well as in political reaction. Government attempts at improvement came after the rebellions, under Commissions for Fisheries, Roads and Bridges, and the Board of Manufactures. The gradual conquest of hand-powered tools by powered machines is shown by the juxtaposition of hand looms (for silk and tartan) and a water-powered beetling engine from Dundee, where it was used to polish linen in the hank for weaving heavy fabrics like sails. A small waterwheel which once drained a Dumfriesshire limestone mine sits close to the Caprington colliery atmospheric pumping engine in its reconstructed engine house, now demonstrated by hydraulic power. Parts for the engine were supplied by the Carron Company in 1811 and the engine worked until 1901. The technological advances of the coal, iron and steel industries are represented by models and product samples. The application of machinery to the textile



Locomotive 'Ellesmere', built 1861 by Hawthorns of Leith
Photo: John Crompton



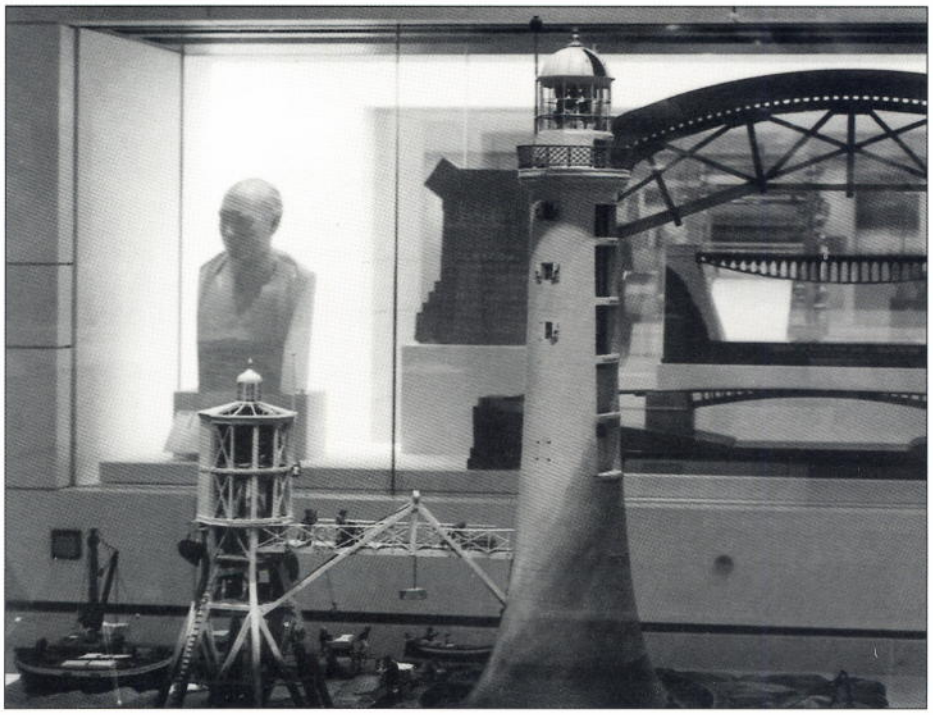
Handlooms and a beetling engine for yarn in the hank, installed second-hand in a Dundee bleachworks in 1948 *Photo: John Crompton*

industry is illustrated by a series of models and a power loom, and a single cylinder horizontal mill engine by Douglas & Grant of Dundee now works on compressed air. At the west end of this level a small gallery shows the regional varieties of Scottish textiles, with examples of products, costumes and tartans.

Level 5 looks at industry in the nineteenth century when Scotland's central belt was one of the industrial powerhouses of the British empire. It features three products which made Scotland's name famous across the world: shipbuilding, railway engineering and whisky. 'Ellesmere', a railway locomotive built by Hawthorns of Leith in 1861, and a whisky spirit still from Glenfiddich were amongst the large objects craned into the building before completion of the roof. They are joined by some fine ship and locomotive models representing design development in Scotland, including a superb one-sixth scale Mexican Fairlie double bogie locomotive on loan from the National Railway Museum, and commissioned by Neilson Reid & Co for the Glasgow International Exhibition in 1901. A short section on civil engineering as seen in the development of transport routes, bridges and lighthouses, includes a macabre object, a broken wrought iron girder from the ill-fated Tay Bridge. Finally on this floor, the West Gallery features more of Scotland's significant industries, general engineering, paper making and printing (the world's first rotary press developed in Edinburgh and demonstrated at the 1851 Great Exhibition), the oil shale and heavy ceramics industries.

To complete the story, Level 6 has galleries devoted to Scottish innovators, emigration, and the commercial world of the nineteenth century. For Level 7, the Twentieth Century Gallery, the people of Scotland were invited to choose and explain objects which were significant to them, and which they saw as formative influences on their own lives.

The opening by HM The Queen on 30 November 1999 marked the conclusion of many years' planning and execution of the new museum, and development is now concentrated on replacing the former themed technology galleries in the Royal Museum. Some progress has been achieved as part of a Heritage Lottery funded refurbishment of the largest gallery; a cast-iron lighthouse lantern first used at Girdleness (Aberdeen) in 1833, and a revolving lighthouse optic from Inchkeith (Firth of Forth) have been built up at high level. Most notably the Boulton & Watt engine, supplied to Barclay, Perkins & Co's Southwark brewery in 1786, has been entirely reconstructed. The surviving parts were acquired in 1886 and have now been erected, with a new cast flywheel, oak beam and parallel motion in an open-sided house copied from the original drawings. The engine is one of the world's two pre-1800 large rotative engines, and is now powered by a compressed air cylinder driving the extended piston rod through a false cylinder bottom. The completed engine will form the centrepiece of galleries charting the inspiration and technological inventiveness of Scots over the last 250 years.



Homage to Robert Stevenson: models of the Bell Rock lighthouse and some of his bridge designs *Photo: John Crompton*

Surveying the public water supply industry in Essex

This survey of the public water supply industry in Essex is part of a major on-going programme of data enhancement and synthesis. As with most counties in England the more recent archaeological and architectural heritage was under-represented on the Essex Sites and Monuments Record and without a reliable database it proved almost impossible to assess the comparative significance of threatened sites and to formulate a coherent long-term management strategy within the planning framework.

Tony Crosby and Shane Gould

The purpose of the current survey was to establish the priorities for archaeological resource management within the industry, thereby enabling an appropriate response should significant remains become threatened and to provide a baseline against which the importance of newly recognised sites could be accurately judged. It was also compiled in conjunction with English Heritage's Step 3 field assessments of the Water and Sewage Industry in order that a representative sample of the surviving remains in Essex could be recommended for statutory protection.

The first issue to be faced when undertaking the preliminary documentary research was the large number of sites associated with the public water supply industry in Essex and, hence, an early decision was taken to exclude anything pre-industrial such as pumps, fountains, hydraulic rams and conduits. Also many structures are small and insignificant historically, technically and architecturally, such as utility buildings and more modern buildings which are secure, vandal proof and functional. The survey therefore concentrated on sites and structures dating from around 1850 to 1939. In all 103 sites were surveyed, with 57 being significant enough to have detailed descriptions in the inventory. These sites consist mainly of water towers, pumping stations and treatment works for both water supply and sewage, service reservoirs and headquarters buildings. A clue to the large number of sites involved lies in the fact that the Institution of Civil Engineers has identified around 80 sites of former and extant water towers in Essex – second only in the country to Yorkshire. Considering this large number of sites now recognised, the fact that one is Scheduled, six are Listed Grade II and four lie within Conservation Areas reinforces the under-representation of the industry in the SMR.

The Dovercourt steel-framed water tower of 1902, a Grade II listed building *Photo: Tony Crosby*

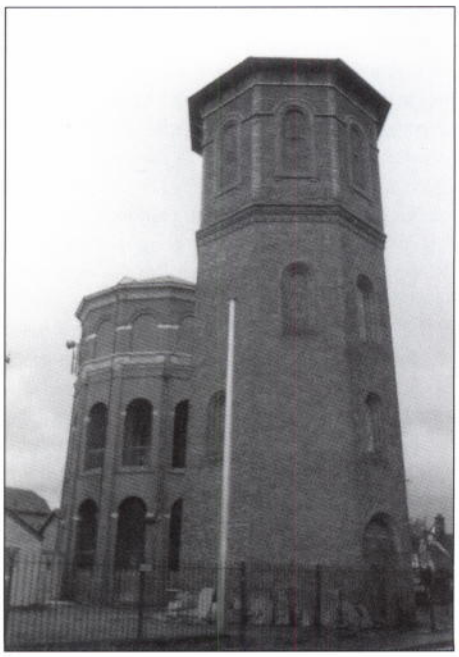
Reflecting the national pattern, the sewage treatment industry in Essex only saw significant development in the last quarter of the nineteenth century. As treatment methods and technology have continued to change to the present day, original structures and plant have been re-developed or replaced resulting in little survival of early components, although there has been continuity in the use of sites. Nine sites were surveyed and only five, dating from the first quarter of the twentieth century, had some extant but not significant structures from the earlier periods of development. Some sites were being actively re-developed around the time of the survey, e.g. Southend on Sea where various Arts and Crafts style buildings dating from 1913 have been demolished, and Tilbury where a similar style pumping station of 1920 has also been demolished.

The first waterworks to be established in the county was that at Colchester in 1808 and, following the Public Health Act of 1848, a number of Local Authorities such as Chelmsford, Halstead and Braintree set up Local Boards of Health. Although the industry has continued to develop right up to the present with changes to structures and technology, there has been continuity of use of many of the original waterworks sites. The Colchester site of 1808 (TL 992254), that was the main works including a reservoir and superintendent's house, has seen much re-development and the earliest extant structures are the pumping station and workshops of 1893/4. The Chelmsford Board's works was established in the mid nineteenth century with an artesian well, pumping station, boiler and engine house and reservoir (TL 709604). Again, although the site has been re-developed, two of the early structures remain and an adjacent building, which was formerly a silk mill and then Marconi's first radio factory, is now the head office of Essex & Suffolk Water Co. At both Halstead and Braintree there are sites comprising two water towers or their remains. At Halstead (TL 817309) there is the stump of a pre-1889 brick tower plus its now redundant 1889 replacement, while at Braintree (TL 758232) there are both the original 1880 tower and its 1928 replacement which is still in use.

As well as local companies serving a particular settlement, four companies serving a wider area included the Southend Waterworks Co., established in 1865. As part of its twentieth-century developments it opened the Langford waterworks in 1927 (TL 836090) and although the original buildings are now redundant the waterworks has expanded considerably on adjacent land. The original buildings are now the Museum of Power and contain a triple expansion steam engine of 1931 provided by the Lilleshall Co. of Oakengates, Shropshire, one of three originals which remained in use until the 1960s. As marine-type triple expansion engines were the last generation of prime mover in water extraction and only six sets survive nationally, this engine and the structure are preserved under Scheduled Ancient Monument status.

There are other sites consisting of a group of structures. Where these were developed by the same water company not only do they represent group value when protection is being considered, but also they demonstrate the use of a house style in their design and represent a link in a chain of pumping sites feeding reservoirs and water towers at different levels for different settlements. Thus the South Essex Waterworks Co. established in 1861 at Grays opened its Warley Lifting Station in 1882 (TQ 594895) to supply Brentwood and the Stifford (Davy Down) pumping station (TQ 592801) in the 1920s to supply metropolitan west Essex. Stifford pumping station has its original Sulzer diesel engines *in situ*.

As well as the large multi-structure sites such as those already described, the survey identified nearly a dozen sites with just a single pumping house (plus sometimes a staff house), often again forming a link in the chain of pumping and storage from source to customer. Thus that at Linford (TQ 672793) is part of the South Essex Waterworks Co. system and was built in 1904 in their house style. Some of these pump houses retain early technology, that at Great Bentley (1903) (TM 115225) contains a diesel engine. As some of these individual structures are becoming redundant they



Braintree Water Tower, showing the original 1880 tower with its replacement behind *Photo: Tony Crosby*

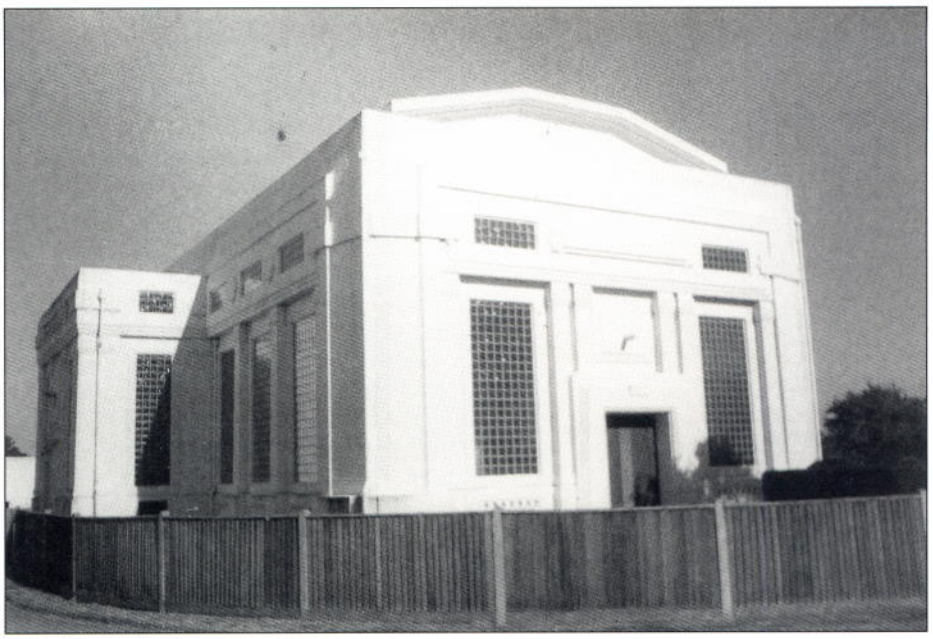
are finding new uses – that at South Benfleet (TQ 777868) as a place of worship, while that at Maldon (TL 845067) is proposed for conversion to residential use.

Inter-war development was in response to both the general increase in demand from growing urban areas and also the need to provide for the rural areas still dependent on wells, springs and streams. The major developments of the 1930s also reflected contemporary architectural style. Thus the Low Lift pumping station (TM 016340) and the High Lift pumping station and the treatment works at Langham (TM 027344), the pumping station at Tiptree (TL 884167) and the Layer-de-la-Haye treatment works (TL 966195) are all in the International Modern Movement architectural style – white concrete, metal and glass block windows. Small estates of staff housing are also associated with these sites.

Covered service reservoirs are numerous throughout the county and the sites of at least three late nineteenth century extant service reservoirs were identified, but these and any others which are recognised as potentially significant will require detailed internal inspection in order to assess their significance.

Ten red brick water towers dating from 1872 to 1933 were identified including the twin sites at Halstead and Braintree already mentioned. A small number of steel framed towers were constructed in the county but only two remain, that at Dovercourt (TM 243309) which is Listed Grade II, and the much altered one at Helions Bumpstead (TL 656422).

An interesting variation on the red brick towers is the 'Campanile style' of which there are five examples in Essex. In these cases the iron water tank rests upon the masonry sub-structure, is not enclosed and is painted in red oxide paint as protection against the elements. They are generally topped with a copper pavilion style roof surmounted with a wooden turret. The first of these was the Balkerne water tower in Colchester of 1882 (TL 993253) which is Listed Grade II. This very substantial tower, known as 'Jumbo' in recognition of its size differs from the others in having a sub-structure of four square columns and a central core. The others are similar in style to each other and vary in age from 1901 to 1928.



Pumping station at Tiptree built in the International Modern Movement architectural style in the 1930s for the South Essex Waterworks Co. *Photo: Tony Crosby*

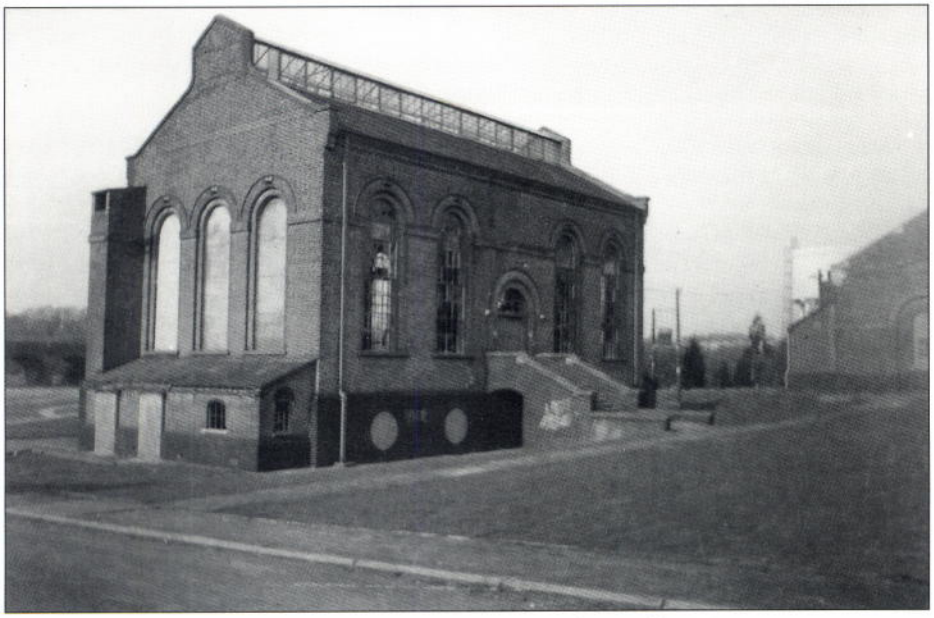
The extensive developments of the 1930s included the introduction of reinforced concrete water towers, about a dozen of which are included in the survey. There is one square example, but mostly they are circular or polygonal, the tanks being supported on anything from six to 16 columns plus a central core. Again a number of water towers are becoming redundant and some are being adapted to other uses, mainly (sympathetically and not so) as residential units and also, considering their height and prominent positions, as supports for aerials of the modern communications industry.

The buildings and structures associated with the public water supply industry are an important, but undervalued aspect of our industrial and architectural heritage. They represent considerable improvements in the quality of life for most people during the nineteenth and twentieth centuries and this is often reflected in the quality and permanence of the surviving built stock. Water towers are the most visible public expression of this achievement and these historic structures add historic depth and character to many of our towns and villages. The sites are important industrial monuments in their own right and some water companies were quick to adopt the prevalent architectural fashion with the use of Italianate, Arts and Crafts or the International Modern Movement style.

The quality and survival of pumping stations and water towers in Essex is probably above the national average and this significance is reflected in the positive recommendations for statutory protection made within the survey report. Those that survive represent the full range of the industry and adopt a variety of architectural styles; the presence of *in situ* historic plant also contributes to this overall importance. Sewage works and service reservoirs are less well represented in the county; the former have been mostly modernised whereas the latter cannot be properly assessed without internal access.

Having undertaken a comparative assessment of the public water supply industry in Essex it is now possible to appreciate the quality and diversity of the surviving resource. The priorities for the industry have been established, inconsistencies in existing statutory protection redressed and a sustainable long-term policy formulated.

Other surveys completed to date include malthouses, World Wars I and II military airfields, limekilns, historic boundary markers, iron foundries, workhouses, hospitals and the telecommunications industry of Chelmsford. Copies of the reports are available for public consultation at the Essex Sites and Monuments Record, Essex Records Office and the National Monuments Record Centre, Swindon.



The pumping station at Davy Down, Stifford, built by South Essex Waterworks Co. in the 1920s. It still contains the original Sulzer diesel engine *Photo: Tony Crosby*

What should we do with our records?

The title of this year's affiliated societies weekend held at Ironbridge on 1-2 April may not initially excite all and sundry, but a moment's reflection will indicate that while we may derive real satisfaction from surveys and site visits, at the end of the day there is little point in making records unless they are available to others. As every speaker showed, there are many issues involved. The AIA is grateful for the behind-the-scenes work put in by Ray Riley, the Affiliated Societies Officer, and John Powell, Librarian at Ironbridge.

Mary Yoward and Ray Riley

The proceedings were opened by two representatives from the Welsh and English recording bodies. Hilary Malaws, Head of Management of the National Monument Record of Wales, stressed the issue of accessibility, pointing out that the industrial archaeologist's contribution to knowledge would be lost if records failed to reach the public domain. It is important to donate records, via wills etc, to appropriate bodies, but at the same time there is the problem of information overload and the need to undertake weeding.

Mike Evans, Head of Archives of the English National Monuments Record at Swindon, set out some of the many issues with which he is faced. The great increase in material being offered recently has raised problems of storage, leading in turn to rejection of records thought not to be significant; some are more appropriate for county record offices but those which are nation-wide surveys are more difficult to place. Mike and Hilary both asked that when collections are offered, they should have been first sifted and well ordered, with a synopsis made of the contents, so that the record is easily understood and accessible to other people. Although they would be only too delighted to accept everything, constraints of space and time to catalogue records mean that, reluctantly, some have to be refused. Copyright and intellectual property rights should always be negotiated and also future access by the donor if required.

Storage is another issue. Good paper is essential if records are to last and if databases are used, they should be updated using a standard programme. The future is unquestionably digital, although it is too early to have established optimal practice. Hard copy should be available where appropriate and CDs are preferred to floppy discs. All records should be kept in archival quality material and bulk can be reduced by giving good references rather than photocopies of material that is available elsewhere.

Negatives are preferred to transparencies, as the latter can fade, and prints can always be made if wanted. Black and white is preferred, but now colour has improved, these are also accepted. Clifford Morris, who is a Fellow of the Royal Photographic Society specialising in industrial subjects, but as art rather than recording, spoke about the methods he employs to store photographs. His exhibition prints are on fibre paper, developed with extreme care, and are stored in sheets of archival film in special boxes and should be safe for very many years.

Peter Stanier demonstrated examples of what we should all be recording with photographs - the location, date, place, subject, orientation, scale and name of photographer - as an absolute minimum to be of value to future researchers. Photographs, negatives and slides should be stored and catalogued so anyone can understand the references and there was discussion on the best way of marking them. It must not be forgotten that a separate catalogue could easily become separated from the originals and lost. Again, pruning and weeding out is necessary to reduce storage space. The thousands of transparencies taken by enthusiastic industrial archaeologists remain a large headache for archivists, especially if poorly labelled.

Malcolm Tucker, who is well known to AIA members for his meticulous recording of any photographs in his little books, explained the sophisticated classification system he has developed to handle his enormous collection. He would deposit his records with a public institution if he was not still using them. He mentioned that GLIAS has initiated a register of members' records, to prevent duplication, and suggested that the AIA might mount an initiative on the ways in which individual and group records might be placed with archives and museums.

The problems of the classification of records were addressed by Ron Martin, who has made a study of the subject. It is clear that as classification systems (such as IRIS) become more comprehensive, definitional problems multiply, something which is compounded by the use of local terms without cross-referencing. He spoke too on the Sussex IA Society's recording forms, of which many thousands have been completed. The Society is now considering what to do with the information - a database is obviously an answer, and microfiche has been considered but found to be expensive.

Without exception, all the speakers had mentioned the role of electronic storage but the subject was brought into focus by Tony Yoward, who gave examples of his 120 databases for various things varying from mill records or cast iron gravestones to the organisation of delegates to AIA Conferences. He is convinced that this is the way forward and demonstrated not only the immense storage potential but also the impressive retrieval potential of the modern computer. The material has to be on a programme in general use and must be kept up to date - and backed up in case of emergencies - but little room is required for hundreds of records. References to original sources for all entries are essential. Discussions during the weekend also concerned the updating of digital records ('onward migration') as new advanced computer systems are introduced.

Ray Riley concluded with some cautionary tales, such as the dangers to records posed by fire (many Norfolk Local Studies Library records were lost this way in 1993). The unreliability of the accession records of record offices is another concern and he quoted the case of Tony Yoward cataloguing the Armfield of Ringwood papers and when the Chairman of Hampshire Mills Group went to see them, he was told that they were not there! But they were eventually found. More worrying, are the results of Ray's own researches in Portsmouth in 1967, which seem to have disappeared into the Portsmouth Record Office and are still being looked for! Back up copies elsewhere would always be invaluable.

Finally, Ray briefly outlined some of the themes which had emerged from the weekend:

- the annotation of records
- the classification of records
- the use of electronic data bases
- information accessibility
- the appropriate placing of records.

It is to be hoped that the AIA will be able to produce some guidelines for 'best practice' based on the weekend's discussions.

During the weekend, John Powell gave members a tour of the Ironbridge Library and archives. He explained how the library had developed over the years and is now as a centre for researchers of the district. We were taken into the strong room and shown, among other things, part of the Elton Collection of prints and manuscripts. The Saturday night dinner was at the New Inn in the Victorian Village at Blists Hill and was followed by a hilarious pictorial quiz organised by Ray Riley. This provided relief from a most stimulating working weekend during which many important issued were raised and aired.

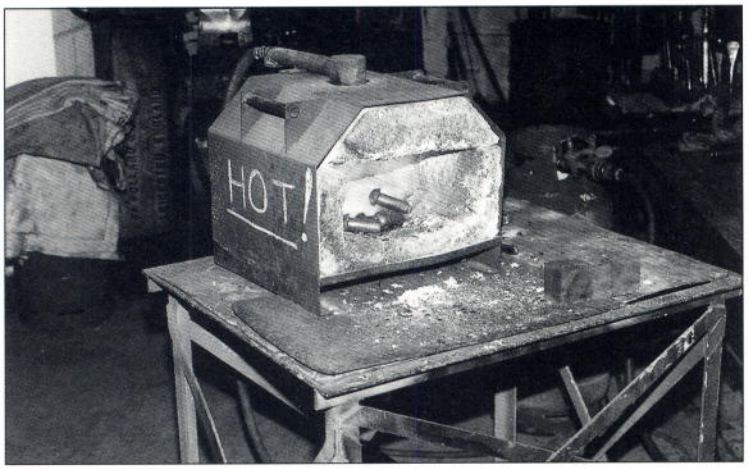
Dorothea's birthday

On 8 October 1999, Dorothea Restorations Ltd held a very successful Open Day at its Northern Works near Stockport, in celebration of its 25th birthday. Over 70 representatives from English Heritage, Cadw, the National Trust, government agencies, architectural practices and private individuals attended.

Demonstrations of architectural metalwork by company staff included hot-set rivetting (and rivet-busting), pattern-making, mould-making, leaded glazing and gilding. Traditional blacksmithing skills of fire (forge) welding, repoussée and leafwork in copper and iron were complemented by a demonstration of the mechanised upsetting of forged palings. Along with punched rails these bars are used to produce park railings without recourse to unsightly welding.

Traditional engineering skills were represented by a recently completed working hot air engine, millstone dressing and associated millwork. An object which attracted a great deal of attention was a comformiteur - a device for measuring heads, as still used by the local (Stockport) hatting trade. A 25th birthday cake was adorned with a flower of charcoal iron, made and gilded during the proceedings.

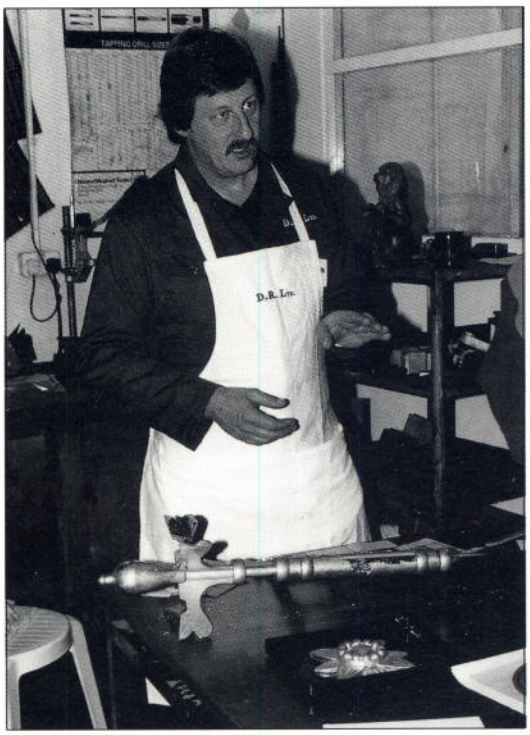
Invitations have been extended to delegates of the forthcoming AIA/TICCIH Conferences to view similar working demonstrations and displays - exact date yet to be decided.



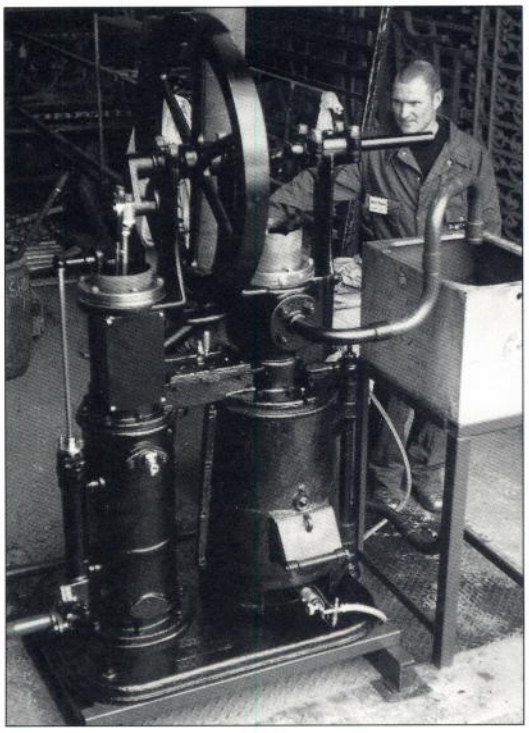
¾-inch diameter rivets being raised to a bright yellow heat in a portable hearth preparatory to a rivetting demonstration

Heavy rivet busting on an old boiler was displayed by Jason Lomas and Brian Thorpe from the Northern works. Only six blows were required to decapitate a ¾ in. diameter rivet

The ancient art of fire (or forge) welding was demonstrated by blacksmiths David Potter and Frank Edwards. They are re-enacting the placing of a 1½in. diameter wrought iron bar across the Avon Gorge by I.K. Brunel prior to the construction of the Clifton Suspension Bridge



Gilding of a stainless steel pennant by Robert Oakes, who is based at the company's Bristol works



A Rider Hot Air Engine, totally rebuilt from a pile of broken and heavily rusted parts, was demonstrated by engineer Brian Thorpe. The engine is shown running on a gas flame, driving a water pump

Endangered Sites Officer

The AIA has recently appointed Michael Payne as our Endangered Sites Officer. Anyone concerned about industrial sites in danger from demolition or redevelopment can seek information and advice by contacting him at the AIA Office, School of Archaeological Studies, University of Leicester, Leicester LE1 7RH, ☎ 0116 252 5337, Fax: 0116 252 5005, e-mail: AIA@le.ac.uk

President's Award 1999

Michael Harrison will be presenting the 1999 President's Award to Crabble Mill, Dover, on the evening of Friday 12 May 2000. All are welcome to attend this event, which takes place during the National Mills Weekend.

Marilyn Palmer

Congratulations to Dr Marilyn Palmer on her election to the chair of Professor of Industrial Archaeology at Leicester University as from the new academic year.

New members

The AIA welcomes the following new members:

M. Ball, Coulsdon
Mr Baxter & Mrs Westen, Amador City, USA
S. Bennett, Glasgow
P.W. Bone, Littleborough
D.J. Brine, St Albans
P. Burnett, Yeovil
M. Carr, Newcastle upon Tyne
Dr G. Chitty, Carnforth
Dr P.H. Collins, Stourbridge
A.W. Fyfe, Leeds
F.R. Lowe, Wadhurst
J.R. Marjoram, Matlock
R.T. Palmer, Southampton
Mr & Mrs Parrett, Worthing
I. Pope, London
Mrs J. Sharpe, London
Mr & Mrs S.J. Welch, Woking

ENGLISH HERITAGE MONUMENTS PROTECTION PROGRAMME

A considerable number of AIA members have provided information to the consultants involved in the above programme for England. The following reports have now been deposited in the Ironbridge Gorge Museum Trust Library and are available for consultation by members on special request to the Librarian. Other copies have been deposited with the Council for British Archaeology, York, and the National Monuments Record, Swindon.

Alum industry: Combined Steps 1 - 3 report, and revised Step 3 report.
Arsenic industry: Step 1 report, introduction to Step 3 site assessments and Step 3 report.
Brass industry: Step 1 report and Step 3 report.
Coal industry: Step 1 report, Introduction to Step 3 site assessments, and Step 3 reports, Pre-20th century collieries: vol. I Avon; vol. II Cheshire, Cumbria and Derbyshire; vol. III Durham, Gloucestershire and Greater Manchester; vol. IV Lancashire, Leicestershire, Merseyside, Norfolk, North Yorkshire and Northumberland; vol. V Shropshire and South Yorkshire; vol. VI Staffordshire and Tyne & Wear; vol. VII Warwickshire, West Midlands and West Yorkshire. Step 3 reports, 20th century collieries: vol. I; vol. II.
Copper industry: Step 1 report, introduction to Step 3 assessments and Step 3 reports: Avon to Cornwall 22; Cornwall 23 - Devon 3; Devon 4 - Staffordshire 5.
Dovecotes: Combined Step 1 - 3 report.
Electric power generation: Step 1 report, Step 2 shortlist, Step 1 report, Step 3 report and Step 3 report update. Step 3 reports: vol. 1 Avon, Cleveland, Derbyshire, Devon, Dorset, Essex, Gloucestershire, Greater London, Greater Manchester, Hertfordshire, Kent; vol. 2 Lancashire, Leicestershire, Northumberland, Nottinghamshire, Somerset, South Yorkshire, Suffolk, Surrey, Tyne & Wear. Step 3 report : Renewables.
Gas industry: Step 1 report.
Glass industry: Step 1 report, introduction to Step 3 site assessments, and Step 3 reports: vol. I Avon (formerly), Cheshire, Cumbria, Derbyshire, Devon, Dorset, Gloucestershire, Hampshire, Hereford & Worcestershire, Kent, Lancashire; vol. II Greater London, Greater Manchester, Merseyside, Norfolk, Northumberland, Shropshire, Somerset, Staffordshire, Surrey; vol. III East Sussex, West Sussex, Tyne & Wear, Warwickshire, West Midlands, South Yorkshire, West Yorkshire.
Gunpowder industry: Combined Step 1-3 report.
Iron and steel industries: Step 1 report.
Lead industry: Step 1 report.
Lime, cement and plaster industries: Step 1 report, Step 2 shortlist and Step 3 report.
Minor metals and vein minerals: Step 1 report, introduction to Step 3 site assessments, and Step 3 reports: Cheshire 1 - Devon 2; Devon 3 - Warwickshire 1.
Oil industry: Step 1 report.
Quarrying industry: Step 1 report and Step 2 shortlist.
Salt industry: Step 1 report.
Tin industry: Step 1 report, introduction to Step 3 site assessments, and Step 3 reports: Cornwall 1-50; Cornwall 51-90; Cornwall 91-130; Cornwall 131-Devon 21; Devon 22 - 66.
Water and sewage industry: Step 1 report.
Zinc industry: Step 1 report, introduction to Step 3 site assessments, and Step 3 report.

Second Early Railways Conference - Call for papers

The second international Early Railways Conference will be held in Manchester at the Museum of Science & Industry on 7-9 September 2001. This follows the successful first conference held at Durham University in September 1998, the papers from which are now in the final stages of publication,

Researchers into the history of early railways (defined as being pre-mainline in concept but not necessarily in date), who expect to be in a position to present their findings in 2001, are invited to inform the Conference Editorial Panel at the earliest opportunity, and to submit a 300-word synopsis of their paper for consideration by the end of this year.

Full papers, short papers and brief reports on any relevant topic will be considered. Likely session themes will include comparison of alternative modes for mineral haulage, progress in transport networking through 'portage' railways, the use of railways underground and technology transfer in the engineering of early railways.

Proposals should be sent to:

M.J.T. Lewis, 60 Hardwick Street, Hull, HU5 3PJ, England. e-mail: michael@lew.karoo.co.uk

Conference Committee: Institute of Railway Studies (University of York/ National Railway Museum), the Newcomen Society (for the Study of the History of Engineering and Technology), the North of England Open Air Museum (Beamish) and The Locomotive Trust.

The Thirlmere crane

May I add a little further information (*IA News 111*, Mystery photos) principally about the rotating crane photo. Over many years having tried to understand pieces of equipment from just an odd photograph, could I comment on R.F. Hall's remarks on how the crane was worked and his question as to whether the crane could travel through a full 360 degrees? I believe the rigid pipe to the right of the central pillar (but not attached to it) is the low pressure water return as it empties into a circular trough near the bottom of the pillar. Therefore the flexible pipe is the high pressure feed, it can be isolated with a stop valve and just behind the handrail is a pressure gauge. So the crane cannot be rotated round and round. Also the chap by the left hand leg is holding a handwheel which is fastened to a spindle that is attached to the speed control valve above, also at the same side as the flexible pipe. I can't see any valve gear exactly, but the chap holding the chains may be able to alter the water flow so the piston valves operated from a single eccentric changes from inside to outside admission, and thereby the engine's rotation reverses, or stops when in mid position. This type of arrangement was used on the anchor winches on wartime 'VIC' naval craft.

Finally, on the Crossness boiler house photograph (*IA News 112*, p.9), the two sets of skylights show from where the boiler house was extended.

Bob Cooper
17 North Parade, Leeds LS16 5AY

Final word on kilns

Following my article on limekiln typology in *IA News 110*, I was pleased to see the responses in *111*. Whilst not wholly supportive of my proposal, the comments firmly underscore the point I tried to make and the need for an objective typology. Both correspondents draw attention to two very different kiln types, primarily used in the South East, with the name 'Flare Kiln'. Their explanation has enabled me to understand the confusion which attends contemporary sources for these important types, which need now to be separated in some objective way if our understanding of them is to proceed.

Paul Sowan makes very useful comments about Brockham, Dietzsch and Smidth kilns, and he begins to explain their internal construction and function, which as industrial archaeologists and historians is surely what we want to know and understand. If my proposal for a typology should gain any general acceptance then these comments (and any others) would need to be incorporated.

Concerning the comments expressed by Mr Martin about the use of IRIS, this has been a useful field tool for many years, but is it appropriate as a sole aid for in-depth knowledge and understanding? The debate as to whether typologies should be based on form or function is surely irrelevant here. Nobody disputes that many intermittent and continuous kilns are similar in form, but to lump them together under some nebulous 'shaft kiln' category avoids asking the very fundamental question as to their function.

If our purpose is simply to survey them (perhaps alongside other monuments in the field) and make lists of them, then we should just simply call them 'limekilns', but if we want knowledge and understanding, then we must investigate them thoroughly and combine fieldwork with research. In whatever branch of study we have, surely it must be agreed that the best published work has been built upon accurate work in the field and painstaking work in the archives. There is however a cost to this process. A good many kilns will remain outside the national corpus until a representative sample has been studied in depth, and a set of guidance criteria produced. Subject to these criteria being tested against future research and refined, they should become the measure to help us assess kilns more accurately in the field.

In a more lengthy critique in *IA News 112*, the author of the MPP reports on the industry, Michael Trueman, criticises my approach but says nothing to explain his own proposed 'model'. Although he kindly showed me a simplified example in correspondence (February 1999) there is no obvious rationale to it and, despite the criticism of my own, it too breaks cleanly on the ultimate division between a continuous and intermittent burning function. To ask but two simple questions of it; does he suggest that clamp kilns can/did become separate feed kilns, and where do small intermittent kilns (say 5-6ft high) fit into the model?

I am criticised for my avoidance of local terms and nomenclatures in a national typology. Trueman says that they are 'intuitive', but he himself has fallen into the trap of not appreciating the two very different types of 'flare' kiln, as the above correspondents from the South East have very ably pointed out. He is quite right, however, to suggest the need to search for characteristics which reflect how the kilns were operated, but his suggestion of counting the number of drawing eyes is too easy a pitfall., Of course the number of eyes is important in understanding process and function, but they are not a suitable classifier. That is why in my own article I juxtaposed photographs of the single pot/eye kiln at Boscastle with the multi pot/eye kilns at Lindisfarne. Their process and function were identical, but the latter kilns operated on a much larger economic scale.

The central point at issue is whether a kiln had an intermittent or continuos process. To understand this archaeologically is both very difficult and crucial, but we must try to make the distinction if we want to understand their economic and practical function (as we might with factories, mills, etc). In other areas of IA, we have wrestled successfully with similar issues for 50 years, so why not with limekilns?

Messrs Martin and Sowan rightly cite vitrifaction as a clue, but their understanding is based on the classic continuous model with its burning zone almost half way up the kiln. In this model, height is another clue because the kiln has to accommodate pre-heating, burning and cooling zones. This model is the most common, but does not exclude others. Only the burning zone is necessary. The pre-heating zone s only required when fuel is scarce or fuel efficiency is important. The issue here then was whether to expend capital in a large kiln or revenue in a small kiln. The cooling zone was needed only when the lime has to be picked by hand (as it was in most large industrial kilns, e.g. Tunstead, Derbyshire, until 1947). In an area which burned limestone with anthracite there would be minimal ash and so the lime could be drawn with a shovel. Perhaps the number of drawing eyes offers another clue. Along the Pembrokeshire coast there are many fine small (8-10ft high) kilns which burnt anthracite with two drawing eyes each. Would anyone seriously build an intermittent kiln (some for a commercial purpose) with two drawing eyes?

There are many more issues to be resolved here. This is where I foresee research in the future, but there needs to be an objective framework for it to be undertaken. Notwithstanding the merits or otherwise of my typology I firmly believe that until one is established, the understanding of limekilns will remain local and limited.

Due to the fundamental importance of the MPP reports and conclusions, it is essential that the issue of typology is resolved satisfactorily before that process terminates. because I have not persuaded Michael Trueman of the merits of my own, I expect that his 'model' will be favoured in these documents. As I am neither an archaeologist nor an engineer, I am prepared to defer to his 'model', but I do insist that before it becomes the accepted one for future researchers, he must make a clear, robust and logical explanation of it, which he has so far failed to do.

As a historian I shall now retire to study the economic aspects of the industry!

John Leach
25 Atherton Way, Tiverton
Devon EX16 4EW

Lawn mowers

Has any reader been involved with a project associated with the cylinder mower? The cylinder mower was patented in 1830 by Edwin Beard Budding of Stroud, Gloucestershire. I am working on a book about the reel lawn mower as manufactured in the USA. I am always looking for catalogues, literature, etc, on reel lawn mowers. The Reel Lawn Mower History and Preservation Project can be contacted at:
jricci@reellawnmower.com or
http://www.crocker.com/~jricci/

James B. Ricci
30 North Farms Road, Haydenville,
MA 01039-9724, USA

Footwear workers

The Northampton footwear worker was the theme of the East Midlands IA Conference 58 held last October. Geoffrey Starmer outlined the underlying processes involved in the production of footwear such as the key processes of shore production, clicking, closing and lasting. Garry Campion showed how outworking remained well into the factory era and that in many areas new factories and speculative housing with outwork workshops were being built concurrently. Northampton and Leicester saw more integration of production into the factories and where domestic workshops existed they were frequently built onto domestic premises, often forming two storey off-shoots at the back of terraced property. Workshops were found in all forms, some having common access with the house and others with separate access from a back alley. There were even some full factories built within terraced housing. In many smaller towns, such as Kettering and Rothwell, the single storey workshop detached from the house was the normal pattern. Kettering had 2,392 such outwork shops in the 1890s, mainly built at the end of back gardens of terraced houses. Usually these were pent roof buildings with a single fireplace. The development of housing in this area was based around speculators buying a group of plots within a street. There was a high level of architectural embellishment in lintels and door cases. Attempts to draw parallels with the East Midland lace and hosiery industries were made but the results were highly inconclusive as the dominant long window shop built into a domestic property is not normally found in Northampton.

Stephen Young charted the growth and finance of the factory system in Northampton itself, where the first recorded dedicated shoe factory was in 1857; by 1894 there were 170. Goad's insurance maps were used in researching numbers and locations. Manfield's Campbell Square factory (now demolished) was the prototype factory. A pattern of building with three storeys plus a half cellar soon emerged as the typical shoe factory. Mechanisation with treadle closing machines from the 1850s and the introduction of sole sewing with the Blake machine between 1850 and 1870 saw a progressive growth in the factory based industry. Output in Northampton rose from 250,000 to 350,000 prs in this period. Initially distribution was through wholesale routes but the leading companies started opening their own retail outlets at the end of the nineteenth century. Manfield was again at the forefront of retail development. Much of the expansion capital was internally generated and there is no clear pattern of external finance. Many of the smaller factories only carried out certain elements of the whole process and an attempt is being made to classify the activities at sites in Northampton.

Barrie Trinder attempted to put the domestic work of the boot and shoe industry in a national context. Much of the early growth of the Northamptonshire industry was built on army contracts and the export market. For much of the nineteenth century the industry was local to its markets. In 1891 one in 110 of the national work force was employed in the industry. Comparative figures for Northamptonshire were one in nine and for neighbouring Leicestershire one in 12. At this date there were also significant concentrations developing in Stroud, Norwich, Stafford and the Rossendale Valley. In all these areas the pattern of domestic work varied and even in Northamptonshire it had regional biases with the greatest concentration in the east of the county: Wellingborough had 250 workshops and Kettering (a town of roughly equal size) had over 2,000. In a broader context, the local practice was reviewed against Lancashire weaving, the Coventry narrow fabric industry, Macclesfield silk weaving and the Black Country metal industries.

Throughout the talks, there was a common theme of proving that in the boot and shoe industry the outworker and factory system survived side by side into the early twentieth century.

In the afternoon, conference delegates visited the collections of shores and shoe making machinery in Northampton Museum, followed by a guided walk around the portion of Northampton that still shows the 1870s mixture of terraced housing, back alley workshops and three and a half storey factories all mixed together. We were reminded that this is an industrial landscape under threat. The collapse of the remaining companies in the boot and shoe industry has been as rapid and depressing over recent years as in many other sectors of British industry. many factories are now empty. The houses in the area are also seeing much unsympathetic window replacement and the appearance of stone cladding.

Mark Sissons

Only the tide of time

AIA member Clifford Morris has an exhibition of his photographs of canals on tour this year. Having been at the Bass Brewery Museum in Burton on Trent, the exhibition will be in Wednesbury Museum and Art Gallery from 12 July to 19 August, before moving to the National Waterways Museum at Gloucester in the autumn. The exhibition is sponsored by the National Lottery and Ilford Ltd.

Clifford has a Certificate of Higher Education in Industrial Archaeology from Birmingham University and is a fellow of the Royal Photographic Society. His images, all in black and white, are far from strict recording and are less concerned with the actuality of the waterways themselves but rather with the effects that the passage of time has had upon them. They are a personal and poignant study and the pictures, it has been said, reflect the paradoxes of social and economic change and out industrial past in a highly original way.

Radstock Museum

As briefly reported in the last *IA News*, the former coal mining town of Radstock in north Somerset has a new museum. The Radstock Museum was officially opened on 10 July 1999 by Loyd Grossman, who is the Chairman of the Campaign for Museums and a Commissioner of both English Heritage and the Museum and Galleries Commission. Occupying the Grade II listed 1898 Market Hall, the museum is ideally placed to explore the outstanding industrial heritage within this region.

The Radstock, Midsomer Norton and District Museum Society was founded in 1985 to preserve the social and industrial heritage of the communities of the Somerset coalfield. Since its formation, the Society, a registered charity, has collected artefacts which were first put on permanent display at nearby Haydon.

Acquisition of Radstock Market Hall was made in 1996, with the help of substantial grants from the District and Town Councils. Its conversion to a permanent home for the Museum Society's collection has been supported by a major grant from the Heritage Lottery Fund, as well as donations from local businesses and private individuals.

Staffed by volunteers, Radstock Museum offers its visitors the opportunity to explore various aspects of the lives of people within the community; their education, religion, places of work and daily activities. Exhibits include the re-created coal face, displays of miners' equipment, miner's cottage, friendly societies, Methodism, Co-operative shop and a Victorian school room. Visits by groups, schools, societies and clubs include guided and special interest tours. The museum also has a research room and the shop stocks a good selection of publications on industrial and transport history.

A recent English Heritage survey has identified Radstock as one of the most complete mining towns in England with an outstanding collection of colliery winding engine houses and associated infrastructure. This importance culminated in the designation by Bath and North East Somerset Council of a Conservation Area around the town. Other places to visit within the area include the remains of coal workings dating from the medieval period to the twentieth century, the Somersetshire Coal Canal, the Dorset and Somerset Canal, railways and rural ironworks. Located on the edge of the Mendip Hills and only a short distance from Bath, Radstock has much to offer to the industrial historian.

Opening times of the museum are:
Tuesday – Friday, Sunday and Bank Holiday Monday 2.00 – 5.00pm;
Saturday 11.00am – 5.00pm.
Closed December – January.
☎ 01761 437722

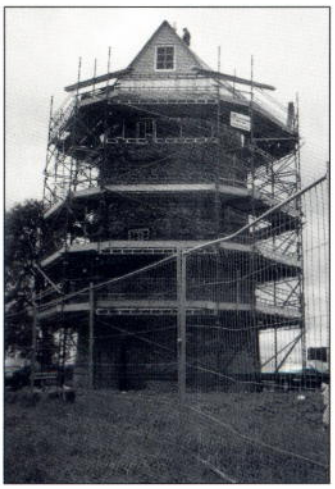
The Radstock Museum, with a former winding wheel from Kilmersdon Colliery
Photo: Shane Gould

The reconstructed Co-operative shop in the new Radstock Museum
Photo: William Allen Photography, Bristol

Swannington Trust refurbishes windmill

September 1999 marked an important development after a 17-year campaign when the cap, made as closely as possible to the original design, was lifted into place on top of the Hough windmill tower at Swannington, Leicestershire. Since being formed in 1980, the Swannington Heritage Trust has preserved a number of heritage sites in the village, such as the Swannington Railway Incline, part of Swannington Common with features of the village's 800-year connection with coal mining, the sites of two nineteenth century coal mines, and the windmill.

A post mill recorded on this site before 1790 was replaced in the early nineteenth century by a tower mill which was operated for some time by Mr Griffin. It was sold in 1877 to the Hough family under whose control it operated until the 1890s when business was taken away by steam mills in nearby Ashby and Coalville. After working spasmodically until the Great War, the windmill then deteriorated and some of its iron was removed for the second World War effort.



The windmill at Swannington under restoration

The windmill remains were listed in the early 1980s and were compulsorily purchased by the Local District Council before being sold to the Trust for preservation. A successful funding bid to the National Lottery Heritage Fund raised £71,000 which, with awards from charities and other sources together with the Trust's own funds, has enabled the refurbishment to be completed by November 1999.

The Trust has been fortunate in obtaining the assistance of Mr John Boucher as consultant millwright to supervise the work of re-capping, re-pointing and repairing brickwork, installing new floors and stairs and fitting new doors and windows. The building work was undertaken by a local company, K.W. Brookes. The cap was professionally made by a specialist millwright from Bristol to a design as close as possible to the original using English oak, roofing felt and pressure treated boarding. While construction was being carried out, two pairs of stones were installed on the stone-floor and these were connected to drive gear and a vertical drive shaft. This equipment was salvaged from a mill in Cambridgeshire. There is no intention at present to fit sails, wind-shaft or fantail, but the cap is designed to accommodate this at a later date.

It is intended for volunteers to open the mill on Sunday afternoons throughout the spring and summer. The Trust also offers guided walks to interested groups and sells it publications (including *The Swannington Village Trail* and a video about the heritage of Swannington) through the village post office. For more details contact ☎ 01530 832704 or 01530 222330.

Denis Baker

A foundry or sawmill?

In 1947 and again in 1961 the late Dr A.J. (Tony) Clark excavated a site on Coneyhurst Gill, Cranleigh, Surrey where, firstly, the Romano-British road from Rowhook on Stane Street towards Farley Heath temple crossed the gill and, secondly, a pond bay indicated the existence of an industrial site. This excavation remains unpublished and the site archive is sparse; the purpose of this article is to appeal for help in identifying the nature of the industry involved.

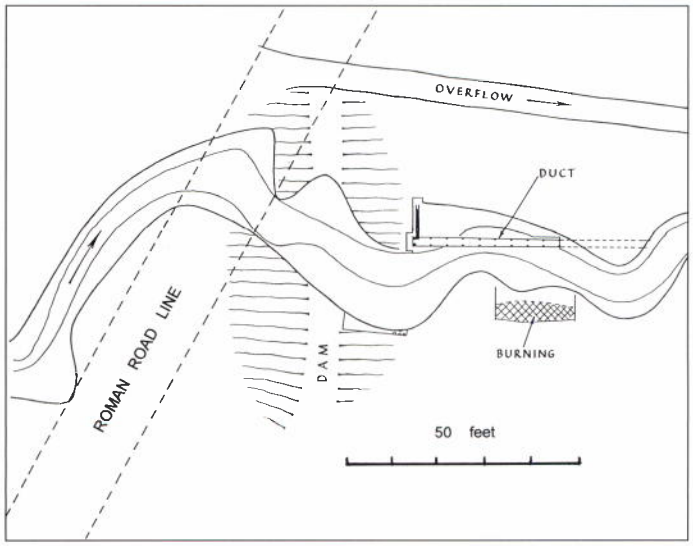
The site has been described as a forge, an outlier of the Wealden iron industry, but the lack of slag and cinder render this open to question. The pond bay would have retained a small pond, some 12m x 15m with a maximum depth of less than 2m but further earthworks upstream may indicate the existence of related pen ponds. Excavation located a number of timber structures including a revetment to the pond bay. A rather poor photograph appears to show a brick wall, not fully excavated and bedded deep in the steep side of the gill, at right angles to the end of the revetment away from the stream. Bricks were commonly available in the area from the late sixteenth century but those visible in the photograph appear from their size to be considerably later.

A leat or duct at least 16m long was constructed of oak and walled and floored with planks on a frame with internal vertical posts of a 15cm scantling. This duct was finished off with an end board at the dam. Trial trenching failed to find any signs of a furnace but a platform of burnt clay was related to possible forging.

Documentary research has not produced any evidence of ironworking at this site. There is, however, extensive evidence of timber production from the holdings bordering the stream - the area is still heavily wooded with oak, beech and ash. One set of documents from Coneyhurst, the estate on the east of the stream, is of particular interest. The documents relate to a disagreement over payment for timber from the estate and detail amounts of timber and bark produced for sale. In 1696 bark valued at £20 11s 8d and large amounts of beech and oak were sold. Much of this seems to have been prepared prior to sale including 4,278 feet of beech planking. In 1697 more planks were sold, together with hewed oak and elm; some of the timber supplied went to repair Chertsey Bridge.

So, could the site at Coneyhurst Gill have been a water-powered sawmill? Sawpits are common in the area and saw frames are also more likely and leave no trace. Minor farm-based industries seem to be under researched and I wonder if any reader has experience of this type of site? If anyone is interested I can show them copies of the photographs of the excavation but any help in identifying the site would be much appreciated. I can be contacted at:
2, Rowland Road, Cranleigh, Surrey GU6 8SW, ☎ 01483 276724,
e-mail: j.english@surrey.ac.uk.

Judie English



Plan of the Coneyhurst Gill site in Surrey, made in 1961, showing the line of the Roman road, the dam and the leat or duct

Tube station lift restored

Historic Steam Ltd, the specialist engineering company that is the trading arm of the Kew Bridge Steam Museum, has restored the mechanism of a 1902 passenger lift for the London Transport Museum. The lift, manufactured by Otis, was formerly installed at Mornington Crescent Tube Station on the Northern Line. The job involved cleaning the winding drum, two motor-driven gear boxes, lift cage cables, sheaves, electromagnetic brakes, a centrifuge governor and assorted nuts and bolts. Historic Steam also supplied support girders and installed the components on them for display purposes at the Museum's out-station depot at Acton.

Historic Steam Ltd operates from a workshop at the Kew Bridge Steam Museum in Brentford, West London. The company specialises in restoring steam engines and industrial artefacts, designing and building steam engines and boilers, and providing general engineering and machining services.

The Mornington Crescent station lift winding drum is off-loaded at Acton by Historic Steam Staff *Photo: Historic Steam Ltd*

Gasholders in the news

The dramatic photograph on page 16 by Clifford Morris shows the moment of demolition on 6 September 1999 of the gasholder at Swan Village, West Bromwich. An earlier (still standing) view by John Powell was published in *IA News 110*, page 14.

Meanwhile, in Cambridge the gasholders by the River Cam near Cheddars Lane industrial museum are to be demolished. Despite the Cambridge City Council wishing to retain them as part of a redevelopment scheme, the inspector at a public enquiry in March 1999 ruled that they were ugly and should be removed along with other buildings on the former gasworks site. The space will be used for a supermarket car park.

By contrast, in Italy, at Bovisa, a suburb of Milan, at least three gasholders have been retained as part of a large development for Milan Polytechnic. The Italian futurist painter Mario Sironi painted the district in the 1930s and included the gasholders in his work. Apparently this has given the gasholders added status. The Bosiva gasworks district is to become a new park for 'Technical and Scientific Culture'.

Despite reports that dismantling of the St Pancras gasholders would start at any moment it turns out that work has been delayed. Being listed, the structures cannot be taken down until the Channel Tunnel rail Link is actually being built. It had been intended to purge the gas from the holders ready for dismantling but there has been a successful local objection, so nothing has changed since September last.

Robert Carr

Stark future: the Cambridge gasholder number 1 *Photo: RJM Carr*

New management at clay museum

On 1 January the management of the award-winning China Clay Museum at Wheal Martyn, St Austell, was transferred to The Trevithick Trust for an initial one-year period. Whilst the museum receives considerable subsidies from English China Clays, its visitor figures have been falling for many years and its Trustees decided to take advantage of the expertise generated by the Trevithick Trust, who already operate 11 sites in Cornwall.

Porthcurno award

In November 1999, the Porthcurno Museum of Submarine Telegraphy, which is managed by the Trevithick Trust, has won the major National Heritage/NPI Award for the Best Museum of Industrial History. It was also shortlisted for the overall Museum of the Year Award. This major achievement does credit to the work of all who have helped transform Porthcurno into a significant historical site. The award was presented to Mary Godwin, Curator of Cable & Wireless and a Director of the Trevithick Trust, by Sir Jocelyn Stevens, Chairman of English Heritage at a ceremony in London at the end of last year.

The success of this museum, down on the coast in the far west of Cornwall, is based not only on its content but also the close relationship it has with the local environment and organisations. Porthcurno, once 'Cornwall's best kept secret', was described in *IA News 93*, Summer 1995.

Canal hydrology history

A new Inland Waterways Hydrology Study Group was formed during a Workshop on the Historical Hydrology of Inland Waterways, held at the Institute of Hydrology during November 1999. Speakers covered the renewed water resource planning interest in canal and river navigation records, and the long record (dating from 1841) of flows from springs feeding the Wendover Arm of the Grand Union Canal. Further topics were the water supply to the summit levels of the Kennet & Avon Canal, and the roles of navigation authorities such as the Tyne Improvement Commission of 1850.

Workshop participants included engineering consultants, university researchers and representatives of British Waterways and the Waterways Trust. There were also members of the AIA, the British Hydrological Society, the Railway and Canal Historical Society and the Panel for Historical Engineering Works of the Institution of Civil Engineers. Details of the new Study Group are available from Henry Gunston, Institute of Hydrology, Crowmarsh Gifford, Wallingford, Oxon. OX1 0BB.

Sussex museums alliance

Two well known museums in West Sussex have forged an alliance to strengthen and secure their future. The Amberley Museum and the Weald & Downland Open Air Museum have joint historic roots, before the former branched off to concentrate on industrial history. Both museums are run as independent trusts and receive little or no central or local government funding. Recently the two museums have discussed ways of sharing resources and ideas, and to develop joint and mutually beneficial activities where appropriate. Areas of co-operation include the reduction in overlap of collections and focusing on strengths with a view to combining catalogues and access to information through IT. Their strong libraries could be brought together, again using IT to enable greater access, and joint marketing and trading initiatives are other possible activities.

OBITUARIES

Raymond E. Bowen

Although not a member of the AIA, Ray Bowen was well known in industrial archaeology circles in South Wales and the South West. He was president of Oxford House (Risca) IA Society from its inception in the 1970s until his death on 11 March at the age of 73. Ray was a larger than life Welshman who never failed to make an impression. He was very knowledgeable over a wide range of interests, well beyond IA, and his work on the Burry Port and Gwendraeth Valley Railway will now be published posthumously.

Kenneth Hudson

Kenneth Hudson, who died at the age of 83 on 28 December 1999, was well known in the early years of the development of IA for his many publications which included *Industrial Archaeology: An Introduction* (1963), *Industrial Archaeology of Southern England* (1967) and *A Guide to the Industrial Archaeology of Europe* (1971). He was also the first editor of the *Journal of Industrial Archaeology*. He moved away from IA into the world of museums and was co-founder in 1977 and President of the European Museum Forum and Director of the European Museum of the Year Award. He was to have read a paper at the AIA conference in Manchester later this year.

Scotland

There is no doubt that these are exciting times in Scotland. Almost a year has passed since the new Scottish Parliament took office and, despite incessantly negative and lazy reporting by many journalists, it has been an active and positive first year of operation. Work continues on the preparation of the site for the new parliament complex in Edinburgh, but this has entailed the sacrifice of much of William Younger's Holyrood Brewery in the Cowgate, very little of which will survive the redevelopment. This, however, is only a minor loss compared with the potential disasters that are possible, given the continued pattern of cuts in public spending.

Despite apparently bulging Treasury coffers, the last twelve months have witnessed worsening financial crises for most organisations whose responsibilities embrace the built heritage. Many are therefore relying increasingly heavily on Lottery funding to keep themselves afloat, despite explicit Government promises that the Lottery would never be used to replace core funding. The result is a further drain on public resources as valuable staff time is diverted towards drafting proposals for Lottery-funded projects designed to avert ever-worsening financial situations. Career structures and the long-term nurturing of professional standards are sacrificed in favour or short-term financial survival.

In Scotland, this sad picture has been further complicated by the emasculation of local government, a process which commenced with the abolition of Regional and District Councils in the mid-1990s, and their replacement with a single-tier of local Councils. This has devastated the local funding of culture and heritage in many areas, not least Glasgow. It is interesting to note that the latest round of funding of local authorities by the Scottish Parliament not only fails to address this issue, but appears to add to the financial crises affecting many Councils. In these circumstances, it is inevitable that soft targets such as libraries, museums, archives and archaeology services suffer because they find themselves competing for resources with essential services.

Against this gloomy backdrop, it is immensely pleasing to be able to report that Phase 3 of the Scottish Mining Museum's development at Lady Victoria Colliery, Newtongrange (in Midlothian, near Edinburgh), was opened by Sir David Steel, the Presiding Officer of the Scottish Parliament, in September 1999. The new exhibitions and displays are very impressive indeed, and it is now possible to spend many hours at the Museum learning all there is to know about coal in Scotland.

Behind the scenes here and elsewhere, however, very real difficulties of long-term funding caused by the familiar problems of local authority financial crises prevail, and the situation appears still more frustrating because Lottery and other grants are 'capital', and cannot be used to maintain any organisation on a day-to-day basis.

The difficulties are such that last year the Scottish Museums Council commissioned 'The Pattison Report', a study entitled *Review of Major Industrial Museums and Sites*, and it is hoped that this will help to address these mounting problems.

Meanwhile, there has been cause for mini-celebration elsewhere in Scotland, with work progressing well on the Millennium Link (the rehabilitation of the Forth & Clyde and Union Canals), the 110th Anniversary of the completion of the Forth Bridge, and the 100th Anniversary of the completion of the West Highland Railway. In addition, Railtrack's station refurbishment programme continues to rescue stations from decay, the latest beneficiaries including Paisley Gilmour Street, Milngavie and Aberdeen. There remains, however, considerable uncertainty surrounding the future of Edinburgh's Waverley Station, which is currently the subject of potential redevelopment. Primary concerns include the effect this might have on the local townscape, and the danger that it will become the 'Birmingham New Street' of the north.

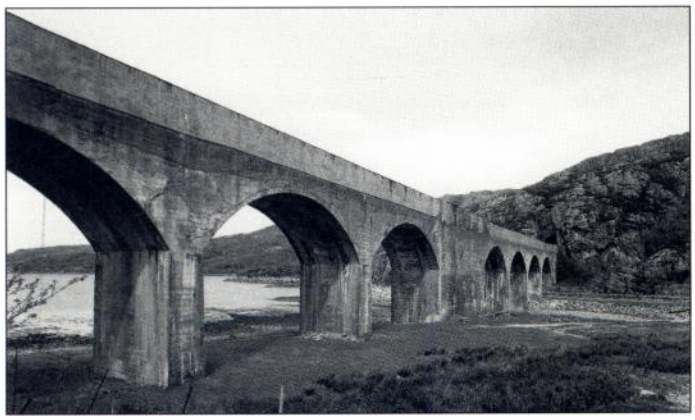
The Scottish Mining Museum, Lady Victoria Colliery, Newtongrange, Midlothian. This view shows the colliery during a photographic survey by RCAHMS, shortly before the opening of its Phase 3 Development in September 1999 *Photo: Crown Copyright, RCAHMS*

Sadly, the year has yielded a number of significant industrial obituaries, many of which seem to be centred on the town of Alloa in Clackmannanshire. These have included the closure of the Alloa Brewery (the place from which Skol lager issued forth for the first time), and more significantly for real-ale fans, the cessation of production at McLay's Thistle Brewery, which is currently being recorded by RCAHMS. Worse still, less than half a mile away, Paton & Baldwins are closing Kilncraigs Mill, the last major survivor of a once vibrant local woollen industry.

Contrary to popular belief, Scotland still retains some heavy industry, and a number of shipyards still operate on the Clyde. However, the former Kvaerner (Fairfield) Yard had to be rescued by a GEC buyout last year, and applications to demolish its 'A' listed giant cantilever crane have been renewed. Further afield, the slump in oil-related business has caused the closure and mothballing of a number construction yards in the Highlands, and the future of several oil-dependent traditional yards, such as the former Scott Lithgow and John Brown shipyards, is now very tenuous.

Finally, on a more positive note, work has continued at RCAHMS on the cataloguing of the Sir William Arrol archive. Following completion of the Scottish material last year, efforts have since focused on projects in England, Wales and throughout the rest of the world. The extent of the company's activities is amazing, and the intention is to publish an illustrated second catalogue to coincide with the arrival of TICCIH 2000 in Scotland in early September.

Miles Oglethorpe



Loch Nan Umah Viaduct on the West Highland Railway, which has just celebrated its centenary. This may be the viaduct at which a horse and cart were lost when they fell into the cavities of one of the mass concrete piers during construction

Photo: Crown Copyright, RCAHMS

North West England

Although just out of our region, the first thing I feel should be highlighted in my first report of the millennium is the Torrs Millennium Walkway in New Mills, just eight miles east of Stockport. This impressive elevated walkway is 175 yards long and spans the otherwise inaccessible cliff wall above the River Goyt. The walkway has attracted enormous interest in the national press and television. The *Manchester Evening News* described it as 'magnificent, a steel spider's web clinging to the vertical face of the Torrs gorge.' *The Guardian*, no less, described the walkway as 'spanning the last inaccessible place in England.' When did the press last speak in such glowing terms of a project which is going to give more people access to an already fascinating industrial site?

A walk through the gorge will take you past mills, a collapsing sixteenth-century cruck barn, old bridges, part of the Peak Forest Canal, dating back to 1796, an old coal mine entrance and a 13-arch Midland Railway viaduct. Last but not least there is the welcoming and interesting Heritage Centre, where stamp enthusiasts will find on sale the Royal Mail stamp illustrating the walkway. Details from Derek

Brumhead, Heritage Centre, Rock Mill Lane, New Mills, High Peak, Derbyshire SK22 3BN. For those unable to visit New Mills, I would recommend their website on www.newmills.org.uk.

The £525,000 scheme was made possible by a Millennium Commission grant and the co-operation of Derbyshire County Council, New Mills Town Council and High Peak Borough Council.

The latest news from Bolton is that another bleachworks closed at the end of January this year. Star Vale, Horwich, were specialist textile finishers, a company that dated back to the 1870s when as bleachers they used water from the adjacent River Douglas. The future of the buildings and lodges is uncertain.

Publicised plans for the Tonge Valley district, subject to planning permission, include a museum in Bolton which will be sited on the now decontaminated site of the former Waters Meeting bleachworks. It is hoped the museum will house a collection of seventeenth and eighteenth century textiles of local manufacture which have never been displayed before due to lack of space. In addition there are many important textile machines, including the only mule still in existence that was built and operated by Samuel Crompton himself.

Manchester Region IA Society has drawn my attention to an area of considerable concern, the survival of complete mill chimneys in the Greater Manchester area. There are only three complete mill chimneys left in the Oldham area, and only one of those, Manor Hill, Chadderton, is listed. There are a few chimney stumps where the tops have been removed for safety, but which reinforce prejudices about chimneys being ugly. Shaw, which once had a great concentration of mills, now only has a few survivors while a few others survive scattered around the district, including Halliwell Bleachworks in Bolton, which is listed in its own right but is no longer complete, and Ellen Road Mill chimney which is still complete. Quarry Bank Mill, Styal, have rebuilt their chimney to its original height, so hats off to Styal. Are other areas suffering a similar problem?

The Sankey Canal Restoration Society report that the Environment Agency has been successful in a joint bid for DETR funding with St Helens MBC for support to prevent pollution from contaminated sites at Sankey and Sutton Brooks. A site investigation will now be carried out to identify the best decontamination solutions for the site. Hopefully remedial work will begin in 2001. The Sankey Brook area suffers from serious contamination from various local sites which remain a legacy from the heyday of the Widnes chemical industry. Problems from alkali waste deposited nearly 100 years ago by polluters who have long since gone have left St Helens MBC with a costly problem to solve. Environment Protection Officer Dave Nilsson (a SCARS Executive member) says that once remediation work is finished, the improvements to the local environment will be the most significant since the creation of the St Helens Canal in 1757.

Recently one of the SCARS working parties was excavating the basement rooms of the lock keeper's cottage at Hulme Lock. This revealed a circular structure with a brick base and the bottom two courses of a brick wall. The base of the structure was roughly at waist level and it was located behind a former range, so it has been concealed from view for many years. It is now certain that the structure is an early bread oven where faggots would be placed inside to heat the brickwork. The burnt wood was then taken out and after sweeping clean, the dough was placed in to bake. In his report of this find, Roy Forshaw says that the problem with this interpretation of the structure is that the oven had been sliced off just above base level during demolition, giving no clues as to what the top looked like. There are two brick courses left that seem to indicate that the brickwork came over to form a dome, but it is only a suggestion.

If anyone has an idea of what such an oven looked like, it may be possible to restore it. This seems to be an important feature and should be made presentable for the public to see. Please contact SCARS if you have any such information, c/o The Groundwork Trust, 19-27 Shaw Street, St Helens WA10 1DF.

SCARS have now fully revised their eight Tow Path Leaflets, which form a set covering the line of the canal. The first gives a brief outline of the whole length, with the other seven describing shorter sections in greater detail. The complete set costs £1 plus 40p P+P. The *Tow Path Guide Book* (£3.50) has also been revised to include contemporary rather than historic views to help walkers identify the route with greater ease. Both are available from The Groundworks Trust, address above.

Edwina Alcock

Early bread oven revealed at Hulme lock keeper's cottage *Photo: Roy Forshaw*

Books Received

The following books have been received for review in *Industrial Archaeology Review*.

An Archaeological Research Framework for the Greater Thames Estuary (1999), ISBN 1 85281 198 6. 58 pp, 12 ills.

This Framework has been prepared under the auspices of Essex County Council, Kent County Council and English Heritage, in its capacity as adviser for the archaeology of Greater London. It presents an overview of existing knowledge and formulates a strategy for the future of archaeology in the estuary.

British & Irish Archaeological Bibliography, 3/2, October 1999. ISSN 1367-4765. 318 pp.

This issue covers material published mainly between 1 January and 30 June 1999. The 2,100 entries are fully indexed under author, subject and place.

The Building Conservation Directory 1999 (Cathedral Communications, 1999), ISBN 1 900915 07 3. 200 pp, ills. £16.95.

The seventh edition of the Directory which is a comprehensive guide to specialist suppliers, consultants and craftsmen in traditional building conservation, refurbishment and design. Short articles on specialist topics include scheduling and listing, HLF applications and the examination of cast-iron structures in building restorations.

Coal Mining, by Geoffrey Hayes (Shire Publications, 2000), ISBN 0 7478 0434 6. 32 pp, 60 ills. £3.50.

Shire Album 349 adds coal mining to the publisher's increasing list of industrial topics, and Geoffrey Hayes takes the reader through all stages, from simple bell pits to full scale deep mining. Mechanisation at the coal face, underground transport and types of shaft winding are explained, and a section on hazards and safety includes ventilation, control of water and precautions against explosion. There is a short list of mining terms and a list of places to visit, both old colliery sites and museums.

Creative Re-use of Buildings, by Derek Latham (Donhead Publishing, 2000), ISBN 1 873394 33 0. Two volumes, 232 pp and 206 pp, many ills. £80.00.

The first volume focuses on the challenge of identifying a suitable building for re-use, understanding its essential qualities, and selecting an option appropriate for both its setting and the people who will use it. Volume 2 contains an extensive collection of illustrated examples from throughout the UK showing buildings of every shape, size and type.

Forged and Founded in Cornwall, by John Ferguson (Cornish Hillside Publications, 2000), ISBN 1 900147 11 4. 194 pp, 233 illus. £13.99 (paperback), or ISBN 1 900147 12 2. £17.99 (hardback).

This book highlights the great variety of iron products to be found in Cornwall, made locally or imported. The technologies of wrought iron, steel and cast iron are explained in clear terms before the Cornish foundries are listed, the most famous being Harvey's of Hayle, established in 1779. The many uses of iron are described for the mining and quarrying industries, agricultural machinery and tools, corn milling, 'maritime ironware' (from bollards to lighthouses) and street furniture. Domestic ironware includes the superb Cornish 'slab' (cooking range), and there is much ironwork in churches, churchyards, shops and market halls. Lastly, we are reminded that two Cornish foundries are working today.

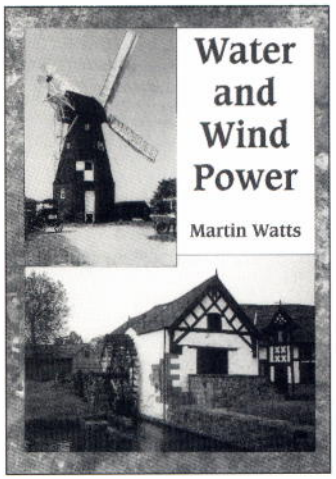
Proceedings of 'Making Heritage Industrial Buildings Work' (Regeneration Through Heritage, 1999), 39 pp.

These are the papers delivered at a conference held on 26 April 1999 at the Great Western Railway Works at Swindon, with a keynote address by H.R.H. The Prince of Wales.

Quarries and Quarrying, by Peter Stanier (Shire Publications, 2000), ISBN 0 85263 728 4. 32 pp, 40 ills. £2.95.

Now updated, this Shire Album 134 deals with examples of four important rock types to explain the methods employed in their extraction: granite, slate, sandstone and limestone. Roadstone quarries are also included.

Water and Wind Power, by Martin Watts (Shire Publications, 2000), ISBN 0 7478 0418 4. 136 pp, 104 ills. £7.99.



This informative book is one of Shire Publications' occasional larger books on specialist topics, presenting a compact volume which demonstrates the importance of water and wind power to the social and economic development of Britain. Martin Watts, who is well known in milling circles, takes the reader from earliest developments to the present day, through sections on Roman, Saxon, Medieval and Post-Medieval mills which include water and wind applications to corn milling as well as fulling, ironworking, textiles, mining, metal working and other industries. Chapters on the age of industrialisation through to the twentieth century trace advances made by engineers and millwrights in both water and wind technology, and include water turbines, hydro electric power, wind engines and wind turbines. A final section on preservation is followed by a glossary of terms and list of places to visit.

Waterways: Images from an industrial age, by Nick Billingham in association with British Waterways (Tempus Publishing, 1999), ISBN 0 7524 1725 8. 128 pp, 160 ills. £14.99.

A collection of photographic illustrations showing a way of life that vanished shortly after the First World War.

TWO SOCIETY PUBLICATIONS

Hampshire Farmsteads in the 1980s, compiled by Edwin Course (Southampton University Archaeology Group, 1999), ISBN 0905280091. 132 pp, 8 illus.

Members of SUIAG were conscious of the escalating rate of change in farmsteads and so this county-wide recording exercise was undertaken by 63 volunteers between 1981 and 1994. Farm buildings were recorded by drawings and 2,627 photographs. The main appendix gives a summary of 300 farm visits, before which there are brief discussions on farm building types, e.g. farmhouses, barns, granaries, silos, dairies and accommodation for different livestock. Other facilities include water supply, drainage power and workshops. Types of farmstead and changes in ownership and working practice are also covered. The methodology of the survey is described and, commenting on visits usually being made in pairs, the author states that the survey was responsible for one marriage! A note of sadness was the plight of small farmers threatened by economic conditions and new legislation. How much worse the economic climate must have got for these farmers since the survey, which surely highlights the urgency of such a recording programme. The complete records have been deposited with the Hampshire Record Office in Winchester.

Sussex Windmills and their Restoration - a 1970s perspective, by R.C. Pinney (Sussex Industrial History, 29, 1999), ISSN 0263 5151. 40 pp, 72 ills. £3.95 + 60p P+P from R.G. Martin, 42 Falmer Avenue, Saltdean, Brighton BN2 8FG.

The 1999 Journal of the Sussex Industrial Archaeology Society is devoted entirely to Ron Pinney's study of the repair of Sussex windmills, which was compiled in 1975. The text discusses the origins of milling, windmill types, sail design and millwrighting problems before recording the state of Sussex windmills in the early 1970s. Finally, the repair work carried out on 16 individual windmills is discussed. the text is fully illustrated with black and white photographs of windmills, most of which are exterior views and a number show repairs in progress. Footnotes are used to supplement the text by giving updates on a number of the windmills discussed and the booklet concludes with a glossary and a brief bibliography.

10 June 2000
EERIAC 10
the 10th Eastern England Regional IA Conference, to be held at the Rugby Cement Company works in Barrington, Cambs. Programme includes lectures and a tour of the works. Details and booking form (SAE please) from: Mrs Brenda Taylor, Crown House, Horsham St Faiths, Norwich, NR10 3JD.

20-22 June 2000
HERITAGE FORUM INTERNATIONAL
Heritage Forum International, the Congress and Exhibition on Conservation and Restoration, will be staged at the Business Design Centre, 52 Upper Street, Islington, London.

30 June - 1 July 2000
THE MILLENNIUM LINK CONFERENCE: THE REHABILITATION OF THE FORTH & CLYDE AND UNION CANALS
at the Edinburgh International Conference Centre, conference on the rehabilitation of the Forth & Clyde and Union Canals. For further information, apply to: Conference Office, Institution of Civil Engineers, One Great George Street, London SW1P 3AA. Fax: 020 7233 1743.

14-18 July 2000
1ST INTERNATIONAL NAMHO CONFERENCE
the 21st annual event of the National Association of Mining History Organisations goes international, hosted by the Carn Brea Mining Society and Camborne School of Mines at Truro School, Truro, Cornwall. The theme of InterNAMHO2000 will be 'aquire, record and display'. Events will include indoor lectures and a large selection of excursions to mining heritage sites. For further information and booking forms, writie to Lawrence Holmes, Rivergarth, Malpas, Truro, Cornwall TR1 1SS, or ☎ (01872) 278234,
e-mail: NAMHO@csm.ex.ac.uk

21-28 July 2000
INDUSTRIAL ARCHAEOLOGY OF GWYNEDD
at Plas Tan y Bwlch, the Snowdonia National Park Environmental Studies Centre, a course examining the current state and way ahead for IA within Gwynedd. For further details please contact Plas Tan y Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd LL41 3YU, ☎ 01766 590324, Fax: 01766 590274, e-mail: plastanybwlch@compuserve.com.

4-11 August 2000
PRACTICAL INDUSTRIAL ARCHAEOLOGY
at Plas Tan y Bwlch, a long established course run jointly with Hull University offering a week in the field recording and interpreting the structures of old slate quarries. Contact for details as above.

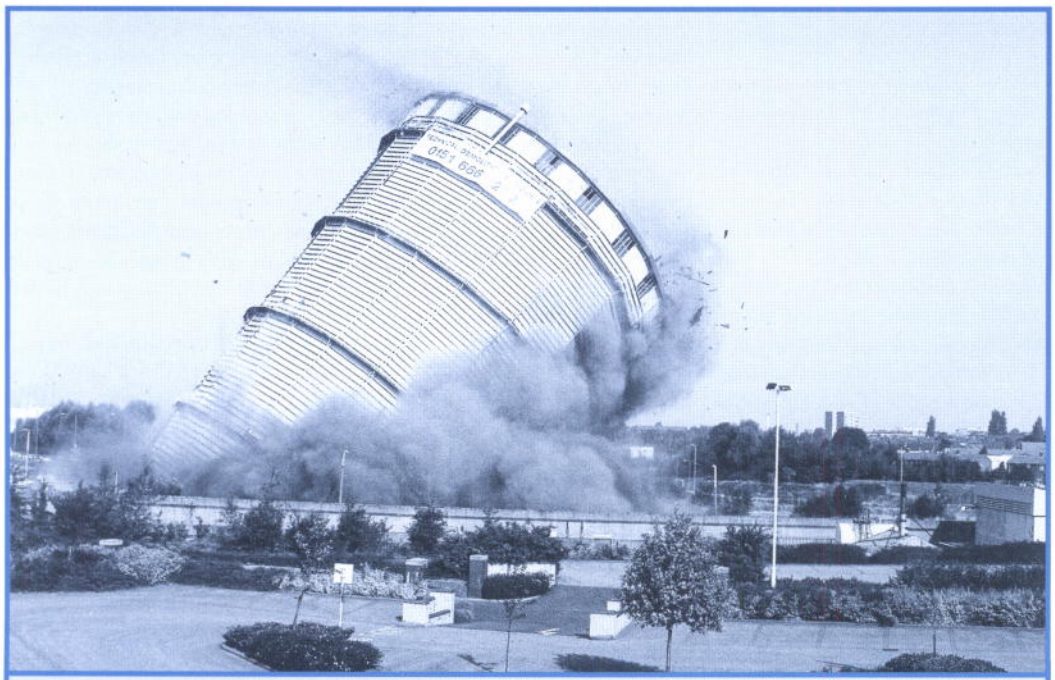
30 August - 7 Sept 2000
TICCIH 2000
the 11th Congress of the International Committee for the Conservation of the Industrial Heritage, with plenary and workshop themes held at Imperial College in London from 30 August to 2 September 2000, followed by a choice of tours to Cornwall, Scotland or Wales from 3-7 September and a concluding evening in Manchester on 7 September. There is then the opportunity to attend the AIA Conference which starts on 8 September. Details from TICCIH Congress Administrator, 42 Devonshire Road, Cambridge CB1 2BL, ☎ +44 (0) 1223 323437, Fax: +44 (0) 1223 460396.

8-14 September 2000
AIA ANNUAL CONFERENCE
at Hulme Hall, University of Manchester. Friday pre-conference seminar and weekend conference followed by programme of field visits and evening lectures. Details and booking forms are included with this mailing. For further information, contact the Conference Secretary, 62 Marley Road, Rye, Sussex TN31 7BD.

19-21 September 2000
ENGINEERING THE MILLENNIUM
a Newcomen Society meeting at the Science Museum, London, to explore the way society has been changed by technology during the past 1000 years. Booking information from The Executive Secretary, The Newcomen Society, Science Museum, South Kensington, London SW7 2DD.

26-28 October 2000
V JORNADES D'ARQHEOLOGIA INDUSTRIAL DE CATALUNYA
a three-day seminar on the textile industry to be held at Manresa. Themes will include machines, systems of production, typology of factories and industrial settlements sponsored by the provincial museum service. Papers are invited. Enquiries to Museu de la Tècnica de Manresa, Ctra. de Santpedor 55, 08240 Manresa, Espana. ☎ 93 877 22 31
e-mail: associomct@eic.ictnet.es

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.



Demolition of the Swan Village gasholder on 5 September 1999 (see page 12) *Photo: Clifford Morris*

INDUSTRIAL ARCHAEOLOGY NEWS
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Editor: Dr Peter Stanier

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30 June for August mailing
30 September for November mailing
30 December for February 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 Office, School of Archaeological Studies, University of Leicester, Leicester LE1 7RH.
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