

WARWICKSHIRE Industrial Archaeology Society

Number 1 December 2000

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WELCOME

Welcome to the first quarterly newsletter from WIAS, designed to replace 'Retort'.

The original intention behind 'Retort' was to inform members about Society matters and to publish articles with an IA slant. However with the burden of its production falling upon one person it became an annual publication and thus more of a journal than the newsletter intended. Hence the monthly meeting became the primary means of communication with the membership; all well and good for members who were able to attend meetings regularly but of little value to those who could only attend occasionally and who undoubtedly felt cut off from the activities of the Society as a consequence.

Now with 'Retort' no longer being published, the resources are available to produce a regular newsletter with the intention of keeping members informed about Society matters. Provisionally, publication dates will be December, March, June and September, but previous

experience suggests this may be flexible! Content will be centred around abstracts of the past quarter's meetings, together with an up-dated programme if space permits. Other features are also planned but of necessity this will remain flexible so that each issue fits within the space constraint of four A4 pages.

Short news or information items, with an IA bias, are encouraged from members. Please submit these to the Treasurer, or e-mail to WIAS@photoshot.com. Please ensure text attachments are in RTF format to prevent file incompatibility problems.

Comments about this newsletter, constructive (or otherwise!) are welcome. Please voice your opinions to a member of the committee.

SOCIETY NEWS

After the upheavals in the programme during the latter part of last season, it was to be hoped that the new season would run more smoothly. Sadly this was not the case when once again outside events intervened: in September the fuel crisis forced the cancellation of Ian Frimston's talk on local aerodromes.

Since a number of members were particularly looking forward to this meeting and Ian is an immensely knowledgeable aviation enthusiast, as well as a noted freelance photographer of the aviation scene, it is intended the meeting be rearranged to fill the vacant May 2001 date.

Confirmation will follow.

Apologies are offered to anyone who did make the journey to Warwick in September. While every effort was made to contact members to warn them of the cancellation, inevitably some people were unavailable.

Summer Walks.

The summer break saw the Society's traditional venture into the great outdoors.

Early in August, Peter Chater led a walk starting in Hockley Heath and taking in a section of the Stratford upon Avon Canal, together with some ecclesiastical architecture. Naturally there were IA connections in the form of a church with its own gasworks and elsewhere the originator of Muntz metal. A leaflet was produced to accompany the walk, unfortunately now out of print.

Later in August John Selby led a walk along the Oxford Canal's erstwhile Fenny Compton Tunnel to the 'Tunnel Brickworks', John's current research project. Unfortunately the failing light, together with a good crop of nettles, prevented an examination of the excavations carried out by John and by Alan Flint at the Brickworks. However the results of John's thorough research into the site will soon be available to members through the AIA's 'Industrial Archaeology Review'.

Mention should also be made of Peter Chater's demonstration of how to pass a boat tow rope under a bridge....something he seemed remarkably practised at for an ex-railway man!

NEWSLETTER

Meeting Reports *by Arthur Astrop*

October 2000

Clive Hester: The History of the Ordnance Survey

Next to a notebook and camera, the enthusiastic industrial archaeologist's best friend must surely be a treasured collection of large-scale OS maps. It is easy to take both the maps and their unquestioned reliability for granted and few may spare a thought for just how the masses of information they contain was accumulated, and at what cost. An explanation of both those aspects came from Clive Hester, the speaker at our October meeting. Mr Hester has served (to date) 27 years with Ordnance Survey, a career length which he wryly observed is unlikely to be repeated in the future.

He traced the history of the OS from its military origins in 1791 to the present day, and from the use of glass length-rods for measurement to today's use of global positioning satellites which can pinpoint the position of a feature to within a few centimetres. (The OS, incidentally, was one of the first UK organisations to 'go metric'!) It was the threat of invasion by Napoleon Bonaparte which first revealed Britain's lack of accurate maps and provided the impetus for the Army, and specifically the Royal Engineers, to remedy that shortcoming. Unsurprisingly, with Bonéy just the other side of the Channel, the County of Kent was the very first to be surveyed and in 1801 the OS went into print with maps of that area at a scale of one inch to the mile. Four years later, maps of Essex followed, by which time the OS was well established and safely ensconced in the Tower of London!

Once the threat of invasion from France had passed however, the work of the OS slowed down somewhat and it was not until 1873 that the whole of England and Wales had been surveyed. Scotland had to wait a further 15 years before its OS maps appeared. Mr Hester explained how the earliest OS maps were laboriously engraved by hand on copper plates, and he also showed some splendid slides of early measuring equipment, including a massive brass and mahogany theodolite with a 36-in diameter base ring. This giant instrument must have required at least two men to lift it, and the problems of setting it up in all weathers in open country can only be imagined. Another slide showed an early theodolite mounted on the dome of St Paul's Cathedral and reached by a series of perilous ladders. Surveyors in those days were clearly a fearless bunch. The introduction by the OS of the first triangulation survey of the UK, and then the grid, were also covered in detail by the speaker.

Today, of course, in addition to GPS, the

Ordnance Survey uses laser and infra-red measuring equipment, powerful computers, digitisers and aerial photography, although in dense urban environments the use of the human eye and measuring tapes seemingly still have a part to play. The OS is now a commercial organisation (with all that implies), and offers an extremely wide range of services tailored to meet specialist needs. However, as Mr Hester frankly admitted, these days the OS increasingly has its competitors, not least on the Internet. But for many, and especially enthusiastic industrial archaeologists, its superb and beautifully printed maps must surely still reign supreme.

All the w's.... Maps on the Internet

As a valuable source of landscape information in many fields of study, OS maps are an unparalleled resource. However the number of sheets required to cover the UK can often mean a specific sheet is not immediately available, especially to the private individual.

Enter www.multimap.com. With a PC and an Internet connection, a simple search procedure will display a map extract centred on the chosen location. The UK map resource is based upon OS data and is available to view at a number of scales from 1:4 000 000 to 1:10 000. At 1:50 000 the familiar OS Landranger data is presented, while at 1:10 000 individual named streets may be located in urban areas.

Rather less impressive is the time taken for the map extracts to download, an inevitable result of sending graphics data down a phone line and each scroll of the on-screen map requires a new download, so it pays to be precise about the location of interest. Also the extracts are quite small, presumably to keep download times as short as possible, whilst visited pages are not available off-line unless specifically saved, probably in the interests of copyright protection.

Nevertheless for a quick survey of a particular IA site this is a valuable service. Usual OS reproduction criteria apply, only a single screen dump of a map for personal use is permitted.

Also worth a look is www.streetmap.co.uk, essentially the same idea under a different name, and of course the OS web site at www.ordnance.gov.uk, who also have a help file covering copyright and licensing issues. Phone: 023 80 792913. For aerial photographs try www.gemapping.com, although whole UK coverage is not yet available.

Gas Turbines and Horsehair

November 2000

Mark Barnard: The Development of the Rover Gas Turbine Car

The sight, on video, of a sleek Rover-BRM car 'whispering' its way through the Le Mans 24-hour races transported many members at the November meeting back to those heady days in the 1950s and 60s when Rover was leading the way for Britain with a gas turbine engine car. WIAS member Mark Barnard started his talk by briefly sketching Rover's initial involvement with Frank Whittle in the early 1940s, when the latter was struggling to get his ideas accepted, and he then took up the story at first-hand from the point where in 1953, as a young graduate, he himself joined the famous car company. In his career with Rover, Mark was subsequently destined to become Chief Engineer of its Turbine Department.

When Mark joined Rover, the Company was being led by the Wilks brothers, Maurice and Bernard, two men with the vision and the courage to get involved with gas turbines, a project which involved pushing engineering to the very extremes of available technology. A time, moreover, when the advanced alloy steels which would subsequently make them a feasible and reliable proposition had yet to be developed. As Mark Barnard said, "In those days we had mild steel, or alternatively we could use.....mild steel!" In his talk, Mark managed vividly to recapture the excitement of those early days; the triumphs, the disappointments, and the faith which he and his colleagues had in the project.

Early versions of the engine had no heat exchanger, and fuel consumption was also horrendously high. When a heat exchanger was developed, made principally from stainless steel, it sometimes had the habit of disintegrating only to re-appear from the exhaust 'like cigarette ash'! A 'glass' material from Corning USA ultimately replaced stainless steel and represented a major advance in heat exchanger design. Successive versions of the engine saw fuel consumption gradually improved, but it was principally this factor, among others, which eventually spelled the end of the gas turbine for car propulsion. Rover finally withdrew from the field in the mid 1960s.

Horsehair and its Uses

The November meeting concluded with a short talk by WIAS member John Brace on the esoteric subject of 'Horsehair and its Uses'. As always, John managed to combine information with a delightfully wry wit. He explained that once the hair had been removed from the horse's tail (with or without its permission), it could be found in many

disparate places, from builders' plaster to Judges' wigs, from violin bows to mattresses, and from bearskins to sporrans. It can also be woven into a material for making ladies handbags, and at one time was used in the manufacture of crinolines. The only limitation of this wondrous mono-filament material, it seems, is its maximum length of approximately 28 inches! But will genetic manipulation, one wonders, result in the breeding of horses with 48-inch long tails?

A Second Look

The High Street Railway Bridge

Leamington Spa

WIAS Database Record No. 146

Many members of the Society must have waited at the traffic lights under this bridge, but probably few have given the structure a second glance. Setting aside the recent inappropriate repaint in 'Great Western' colours, this bridge is a remarkable structure of asymmetrical design, perhaps best appreciated from the platforms of the nearby station. It is probably the second bridge on this site.

McDermot (History of the Great Western Railway Vol. 1) states that the construction of the Birmingham to Oxford Railway started in early 1847. Completion was delayed by financial economies and negotiations with the LNWR for a joint viaduct through Leamington and a common station in Birmingham; this following the decision to alter the intended route from a line west of Leamington to a line into the town.

By September 1852 the line was ready for inspection and there is mention of the Leamington viaduct and a bridge of 105 ft span over High Street. The line opened as mixed gauge on 1st October 1852 and the gauge was narrowed on 1st April 1896.

The 1852 1/500 OS plan indicates that the configuration of the bridge was the same as the present bridge but clearly shows columns, sited on the kerb lines of the roads under the structure, propping all the girders. There is no sign of these props now, so it is likely that at some time the bridge was rebuilt. Indeed, member Peter Chater has some slides of photographs apparently taken during this rebuilding work and the caption to a picture in the Warwickshire Image Bank resource, dated '1930s', refers to the extant bridge as the 'new bridge'.

If any member can provide further information please contact Roger Cragg.

Programme 2000 / 2001

PROGRAMME

2000

Thursday 14th September

Ian Frimston: "Three Local Aerodromes: Wellesbourne, Gaydon and Sherington."

Thursday 12th October

Clive Hester of the Ordnance Survey: "The History of the Ordnance Survey."

Thursday 9th November

Mark Barnard: "The Development of the Rover Gas Turbine Car."

Thursday 14th December

Keith Draper of the Coventry Evening Telegraph: "Aspects of Coventry's Industry."

The majority of time at these meetings is occupied by our speaker, followed by refreshments and a subsequent period for questions and follow up material. The final part of the meeting is then usually taken up with a brief contribution from one of our members, often concentrating on an aspect of the industrial archaeology of Warwickshire. We are always keen to have contributions from members or visitors ~ do not be afraid to put yourself forward for one of these presentations. Occasional additional events will also take place during the year, and members will be duly notified of these.

2001

Thursday 11th January

Maureen Bourne: "Francis Skidmore of Coventry, the Famous Nineteenth Century Metalworker."

Thursday 8th February

David Kennet of the British Brick Society: "The Development of Brickmaking in the British Isles."

Thursday 8th March

M. T. Sharman: "Warwickshire Bridges: How the County Council Looks After Our Local Bridges."

Thursday 12th April

Barrie Trinder: "The Industrial Archaeology of Two World Wars: Manufacturing Industries and their Problems."

Thursday 10th May, Ian Frimston
To Be Arranged. *Local Aero Show*

Thursday 14th June

Annual General Meeting and Members' Evening.

Thursday 12th July

Members' Research Evening.

Please note this programme may be subject to changes due to circumstances beyond the control of the Society.

WIAS Meetings

Meetings of the Society are held on the second Thursday of each month in the Sixth Form Centre at Warwick School, Myton Road, Warwick, starting at 7.30pm. A map of how to find the Sixth Form Centre at Warwick School is available from the Secretary. Visitors should park in the Junior School / Sports Hall car park. The Sixth Form Centre is adjacent to the car park.

Subscriptions 2000 / 2001

£10.00 per person (or couple)

Cheques payable to Warwickshire Industrial Archaeology Society please.

An additional payment of £1.00 per person is due at each meeting to meet the cost of refreshments.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

Chairman

L. F. Cave
24 Portland Street
Leamington Spa
Warwickshire
CV32 5EY
☎ 01926 425987

Secretary

M. J. Green
'Argyll' 2(b) Union Road
Leamington Spa
Warwickshire
CV32 5LT
☎ 01926 313782

Treasurer

M. W. Abbott
53 Stowe Drive
Southam
Warwickshire
CV47 1NZ
☎ 01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Peter Chater

Roger Cragg

Printing:

Martin Green /

Warwick School

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THIS ISSUE

- Meeting Reports
- Society News
- A Second Look - Update
- Drakelow Unearthed

EDITORIAL

I write this editorial after a somewhat disorienting week, the middle of which saw a 3.00am start for a visit to the depths of Lincolnshire! The reason for this was the rare spectacle of a genuine wartime Avro Lancaster bomber, performing some tail-up runs on a wartime Bomber Command airfield for the benefit of a BBC film crew.

There is a link to local IA in this event, since the aircraft concerned was built by Austin Motors at their Longbridge plant, a further example of the diverse industrial past of Warwickshire.

This diversity is reflected in the interests of our membership, who again ably saved the day at the February meeting when the speaker was forced to withdraw at very short notice (a full report is on page 4). This diversity of interests is also something that, as a Society, we perhaps do not recognise sufficiently.

Other recent meetings have shown there is a considerable industrial knowledge base amongst the membership, on both a professional and amateur level, and yet relatively few members contribute to the

meetings. If you have something to say, we would love to hear from you. Even if you do not wish to talk yourself, you may know of someone in your field of interest whom the Society could approach to speak. Toby Cave is in the process of drawing up the 2002 programme (and beyond) and urgently needs leads to potential speakers to maintain the high standard of meetings that he invariably arranges.

Please pass the details of any likely contacts to a member of the committee.

Mark W. Abbott

SOCIETY NEWS

Programme

The vacant May meeting has been filled, as hoped for, by Ian Easton. His subject will be *Three Local Aeroplanes: Wellesbourne, Gorden and Stratford*. This is the speaker and subject originally scheduled for January 2001 and unfortunately cancelled because of the fuel crisis.

Lives and Times

The Society has again been invited to exhibit within the *Lives and Times* event at the annual Coventry Godiva Festival. This year's dates, subject to confirmation, are the ninth and tenth of June.

Drakelow Factory

This site and the book detailing its history (reviewed elsewhere in this newsletter), were mentioned at the February meeting. Following an excellent response to the suggestion of tour of the site, an enquiry has been made to see if the Society can make a block booking for a Sunday tour.

CROSSNESS CORRECTION

The recently featured Crossness article in Retort Issue 10, contained a slight error in the omission of a single word, *rotative*.

Whilst not wishing to diminish in any way the greatness of the engines at Crossness, they are not, in the generally accepted sense, 'The largest beam engines in the world'. That accolade, in conventional beam engine terms based on cylinder dimensions, beam size and weight and pumping duty, expressed in millions of gallons per day (sorry no SI units here), must be reserved for the Kew Bridge 100 inch engine built by Harvey and Co., Hayle, Cornwall, in 1869.¹ Together with the equally fine and adjacent 90 inch engine, constructed by the Copperhouse Foundry, Hayle, the Kew engines represent the largest beam engines in preservation anywhere in the world.² The Crossness engines may well be the largest *rotative* beam engines in existence.

However, in absolute terms, the unique multi-beam, annular compound engine preserved at Cruquius in Holland is, definitively, the largest steam engine ever constructed; again Harvey and Co. being largely responsible for the work.³

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1. Watkins G. *The Stationary Steam Engine*. David & Charles. 1968
2. Barton D. B. *The Cornish Beam Engine*. Barton, Cornwall. 1969
3. Willock J. F. *The Largest Steam Engine in the World*. Model Engineer, No. 3795. 1987

John Willock

NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2000

Keith Draper: *Aspects of Coventry's Industry*

Being Coventry-born, having served an apprenticeship with the Standard Motor Co, and now a well-known Features writer for *The Coventry Evening Telegraph*, meant that Keith Draper was trebly qualified to speak knowledgeably on the industrial history of his native City. He brought all his accumulated experience to bear on that subject at the Society's December meeting when he took members on a 'saunter' through the years when Coventry had almost more factories than it had shops, when it was the unchallenged centre of motor car manufacture in Britain, and when the City echoed to the sound of scores of factory hooters. Not to mention the ringing of bicycle bells as literally tens of thousands of craftsmen and women pedalled daily to and from their work at benches or on machines!

Using what must surely be an unrivalled collection of slides, with some subjects dating from the 19th century, Keith's talk was a roll call of famous names covering individuals, companies, factories, and streets, few of which are still with us. Understandably, because of his early background, the vehicle makers of Coventry featured most prominently in Keith's talk, with Daimler, Maudsley, Standard, Morris, Triumph, Humber, Alvis *et al* and their various factories being lovingly described. Slides showing both the exteriors and the interiors of their plants, many from their early days, recalled the conditions under which the car makers of the 1920s and 30s worked. These factories, crowded with machines and workers, all labouring under a forest of overhead shafting and flapping leather belts, and with the absolute minimum of artificial lighting, would today be considered nothing short of a Factory Inspector's worst nightmare. Yet somehow, the pride which those men and women felt both for their work and for the Companies they served, came over.

Then there were the names of some of the men who led them. For example, Sir John Black of Standard who, immediately after the Second World War, sent his designer Walter Belgrove to make a pencil sketch of a US-built Plymouth car which Sir John knew was regularly parked outside the American Embassy in London. That day trip, with notebook and pencil, eventually became the inspiration for the famous Standard Vanguard saloon car. Keith also ranged over many other products which once made Coventry famous, including aircraft (Whitley bombers, Mosquitoes), aero engines, sidecars (with one particularly elegant

wickerwork and leather upholstered model made by Montgomery), power transmission chain (Renold), high-accuracy speedometers and petrol taps (Rotherhams), gas meters (Wilson) and, of course, the naval guns, almost unbelievably large by today's standards, which were once made in Coventry's huge Ordnance Factory in Foreshill. Keith had high quality slides to show for almost every topic he covered.

He also had slides of daily life in the City itself, from the early years of the 20th century through to its battered condition immediately after the Second World War when, as a small child, he knew its streets and buildings intimately. There were those in his audience who also knew those subjects intimately and who were able to identify for Keith some landmarks of which even he was unsure.

Indeed, the evening was so successful not just because of its subject, and Keith's skill as a speaker, but because it was also a lively 'interactive event', with members contributing their own knowledge and experiences as well.

Book Review: *Drakelow Unearthed*

Drakelow Unearthed, Paul Stokes, £5.50

One of the country's largest wartime Shadow Factories, built 150ft underground for Rover, is described in considerable detail by Paul Stokes in his book *Drakelow Unearthed*. It was not until 1993, when the entire complex was sold into private hands, that the official mantle of secrecy covering this massive underground 'town' just a few miles north of Kidderminster was lifted. Stokes was then given free rein to explore its maze of tunnels in their entirety, describe their uses and illustrate his work with a large number of excellent photographs and plans.

In its time, besides being used by Rover for war work, Drakelow also served as a secret Regional Government HQ in case of a nuclear attack and Stokes records in considerable detail its changes in fortune over the years. An astonishing number of the original facilities remain, albeit in a somewhat dilapidated state, and bear poignant witness to their various uses. In that respect, Drakelow is a 'time capsule' of a piece of 20th century industrial archaeology. The book is obtainable from Paul Stokes at 'Fairfield', The Compa, Kineton, West Midlands DY7 6HT, and it is understood that party tours of the complex can be made by special appointment.

Metalworking and Leamington's Railway

January 2001

Maureen Bourne: *Francis Skidmore of Coventry - Famous 19th Century Metalworker*

The metalwork of Francis Skidmore was once described as 'The jeweller's art writ large' and indeed much of his output, from his early crafting of chalices to the major pieces of architectural metalwork for which he ultimately became most famous, was clearly influenced by skills he learnt while apprenticed to his jeweller father.

Maureen Bourne, who is Slide Librarian to the Department of History of Art at the University of Warwick, presented a profile of Skidmore, much of whose work stands to this day in churches, cathedrals and public buildings throughout the UK. It is wide-ranging, and covers a spectrum from small pieces of silverware to the decorative features of the Albert Memorial, and from gas lighting standards to the roof of the Oxford University Museum.

Skidmore earned the respect of, and co-operated with, many eminent Victorians. In particular he worked for Sir George Gilbert Scott, supplying almost all the decorative ironwork for the latter's buildings. Skidmore's willingness to tackle projects for which his background and training did not always fit him proved at times to be both a strength and a weakness. His genius for designing and producing elaborate decorative metalwork of the highest quality and artistry is beyond question. However, his venture into using the same materials (notably wrought iron) for load-bearing architectural structures proved to be far less successful. For example, his design for an elegant glazed roof to cover the quadrangle of the Oxford University Museum, using wrought iron for major structural members, collapsed during construction and a redesign using cast iron was needed.

Skidmore was born in Birmingham in 1818, but in 1822 his father moved the family to Coventry where he set up in business as a jeweller. In his apprenticeship, Francis learned the full range of jeweller's skills, a training which might appear inappropriate for the type of work which was later to make his name. In fact its influence can be seen even in his largest projects, which are renowned for their delicate and complex metal tracery.

Skidmore eventually had a series of workshops in Coventry, the sites of which Maureen Bourne showed on early maps of the City. Although this man of relatively humble origins was an associate of many famous Victorians, and although his work remains a permanent memorial to his genius, he died in poverty, for like many another outstanding artist he was sadly in fact not at all a successful business man.

Leamington's Railway Bridge and Station.

The January meeting concluded with a short presentation by Peter Chater of various stages in the history of Leamington's railway station and its associated bridge over the High St/Clemens St junction. Peter traced the history of the station from the original fully covered design through the subsequent re-developments which led ultimately to the 1930s design we know today. He then turned to the associated rail bridge and covered the various versions which have been used over the years, none of which it must be admitted has ever done much to add to the elegance of the town. Peter's intimate knowledge of railway history and practice, and a splendid selection of slides, ensured that his talk was as rich in detail as it was comprehensive in presentation.

A Second Look - Update

The High Street Railway Bridge.

The following notes on the reconstruction of this notable Leamington landmark were provided by Peter Chater.

The original bridge of 1852 that spanned High Street was constructed with plated girders of wrought iron, supported at either end on brick and stone piers and 10 supporting cast iron columns throughout its length. It originally carried a double track of mixed gauge. This bridge remained *in situ* until replaced in 1906.

The present bridge is built with arched truss girders (five in number) supported at each end on brick and stone piers, one central column and one blue brick pier at one side. The removal of the columns of the old bridge facilitated the movement of road traffic beneath.

The two sides of the new bridge were constructed separately so that rail traffic would not be disrupted. The upside was completed first with all rail traffic passing over the downside of the bridge, tracks being interlaced (this avoids any moving points). When finished, tracks were diverted to the upside so that the downside could be built.

This information was obtained from the Great Western Magazine of 1906. To quote: The manufacture of the steelwork, 330 tons in weight, was undertaken by Messrs. Eastwood and Swingler of Derby. The erection was supervised by Divisional Engineer L. R. Wood, Wolverhampton.

City Planning, Bricks and Vintage Aircraft

February 2001

Members to the Rescue

Only three hours before this meeting was due to open, news was received that the scheduled speaker was unfortunately indisposed and therefore unable to attend. Nevertheless, by 7.30pm enough of our members had been mustered to fill the evening with contributions of their own, and to present a variety of topics and slides of impressive quality and interest.

Martin Green took us on a splendid pictorial tour of Birmingham City Centre, concentrating on some of the difficult choices faced by planners in its redevelopment, and especially where the 'old' must soon perforce give way to the 'new'. The Rotunda, one of the buildings to be retained, served as vantage point from which he took a series of panoramic 'aerial' views to illustrate both the beginnings of the redevelopment and some of the cherished landmarks which may soon disappear. Interspersed were external and internal shots of such historic areas as the Jewellery Quarter, the Law Courts, the Midland Art School, Moor St station, and the Birmingham Gun Barrel Proof House. Other subjects covered by Martin included canal-side buildings, and the Typhoo Tips Tea and Bird's Custard factories. The fact that Martin was on the 'home ground' of his childhood meant he could bring some of his personal memories to bear with great effect.

Roger Cragg was the next speaker with slides he had taken on tours of industrial sites within and without Warwickshire. When the roof of the Retort House for the original gas works in Gas St, Birmingham, was being restored Roger was in fact consulted by the contractors, and he had a fascinating tale to tell of the unique cast-iron trusses which had to be preserved. These trusses needed to be assessed for strength in relation to the new covering they were destined to support, and this work was carried out by a colleague of Roger's from Coventry University. Other topics covered by

Roger included Wigan Pier, the Adam Bridge on the Liverpool & Bury Railway (for which early pre-stressed concrete beams were used); the Albert Dock in Liverpool; and finally some aspects of bridges, aqueducts and inclined planes on canals in the West Country.

Since the scheduled speaker was to have given a talk on brickmaking it was fortuitous that both Peter Chater and Richard Storey were able, at such short notice, to make contributions on that very same subject. Peter had had the foresight to photograph the Cherry Orchard Brickworks, Kenilworth, at a time when it had already stopped production but before it was razed to the ground. His slides showed both general views of the site and internal views of the buildings where some of the original brickmaking machinery was still installed, albeit long since abandoned.

Richard Storey spoke next on the patented Caleb Hitch Brick, an interlocking design which had some success in the years *circa* 1820-1840 but which ultimately lost favour, possibly because of its complexity, the need for so many variations on the basic design to accommodate corners and ends, and consequently the difficulty and relatively high cost of production compared with a standard brick.

Mark Abbott rounded-off the meeting with a brief profile of the Shuttleworth Collection and showed slides of vintage triplanes, biplanes and monoplanes, many of them airborne, and a roll call of historic names that included Bleriot, Sopwith, Blackburn, Bristol, Avro, Supermarine and Hawker.

The meeting was a splendid example of the knowledge which resides within members of the Society itself, and it is hoped should encourage others to come forward from time to time with short contributions.

Any member wishing to make a contribution to a meeting (short or otherwise!), should contact a member of the committee.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

L. F. Cave
24 Portland Street
Leamington Spa
Warwickshire
CV32 5EY
☎ 01926 425987

SECRETARY

M. J. Green
'Argyll' 2(b) Union Road
Leamington Spa
Warwickshire
CV32 5LT
☎ 01926 313782

TREASURER

M. W. Abbott
53 Stowe Drive
Southam
Warwickshire
CV47 1NZ
☎ 01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Peter Chater

John Willock

Printing:

Martin Green /

Warwick School

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Industrial Archaeology Society

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- Meeting Reports
- New Programme Details
- IA on the Internet
- TEE Publishing

EDITORIAL

Conservation and preservation; terms often used in a discussion of IA. Terms, also, that are frequently used as if interchangeable, which implies they have a similar meaning. However, is this implication of common meaning correct and if not how exactly may the terms be defined?

This train of thought was caused by the recent reading of a book about museum restoration policy and practice (much more accessible than it sounds!), which was obviously careful to make correct use of the relevant terminology. It also contained the following definitions:¹

CONSERVATION: As the technology of preservation, conservation is the scientific investigation of materials, the environment, and those things responsible for the deterioration of cultural resources. Its purpose is to limit the decay process and to prolong the existence of objects.

PRESERVATION: The act of sustaining and maintaining cultural and natural resources that have been identified as significant

and/or threatened and that warrant protection.

Therefore, an industrial archaeologist might seek to preserve a particular site or object for future generations to study. To do this might require the application of conservation techniques, for example to halt corrosion.

This plainly demonstrates that conservation and preservation are not similar in definition, but rather means to a common end. Preservation may require the use of conservation and both have the aim of long term protection for a site or object. Perhaps it is this common aim that causes the confusion whereby the terms are used incorrectly?

REFERENCES:

1. Mikesch Robert *Restoring Museum Aircraft*. Airline Publishing Ltd. 1997

Mark W. Abbott

SOCIETY NEWS

PROGRAMME

Looking forward to September 2001 and the new season of meetings, the following speakers are confirmed:

15th September

Roger Cray, *The History of Railway Signalling*

11th October

Alan Redman, former City Engineer of Coventry, *Thoughts on the Planning of Coventry from a Historical Point of View*

5th November

Nigel Crowe, of British Waterways, Subject to be confirmed.

All the w's....IA on the Internet

Members who are on line are strongly recommended to visit the Web Site www.britishengineerium.com for a splendid display, in photographs, drawings and text of the Goldstone Pumping Station. Built on the South Downs in 1866 to deliver water to Brighton, Hove and Preston, this magnificent building is now a working museum and a 'temple' to Victorian engineering excellence. Its director, Dr. Jonathan Minns describes it as a point "where Art and Science meet" and as a memorial to the Victorian era and a time when "the battle of styles between the Classic and the Gothic was fought as fiercely in the nation's iron foundries and workshops as it was in architectural competitions". At Goldstone, he adds, the Classical Style won hands down!

The Web Site sets out the history of Goldstone and allows you to explore on-screen the Pumping Station, the Main Hall, the Boiler Room, and the Beam Engine. An important part of the aims of the project is an attempt to show the young the functions (and the sheer beauty) of moving mechanical components, many of them on a truly giant scale. Fifty years ago, Dr. Minns says, every schoolboy knew how levers, gear trains, pulleys, cranks, pistons and cylinders worked. Today their counterparts know only sealed grey boxes containing unmoving components with functions of which they are largely ignorant and, sadly, all too often uncaring.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2001 Mike Sharman:

Warwickshire Bridges: How the County Council Looks After our Bridges

Until his retirement a few years ago, Mike Sharman had a major responsibility in our County for the care and maintenance of its road and foot bridges, old and new, and his talk illustrated vividly the scale, variety and complexity of that task. It covered methods of bridge construction from very early stonework through timber, brick, cast iron, wrought iron and steel up to the latest reinforced concrete spans which cross our motorways. His responsibilities also involved balancing the views of those who insist on total preservation of any original structure, seemingly regardless of cost, with those who want the most modern and most economic solutions, sometimes with little regard to aesthetics. And paramount over all, of course, is the question of the safety of the public.

The bridge was one of the first efforts of Man in the field of civil engineering for, as Mike pointed out, almost every bridge exists principally either to 'avoid a natural hazard' or to make it easier, or quicker, to get from A to B. A plank thrown over a small stream fits that definition as much as does a multi-million pound suspension bridge soaring over an estuary. In the history of bridge design, Mike suggested that the development of the arch was probably the single most important step. Capable of supporting loads even when it is in a sorry state of deterioration, the arch appears in a multitude of different forms, many of which were shown on his slides. Arches of different shapes even appear in the same bridge, as that at Bidford where legend has it that responsibility for the design of each arch was allocated to a different monk!

With over 50 slides to illustrate his talk, Mike was able to give technical details of a very wide range of different designs and types of construction materials. He offered insights into the histories and details of many local bridges which we pass by, or use, every day, including one in Warwick with lateral cavities in which demolition explosives were secretly packed during the Second World War. A bridge over the Birmingham Rd, Warwick, has an interesting feature which is easily missed by the uninitiated, namely the fact that the brickwork above the string course is laid in a very shallow curve, to follow the shape of the roadway, whereas that beneath the string course is truly horizontal.

Other local bridges with features of special interest included: the Lucy Mill Bridge at Stratford, where a disused railway bridge was refurbished as a road bridge, increasing its width by cantilevering the

footways; the footbridge over the Leam which is the nearest the County has to a suspension bridge; and the Adelaide Bridge in Leamington, where the use of an early (and brittle) grade of mild steel led to all sorts of problems as time passed. A major project, dealt with in some detail by Mike in his talk, was the new bridge which carries the A423 over the Leam at Marton and the simultaneous preservation and restoration of the nearby medieval stone bridge which has stood for over five centuries. First constructed in 1414, that bridge has seen many repairs and alterations in its time, and will continue to serve as a footbridge. Mike distributed an excellent brochure* on the Marton Bridge project, which represents the very best practice for combining the sympathetic design of a new bridge with the careful preservation and continued use of its venerable neighbour, an important piece of our heritage.

* Published by the Highways Agency, 5 Broadway, Broad St, Birmingham B15 1BL (Tel: 0121 678 8210).

Cherry Orchard Brickworks: an addendum by Peter Chater

Further to his short talk at the February meeting on the Cherry Orchard Brickworks, Kenilworth, (see Newsletter No 1 page 4), Peter added some details of the incline in the quarry and the means used to move the clay tubs up and down it. The incline was 348 ft in length with a gradient of between 1 in 4 and 1 in 5. A winding house at the head of the incline housed an electric motor which drove a 4ft 9inch diameter cast-iron sprocket, with another similar sprocket at the foot of the incline. A heavy-duty continuous chain with 2-inch links joined the two. The tubs moved on a 15-inch gauge track and each had a projecting vee-shaped horn at one end, with which any link in the chain could be engaged. A total of 16 tubs were in continuous circulation up and down the incline.

Marton Bridge Leaflet

A very limited quantity of the Highways Agency leaflet, describing the Marton Bridge project, remain in the Society's stock of publications. Any member who did not secure a copy at the meeting please speak to the Treasurer. Allocation will be on a first come, first served, basis.

The Legacy of Two World Wars

April 2001 **Barrie Trinder:**

The Industrial Archaeology of Two World Wars

The two world wars of the 20th century left their mark on the landscape of Britain in many ways. Not least, both conflicts triggered an unprecedented increase in the nation's industrial output and the need for the buildings and equipment to achieve it. It was the residual evidence of both which remain to this day that Dr. Trinder dealt with in his excellent presentation at our April meeting.

In World War One the first rude awakening came in 1915, when it was realised that Britain's production of munitions, and especially of artillery shells, was totally inadequate to the task ahead* and a massive expansion of output was ordered. Many new factories were built, especially for the machining and filling of shells, some of them on greenfield sites and on a scale which seems astonishing today. At Gretna Green, for example, a shell making facility which spread over 7 to 8 miles east-to-west, and employed 15,000 workers, was built and literally transformed what was hitherto little more than a 'village' into a substantial town. That factory was demolished in 1924, but some of the infrastructure which supported it, including housing for the workers, is still to be seen.

Dr Trinder dealt with a number of other similar projects of World War One origin, including the Austin Village (built 1915/16); shell filling factories at Hereford and Banbury; major sites in Slough and Perivale; the airship hangars at Cardington; and the National Machine Gun Factory near Burton-on-Trent (a private initiative), which curiously was built in 1919! Another major facility, the 1910 Abbey Works of Express Lifts, Northampton, was expanded in 1914 to cope with World War One and in 1940 for World War Two. Wartime factories having established precedents at Slough and Perivale (Park Royal), both have since become major industrial sites with some of the World War One buildings still in use, albeit substantially modified. Some of the World War One munitions plants, especially the Royal Ordnance Factories, continued to operate in the inter-war years, and were ready for the rearmament programme of the 1930s and thus for the Second World War.

That programme also saw the construction of numerous 'shadow factories', also a further expansion in the number of ROFs, of which between 30 and 40 were in use during WW2. Running alongside factory construction was the need to build accommodation for the huge numbers of workers employed therein, many of whom were

'incomers' from other areas. There was also the major Anglo/US project code-named Operation Bolero, which was aimed at providing the means to accommodate and support the huge influx of US Forces arriving in Britain for the build-up to D-day. Some buildings constructed during Operation Bolero can still be seen.

With the end of World War Two, the housing needs of the civilian population then became urgent and a number of different variants of 'prefabs' appeared, many of them designed and made by aircraft companies whose skills in sheet metal and wood were turned over to produce prefabricated building components. Examples of many of these buildings, (including some originally expected to stand for only 10 years or so), are with us still and Dr Trinder's talk showed us just where to look for them.

* As an indication of the scale on which shells were required in World War One, it is recorded that in one action alone (at Aubers Ridge in 1915), a total of 1.5 million shells were fired in a barrage which lasted for 72 hours.

TEF Publishing

Not all members may be aware of TEF Publishing, which has premises just out of Leamington, on the Fosse Way. This company specialises in publications on a very wide variety of technical subjects, and along with its own titles it has an extensive collection of rare and second-hand books, also on technical subjects and many now out of print. It is well worth a visit, and browsers are welcomed. To reach TEF Publishing, leave Leamington on the Radford Semele Road and at the island on the Fosse Way turn left. The entrance to TEF Publications is a few hundred yards along, on the right.

Newsletter Contributions

Thank you to all members who have contributed material to the newsletter and please do not be dismayed if your work has not yet appeared in print. With the meeting reports occupying the majority of the newsletter, space is extremely limited for other material. All submitted items will eventually appear so please continue to pass new material to the editor. Short pieces of around 50-100 words are particularly welcome.

Local Aviation History and Gunpowder Engines

May 2001 Ian Frimston:
Some Historic Warwickshire Aerodromes

In practical terms, and discounting the mythical exploits of Icarus and the sketches of Leonardo da Vinci, the history of aviation proper can be said to have started with the Wright brothers. Consequently, nothing is much more than 100 years old. Nevertheless, some of the slides of early flying machines that Ian Frimston showed at the start of his talk seemed as far removed from those of today as do Newcomen's atmospheric engines from the modern power turbine.

Ian used shots of early planes from the Shuttleworth Collection to illustrate the astounding progress which aviation has made in the last century before moving on to discuss the parts played, both in wartime and in peace time, by the historic aerodromes of Warwickshire. These fields rapidly gathered importance in the inter-war years and then assumed national significance in World War Two, both as training and as operational aerodromes.

Picked out by Ian for special and detailed description were the aerodromes at Baginton, Church Lawford, Snitterfield, Warwick, Wellesbourne, Stratford, Gaydon, Long Marston, Southam and Edgehill. The Warwick aerodrome was used mainly for repairs to aircraft, and the skeleton of a hangar remains on that site today, while Snitterfield was a bomber base for the US Air Force. The aerodrome at Stratford was a satellite of Gaydon but the latter was eventually destined to grow both in stature and importance and, from 1954, to become a home for Britain's formidable V-bomber force.

In the Second World War, Long Marston was a base for Coventry-built Whitley bombers and Edgehill had a special claim to fame as it was the field from which, after its initial trials at Cranwell, Britain's first Whittle-jet-engined airplane went into serious operation. At one time, the aerodrome at Wellesbourne held the distinction of being the largest training unit for flyers, with many thousands of airmen gaining their wings high above the green

fields of Warwickshire. Today, Wellesbourne aerodrome is a centre for light aircraft.

Ian's talk was in many ways a 'trip down memory lane' for those who recall with affection such classic aircraft as the Sopwith Pup, the Tiger Moth, the Lysander and, of course, the mighty bombers of World War Two.

Gunpowder Engines: John Brace

The May meeting concluded with a short talk by John Brace. For many, John suggested, the history of the internal combustion engine is assumed to have started with Otto. Not so, for in fact many attempts to derive useful power from such a device occurred in what is termed 'the Middle Ages of the IC engine', roughly from 1794 to 1886. Acknowledging the writing of Horst O. Hardenberg* on that subject, John entertained members with some of the more bizarre ideas for IC engines, which used a variety of fuels, including gunpowder. In one such attempt, a military mortar was set to fire a cannon ball vertically upwards. An overhead mechanical device was then employed to catch the ball in flight! Once it had been captured, the same device was then used to control the descent of the ball, slowly, under gravity, and in the process to do some 'work'. A more technologically advanced version of the same idea had the cannon ball being 'captured' by an overhead arrangement of springs, which were thus compressed and their stored energy used to do some work. Curiously, none of the devices described by John appears to have been commercially successful, but each one was an amazing example of the ingenuity, and optimism of inventors in the 18th and 19th centuries.

* *The Middle Ages of the Internal Combustion Engine - 1794-1886*, Horst O. Hardenburg, Society of Automotive Engineers Inc, 400 Commonwealth Drive, Warrendale PA 15096-0001, USA

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN
 L. F. Cave
 24 Portland Street
 Leamington Spa
 Warwickshire
 CV32 5EY
 ☎ 01926 425987

SECRETARY
 M. J. Green
 'Argyll' 2(b) Union Road
 Leamington Spa
 Warwickshire
 CV32 5LT
 ☎ 01926 313782

TREASURER
 M. W. Abbott
 53 Stowe Drive
 Southam
 Warwickshire
 CV47 1NZ
 ☎ 01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:
 Mark W. Abbott

Additional material:
 Arthur Astrop

Printing:
 Martin Green /
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WARWICKSHIRE

Industrial Archaeology Society

WIAS

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THIS ISSUE

- Meeting Reports
- 2001 / 2002 Programme
- Parys Mountain
- Industrial Gwynedd

EDITORIAL

What does Industrial Archaeology mean to you? Not in the literal sense, but at the personal level. We all presumably have an interest in the subject, but I am sure that the role it plays in each of our lives differs.

During a recent holiday in North Wales, I inevitably found myself on several occasions, driving up the narrow road through Deiniolen and Dinorwig, to the 'bus turn round' at the foot of the immense Garret side tips of Dinorwic Quarry. Each visit, I found myself reflecting upon why I am drawn to this area.

It is not the most attractive of locations, although it is undeniably atmospheric, especially with cloud low over Elidir Fawr and the mewling of the resident pair of buzzards echoing off the tips. There is much of interest in the landscape and every visit yields another detail to explain and fit into the bigger picture. Photographing what I discover, in a way that captures the spirit of the place, is a continuing challenge too and one reason why I return time after time. I know I can always do

better.

All of which I think gives a clue to what Industrial Archaeology means to me. Put simply, it is a walk with a purpose! So much more satisfying than walking for the sake of it, with the added benefits of exercising the mind as well as the body, while keeping everyday pressures at a distance for a few hours.

Which raises in turn the question why, as a Society, we do not venture into the outdoors more often? True, there has been the tradition of an annual walk led by Peter Chater, who invariably devises a route of great interest, but requiring little physical effort. As a consequence these have been well supported. However, other such events have met with mixed success. A trip to the Welshpool and Llanfair Railway, organised some years ago by Roger Cragg, was not well supported by members I thought. On the other hand, John Selby's tour of the Oxford canal at Fenny Compton last summer, did attract a good following.

So what makes a good excursion and how might the Society ensure good support from members? If you do have any thoughts on the matter, let me know. John Haslam, who has considerable experience of organising coach trips, is keen to arrange an outing for the Society, possibly to Blaenavon. To take advantage of such skills and enthusiasm in the membership, can surely only benefit us as a Society.

Mark W. Abbott

SOCIETY NEWS

SUBSCRIPTIONS

Members are reminded that following the agreement of the AGM to retain subscriptions at their 2000 / 2001 levels, these are now due. The amount is £10.00 per person inclusive of partner. A further £1.00 per person is payable at each meeting to help meet the cost of refreshments. Please make cheques payable to Warwickshire Industrial Archaeology Society. To save on postage costs, any payments received by post will be acknowledged by receipt at the subsequent meeting.

PROGRAMME

A full programme for the forthcoming season is set out on the back page of this newsletter. Once again this represents the sole work of the Chairman, Toby Cave, to whom our thanks are due. One meeting awaits confirmation of a speaker and members will of course be advised of developments.

SUMMER WALK

This summer was the first for many years in which Peter Chater did not lead the now traditional evening walk in a local area with industrial connections. This was because of the national outbreak of Foot and Mouth disease, which caused severe restrictions on footpath access throughout Warwickshire, as elsewhere in the Country. All being well, one of more walks will be arranged for next summer. Suggestions for possible routes, of about two miles in length, are welcome.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

June 2001 Jo Bell:

The Working Boats Project

Boats are floating listed buildings! It was thus that Jo Bell started her talk on the 'Working Boats Project' currently being tackled by British Waterways with support from the Heritage Lottery Fund. Many areas of preservation and conservation of long-lost waterway life are covered by the 3-year project but the centre piece must be that part of the programme aimed at restoring ten specific working boats. These boats have been carefully chosen to illustrate different aspects of the time when our canals were serious 'work places' rather than, as today, merely pleasure grounds.

Atlas, for example, is a boat built in 1930 for the Grand Union Canal Carrying Co. and is being restored complete with its butty, the Leo. Saggita and Carina, both built in 1936, have been converted into floating classrooms designed so that children can learn at first hand what it meant to work and live in a narrow boat and to earn enough money to support the family it carried. Also built in 1936, the Scorpio was a gravel carrier, and is complete with its butty the Malus. At the height of the canal-carrying trade, there were 10,000 or more 'joey' boats on the waterways. Long, cargo-carrying day boats they had neither cabin nor motor and because they were not highly rated few remain today. Most were simply 'sunk', as an easy way of disposing of them, but the project has one which is being carefully refurbished.

Another particularly interesting item is a piling rig, built in the 1950s, which will be used to demonstrate the method by which the banks of canals were once reinforced. Working boats plied the canals all the year round, even in the depths of the harshest winters, and work is in hand restoring the Nansen, a powerful icebreaker. It was an appropriate touch, when it was first launched, to name this boat after the Norwegian Arctic explorer. Finally, mention must be made of the Birmingham, built in 1912 and most unusually along traditional shipbuilding lines. Below the waterline, its hull has all the curvatures associated with offshore boats and it draws no less than 3ft 9in. It is moored at Tardebigge and, needless to say, with that draught it doesn't move far on the canals of today!

Other aspects of life on working boats covered by the project include a wide variety of artefacts, also the traditional painting skills, especially the regional variations on the classic 'roses and castles' designs which adorned the boats themselves and some of their equipment. In a conservation project of this scope and magnitude, Jo Bell conceded it is inevitable that some compromises must be made.

For example, replacement parts cannot always be made out of the type of wood originally used. Nonetheless every effort is being made by the project to adhere to four basic guidelines, namely to 'make it truthful, relevant, local and alive'.

Canal folk, Jo pointed out, had a uniquely 'linear' view of life. They knew people hundreds of miles in each direction up and down the waterways, but had little or no contact with anyone either side of the banks. Many of those working the boats were, by today's standards, illiterate. As a result, their social culture existed in oral rather than written form. Consequently much of it is lost, and as the years go by even more will disappear. The work of the project therefore includes attempts to record as much of 'social and family culture of the cut' as possible, before it is too late.

Further Afield: Parys Mountain

Parys Mountain is situated in the north east of Anglesey, 2 km south of the small town of Amlwch. Its particular significance is that, in the latter part of the 18th Century, it was the site of largest copper mine in the world and it has a proven history of copper extraction dating back to the Bronze Age. Associated with the site were other chemical industries, based on mining by-products. These produced ochre pigments, saltpetre, vitriol and alum, and an ochre works was in production on the mountain until the 1960s.

Recognition of the unique nature of this landscape led to the establishment, in 1997, of the Amlwch Industrial Heritage Trust. It has charitable status and its aims are to conserve the natural and industrial landscapes of Parys Mountain and Amlwch Port; to promote scientific and historical research and a fuller understanding of these two sites; and to present them for the appreciation of the public. This has resulted in the establishment of an excellent way marked trail on the mountain and a museum in Amlwch Port. In addition, access has been regained to the underground workings that remain above the water table and the intention is to reopen blocked drainage levels, so that exploration can continue deeper into the workings.

A visit provides a fascinating day out, although the trail on the mountain does require a reasonable degree of stamina and a strong pair of boots. The project also serves as an excellent demonstration of what can be done to promote industrial archaeology in a positive and accessible manner. Recommended!

The AGM and Members' Evening

July 2001

The Society's AGM and Members' Evening

Members attending the 12th Annual General Meeting of WIAS heard an encouraging report from Chairman Toby Cave, who was able to announce a marked improvement in the Society's finances, and increases in both its membership and the attendance at its monthly meetings. Opinion indicated wide appreciation of the Committee's choice of speakers in the year under review, and in fact the attendance of 51 members at the April meeting (addressed by Barrie Trinder), constituted a record. Toby also confirmed that, while he was willing to serve as Chairman for one more year, thereafter he wished to retire. It was pointed out that, if Martin Green were to be chosen to succeed him then the post of Secretary to the Society would become vacant, and all members were urged to address themselves to that problem.

In his report as the Society's Treasurer, Mark Abbott presented the detailed accounts, explaining how the improvement in finances resulted from, among other reasons, a combination of last year's increases in annual membership and meeting attendance fees, together with an unanticipated reduction in the charges for hire of Warwick School facilities. Opportunity was taken at that point to express the Society's appreciation of the generous support of its activities which is made by the School, in a variety of different ways. In view of the Society's improved financial position, Mark wondered if members felt the meeting attendance fee should revert to 50p. It was the unanimous decision, however, that it should remain at £1.00, both as a 'cushion' for the future and to give the Society more ability to 'pay its way' whenever possible. Following re-election of the Committee en bloc, and a vote of thanks to its members, the 2001 AGM was closed.

The evening then heard two talks by WIAS members. First, Martin Green presented a series of slides taken during a recent visit to Belfast, giving a fascinating insight both into the past industrial history of the Province and a pictorial representation of some of the results of its last 40 years of anguish. Shots of the mute and abandoned factories of its traditional industries were mixed with those of civic buildings erected when it was a prosperous city, and then further intermingled with views of some of the murals and crude graffiti which today bear witness to the tribal conflicts still raging in its streets. Martin's talk was a poignant reminder of a once proud and thriving city whose industrial archaeology is either

crumbling away or is the 'blackboard' on which the lurid slogans of its sectarian strife are sprayed.

The evening concluded with a talk by John Brace in which he traced the early efforts of Stratford upon Avon to provide its citizens with an adequate supply of clean water and efficient sewage disposal. He tackled the period from about 1840 to the first few years of the 20th century, during which those efforts were beset both with obstacles and, at times, with incompetence. Stratford, then, was little more than a large village and sources of water within its own bailiwick were few. Snitterfield Brook, for instance, was outwith its reach but was later to become accessible, although it was prone to 'dry up' for fairly long periods. Flowers Brewery had its own artesian wells, and for a period supplied water to the town, but even when water and sewage pipes had been laid it was discovered that somehow their actual connection to its houses had been unaccountably overlooked. Today's Stratford citizens would be astonished to know how their grandparents overcame such difficulties!

Review: Industrial Gwynedd

Industrial Gwynedd, Volumes 1-4, Plateway Press 1996, 1997, 1998 and 1999

The industrial history of the modern county of Gwynedd is dominated by mining and quarrying, especially the extraction of slate. This is reflected in the content of this occasional journal from Plateway Press.

Overall production quality is excellent. Photographs are well reproduced, good clear maps and drawings are appended where appropriate, and the writing style is accessible to the general reader. The occasional article is in Welsh, but an English abstract is always provided.

The most recent edition, Volume 4, 1999, is dedicated to Dinorwic Quarry. Articles include a description of the Dinorwic Quarry Railway's Crumpton locomotive, *Pit Quest* and an account of the recording, and a visitation to working order, of the Vivian Quarry V2 incline. However, not all the content is slate industry oriented. Previous volumes, for example, have covered the Parys Mountain Copper Mine (Volume 1, 1996) and Broad Gauge at Holyhead (Volume 2, 1997).

Back copies are available from the publishers, Plateway Press, Tawern House, Harding Road, East Harding, Norwich, NR16 2QR. Price varies from £5.00 to £7.50.

Programme 2001 / 2002

2001

Thursday 13th September

Roger Cragg: *The History of Railway Signalling.*

Thursday 11th October

Brian Rednap, former City Engineer of Coventry:
Thoughts on the Planning of Coventry from a Historical Point of View.

Thursday 8th November

Nigel Crowe of British Waterways: *Recent Work at British Waterways.*

Thursday 13th December

Jo Bell: *Exploring Telford's Welsh Road.*

The majority of time at these meetings is occupied by our speaker, followed by refreshments and a subsequent period for questions and follow up material. The final part of the meeting is then usually taken up with a brief contribution from one of our members, often concentrating on an aspect of the industrial archaeology of Warwickshire. We are always keen to have contributions from members or visitors ~ do not be afraid to put yourself forward for one of these presentations. Occasional additional events will also take place during the year, and members will be duly notified of these.

Please note that this programme may be subject to change without notice.

2002

Thursday 10th January

To be arranged.

Thursday 14th February

J. M. Carrington: *The Motorway Archive and the Preservation of Documents Telling the Story of the Construction of British Motorways.*

Thursday 14th March

Anthony Coulls: *Power in Manchester; the Energy Collection of the Museum of Science and Industry.*

Thursday 11th April

Brian Stokes: *How Automotive Products Became Leamington Spa's Largest Manufacturing Company.*

Thursday 9th May

Geoffrey Starmer: *Changes in LA in Northamptonshire During the Past 35 Years.*

Thursday 13th June

Peter Lee: *Railways in the Warwickshire Coalfield.*

Thursday 11th July

Annual General Meeting, followed by Lyndon F. Cave: *How to Make Cement and Concrete; the Warwickshire Cement Industry.*

WIAS Meetings

Meetings of the Society are held on the second Thursday of each month in the Sixth Form Centre at Warwick School, Myton Road, Warwick, starting at 7.30pm. A map of how to find the Sixth Form Centre at Warwick School is available from the Secretary. Visitors should park in the Junior School / Sports Hall car park. The Sixth Form Centre is next to the car park.

Subscriptions 2000 / 2001

£12.00 per person (or couple).

Cheques payable to Warwickshire Industrial Archaeology Society please.

An additional payment of £1.00 per person is due at each meeting to meet the cost of refreshments.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

L. F. Cave
24 Portland Street
Leamington Spa
Warwickshire
CV32 5EY
☎ 01926 425987

SECRETARY

M. J. Green
'Argyll' 2(b) Union Road
Leamington Spa
Warwickshire
CV32 5LT
☎ 01926 313782

TREASURER

M. W. Abbott
53 Stowe Drive
Southam
Warwickshire
CV47 1NZ
☎ 01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Printing:

Martin Green /
Warwick School

WARWICKSHIRE

Industrial Archaeology Society

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THIS ISSUE

- Meeting Reports
- Burton Dassett Ironstone
- Favourite IA Project
- Cambridge IA Guide

EDITORIAL

Do you have a favourite piece of industrial archaeology? Mine is undoubtedly the area of slate quarrying between Talysarn and Nantlle in Gwynedd, which also happened to be my introduction to industrial archaeology in the field.

I have a vague recollection of a wrong turn taken on a family holiday sometime in the mid 1970s, which led to what I thought a desolate wasteland of slate rubble and grey villages.

Ten or more years later, acting upon information gleaned from Boyd's *Narrow Gauge Railways of North Caermarvonshire*, I went in search of the remains of the Nantlle Railway and found myself in the same place, but with a fresh eye. A sharp left turn in Nantlle village, along the old valley road, led through towering tips of slate rubble and dry stone bridge abutments, to a derelict gate. Here more abutments marked the course of the Nantlle Railway on the edge of the foul, rubbish choked, Twwl Ballast pit of Pen yr Bryn quarry.

This less than promising start proved to be illusory. A little

exploration on foot revealed a maze of flooded pits, tramways and dereliction. To the West, along a deep cutting, lay the vast flooded excavation of Dorothea Quarry with its apparently forgotten and derelict Cornish pumping engine still *in situ*. To the East the railway could be followed, curving above the rooftops of Nantlle village, to Pen yr Orsedd Quarry. This was on the brink of closure (it closed in that winter of 1984) and was full of relics. The workshops and stores lay as they had been abandoned in the 1970s; a wooden locker contained the last newspaper brought to work by its owner and the details of his last fitting job were chalked on the door. On the upper level stood several intact Blondin cableways, their machinery and electrical control gear rusting in the winch cabins. Ladders lashed to the sides of one pit marked the route the quarrymen had taken to work. Only the tramways were missing, torn up in favour of antiquated dump trucks.

I returned numerous times to explore, until in 1994, I found Dorothea Quarry full of travellers and Pen yr Orsedd stripped of any likely firewood and altered by reworking on the upper level. I have not been back, the magic tarnished by so much vandalism. However, in my memory at least the area remains a favourite and as an illustration of quarrying ingenuity in a confined space, there are probably few better examples.

A development of this theme I would like to pursue is to compile

a short list of members favourite IA sites. These need not be restricted to Warwickshire, as the intention is to publish the list in time for next summer, so that those who travel elsewhere in the UK may have some recommended IA to visit. To work, this needs contributions from the membership, so please pass these to the editor.

Mark W. Abbott

SOCIETY NEWS

Programme

The vacant January meeting has been filled by Peter Coullis. His subject will be *Looking at Iron*.

Subscriptions

A further reminder to members that subscriptions for the 2001/2002 season are now due. The unavoidable absence of the Treasurer from the last two meetings has meant that collection of subscriptions is a little behind schedule and prompt payment would be appreciated. The amount due is £10.00 per person inclusive of partner and cheques should be made payable to Warwickshire Industrial Archaeology Society please.

Newsletter

Retained contributions for the Newsletter are now minimal. It would be preferable if the contents reflected more than just the meetings and the editors personal interests, so this is a call for contributions from members. These should have an IA bias and ideally be 150-200 words long. Hand written copy is acceptable if access to a typewriter or computer is not possible.

NEWSLETTER

Meeting Reports *by Arthur Astrop and Roger Cragg*

September 2001 Roger Cragg:

The History of Railway Signalling

This talk covered the development of railway signalling and train control systems from the earliest days of railways until the present time. It was explained that most of the improvements in signalling and train control had come about because of accidents having highlighted deficiencies in the systems.

Starting in the 1830s the only method of train control in use at that time was the 'time interval' system under which a train was allowed to leave a station after the specified time had elapsed after the departure of the preceding train. Flag or lamp signals were shown to passing trains by the 'policeman' who was stationed by the side of the line. When trains were relatively slow and infrequent this was just about adequate but as trains became faster, heavier and more frequent it was the cause of many rear end collisions. The Railway Inspectorate urged the adoption of three measures which would increase rail safety – the adoption of the Absolute Block system of working; the interlocking of points and signals and the positioning of all levers in one place under the control of one man; and the fitting of continuous, automatic brakes to all passenger trains.

The Absolute Block system, in which the trains are separated in space rather than in time was dependent on two developments – a system of communication between signal boxes, provided by the introduction of the electric telegraph, and a system of communication between the signalman and the engine driver, provided by the introduction of semaphore signals. Block instruments were used together with signalling bells to indicate 'line blocked', 'line clear' or 'train on line' for each block section. The various types of semaphore signals were described including home and starter signals, distant signals to give advance warning and special signals used at junctions and for shunting. The method by which point and signal levers were interlocked was demonstrated by the use of a model locking frame, the object being to prevent conflicting signals being given.

All train working messages and other significant events were recorded in the Train Register which was kept by the Signalman in his signalbox, and this would always be consulted in the case of accident or working irregularity to ascertain the possible cause.

Single line working presented a particular problem and Roger outlined several methods of train control which could be used in this situation. Nearly all the methods involved the use of some

form of 'staff' or 'token', the possession of which by the engine driver authorised him to take his train into the single line section to which it referred. The use of 'tickets' to enable trains to follow one another through a single line section was also explained.

Modern developments that were briefly considered included the use of multiple aspect colour light signals, track circuits and automatic warning systems which give an indication to the train driver of the state of the signals.

A Second Look

Burton Dassett Ironstone Workings

Unlike neighbouring Northamptonshire and Oxfordshire, little iron ore has been quarried in Warwickshire. There are proven reserves of ironstone on Edge Hill, which led to the abortive Edge Hill Light Railway, but only the ironstone outcrop on the Burton Dassett Hills was commercially exploited for iron ore and here quarrying was a small intermittent operation.

Eric Tonks in his history of the site¹ suggests that the quarries were working by the early 1870s. Thereafter, a reopening took place in November 1898, for which Wm. Glover & Sons Ltd of Warwick, installed a steam powered aerial ropeway to Burton Dassett Platform on the Stratford and Midland Junction Railway. Tonks states the quarry tramways were operated by pony and gravity but also gives anecdotal evidence of a steam locomotive being used for a short while. Closure came again in 1901, with a brief working interlude in 1907/1908, until the increased demand for iron ore in World War One caused a final reopening in 1918 by T. & I. Bradley & Sons Ltd. Equipment from the previous periods of working was reused. Production during this phase of operation was small; Tonks quotes 100 tons per day, largely by hand labour. Final closure probably came in 1921 and all the equipment was removed sometime after 1929.

Today of course, the site is part of the popular Burton Dassett Hills Country Park. This has ensured the survival of many of the quarrying features and it is easy to trace both the various tramway routes radiating from the site of the former ropeway terminal and some quarry faces.

References:

1. Tonks E. *The Ironstone Quarries of the Midlands History, Operation and Railways Part II The Oxfordshire Field*, Runpast Publishing, Cheltenham, 1988

Coventry City Planning

October 2001 Brian Redknapp:

Thoughts on the Planning of Coventry from a Historical Point of View

Brian Redknapp, former City Engineer of Coventry, painted a very broad canvas in his talk to our October meeting and, in fact, gave members a panoramic view of the development of the City from mediaeval times to virtually the present day. He tackled three main aspects of its civil engineering history, namely sewerage, drainage and highways. All three were set against the background of a City which grew from a population of a mere 16,000 in 1800 to a peak of over 330,000 in the 1970s, and which in the late 1940s was destined to play a pioneering role in urban redevelopment, following its devastation by bombing in the second world war.

The topography of Coventry played a crucial part in attempts to provide the city with effective sewerage and drainage systems. The rivers Sherbourne and Sowe, also Canley Brook, were the main natural arteries for these systems but for a long time the city tried, for financial reasons, to utilise only gravity for liquid flow. There was also a reluctance, again for financial reasons, to provide proper sewage treatment, and for a very long time sewage and effluent were simply 'passed on' by way of the water courses to towns outside the city boundary. In the mid-19th century, however, Government legislation forced change and major work on disposal systems for both sewage and drainage was started. Treatment of sewage, however, was not provided for and it was not until 1874 that settling tanks were built by the Coventry Manure Co Ltd, which hoped thereby to have a 'saleable' product! These hopes were not fulfilled and the company failed.

In 1901, the City finally accepted that 'gravity was not enough' and conceded that a proper pumping system was imperative. Massive pumps capable of handling over 11 million gallons/day were installed, but still no treatment system was provided. Indeed, the city did not have that amenity until the construction of the Finham Sewage Works, in 1929.

Brian's account of the planning of the new city centre post-1945 was a fascinating story of contrasting ideas, not least those of the long-serving City Engineer Ernest Ford and the relatively newly appointed City Architect Donald (later Sir Donald) Gibson. To an extent it was a conflict between the visions of a younger and an older man, one seeing the opportunity for a fresh start with a 'brave New World' of concrete and traffic-free precincts, and one who took a more conservative (and perhaps conservational) view. Both schemes eventually had

to be put before Lord Reith, as an arbiter. He drily commented that whereas one scheme seemed rather to lack imagination the other appeared to have a surfeit of it! Shrewdly Reith suggested that perhaps the best aspects of both schemes should be implemented.

Brian showed two excellent photographs of the Upper and Lower Precincts shortly after they were officially opened. Each picture touchingly recalled the high hopes of the period, illustrated both by the freshness of the architecture and the self-confidence of the people strolling about in the sunshine. The original vision was of a 'People's City' but, as Brian observed, architectural fashions were to change with time, as also perhaps were the people of Coventry.

Finally, Brian turned to the equally interesting story of the design and construction of the Coventry Inner Ring Road. This bold venture, designed specifically for traffic only and deliberately without 'frontages', is especially successful in catering for those who make daily journeys from one side of the city to the other for work, allowing them to avoid the centre itself. Brian's talk was a *tour de force* not least because it gave WIAS members a uniquely personal and firsthand account of the many problems involved in the major redevelopment of an industrial city in the second half of the 20th century.

Book Review

Balchin N. and Pilby P. *A Guide to the Industrial Archaeology of Cambridgeshire and Peterborough*. Association for Industrial Archaeology 2001. ISBN: 0 9528910 4 5. Price not known.

Cambridgeshire is probably not a county that might be considered to have a rich industrial heritage. However, the reality is quite different as this latest of the guides from the Association for Industrial Archaeology demonstrates. Published to tie in with the location of the annual conference, the guide follows the established and successful format of previous years. The area of study is divided into smaller geographical regions and significant sites therein are described by a short written piece together with a grid reference and access details. Good, although sometimes rather small, monochrome photographs illustrate some of the chosen sites. Also, for the first time, criteria are given for the choice of sites. Although not exhaustive, the contents will prove of interest to the enthusiast and if taken with previous AIA regional guides, form part of a useful and growing resource.

Industrial Archaeology and British Waterways

November 2001 Nigel Crowe:

Recent Archaeological Work at British Waterways

With a staff of only six, and the entire country to cover, Nigel Crowe's remit as Heritage Manager for British Waterways is daunting by any standards. Just how daunting was illustrated by the range of different projects, in widely scattered locations, which he chose to cover in his talk to our November meeting.

Nigel has been with BW for 15 years during which time, he said, the organisation had changed beyond all recognition. Its dedication to the heritage of our waterway system is unquestionable but, as Nigel pointed out, BW must 'pay its way', and time and money spent on heritage work must always be consistent with, and proportionate to, that requirement. Nevertheless, the examples he gave of heritage projects already accomplished, and others in hand, were impressive.

Work on the Anderton Boat Lift, which connects the River Wear Navigation with the Trent & Mersey Canal, has included excavation of the original engine house, first used when the lift was powered by steam. It had been possible to trace significant stages in the history of the engine house from its opening in 1875 through to its final electrification, just before the first world war. On the Kennet & Avon canal, a pair of stop gates has been discovered which were designed to close automatically if there was a sudden unintentional loss of water. Adjacent to Lock 10 on the same canal, but not connected with it, a large water tank had been found which appears to have been a cistern or reservoir once supplying water to a nearby 'grand house'.

At Clarence Lock, Leeds, Nigel's team was called in to investigate and record the remains of a very large derelict boat. Measuring over 20 m long, and unusually broad of beam, it was sadly in a completely unrecoverable condition. In design, however, this boat appears to have been not unlike one of the famous Forth & Clyde 'steam puffers' and its presence on an inland waterway was both surprising and difficult to explain. Also in Leeds, Nigel

referred to excavations on the site of a BW property alongside the Aire & Calder Canal. Here was found a 1940s air raid shelter with accommodation for 165 persons.

Coming nearer to home, work on repairing leaks in the Engine Arm Aqueduct of the Birmingham Canal has uncovered some unusual 'Gothic' decoration in the ironwork, which has been carefully recorded. A project of an entirely different nature, namely maintenance work on the 3-mile long narrow Standridge Tunnel, Huddersfield, required recording the facing stones in the portals individually before work could begin. A 'lost' spillway at Lock 24 on the Lichfield Canal needed recording before work on the lock itself started, and to conclude Nigel described a particularly successful educational project which BW has started at Welford Wharf on the Grand Union Canal.

This project had its origins in the excavation of a canalside lime kiln but has since been extended to provide a centre where training in the methods and disciplines of industrial archaeology is provided. Indeed, the site is now a community project, with the enthusiastic involvement of local schools and villages, and is significantly raising awareness of the importance of industrial archaeology. As a postscript to his talk, Nigel drew attention to an interesting aspect of BW in the 21st century. More of its income is today derived from the fibre optics cables laid in its towpaths than from any activity connected with boats or boating!

Errata

The September edition of the Newsletter unfortunately contained a couple of minor errors. First, the speaker for October was Brian Redknapp; not Brian Rednap as printed. Apologies to Brian for this proofreading oversight. Second, the subscription rates quoted were of course for 2001/2002 and not for 2000/2001 as indicated.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN
L. F. Cave
24 Portland Street
Leamington Spa
Warwickshire
CV32 5EY
☎ 01926 425987

SECRETARY
M. J. Green
'Argyll' 2(b) Union Road
Leamington Spa
Warwickshire
CV32 5LT
☎ 01926 313782

TREASURER
M. W. Abbott
53 Stowe Drive
Southam
Warwickshire
CV47 1NZ
☎ 01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:
Mark W. Abbott
Additional material:
Arthur Astrop
Roger Cragg
Printing:
Martin Green /
Warwick School

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Industrial Archaeology Society

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- Freight Train Working
- Warwick Castle Mill
- Society News

EDITORIAL

The testimony of people once involved with what, by reason of passing time or technological progress, is now industrial archaeology, is something that is perhaps neglected. Only those who were there can truly describe how something was done.

With this in mind, this Newsletter sees a change in layout to publish a piece by Peter Chater. Peter's experience as a locomotive fireman gives a valuable insight into how the job was done and I am grateful for his contribution.

Mark W. Abbott

FREIGHT TRAIN WORKING

I would like to give a detailed description of a journey with a heavy freight train, weighing more than one thousand tons and made up of seventy loaded wagons, between Leamington and Stratford on Avon. All the wagons are unfitted, that is with no continuous brake and are loose coupled. I have chosen this particular journey as it is quite undulating and a route I frequently worked over in the 1940s and early 1950s.

On leaving Leamington there is a falling gradient of 1 in 100, this takes the railway under the canal aqueduct, then immediately the track rises by 1 in 90 to climb over the River Avon thus forming a dip beneath the canal. The next part of journey is Warwick to Hatton, a long bank of 1 in 100. From Hatton to Stratford the route is generally falling, with a steep decline of 1 in 75 on leaving Wilmcote.

Most long distance freight and mineral trains were worked by tender engines as they carried more coal and water. As this train working that I am about to describe was destined for South Wales, I will suppose the engine to be a 28xx class 2.8.0 tender engine.

When the train is ready to leave Leamington and the signals are in the off position, the driver will create vacuum in the engine and tender brakes. When this is done the fireman will gently ease the tender hand brake and as it is falling gradient the engine will edge forward to take up the slack in all the couplings. This might be as much as a hundred feet. The guard at the rear of the train keeps his hand brake hard on until he reaches a point near the dip beneath the canal aqueduct, then releases it. When the driver on starting away knows he has a tight coupling throughout the train, he applies a little steam to keep it that way. The fireman would be busy making up his fire. On reaching the canal aqueduct the driver would apply maximum power to climb the gradient of 1 in 90 to the bridge over the Avon

and to keep the couplings tight. This is to prevent a snatch from the rear portion of train that is still on a falling gradient. (Every few weeks a coupling or draw bar would be broken here). When the train is completely through this dip, firing could start again. (When an engine is being worked at its maximum it is not easy to fire, as the blast from the chimney would take the coal off the shovel.) On arriving at Warwick the driver would bring his train to a stand in advance of the station to await the assistance of the banking engine to Hatton. (The prime purpose of this engine is to assist heavy trains, but it also has a secondary role; this being in the event of a coupling breaking to hold the train from running backwards.) The bank engine would buffer up to the rear of the train, the guard would hand this driver details of his train and then remove the tail lamp from his van. The bank engine driver would then whistle the signal code, two crows and one. (A crow is one long, three short and one long whistle.) When the driver of the train hears this whistle he repeats it and both drivers start off together. On reaching Hatton the bank engine would stop at the signal box and if lines were clear the train would continue towards Stratford on Avon. This is mostly a falling gradient, but very steep after leaving Wilmcote where the train would be kept under close control.

The remainder of the journey to Gloucester is fairly straight forward.

Peter Chater

NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2001:

Windmills and Watermills, Fishponds and Carpets

From time to time events fortuitously conspire to reveal the depth of knowledge which resides, just waiting to be tapped, among the members of our own Society. Such was the case in December when, a bare 24 hours before that meeting was due to open, the scheduled speaker was laid low with 'flu. The Committee was immediately and urgently seeking a substitute. In fact, they needed to look no further than member Peter Chater who, despite the extremely short notice, stepped in with a full length talk on windmills and watermills, illustrating it with his own slides of outstanding quality.

Before the arrival of steam engines, windmills and watermills were the only sources of mechanical power available to agriculture and industry and, as Peter reminded us, from the 12th century onwards our countryside was increasingly populated with both. The evolution of the windmill saw three main types being developed, namely (in order of appearance) the post-mill, the smock mill and the tower mill. Peter explained the basic design principles of each type of mill in turn, also the various designs of 'sails', illustrating all aspects with sectional line drawings and colour slides of mills still surviving. The problem of turning the mill to face the 'wind of the day' was the first design challenge to be met, and was initially solved by arranging for the entire structure to be rotated about its massive stationary central post. Rotating the total dead weight of the mill was no mean task and was undertaken by the miller (and an assistant surely?) pushing on a long lever projecting from the base of the structure.

Eventually, of course, it was realised that it was really only necessary to rotate the cap of the mill, containing the sail spindle and the bevel crown and pinion which turned the vertical shaft driving the mill wheel. Soon the fantail drive also appeared, which meant that the mill would automatically seek to maintain an optimum position relative to the direction of the wind. Millers (and their assistants) must surely have thought the millenium had arrived. Peter's slides showed mills he has visited and explored in a large number of English counties, some of them lovingly restored, some adapted as dwellings, and some sadly in a state of dereliction. Among them were many old favourites in Warwickshire which most of us have seen but possibly not studied.

Turning to watermills, Peter started by briefly outlining the four main types, namely undershot,

overshot, pitchback and breast shot. He had excellent slides to illustrate each type and in sites as widespread as Bridgnorth, Bristol, Sheffield, Woodbridge, Blockley, Derbyshire and the Isle of Man. The latter, of course, boasts to this day the giant, splendidly restored Laxey Wheel (The Lady Isabella), which pumped a mine and developed no less than 200 hp.

The December meeting concluded with two short contributions, also from Society members. John Brace spoke about a long-forgotten country 'industry' centred on man-made pond systems for cultivating fish, and their associated stewponds for nurturing small fry. The design of the ponds in a group, and the systems of channels whereby they could be drained for maintenance when necessary, was quite complex. John drew particular attention to the fishpond/stewpond complex which once existed at Compton Verney from as early as 1738, records suggest.

Finally, Martin Green showed a short video on the Templeton's 19th century carpet mill, Glasgow. Dubbed locally The Doge's Palace, its exterior is notable for its highly decorative design and its polychromatic facing brickwork. The video also included developments in the design and manufacturing of carpets.

Society News

Programme

Sadly Brian Stokes, who was to speak on the history of Automotive Products at the April meeting, has died. A new speaker is being sought and members will be advised of the topic of the presentation once details are finalised. However, it is unlikely that the subject of the meeting will remain as Automotive Products.

Lives and Times

The *Lives and Times* festival of Coventry and Warwickshire history will take place during the second weekend of June (June 8th and 9th 2002) in the War Memorial Park, Coventry. The Society has accepted an invitation to attend and further information should be available to members once the booking has been confirmed. The end of March is the deadline given for this confirmation, but this has proved optimistic in previous years.

Offers of help to staff the Society's stand over the weekend will be gratefully received. Please speak to Mark Abbott if you can spare a few hours.

Steam Power Variety

January 2002 Peter Coulls:

A Cavalcade of Steam

Few of us can claim to have had friendly GWR loco drivers blowing their whistles at us when we were babies in our prams, but that was how Peter Coulls was initially infected with the 'steam bug'! Then, almost as soon as he could walk, he was into train spotting and today he is a leading authority on virtually any machine or mechanism which is driven by the by-product of boiling water.

Peter started his talk close at home with early slides of Leamington Station and shots of steam locos of various classes. Gradually his pictures widened in scope to include Continental railways, locos and rolling stock, and he recalled how on one occasion in post-war Germany his enthusiasm for 'train spotting' nearly resulted in his being arrested. Unwittingly he had photographed an ammunition train and it required all his phrase-book German and skill at sign language to escape with nothing more than a stern warning.

As the use of steam locos steadily declined, Peter's interest widened out to include road engines, traction engines and, his particular enthusiasm, ploughing engines. He showed slides of a number of the latter and described the various ingenious methods whereby pairs of engines and steel cables were used to drag massive multi-share ploughs back and forth across large-acre fields. This technology was an early attempt to mechanise ploughing but it required considerable skill, not least in manoeuvring and positioning the engines on the edges of the fields, and was quickly (and one suspects thankfully) abandoned when the tractor appeared.

Ploughing engines, as well as road and traction engines, inevitably led Peter into the world of steam rallies and events such as the Town & Country Festivals where, because of his encyclopaedic knowledge of the makers and their types of steam engines, he soon found himself recruited to give running commentaries. The names of the engine builders he mentioned read like a roll of honour and the glory of many of the lovingly-restored machines shown in his slides, often in their original makers' colours, was a joy to see.

Peter also had some slides of the more unusual types of steam-driven machines, including a tram, a dredger, a jib crane, an excavator, showmens' fair engines and, believe it or not, a Haleson steam-driven motor cycle! The latter is believed to be the only example of its type still extant and if its performance was comparable to the famous Stanley steam car then its acceleration might have shown a

modern bike a thing or two. Another of Peter's slides showed a 'fireless' steam loco, a variation developed for use in hazardous environments such as munition factories. Steam drawn from a steam-raising plant off-site was stored in a heavily insulated pressure accumulator on the engine and, depending on usage, one charging could drive it for up to six or eight hours.

As a digression, Peter also showed a series of slides of the wholesale meat market and abattoir in Birmingham, built in 1903 and demolished in the 1960s. He drew particular attention to the ornamental facing brickwork of the massive building and to the stone heads of animals, also the City's coat of arms, which were incorporated to decorate the façade.

Warwick Castle Mill

Long standing members of the Society may well recall an evening visit to Warwick Castle Mill. Organised a number of years ago, by Toby Cave, the visit enabled members to see the restoration work being done on the building, in preparation for opening the mill to visitors.

Since then the project seems to have attracted little publicity and it has been unclear what progress was being made. However, as reported in the Coventry Evening Telegraph of 19th December 2001, the intention is apparently to open the mill to the public sometime this year. A photograph in this newspaper showed machinery being unloaded in preparation for installation in the building. The only identifiable item was a horizontal cylinder-Crossley steam or oil engine, which the accompanying text stated was, 'Part of the restored machinery that drives the mill...' (*sic*). In addition, the piece stated that visitors would be able to see both the engine house and water wheel in working order and that the 'mill house' would be recreated as it was in 1900.

The mill has a long history dating back to the late 14th century. Originally a corn mill, an engine house was added to pump water to the castle in the 17th century and in the late 19th century the Earl of Warwick set up an electricity generating station in the building. If the Crossley engine in the photograph is originally from the mill building, it was presumably part of the electricity generating equipment.

If any member can provide further information about the history of the mill or indeed the current restoration plans, please pass this to the Editor.

Motorway History

February 2002 J. M. Carrington:
The Motorway Archive

Work is well advanced on the compilation of a national archive which records the design and construction of the motorway network in the UK, and when it is complete the nation will have a research resource equal to those which record the history of the waterways and railways of this country.

As John Carrington explained, the archive was the brainchild of Sir Peter Baldwin, a former Permanent Secretary to the Department of Transport and current chairman of the Motorway Archive Trust. Some 200 volunteers nationwide are involved in providing, collecting and collating data and the archive is subdivided into three main sections, namely: Policy; Standards and Technology; and Planning and Construction. Along with the storage of records, the archive will include learning packages for schools, a website, and ultimately the publication of a comprehensive 3-volume motorway history.

John Carrington's career was intimately connected with the motorway system in the Midlands, notably through his years of service with the Midlands Road Construction Unit based in Leamington Spa. As John pointed out, unlike some European countries, notably Germany with its 1930s autobahns, Britain had no previous experience of planning, designing and building a network of motorways. As a result, when in the 1950s work on 'a motorway system for the UK' began everything had to be started from scratch. As a result there was a long, sometimes painful, and occasionally a rather costly learning curve to be endured.

The history of motorway building in the UK is largely that of the second half of the 20th century, and while there are now some 2,000 miles in Britain that figure is still relatively small compared with say France and Germany. In fact, a recent report has described the current motorway provision in the UK as 'sparse and inadequate for the nation's needs'.

Drawing on his firsthand experience, John described some of the problems of motorway planning and construction in the Midlands, masterminded by the MRCU and covering eight different counties and the Birmingham conurbation, with its 3 million population.

He gave insights into many of the Midlands motorways, including the BNRR (Birmingham Northern Relief Road), and the ill-fated BWOR (the Birmingham West Orbital Route), together with the M40, which was the first motorway in the UK to be the subject of a public consultation exercise. When the intention to build any motorway is first mooted there is understandably immediate intense speculation as to its possible route, with all the implications that carries.

To the fore in such speculation is often the local Press which is eager to show that its has 'inside information'. In one instance, John said, a well-known Midlands paper even assigned a journalist to record the position of all bore holes being drilled, and then published a map purporting to show the intended route of the 'new motorway'. Unfortunately, this bore no relation to the actual route with the result that a number of residential areas were unnecessarily 'blighted' for a considerable time.

Using a PowerPoint computerised presentation (have colour slides had their day?) John showed some splendid shots of motorways and their bridges under construction. These including the M54 (for which no fewer than six public inquiries were needed); the M42 where many public inquiries were also necessary; and the world-famous Spaghetti Junction. When the latter was first opened, a leading Midlands newspaper thundered that, 'an ambulance should be posted permanently on each loop, to pick up the bodies'. In fact, the safety record of this most complex junction has proved to be exemplary.

* * *

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

L. F. Cave
24 Portland Street
Leamington Spa
Warwickshire
CV32 5EY
☎ 01926 425987

SECRETARY

M. J. Green
'Argyll' 2(b) Union Road
Leamington Spa
Warwickshire
CV32 5LT
☎ 01926 313782

TREASURER

M. W. Abbott
53 Stowe Drive
Southam
Warwickshire
CV47 1NZ
☎ 01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop
Peter Chater

Printing:

Martin Green \\
Warwick School

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Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ Autumn Programme
- ☉ Industrial Walks
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EDITORIAL

A constant source of surprise to me is just how much industrial archaeology there is in Warwickshire. I suspect that many outsiders' impression of the county is one of a rural shire and perhaps not the most likely place to find evidence of past industrial activity.

The truth is rather different of course. Both Birmingham and Coventry, once major industrial centres, were part of Warwickshire, while the rest of the modern county has evidence of industrial activity almost anywhere one cares to search; something that Peter Chater's industrial walks ably demonstrate. It is therefore disappointing to report below the apparent lack of interest amongst members for these short excursions. Each was a fascinating snapshot of our industrial heritage, as those who did attend will testify.

Mark W. Abbott

SOCIETY NEWS

A feature of the Society's programme for many years, have been evening walks in a local area with industrial connections,

usually led by Peter Chater. This year Peter elected to try a different approach and proposed a series of walks on Sunday mornings, at fortnightly intervals. At the time of writing, two of these have taken place, sadly with poor support from members.

The first walk saw five members meet on a beautiful late spring morning at Leamington's Victoria Park, for a walk to the Emscote area of Warwick, via the Leam riverside path and the Grand Union Canal.

En route, there proved to be many points of industrial interest, starting with the Princes Drive bridge over the River Leam; an early example of a concrete built bridge. At the Grand Union Canal both the aqueducts over the railway and the River Avon were studied, a peculiar feature of the former being that the railway falls from Leamington to go under the structure, before climbing again to cross the Avon. In the lee of the Avon aqueduct Peter pointed out an apparently insignificant ditch, all that remains of the tailrace from Emscote Mill. This mill, which was demolished some years ago, was unusual in that it used the overflow from the canal as its power source.

After traversing Tesco's car park, once the site of Emscote power station, the walk continued across Emscote Road to Charles Street. Here, the only evidence remaining of Nelson's Gelatine Works is the imposing brick-built social club. However, further up Charles Street are a number of concrete built houses, dating

from the latter half of the 19th Century and provided by Nelson's as worker's accommodation. Two more larger houses, of similar construction (provided for management?), exist on All Saints Road.

The canal was then regained by way of All Saints Road and the environs of All Saints Church, for the return to the start.

The second walk was preceded by an almost biblical deluge and was consequently even less well supported than the first, with just two members walking from Hatton Station, along the Grand Union Canal, to Shrewley and back.

This commenced with a look at the now unmanned Hatton Station, where Peter was once Station Master with no fewer than 19 staff! Then, after a hunt for GWR boundary markers in the hedge along the canal, the walk continued to Shrewley with a stop at the Shrewley Canal Tunnel. Here considerable time was spent discussing how horse and boat might be efficiently separated, there being no towpath through the tunnel. The evidence of an *in-situ* rubbing post on the horse path and a roller at the Birmingham end of the tunnel, supports Peter's theory that the rope remained attached to the horse while it traversed the horse path.

The return to Hatton Station was made by field paths. Fortunately the weather held!

Mark W. Abbott

Please see overleaf for advance details of the Society's new season of meetings.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2002 Anthony Coulls:

Power in Manchester

The sheer density and variety of industries which sprang up in the North-west region of the UK during the industrial revolution and thereafter meant that it was an extremely important area for the development and application of all types of power units. It is entirely fitting, therefore, that the Museum of Science and Industry in Manchester should have what is possibly an unrivalled collection specifically dedicated to 'Man's use of power'. And it was the good fortune of WIAS to have Anthony Coulls, the Curator of Energy at that very Museum, as the speaker at its March 2002 meeting.

Anthony covered the entire field of Man's efforts to apply power to manufacturing, from early wind and water mills to the most advanced turbines, but understandably his main focus was firstly on steam engines, then on oil and gas engines, and finally on the generation and application of electricity. The Museum's collection of historic, restored, and most importantly *working* units in each of those fields of technology is most impressive, and as a resource both for research and for the enlightenment of the young it can have few rivals in the UK.

The museum and its exhibits are designed on the interactive pattern which is increasingly popular today, with an emphasis on 'working' as distinct from 'static' exhibits. Considerable effort has also been put into explaining the operating principles of each type of power unit. Using an excellent set of slides, Anthony in effect led us through the Museum, from early water wheels to a 1/3rd scale model of a Newcomen atmospheric engine, and onwards through oil, gas and internal combustion engines in general to examples of large high-speed steam turbines. In this journey it became apparent how many engine-building companies once flourished in the UK in general, and in the North-west in particular, and just how important a part they played in the development of all types of industrial power units.

The technological advances made by these engine-builders were frequently driven by the users of power themselves, who were based virtually on their doorsteps and who constantly clamoured for engines with greater output to drive more and more machines in larger and larger factories. Not least, the textile mills of the North-west were massive consumers of power and, as Anthony remarked, the size of those mills, the numbers of machines installed in them, and the thousands of workers they employed, are difficult to imagine today. But not all

engine development was aimed at horsepowers measured in the hundreds.

Anthony showed, for example, a slide of a tiny single-cylinder steam engine designed to drive an equally small dynamo which was installed in one corner of a shop window. The engine and dynamo provided just enough electricity to light the bulbs which illuminated the shopkeeper's display of goods. This was groundbreaking 'marketing' in its time and must have drawn the crowds!

Anthony's presentation went on to cover hot-air engines, the generation and storage of Town's gas, early means of generating electricity, and finally he touched on hydraulic power. For over 100 years, the city of Manchester had a hydraulic 'ring-main' carrying water at a pressure of 1,100 psi through thick-walled underground cast iron pipes. Manufacturing companies could literally plug-in to this main and use the hydraulic pressure as motive power. The system itself is long since out of use, of course, but the pipes are still *in situ* and today have been 'rediscovered'. They are being put to use for carrying cable TV!

New Season Programme

Looking forward to September 2002 and the new season of meetings, the following speakers have been booked:

12th September 2002

Roger Cragg: *The Stratford to Moreton Tramway.*

10th October 2002

Charles Catt: *Why Roads Exist.*

14th November 2002

Dr. John Bland: *Coal Mining in North Warwickshire.*

12th December 2002

Paul Howells: *Restoring the Royal Pump Rooms, Leamington Spa.* To be confirmed.

9th January 2003

Peter Coulls: *A Look at the History of Fairground Machines.*

13th February 2003

Anthony Grantham MBE: *Gas Making* To be confirmed.

A full programme for the 2002/2003 season of meetings will appear in the September 2002 edition of this Newsletter. A number of dates currently remain vacant, so suggestions of potential speakers remain welcome. Please pass details to a member of the committee.

Nineteenth Century Roadbuilding

April 2002 Jo Bell:

Thomas Telford's Holyhead Road

A long walk, mostly in the rain! That was how Jo Bell described the exhaustive survey which she and a colleague undertook, in 1998, of the 83-mile stretch of Telford's Holyhead Road which traverses east/west across Wales. Telford is recorded as having expressed the wish that this road, built between 1811 and 1824, should be his 'memorial' and it is undoubtedly one of his masterpieces.

To set the scene, Jo sketched in the general parlous state of Britain's major roads at the time when they were built by private venture, for private gain and with private vested interests having a marked influence on the routes they took. It was only at the beginning of the 19th century when, for political, economic and military reasons, the Government started to take an interest in road routes and their construction that things began to change for the better.

Telford planned his roads, and the Holyhead Road was no exception, on rational routes ignoring (if not actually riding roughshod over) vested interests, and introducing tight control over design and construction. Under Telford's management, the Welsh section of the route for the Holyhead Road was divided into discrete blocks of varying lengths but of approximately equal work content.

These blocks were bid for by contractors who, once they had won a contract, came under continuous scrutiny for adherence both to specification and to start and finish dates. Telford's 'site inspectors' were empowered to order contractors to tear up and remake, at their own expense, any stretch of road which fell short of specification. Quality control, as we would know it today, was imposed on all aspects of construction, including the use of gauges to monitor the sizes of the aggregates used.

Telford could impose such tight specifications because he had Government money behind him, and he also had at his disposal the craft skills and the technology (i.e. sheer blasting power!) to follow his chosen route and simply force the road through any obstacles which lay in its path. Gradient control was very important to Telford, and he aimed never to exceed an incline steeper than 1 in 30. At various points along its route, the road had to cross water, and traversing the Menai Straits was probably Telford's greatest challenge. The suspension bridge he designed to span the Straits, which was the largest of its type at the time, was built between 1824 and 1826.

Jo showed a number of excellent slides taken during her survey in which even parts of Telford's original constructions could still be seen. Also still to be seen are some of the Telford-designed toll houses on the road, together with smaller items of road furniture such as 'sunburst' gates and his standard pattern of milestones. Jo announced that the complete survey of the Welsh section of Telford's Holyhead Road will be published in book form later this year.

The April meeting concluded with short contributions from two WIAS members, namely Roger Cragg and Martin Green. Roger gave an account of an organised visit to various industrial archaeological sites in Limerick. He touched on the canal from Dublin to Shannon; the Barrington Bridge built in 1818 and featuring some interesting wrought-iron tubular construction; and a hydroelectric power station built in 1929 by Siemens Schukert and fed by water with a 100 ft head. This station at its peak supplied 80 per cent of Ireland's electricity. Other sites described by Roger included Limerick Docks and the Foynes flying-boat terminal and rail head.

Finally, Martin Green described a short visit to Londonderry, showing pictures of the 'walled city', the route of the Bloody Sunday March, and some poignant shots of the city's now silent flax mills which, at one time, employed many thousands of workers.

Society Library

Members are reminded that the Society is an affiliated member of The Association for Industrial Archaeology. This entitles the Society to receive a copy of the AIA's publications; the biannual *Industrial Archaeology Review* and the quarterly *Industrial Archaeology News*. These are held by the Treasurer and are available to members on request.

Those with a general interest in IA may find the journal *Archivemore* to their taste. This is picture led and the current edition (Issue 34), includes an article on the Argyll Motor Works; a description of the Bude Canal and the second part of a two instalment look at the Cardiff (Llanishen) Royal Ordnance Factory. Again, the Society subscribes to this publication and copies may be borrowed through the Treasurer.

Regrettably, for logistical reasons, it is not possible to formally offer the loan of these journals at meetings.

IA in Northants

February 2002 **Geoffrey Starmer:**
Industrial Archaeology in Northamptonshire

With a history to date of at least 40 years, the Northamptonshire Industrial Archaeology Group (NIAG) must be one of the strongest and most vigorous in the Midlands and, as such, is both an example and an inspiration to others in the region. Its range of activities, and the authoritative position it has established, were vividly described by Geoffrey Starmer, a stalwart of NIAG and an enthusiast for all aspects of IA.

Indeed, Geoffrey's enthusiasm illuminated his coverage of every aspect of IA which has been tackled by his Group, including the iron ore industry, footwear, transport (road, rail, canals), the utilities, breweries and foundries. The iron ore industry, centred around Lamport, Brixworth and Scaldwell, was once of major significance to the County and Geoffrey had a number of slides showing workings when it was at its height. These included an extensive pylon-supported ropeway by which the ore was carried over long distances, high above ground, to processing plants. Narrow-gauge railways and blast furnaces also featured in his slides.

The boot and shoe trade has been of great importance to Northamptonshire and Geoffrey had a series of slides showing practices in that industry in its early days, when everything was carried out manually by skilled craftsmen working in what were, by today's standards, Dickensian conditions. Some of those practices, moreover, prevailed until well past the middle of the 20th century, must have constituted a Factory Inspector's nightmare, and may have contributed to the industry's subsequent decline. The shoe industry was originally based primarily on 'out-workers', labouring away in their own homes, and it was not in fact until 1857 that the first 'shoe factory' proper was built. Some of the slides showing skilled workers making the uppers for surgical shoes from hand-drawn 'brown paper patterns' were fascinating.

Northamptonshire has a long history of brewing

and at one time there were no fewer than 10 breweries in Northampton town alone. The same was also once true of the iron foundry industry in the County, of which slides of pattern-making, moulding and iron-melting cupolas were shown. Today one foundry alone survives.

In the field of 'utilities', Geoffrey concentrated on Northamptonshire waterworks and showed some splendid slides of beam engines, filter beds, pumping stations, the Ravensthorpe reservoir and the 1868 Castle Ashby water tower. The latter, incidentally, was scornfully dismissed by Pevsner as being of 'little interest', but today is cherished as a splendid example of well-designed and executed 'waterworks' architecture.

Finally, Geoffrey turned to transport where his County, in the famous Watford Gap area, has a unique juxtaposition of the old and the new in the shape of Roman roads, canals, railways, and 20th century motorways all competing for the attention of the industrial archaeologist. Aerial photographs of the area, showing the splendid brick-built ventilation shafts of the Blisworth tunnel from an angle rarely seen, were included.

An important point for NIAG came in the 1990s when a County Sites and Monuments Officer was appointed, and the Group recognised that its procedures had to be revised and its activities needed to become more 'professional'. This has been achieved, and today some of its enthusiastic 'amateur' workers have even moved into the laptop era!

ADVANCE NOTICE OF THE AGM

The AGM of the Society will be held on Thursday 11th July at 7.30 pm. Some changes to the committee are anticipated, so the attendance of all members is requested.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

L. F. Cave
 24 Portland Street
 Leamington Spa
 Warwickshire
 CV32 5EY
 (01926 425987

SECRETARY

M. J. Green
 'Argyll' 2(b) Union Road
 Leamington Spa
 Warwickshire
 CV32 5LT
 (01926 313782

TREASURER

M. W. Abbott
 53 Stowe Drive
 Southam
 Warwickshire
 CV47 1NZ
 (01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Toby Cave

Printing:

Martin Green \

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Industrial Archaeology Society

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THIS ISSUE

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- ☉ 2002 / 2003 Programme
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CHAIRMAN'S MESSAGE

I felt that I could not let this issue of the Newsletter pass without officially recording the Society's – and my own – gratitude to my predecessor as Chairman of WIAS, Mr. Toby Cave. Toby has been the guiding light of the Society since its formation in 1989, working tirelessly to raise the profile of industrial archaeology both locally and beyond, taking responsibility for securing speakers for the monthly meetings, and making his own personal contributions to the recording of the industrial history and industrial archaeology of Warwickshire. I was delighted that he was willing to accept the position of President of WIAS, and we look forward to his continued influence on the Society.

The new committee is made up of the President, the Chairman, the Secretary – Mr. Dennis Crips – and the Treasurer – Mr. Mark Abbott, with the approval of the AGM to co-opt further members. The first decision taken at the recent meeting of the new committee was to issue a members' survey to

ensure that all our information about members was accurate and up-to-date, to discover whether there were any members willing to make a fuller contribution to the work of the Society, and to seek members' views on the future development of the Society. The members' survey is distributed with this Newsletter, and I do hope you will be able to complete this in the near future.

I very much look forward to my new position as Chairman and sincerely hope that the next twelve months will be a happy, busy and successful time for the Society and its members.

Martin Green

SOCIETY NEWS

Subscriptions

Members are reminded that following the agreement of the AGM to retain subscriptions at their 2002 / 2002 levels, these are now due. The amount is £10.00 per person inclusive of partner. A further £1.00 per person is payable at each meeting to help meet the cost of refreshments. Please make cheques payable to Warwickshire Industrial Archaeology Society. To save on postage costs, any payments received by post will be acknowledged by receipt at the subsequent meeting.

Programme

A full programme for the forthcoming season is set out on the back page of this Newsletter. Once again this represents the sole work of the retiring Chairman, Toby Cave, to whom our thanks are due. Two

meetings await confirmation of a speaker and members will of course be advised of developments.

With the election of Martin Green as Chairman at the AGM, responsibility now passes to him for the organisation of the programme. As ever, suggestions of potential speakers are welcome; all the more so if you have personal experience of their ability.

John Turner Festival

The Society has been invited by Southam and District Lions Club to appear in the Hobbies Section of the 2002 John Turner Festival. This will take place at Southam College, Welsh Road West, Southam, on the 1st and 2nd November 2002. Opening times will be 6.00pm to 9.30pm on Friday 1st November and 10.00am to 5.00pm on Saturday 2nd November.

Members Survey

As the Chairman noted in his opening message above, the committee has agreed to issue a members survey form with this edition of the Newsletter. A principal aim of this survey is to update the Society membership records. Currently the membership database contains around 60 names, many of which lack corresponding telephone numbers and e-mail details. In particular, the committee is keen that the Society has an up-to-date e-mail address for all members who have a one, as this is a quick and economical means of communication.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

June 2002 Roger Cragg:

The Stratford to Moreton Tramway

At the June meeting, the scheduled speaker was unavoidably prevented from attending and Roger Cragg came to the Society's rescue. At a mere six-hours notice, Roger was able to bring forward his talk on the Stratford to Moreton Tramway (originally programmed for September 2002), and produced one of his highly professional presentations.

The story of the Stratford to Moreton Tramway started in the early 19th century when William James conceived the idea of a rail connection between Stratford-upon-Avon and London (no less). The 16-mile stretch from Stratford upon Avon to Moreton-in-Marsh, with a branch line to Shipston-on-Stour, was to be the first link in this highly ambitious project. As it happened, it turned out to be the *only* link in the project! James got permission to go ahead but only on condition that where his line ran close to the turnpike road 'no steam locomotives would be allowed!'. Since approximately the first third of his proposed route did precisely that, this was an onerous condition by any standards, and one with far-reaching consequences. Motive power was consequently restricted to horses, which also meant that conventional sleepers could not be used and each rail chair had to be set on its own square stone block. Very many thousands of these blocks were needed to build the line, and astonishingly Roger discovered one, in the undergrowth, and has a colour slide to prove it.

Work on the tramway started in 1824. Wrought iron rails in 15-ft lengths were laid at 4-ft 8 1/2-inch gauge, with the chairs at 3-ft spacing. Between each pair of chairs, the rail had a fish-back profile on its underside. Eventually it became clear that the original estimate of around £35,000 to build the line was inadequate and that another £11,000 would be needed. (*Plus ça change...!*) Two shareholders alone then bravely donated £5,000 each, to make sure the line was completed, and in 1826 it was officially opened. The branch line to Shipston-on-Stour, however, did not materialise for another 10 years.

Following canal practice, any carrier was allowed to use the tramway provided he had wagons of the appropriate gauge, complied with the Company's rules and regulations and, of course, paid the statutory fee. The track was single-line, with passing places at 1/4 mile intervals, and a post was placed at the precise midpoint between each pair of passing places so that there should be no argument as to who should back-off! Predominantly used for

transporting freight, the line typically carried coal, Cotswold stone, lime etc, and the maximum load per wagon was set at 4 tons. By 1853, there was also some passenger traffic, and the journey time from Stratford to Moreton-in-Marsh was a mere two hours!

In a series of slides, Roger highlighted items testifying to the existence of the tramway which can still be seen to this day, including bridges, junction houses, residual track routes and so on. In 1854, the line was leased by the Oxford, Worcester and Wolverhampton railway, and in 1858 passenger services on the line ceased. In 1863, the OW & W line was taken over by GWR, and in 1869 the original tramway company was finally wound up.

To conclude the June meeting, Toby Cave gave a short paper on 'historic concrete structures', illustrating the use of unreinforced concrete in an extremely wide range of applications, from the production of classical statuary and decorative items to a wide variety of buildings. With an excellent series of slides, Toby covered the uses of this very versatile material from lighthouses to viaducts, from humble dwellings to mock castles, and from stately homes to follies. Examples included as widely disparate structures as the 1870 Marine Crescent in Folkestone, a 21-span viaduct in Scotland, a mock-Elizabethan manor in Wales, a 65-metre high tower in the New Forest and a group of Norman Shaw-designed houses in Croydon.

Toby's talk was by way of a trailer to the more extensive one on the Warwickshire Cement Industry which he subsequently presented in July, following the formal business of the Annual General Meeting.

Industrial Archaeology Journal

Thanks to the generosity of Huw Jones, Coventry's Keeper of Industrial History, the Society has been donated a run of the Industrial Archaeology Journal from Volume 1 (1965) to Volume 16 (1981). Although undoubtedly much of the content will now be rather dated, a glance at the accompanying bound index reveals many articles of possible interest to members. This index will be available for inspection at Society meetings and members who wish to borrow copies of this Journal should advise Toby Cave of the relevant dates.

Unfortunately, because of the number of journals involved and the difficulty in keeping track of borrowings, it will not be possible to have the entire collection at meetings for members to browse.

Local Lime and Cement

April 2002 Lyndon Cave:

The Warwickshire Cement Industry

Even before the era of universal DIY, and certainly after it, there can be few people who have not at some time or other found themselves wielding a shovel and following the classic recipe of 'three of sand and one of cement'! From the traditional one hundredweight paper sack (of which only one third was usually used, leaving the remainder to set solid!), to the dainty 1 kg plastic bag of 'readymix' we have all used the stuff, with probably few of us realising that the Romans in their time were doing likewise with a not dissimilar substance.

Since the early 18th century, our County has been a major producer of cement and it was the development of that industry in Warwickshire which Lyndon Cave traced in his address to the July meeting. The origins of the industry in Warwickshire lay first in lime workings, with clusters of kilns around the Arbury Estate and Chilvers Coton being recorded in 1746. Twenty years later kilns were also springing up in the Long Itchington area and by 1800 both lime and cement production were also thriving in the Stockton/Southam areas, with the industry largely controlled by Warwick businessmen with premises near the canal.

Of immense significance to the growth of the industry was the Stockton blue lias ridge, and soon powerful business men like John Tomes and Charles Handley began to appear as important figures in lime and cement production. In the first quarter of the 19th century John Greaves was another powerful player, by which time Southam was already one of the most important areas in the UK for lime and cement production. By that time also, the first patent for 'artificial cement' had been granted to one James Aspdin, now widely acknowledged as the originator of Portland Cement. As often happens with a new technology or process, the military soon became interested and in the 19th century the Royal Engineers played a very important part in the development of cement.

The Midlands canal system as a means of transportation of cement and limestone was crucial until towards the end of the 19th century, when the railways took over, but it is interesting to note that some working boats were still being used to carry cement as late as 1940.

In 1910, the first 'combine' of 32 British companies involved in cement production was formed, and such an important industry inevitably had its industrial relations problems. In 1924, a strike of cement workers demanding 1/4d per hour

rise and a seven day annual holiday brought the industry to a standstill. However, the employers stood firm against this outrageous demand, and the strike collapsed.

Lyndon concluded by sketching the history of the industry in Warwickshire in the late 20th century, when once mighty groups like RPCC began to show the signs of distress which led to take-over battles and finally, in 2000, to the acquisition of Rugby Cement by the Australian Ready Mixed Concrete Company.

All the w's.... Parys Mountain Website

Members who read the short piece on the copper mines of Parys Mountain in the September 2001 edition of the Newsletter, might like to visit www.parysmountain.co.uk; the homepage of the *Parys Mountain Underground Group*. Here, the link 'Go Underground' gives access to a comprehensive body of information on this industrial site of world importance.

There are pages devoted to the location, history and unusual geology of the area. Further pages detail how the ore was processed, the use of steam power and the locations of the various steam engines on the mountain; together with photographs of the engine houses in the past and now. All 163 known shafts and adits are described, located with six or eight figure grid references and for the majority, modern photographs are provided. This information is also available to download as a text file for those who wish to study the remains in the field.

Perhaps of more interest to members, given the distance of this site from Warwickshire, are the illustrated Virtual Tours. These give an excellent impression of the important mining features and the surreal landscape of the mining ground.

There is also a link to the informative sister website of the Amlwch Industrial Heritage Trust.

As a whole, this website is a superb example of the positive aspect of the Internet. A bonus is that it presents industrial archaeology in an interesting and accessible manner. Yes, the design of the site may be a little fussy for some tastes and a number of the images suffer from heavy compression, but these are minor points in the face of the sheer wealth of information provided. This is almost as good as visiting the mountain itself and even those familiar with the locality will find something new here.

Mark W. Abbott

Programme 2002 / 2003

2002

Thursday 12th September

Peter Lee: *Railways in the Warwickshire Coalfield.*

Thursday 10th October

Charles Catt: *Why Roads Exist.*

Thursday 14th November

Dr. John Bland: *Coal Mining in North Warwickshire*

Thursday 12th December

Paul Howells: *Restoring the Royal Pump Rooms, Leamington Spa.*

The majority of time at these meetings is occupied by our speaker, followed by refreshments and a subsequent period for questions and follow up material. The final part of the meeting is then usually taken up with a brief contribution from one of our members, often concentrating on an aspect of the industrial archaeology of Warwickshire. We are always keen to have contributions from members or visitors – do not be afraid to put yourself forward for one of these presentations. Occasional additional events will also take place during the year, and members will be duly notified of these.

Please note that this programme may be subject to change without notice. If you are particularly interested in a specific speaker and subject, it is recommended that confirmation of that meeting is sought from a member of the committee.

2003

Thursday 9th January

Peter Coulls: *A Look at the History of Fairground Machines.*

Thursday 13th February

Speaker and Subject to be Confirmed.

Thursday 13th March

Huw Jones: *Coventry's Engineering Heritage.*
To be Confirmed.

Thursday 10th April

Alan Cooke: Subject to be Confirmed.

Thursday 8th May

Peter Cross-Rudkin: *Some Warwickshire Eighteenth Century Engineers and Their Work.*

Thursday 12th June

Speaker and Subject to be Confirmed.

Thursday 10th July

Annual General Meeting, followed by Lyndon F. Cave: *Brickmaking in Warwickshire*

WIAS Meetings

Meetings of the Society are held on the second Thursday of each month in the Sixth Form Centre at Warwick School, Myton Road, Warwick, starting at 7.30pm. A map of how to find the Sixth Form Centre at Warwick School is available from the Secretary. Visitors should park in the Junior School / Sports Hall car park. The Sixth Form Centre is next to the car park.

Subscriptions 2002 / 2003

£10.00 per person (or couple).

Cheques payable to Warwickshire Industrial Archaeology Society please.

An additional payment of £1.00 per person is due at each meeting to meet the cost of refreshments.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road
Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

SECRETARY

D. M. Crips

27 St. Nicholas Church Street
Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive
Southam

Warwickshire

CV47 1NZ

(01926 813155

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Martin Green

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Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ A Mystery Photograph
- ☉ Another Brick Kiln
- ☉ Further Afield

EDITORIAL

This copy of the Newsletter sees a slight change in layout compared with previous editions. The reason is the absence of the booked speaker from the September meeting, a vacancy admirably filled by the new Chairman, Martin Green, at the last minute. As his subject, Martin took the Industrial Archaeology of Warwickshire and gave a broad summary of some of the important sites in the County, followed by a video of hat-making in Atherstone. He also shared with the members some thoughts on how he would like to see the Society develop over the next few years.

Rather than going over what to many is probably familiar territory, the space allocated to the meeting report has been given over to a piece about the Lincolnshire Aviation Heritage Centre written by John Willock. This has a local link, since the Avro Lancaster that forms its centrepiece was built at Longbridge.

However, as John points out there is far more to the museum than this one aircraft. In my

opinion it is probably one of the finest aviation museums in the country. The atmosphere is tangible and the supporting displays are on the one hand fascinating, yet poignant and moving, bringing home the terrible loss of life endured by Bomber Command during WW2.

This area of Lincolnshire is, after all, what came to be termed bomber country. East Kirkby was just one of many operational Bomber Command airfields in this region. Both 57 Sqn, and later 630 Sqn, operated from East Kirkby for about 18 months. Both flew Lancasters, largely on night raids over Europe. The chapel, reconstructed as part of the museum, illustrates the human cost. The side walls are lined with column after column of names in gold leaf; the members of 57 Sqn and 630 Sqn who died on active service while stationed at East Kirkby. There are over 400.

Details of the museum are appended below and I would recommend a visit. It is well worth the long journey, especially if the Lancaster is performing a twilight taxi. There is nowhere else in the UK that one can get so close to a living piece of aviation history.

Mark W. Abbott

CONTACT:
The Lincolnshire Aviation Heritage Centre, East Kirkby Airfield, East Kirkby, Near Spilsby, Lincolnshire, PE23 4DE. Telephone: 01790 763207 Email: enquiries@lincsaviation.co.uk Website: www.lincsaviation.co.uk

The museum is open all year round apart from the Christmas holiday period. Opening hours vary depending upon the season. Specific opening times and details of any special events, such as the twilight Lancaster taxi displays, are available from one of the above sources.

SOCIETY NEWS

Fenny Compton Tunnel

The current edition of *Industrial Archaeology Review* (Volume XXIV, Number 2, November 2002) sees the publication of John Selby's research into the erstwhile Fenny Compton Tunnel on the Oxford Canal, and its associated brickworks. The account covers the construction, and opening out in stages, of the tunnel and the establishment of a brickworks to utilise the clay spoil. The text is supported by some excellent diagrams and both period and contemporary photographs.

The Society is of course an Affiliated member of the AIA and so receives a copy of the *Review* that members may borrow. If you do not personally subscribe to the AIA, but wish to read the article, please speak to the Treasurer.

Members Survey

The response to this has been a little disappointing, with a slightly less than 50% reply rate. A prime aim of this exercise was to update the Society's address database, so please complete the form so the records can be brought up to date. Also, any suggestions of potential speakers would be most welcome.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

October 2002 Charles Catt:

Why Roads Exist

Britain got its first roads because, as is so often the case, it was the army which needed them! In short, it was the Romans and their determination to get their occupying troops from A to B as quickly as possible (to put down the recalcitrant natives!), who saw to it that the first hard surfaces were laid down in this green and pleasant land. And it was from that starting point that Charles Catt, at our October meeting, began a most interesting talk on the development of roads in the UK.

Charles spent a major part of his career in the Highways Department of Warwickshire County Council, so he was able to relate much of his talk to roads with which we are all familiar. Major landmarks in road construction in the Midlands to which he referred included the Fosse Way, Watling Street and Icknield Way. In the South, the road from London to Dover, and thus to a channel port, was another vital route.

As a cross-section of the construction of a typical Roman road showed, the need for a 'cambered' surface which shed water to either side was already well understood. Unless the water could be shed efficiently, into ditches at either side, the tramp of countless legions would soon reduce the road to a muddy morass. And indeed, as Charles explained, water and its almost unstoppable power to penetrate remains to this day the single most common cause of damage to roads.

When the Romans left these islands, the roads they had bequeathed us progressively deteriorated and road construction, as we understand it today, did not really start until the 1800s. In fact, road construction proper in Britain started with Thomas Telford (1757-1834) and Robert McAdam (1756-1836), and their pioneering work on basic road construction and road-surfacing respectively remains unparalleled to this day. Showing a cross-sectional drawing of a modern road, Charles identified the many layers required, starting with the deep sub-base (which rests on natural soil), and including successive layers comprising the base proper, the binder and finally the carriageway surface itself. The principal constituents in road making today are stone, sand, filler and bitumen.

The discovery of North Sea oil and natural gas had an unforeseen consequence for Britain's road builders. Traditionally it was tar, a by-product of town's gas, which was used as a binder on top dressing of roads. But with the advent of natural gas, and the progressive closure of gasworks, tar first

became scarce and then disappeared. Bitumen was its replacement, but the properties of bitumen are quite different from tar and road builders had to learn a whole new technology. Unfortunately, bitumen is not as 'sticky' as tar but, on the plus side, it is not, like the latter, carcinogenic.

Charles quoted some figures for the weight of materials required for making various types of road. For the very simplest hard surface on which a vehicle can be driven (i.e. a drive), 1 ton per sq metre is needed, for an estate road 1.5 ton is needed, and for a motorway it rises to 2.5 ton per square metre. Most of us from time to time have complained bitterly about the state of our roads, but Charles put the problem neatly in perspective with his last slide. This showed a large water-filled 'pothole' in a metalled road in an unidentified third-world country alongside which sat a man.....fishing!

A MYSTERY

Thanks to David and Thelma Gee, I have recently been able to scan a couple of old photographs of the local lime and cement industry. Both reputedly show workers from the Blue Lias works of Greaves, Bull and Lakin. This was alongside the canal by the *Blue Lias* public house, between Stockton and Long Itchington. The site is now occupied by Dowdswell Engineering. This works was also known locally as *The Cally*, Cally being a corruption of California, the original name of the *Blue Lias* perhaps?

The more recent of the two pictures contains a slight mystery. It shows a gang of workmen posed in a works setting, one of whom is holding a roughly chalked sign on which the words *Silent Ones* and *Rotary 1923* (or possibly *1928*) are just visible. This presumably refers to the gang's work location or job, but just what this job was, is not clear.

My best guess is that *Rotary* refers to either the rumpers which screened the quarried rock to remove the unwanted clay, or to the crushers used both to reduce the limestone to a fine powder suitable for the kiln and to mill the kiln output, known as clinker. These processes would have been very noisy and any supervising men could only have communicated by hand signs or lip reading and thus might have been known as *Silent Ones*. However, it must be stressed that this is only conjecture. A more reliable explanation would be very welcome.

Mark W. Abbott

Warwickshire Coal Mining

November 2002 Dr. John Bland:
Coal Mining in North Warwickshire

A splendid pictorial pageant of an industry which once dominated a large section of our County, and indeed became a way of life for many thousands of families, was unrolled at the November meeting by Dr John Bland. Dr Bland was a GP in the Arley area for over 40 years and as a consequence had intimate contact with the coal mines of north Warwickshire, the miners themselves, their families and their daily lives. Over those years he painstakingly amassed a very large number of pictures, maps, drawings and anecdotes of practically every aspect of the mining industry in the midst of which he practised, and consequently was able to present a fascinating story of an activity and a way of life which so swiftly came to an end in the 1980s.

Dr Bland started by showing a map drawn by Bateman in about 1600 AD on which the sites of a number of primitive pits in north Warwickshire were included. He touched on early mining methods, including the bell-pit used in outcrop working, the adit mine, and the 'dig a bit, leave a bit' method where natural pillars of coal and rock were left as roof supports. Early mining practices, which included the employment underground of women and very young children, were also described.

The North Warwickshire coalfields saw some of the earliest applications of Newcomen atmospheric engines and later of Boulton & Watt steam engines. Around this time the names of Warwickshire collieries also began to gain fame and prominence, including Griff, Bedworth, Hawkesbury, Exhall, Newdigate, Binley, Arley, Dawe Mill and, of course, Coventry. Dr Bland had some fine slides of many of these pits and the men who managed and worked them. Inevitably, from time to time, there were pit disasters and other slides showing scenes around the pitheads, and the early rescue squads with their primitive breathing apparatus of the time, were grim reminders of the real price which was paid for coal.

Fathers, sons and grandsons followed each other successively into working in the pits, and the infrastructure which gradually grew up around the collieries and their workers, to meet their needs and those of their families, included hospitals, schools and a very wide range of social and cultural activities. Religion also played an important part and many churches, chapels and organizations such as the Church Army and the Boys' Brigade, flourished mightily. To many of these movements, including the brass bands, the colliery owners were substantial benefactors with gifts of land, or money, or both. In

fact, when one by one the mines closed the loss of this support was felt as keenly on the social and cultural levels as it was in terms of employment.

In addition to his talk and slide presentations, Dr Bland also mounted an exhibition of maps, photographs, models of engines and wagons, and mining memorabilia which added even further to the interest of a very successful evening.

ANOTHER BRICK KILN

An Imaginary Conversation with a Donkey

I met this donkey in a small paddock at Norton Lindsey. He was very proud of his surroundings and home, and kindly invited me to look over his little bungalow.

It was a building of substantial brickwork with battered outside walls and on entering this cosy single room of about 15'x 9', one noticed it had been well heated as there were the remains of twelve fireplaces and to prove they had at one time been used there was vitrified brickwork above them. The donkey commented that he much preferred his new corrugated iron roof to the old brick one as it was safer and kept him so much drier, he also liked his new concrete floor as it was so very easy to keep clean. He also loved his little sunken paddock (former clay pit), which protected him from the winds and is now covered with luscious grass.

I asked if he would reveal his address to me so I could write a 'thank you' letter and others could come and see him. He said it had a name and a very long number, which he kindly gave. The Brickyard, Curlieu Lane, Norton Lindsey. O/S Grid Reference SP 222635.

This kiln and old clay pit are visible from the roadside gateway.

Peter Chater

This brings the number of extant brick kilns in Warwickshire, known to the Society, to three: Fenny Compton Tunnel; Elms Farm, Bishops Itchington and now Curlieu Lane, Norton Lindsey. Do any members know of others that may be added to the list?

A site that I have recently discovered is Toft Cottage Farm, Toft, just south of Dunchurch on the A426. There is no kiln now, but an obvious claypit remains, together with a two-storey house that was originally an office or workshop according to a contact I made at a Local History Fair in Coventry.

Mark W. Abbott

Further Afield

The Lincolnshire Aviation Heritage Centre

by John Willock

This very interesting museum, which is situated on the site of a former RAF wartime airfield, was set up by the Panton brothers, Fred and Harold, to commemorate their brother, Christopher, who was killed whilst flying on operations with Bomber Command in 1944. The Heritage Centre is also dedicated to the memory of service personnel of No's 57 and 630 Squadrons, who operated from East Kirkby during the war.

The Pantons have re-created at East Kirkby all the atmosphere of an operational wartime Bomber Command airfield, complete with original, fully equipped Control-Tower, NAFFI, Huts, Air Raid Shelter, Hangar and Chapel. Housed in the museum are extensive collections of memorabilia relating to the RAF Escaping Society, together with the remains of many aircraft and artefacts found on various excavations carried out by the Lincolnshire Aircraft Recovery Group. Also displayed is a genuine Bouncing Bomb, designed by Barnes N. Wallis. It is similar to those used on the famous Dam Raid, although the example exhibited is a practice bomb, retrieved from the sea at Reculver, in Herne Bay.

Centrepiece of the museum is Avro Lancaster B Mk VII, NX611, *Just Jane*. This aeroplane was built by Austin Motors at Longbridge, Birmingham, in April 1945, and therefore is quite a late wartime Lancaster. One of a batch of 150 machines built to Far Eastern Tropical standards, NX611 was intended for use in the Pacific theatre of operations. However, the war ended before it could be deployed and the aircraft had a very chequered service career, including maritime reconnaissance use in the Pacific with the L'Aeronavale. It finally ended its operational life in August 1964 at Bankstown, Sydney, Australia.

At about this time a number of individuals started to take an interest in the aeroplane with a view to securing its preservation. NX611 was eventually flown back to the UK, to what was to be a rather

uncertain future. After spending time in various locations and appearing at a few air displays, NX611 ended up at the Squires Gate, Blackpool, Aviation Museum where, in poor condition, the aircraft was eventually offered for sale by public auction. The outcome was unsuccessful and the aircraft remained unsold, failing to reach its reserve price of £12,000. Eventually the owner of NX611 offered the machine on extended loan to the RAF, and after some conservation work she became the Gate Guardian at RAF Scampton in 1974. In September 1983 the Panton brothers bought the aircraft, although it remained for another five years in RAF custody, before being removed from Scampton to East Kirkby.

Just Jane has undergone a considerable amount of conservation work since her arrival at East Kirkby. This has primarily centred on bringing the aircraft up to a ground engine-running standard. The four Rolls-Royce Merlin 24 engines have all been refurbished and can be run at full-power for public demonstration purposes. Some tail-up taxi runs have also been performed, during filming of a BBC drama production in the early spring of 2001. The writer of this report, together with his son, were fortunate on the 19th October to be aboard *Just Jane* during one of these ground-running and taxiing sessions at East Kirkby; a tremendous experience. On the same evening the machine's engines were again run-up in front of an enthusiastic crowd. It was an amazing sight to see jets of blue flame, and occasional showers of sparks stabbing the darkness, from forty-eight Merlin exhaust stubs. An altogether unforgettable experience; a true working museum of the twentieth century, and an absolute must for all aviation enthusiasts.

Errata

The meeting report heading which reads *April 2002*, in the September edition of the Newsletter, should read *July 2002*.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Peter Chater John

Willock

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- ☉ Meeting Reports
- ☉ Leamington Gas
- ☉ IA Recordings
- ☉ Programme to July 2003

EDITORIAL

This year, 2003, marks a significant anniversary in technological achievement. On 17th December it will be 100 years since Orville Wright first achieved flight in a powered heavier than air machine; at 10.35 am on 17th December 1903, at Kill Devil Hills, Kittyhawk, North Carolina. It may only have been a 120 ft, 12 second flight, and it is unlikely that Wilbur and Orville Wright could have foreseen the implications of their achievement, but that flight set in motion aeronautical research and development that led to the aeroplane becoming a key component of the modern global economy.

The original Wright Flyer is now in the Smithsonian Institute Collection, accompanied by the following on a descriptive plaque:

“THE ORIGINAL WRIGHT BROTHERS AEROPLANE: The world’s first power-driven, heavier-than-air machine in which man made free, controlled and sustained flight invented and built by Wilbur and Orville Wright; flown by them at Kitty Hawk, North Carolina December

17, 1903. By original scientific research the Wright Brothers discovered the principles of human flight. As inventors, builders, and flyers they further developed the aeroplane, taught man to fly, and opened the era of aviation.”

Warwickshire industry, of course, once played an important part in aviation, although sadly this is no longer the case now the technology has become the preserve of giant industrial corporations. That part was, however, significant since Warwickshire is the home of the most important element of modern aviation, the jet engine. Its inventor, Sir Frank Whittle, was a Warwickshire man; born in Coventry and an attendee of Leamington College. He undertook his jet engine development work in Warwickshire, although he laid down the principles as early as 1929 in a thesis written at Cranfield College. After initial trials at Cranwell, the first British jet-powered aircraft, the Gloster E28/39, was tested from Edgehill. Admittedly, Whittle’s jet engine was not the now widely used axial flow turbine, subsequently developed in the USA using Whittle’s theory and German wartime experience, but as a practical unit, the jet engine was first built here in Warwickshire and all such engines owe a debt to Whittle’s work. Unfortunately, there is no significant memorial in the county to commemorate that momentous achievement.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme for the remainder of the current season is as follows:

10th April

Alan Cooke: Subject to be confirmed

8th May

Peter Cross-Rudkin: *Some Warwickshire Eighteenth Century Engineers and their Work.*

12th June

Speaker and Subject to be Confirmed.

10th July

Society AGM, followed by Lyndon F. Cave: *Brickmaking in Warwickshire*

Society Coach Trip.

John Haslam has kindly volunteered to organise a coach trip for the Society. Possible destinations being researched are Blaenavon, Saltaire and/or Armley, Leeds. The provisional date is Saturday 16th August 2003. Other suggestions are of course welcome.

Subscriptions.

A number of subscriptions remain outstanding. By now, those who have still to pay should have received a written reminder, but if you are in any doubt the Treasurer can confirm payment or otherwise! If you are in arrears, prompt payment would be appreciated; cheques payable to Warwickshire Industrial Archaeology Society please.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2002 Paul Howell:

Restoring the Royal Pump Rooms, Leamington Spa

The restoration of the Royal Pump Rooms together with the incorporation in the building of the town's library, museum and art gallery is undoubtedly a success story for Leamington Spa. It was the history of the restoration, from its start to its triumphant finish, which was the major part of Paul Howell's address to our December meeting. But he began by sketching in the origins of the building in the early years of the 19th century and by reminding us that from the very start it had a chequered history. The alternate periods of success followed by longer periods of commercial failure and neglect which characterized the late 20th century life of the Royal Pump Rooms were really only echoes of very similar events in its earlier years.

Using a fine collection of colour slides, Paul showed a record of restoration 'work in progress' virtually from Day One to the official opening. We saw the state of dereliction of some parts of the building when work began, together with many architectural features which literally 'saw the light of day again' as demolition connected with structural work took place. The original spa water spring was uncovered, as were the various grades of baths originally provided, catering for men and women and offering water at various temperatures. Underground was exposed the 'engine' room of the building, where once vast quantities of water were heated, and steam for the Turkish Baths was raised.

Part way through the restoration work, the Great Flood hit Leamington and the building, which at the time was in a quite vulnerable state, was potentially imperilled. Fortunately, the wooden hoarding which had been erected around the frontage of the building broke the main force of the surging waters. Some damage was inevitably sustained, but without the protection provided by the hoarding it would have been very much greater. During the course of the restoration work, the innovatory design of the king-post and roof structure over the de Normanville baths (now the library) was seen in all its ingenuity, and great care has been taken to preserve and highlight it.

The writer is probably not alone in saying that, following Paul's talk, he sees the restoration of the Royal Pump Rooms in a different light. Now knowing exactly what to look for, he will revisit them with even greater interest.

Sheep Washes: John Brace

To conclude the December meeting, it was appropriate that John Brace should also give a short

talk on baths, this time not for people but for sheep! Sheep manage to get their themselves appallingly filthy and shepherds very soon recognised that a clean fleece fetched more money than a dirty one. John traced the history of 'sheep washes' in the Midlands from the early use of the village pond, in which the poor creatures were forcibly dunked. He went on to describe the progressive design and development of specially constructed 'washes' where one-way in and one-way out, plus running rather than static water, significantly increased both the effectiveness and the productivity of the process. Moreover, with the specially built washes it was only the sheep which got wet, and not the shepherds as well! If you know where to look, and John surely does, remains of some of these 'sheep washes' can be seen to this day.

Leamington Gas

The current edition of *Archive* issue 37, has under its *Skimpings* header, a familiar (to my eyes anyway), aerial photograph of Leamington Spa Gasworks taken in 1933. This is accompanied by an informative and detailed half page caption, within which a number of minor points are raised that, as a Society, we ought to be able to follow up in a letter to the publication.

Therefore, I would be pleased to hear from any member who can provide information about this now lost local industry, however minor the detail might seem. In particular, confirmation of the date when the gas holders were finally demolished would be welcome. They were standing when I first came to Leamington in 1981 and I seem to recall that they lasted at least a decade longer, but I have no record of the date that demolition took place. I also recollect hearing from an unknown source that the bridge under the railway between Waverley Road and the Sydenham industrial estate, was provided for the passage of horse drawn carts carrying coal from the GWR yard to the gasworks. Can anyone confirm or deny this too?

Should any member wish to borrow the relevant edition of *Archive*, this is available from the Treasurer. Quite apart from the view of the gasworks, it is an interesting exercise to compare other buildings with the modern scene.

REFERENCE:

Skimpings; *Archive* Issue 37, Lightmoor Press, Whitney, 2003.

Mark W. Abbott

Fairgrounds and Steam

January 2003 Peter Coulls:

Fairground Machinery

One of the most attractive features of the study of traditional fairground machinery must be that it allows one simultaneously to combine the joys and recollections of early childhood (i.e. roundabouts, swings, helter-skelters etc) with the serious grown-up business of coal, water and fireboxes (i.e. steam engines)! Both ends of this continuum were on display at our January meeting, when Peter Coulls made a most welcome return visit to the Society. This time to remind us of the magic of the fair as we saw it as children, combined with an insight into both the technology and the sheer hard work and raw muscle power which lay behind that magic.

Starting with the earliest simple machines, such as hand-driven roundabouts and swings, Peter sketched in the development of fairground machinery through the 19th and 20th centuries, and particularly the great leap forward which occurred with the advent of the steam engine as the prime mover for so many different types of fairground 'rides'. Steam was also the 'puff' and actuating force behind the magnificent organs which were progressively developed, and became such an essential part of fairground magic.

Peter's collection of colour slides of fairground machinery, from plain Roundabouts to Gallopers, from Swing Boats to Big Wheels, and from Steam Yachts to Showmens' Engines must surely be one of the finest, and his knowledge of the technology, also the makers of the machines and the history and tradition of fairs and fairground folk, is encyclopaedic.

Slides included shots of the Warwick and Stratford Mops in the early years of the 20th century and reminded us that, as today, the arrival of the traditional fair in a town was a once-a-year longed-for event. We were also reminded of the amount of physical effort which goes into transporting, setting-up and dismantling the rides, much of which necessarily takes place in the early hours of the morning. Fairground folk zealously guard their traditions and pitches in the towns which they visit at set times each year. For a local authority to attempt to make even the smallest alteration to these traditions, or to change the precise position of the 'pitch' traditionally reserved for a given 'ride', is almost impossible.

The steam-driven engines which hauled the fairs around the country are a subject for study in themselves, and Peter spent some time on them. Here again, one was reminded of the effort and

physical endurance involved. Typical recorded journey times for early engines with iron-shod wheels, hauling heavy loads from town to town, were:-12 hours to cover 91 miles; 14 hours to traverse 109 miles (a single continuous run); and three days to cover 240 miles. It was most gratifying to see just how many of these magnificent 'showmens' engines' have been saved by enthusiasts.

All the w's.....IA on the Internet

Increasingly, the Internet is promoted as a source of entertainment. However, this overlooks this modern phenomenon's greatest resource; information. The access to information that the Internet provides is unrivalled and a common problem met is finding exactly what is required, especially if starting with a somewhat general term such as industrial archaeology.

As an example, the Google search engine; www.google.com, returns 12 700 references to the term "*industrial archaeology*". Note that the quotation marks ensure that only references to the two words together on web pages are presented. Without the quotation marks, the search looks for both words, irrespective of whether they are together on a page or not, and 161 000 references are returned! Apart from the sheer number of references listed, the other problem with this general approach is that many sites or pages with IA content will not contain the words *industrial archaeology* anyway, and so will be overlooked.

The key is of course to use more precision in the term selected for the search, or start from a comprehensive page of links that lead to specific IA content.

With the latter in mind, a particularly useful website is www.iarecordings.org. IA Recordings are probably well known to many members as producers of videos about industrial archaeology, but their site is a useful general IA resource and contains a links page with over 520 links to websites with specific IA content, all conveniently categorised under subject headings. Thus, for example, it is possible to view a list of links on mining, or general organisations connected with IA. As is frequent with such listings, not all the links work, but these dead links are few and the standard of the linked sites is high. Altogether an excellent starting point for anyone with a general interest in IA and one that is recommended to members.

Mark W. Abbott

Archaeology and Planning

February 2003 Edward Wilson

Archaeological Recording in Warwickshire

Today, the submission of a planning application to a Local Authority routinely triggers an enquiry to see if any archaeological sites or monuments are likely to be affected by the proposed development. In his position as Planning Archaeologist, in the Sites and Monuments Office, Warwick, Edward Wilson is therefore often among the first to know when anything of archaeological interest in the County, including industrial remains, is likely to be affected by building developers, and at our February meeting he gave a most interesting insight into the workings of his Department.

His remit covers everything from Roman times up to (broadly) the 1920s and the onus lies with the developer who makes a planning application to carry out, and pay for, investigations appropriate to ensure that no site or monument, industrial or otherwise, is inadvertently destroyed for lack of proper professional investigation. As an example, Edward showed pictures of Coombe Abbey, Coventry, (now a hotel), for which planning application for an extension to one side was made. It was believed that the extension would intrude over an area where late 19th century kitchens may once have stood, and trial trenches were ordered to be dug. Sure enough, not only the foundations of the kitchen were found but, unexpectedly, the remains of an ice house were also exposed. The development to the hotel was not stopped, but the archaeological items of interest found were meticulously recorded before building work was allowed to start.

Trial trenches dug on the Potterton Factory site prior to impending redevelopment have shown that all relics of 19th century industrial activity in the area have disappeared, but evidence that there was once a medieval bridge over the Avon, near the present Portobello bridge, was uncovered. By the same token, the recent development of Rock Mill, adjacent to the Potterton site, into residential properties, was preceded by an investigation and

recording of the interior of the mill, before conversion work began.

Edward went on to describe similar finds which have been triggered by planning applications including: the foundations of a windmill at Lower Quinton; Bridge 51 over the Stratford upon Avon canal; an aqueduct at Yarningale, where work also revealed a hitherto unrecorded quarry site; unusual aspects of a late 19th century railway bridge at Brinklow; and the remains of a private sewage plant at Cawston House, near Rugby.

Moving towards more modern times, some interesting slides were also shown of a group of anti-aircraft gun platforms and associated buildings erected on the outskirts of Coventry just before the outbreak of the second world war, and forming part of a ring of defences for the City. The details of the site were carefully recorded and photographed. This investigation was triggered, Edward explained, by a planning application (subsequently approved) by the land owner to turn the remains of the wartime buildings into stabling for horses!

Much of the burden of Edward's talk was to stress just how many archaeological sites and evidence, including industrial, still remains to be recorded. Many, indeed, are far from concealed and only lack the interest, effort and manpower required to photograph and record them. The minimum of photographic evidence and written description, Edward stressed, is needed to get a site 'on record'. His message was plain. WIAS members were being cordially invited to help! Edward Wilson's office is in The Butts, Warwick; his telephone number is 01926 412734, and his e-mail address is ewilson@warwickshire.gov.uk.

Sir Frank Whittle Addendum

An excellent précis of Sir Frank Whittle's career, together with much other aviation history, can be found at www.raf.mod.uk/history/whittle1.html.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Mark Abbott

Printing: Southam

Office Supplies,

Market Hill,

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- ☉ Meeting Reports
- ☉ Miniature Railway IA
- ☉ Shuttleworth Collection
- ☉ Programme to Year End

EDITORIAL

The photographic image is undoubtedly a key resource in the study of Industrial Archaeology from the middle of the 19th Century onwards. It is unique in its ability to give a visual record of an instant in time and to show how things were, as opposed to maps, plans and written descriptions which can be inaccurate.

This role of the photograph was most convincingly shown by Peter Chater's March presentation about aspects of railway civil engineering and architecture. The most striking feature of these images was how much the appearance of our surroundings has changed, even over a relatively short period of time. Such change is typically slow and imperceptible; often unnoticed. It is only when presented with, for example, a street view taken as little as 15 years ago that change becomes startlingly apparent. The road vehicles, the style of street furniture and fashions; all such minute details suddenly become noticeable when compared with the modern scene. Yet at the time these things were unremarkable,

just as a car in the street or a particular road sign are today.

This is perhaps the key hidden value of photography as a resource in industrial archaeology. It is often the details that are incidental to the subject photographed that become of interest later.

Nevertheless, the expansion of this valuable resource is in danger of becoming lost to future generations, overwhelmed by a tide of digital data.

A photograph is an instant visual reference. Even as a negative, the content can be assessed easily. However, a digital image needs technology to translate the binary data into a picture, be it on screen or a print. That technology is changing fast and there is no guarantee that it will be possible to view images archived to CD, for example, in as few as 10 years time. Remember the Betamax video format?

Yes, a digital image can be printed, but how many are? Research company IDC estimates that 78 billion digital pictures were captured world wide in 2002. At best, half may have survived in-camera editing and other research by Lexmark, suggests that three quarters of digital pictures are never printed. Thus, 68.25 billion images may never be printed from 2002 alone!

Film exposures for 2003 are estimated to be 85 billion world wide. Many of these will not survive long, but at least those that do endure should be accessible to future generations.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme for the remainder of this year is as follows:

10th July

Society AGM, followed by Lyndon F. Cave: *Brickmaking in Warwickshire*

August

No meeting.

11th September

Dr. Michael Hodder: *The Industrial Archaeology of Birmingham*

9th October

Mr. John Boynton: *Railways to Stratford-upon-Avon*.

13th November

Regional Survey. A presentation by members of the Society on the industrial archaeology of the Warwick District.

11th December

Dr. Barrie Trinder: *The Industrial Archaeology of the Market Town*.

Society Coach Trip.

The date of the coach trip, organised on behalf of the Society by John Haslam, is confirmed as Saturday 16th August 2003. Saltaire and Armley, Leeds are the planned destinations. Please show your appreciation of John's hard work for the Society and support this venture.

Leamington Gas Works

Thank you to all those members who answered the appeal for information about Leamington Gas Works in the last Newsletter. It is intended the facts be submitted to *Archive* as a short follow up article to the photograph published in Issue 37.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2003

Members' Evening

The Society was 'batting in depth' at its March meeting when, the scheduled speaker being unable to attend, three members came forward with a full programme of illustrated presentations, each of exceptional interest. First in was Peter Chater, who drew on his wonderful collection of slides to talk about railways, but with barely a mention of locos or rolling stock!

Instead, he dealt almost exclusively with all those aspects of the railway industry which were needed to support the actual trains themselves. Thus, he looked at everything from stations to hotels, from bridges to tunnels, from booking offices to waiting rooms, from arrival/departure boards to signal gantries, and from station advertising boards to railway workers' houses. Railway stations and railway hotels came in a wide variety of architectural styles, some for example rather pretentiously echoing the Italianate or even French *chateaux*, while others, specially in major cities, projected the air of solidity and permanence which was thought essential to persuade apprehensive passengers that their lives were in safe hands.

Passengers' fear of the 'new technology' also led to some other strange ideas which were designed to reassure. The portal entrances to some early tunnels, for instance, were deliberately made unnecessarily high and wide so that passengers would not get the impression they were plunging perilously into a small dark hole. A few hundred yards further into the tunnel, however, the workings returned to a more appropriate height and width! A tunnel in Sussex had a twin-tower portal with, between the towers, a small cottage. This building was occupied by the man responsible for the gas lighting inside the tunnel, again provided to reassure passengers.

Some excellent slides of permanent, swing- and tilting bridges followed, also a variety of viaducts some with 'stop piers' included to avoid the possibility of the arches falling in domino-effect during the construction. The 150-ft high by 700 ft long railway viaduct near Consett had supporting piers added as a precaution following the Tay Bridge disaster. Moving nearer our own times, Peter showed some slides of the advertisements which were commonplace in stations and alongside railway lines, including the never-to-be-forgotten Hall's Distemper men carrying a plank on their shoulders!

Next in was George Sayell, who started by showing a short Government film, made in the middle of the second WW and simply entitled *Life in an Aircraft Component Factory*. The factory, it

transpired, was in fact Automotive Products, Leamington Spa, a company for which George worked for 35 years and in the preservation of whose history he has played a crucial part. In fact, the last six months of George's service with AP included heroic efforts to save priceless Company records, including vast numbers of photographic negatives, which were being wantonly tossed into skips. Almost entirely due to George's efforts, which are in the best traditions of Industrial Archaeology, the County Records Office now has in safe keeping a treasure trove of data on AP which would otherwise have finished up in the incinerator.

The third presentation was by Roger Cragg, who spoke on the original ill-fated Tay Bridge, its conception, basic design, construction and finally the findings of the enquiry which was charged with investigating the causes of its tragic collapse. Roger brought to life both the night of the tragedy and the findings of the enquiry, which were as devastating in their criticism of the design of the bridge, the quality of the workmanship, and the standard of maintenance, as they were of the culpability of its designer Sir Thomas Bouch.

Anthony Coulls and Miniature Railways

Members may be interested to learn that Anthony Coulls, who has spoken at Society meetings on two occasions in the past, has an article in the current edition of *Industrial Archaeology Review* (Volume XXV May 2003 Number 1). Titled *The Ephemeral Archaeology of the Miniature Railway*, the article seeks to establish why miniature railways both merit and require archaeological study, as an aspect of the industrial archaeology of leisure and a form of 'mimic technology' of the industrial period. It further shows how a study of their surviving material remains illustrates the worth of some unusual sources which have survived as evidence of a railway's existence.

The article is easy to read and supported by some fascinating period photographs, which invoke happy memories of family seaside holidays.

Other articles of interest include: *Technology as Culture: The Tom Rolt Memorial Lecture 2002* by John R. Hume and *The Archaeology of the Canal Warehouses of North-West England and the Social Archaeology of Industrialisation* by Michael Nevell, together with the usual book reviews and shorter notices.

The *Review* is available for loan to members from the Treasurer.

Members Presentations

April 2003

Members' Evening

Rarely has the phrase 'circumstances beyond my control' been more appropriate than when applied to Paul Cook, the speaker scheduled to address our April meeting. On the day in question, Paul was literally still 'grounded' at Dallas airport, Texas, USA, by a combination of a security alert and a tornado! Nevertheless, our chairman Martin Green and member John Brace stepped in at extremely short notice to provide members with a most interesting variety of topics.

Martin dealt first with Rock Mill, the former water-powered cotton mill on the Avon between Warwick and Leamington and now a prestigious residential address. His slides showed various views of the mill prior to development, and then as it is today, when sympathetic conversion has enabled various aspects of the character of the original buildings to be preserved. Close to Rock Mill is the Potterton Works, now unoccupied and with the site currently the subject of substantial (and needless to say controversial!) development plans. To the rear of the abandoned factory, Martin found the remnants of the greyhound track which once flourished there, including a small wooden building inside which the remnants of the electrical switchgear once used to control the 'running of the hare' can still be seen.

Turning to the Automotive Products factory on Tachbrook Road, Leamington, so recently swept away and already fast fading in local memory, Martin then showed excellent slides of the Works in the days when the names Borg & Beck, Lockheed, and Thomson meant so much to the town. Today it is virtually only the AP water tower (used now as a support for a number of telecommunications aerials), and parts of the Sports and Social Club buildings, which remain standing on the site.

Emotive shots included the mosaic paving in the entrance hall carrying the name Lockheed, and views of the water feature in the forecourt. Even more nostalgic were the shots of *Miranda*, the bronze mermaid which once graced the water feature and which one night simply 'vanished'. Believed to have been 'stolen to order', *Miranda* was sculpted by a German artist who fled the Nazis in the 1930s and was first shown publicly at the 1951 Festival of Britain. Cast from the sculptor's original by the lost-wax process, *Miranda* has never been recovered and is still on the 'wanted list' of stolen art treasures maintained by Interpol.

John Brace's account of the fire in the Channel Tunnel, with its grievous loss of life, was in some

respects not unlike the inexorable unfolding of a Greek tragedy. From the moment when it was reported by an observant member of staff that a train carrying a vehicle on fire had been spotted entering the tunnel there was a sequence of events, a veritable 'chapter of accidents', in which confusion became worse confounded and the tragedy developed unchecked and in a nightmare of wrong decisions, and/or lack of decisions.

One after another, with a terrifying 'cascade' effect, the forward planning, strategies and automatic systems installed to deal with just such an emergency either simply failed to cope, were not followed, or were overtaken by events. At root, the catastrophe may well have started because all the advanced systems were designed to react to a fire which started *within* the tunnel. What had not been foreseen was a fire which started *outside* the tunnel, and was then carried into it.

Finally, mention may be made of the fact that the Coventry Watchmakers' Project Ltd has succeeded in acquiring premises to the rear of the Shakespeare pub in Spon St, Coventry. The building is in a rather poor condition, with a great deal of work needed to be done, but it is hoped that in due course it will house a museum dedicated to a trade which flourished in Coventry from approximately 1660 to 1960.

The Shuttleworth Collection

Members attention is drawn to the Shuttleworth Collection, a private collection of historical aircraft, many unique, and motor vehicles, originally begun by the late Richard Shuttleworth and situated near Biggleswade. It is now a charitable trust, but differs from other similar collections and museums in that during the summer, the aircraft are flown from the Collections own grass airfield and the motor vehicles are regularly driven.

Displays are held at roughly two week intervals from May to October and are an atmospheric experience. No where else in the UK is it possible to see operational historical aircraft at such close quarters, while the remarkable sight of a Bleriot taking to the calm evening air, is an event unique to Shuttleworth.

The Collection is open as a museum throughout the year and apart from the aircraft and vehicles, contains many aviation and motoring artefacts. Full details and a 2003 display programme are available from the Treasurer.

Warwickshire Civil Engineers

May 2003 Peter Cross-Rudkin

Some Civil Engineers of Warwickshire

Distinguished civil engineers with notable achievements in the County of Warwickshire formed the core of Peter Cross-Rudkin's presentation to the May meeting, and many of them in fact occupied the post of County Surveyor at one time or another. Peter started with brief reference to Sir William Dugdale, a well-known name in our area and author of an early book (1662) on the civil engineering of 'banking, draining and the construction of sea defences', with special reference to The Fens and East Anglia as a whole.

The post of County Surveyor originated principally in connection with the care and maintenance of bridges, after it was laid down by the King's Bench Division that any bridge which had established itself as 'being useful to residents of a County' should thereafter become the responsibility of that County. This ruling applied nationwide, and thus overnight to no fewer than 77 bridges in Warwickshire! From that point, it was obvious that the post of County Surveyor was one of considerable importance and responsibility.

Henry Couchman (1738-1803), although born in Kent, first made his mark as Clerk of Works at Packington Hall. As his career developed he became Bailiff of Temple Balsall Hospital, Surveyor of Buildings and then, in 1790, Bridgmaster (i.e. effectively County Surveyor) of Warwickshire. He also had considerable involvement with the county's canals and when he died he was succeeded as County Bridgmaster by his son Henry Couchman Junior. Eventually, many bridges required rebuilding as distinct from regular maintenance, and Henry Couchman Jr, born in Packington in 1771, was responsible for many County projects in that respect.

Next, Peter described some of the work of William Wright of Barford, contractor for the Staffs & Worcester canal, Clerk of Works of the Birmingham Canal, and associated with

Wolverhampton Locks and the Stroudwater Canal. Charles Handley (c1750-1812) was also associated with Barford and was a prominent contractor on the canal network, including the Warwick to Napton stretch. Tamworth-born Thomas Sheasby Senior (1740-1799) was originally a stone mason who turned to canal work and notably bridge building. He contracted to demolish and rebuild the stone bridge at Polesworth and worked on the 5-arch Dukes Bridge at Coleshill. Extensive work on canal systems in a number of counties followed. His son, Thomas Sheasby Junior, followed in his father's footsteps and is credited with designing and building the first canal aqueduct to be lined with hydraulic cement.

The work of Thomas Baylis on the Gloucester to Sharpness ship canal impressed Thomas Telford and as a consequence the two men co-operated on a number of civil engineering projects thereafter. Baylis was involved considerably with Telford on work on the Holyhead Road, mainly concerned with evening-out the gradients, and his contract in that respect included work on the Braunston, Meriden, Hickcliff and Brickhill sections. A colourful character, Baylis tackled a wide variety of work and had a chequered career, including going bankrupt in 1829. Nevertheless, eight years later he was 'afloat' again and went on to complete a distinguished career.

ADVANCE NOTICE OF THE AGM

The AGM of the Society will be held on Thursday 11th July at 7.30 pm. The attendance of all members is requested so that any decisions about the future of the Society accurately reflect the wishes of the membership. Please advise the Secretary, Dennis Crips, as soon as possible, if you have a particular matter you wish to bring to the attention of the Society.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Mark Abbott

Printing: Southam

Office Supplies,

Market Hill,

Southam, CV47 0HF

WARWICKSHIRE

Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ Favourite IA
- ☉ Society Website
- ☉ Programme to Year End

EDITORIAL

I first raised the subject of an example of favourite industrial archaeology in the editorial of the December 2001 Newsletter. The intention then was to prompt members to contribute examples of their own favourite industrial archaeology sites, so that a list of recommended IA could be compiled for those travelling elsewhere in the UK, perhaps on holiday. Sadly, the response to this initiative was poor, save for an excellent short article from Richard Storey describing the malting industry in his home town of Ware.

Not before time this article is reproduced overleaf, using the space normally reserved for the full programme for the forthcoming season. The programme does not appear, because the Chairman, Martin Green, who now has the task of compiling a programme, understandably would prefer only to publish details of confirmed speakers. A couple speakers for 2004 are not yet confirmed, so a programme to December 2003 is included under the Society News heading and the remaining

programme will be made available at a later date. Also, since a number of members have indicated that they would prefer a reminder of the programme to appear in each Newsletter, rather than just the full programme appearing in the September edition, this quarterly listing of speakers will continue. I hope this change meets with the approval of all.

Returning to a listing of favourite IA, this is something I would still like to pursue as I am sure many members have knowledge of sites that may be unknown to others. Such an exchange of information is surely one of the potential benefits of membership of the Society. A full article, such as Richard Storey's piece, is not necessarily required. Just a brief list of a few sites of particular personal interest, with perhaps some location directions and a little of what a casual visitor might be expected to see or to look out for. Initially, I envisage a simple A4 sheet published as an insert to a future Newsletter, so please submit some sites for inclusion.

Mark W. Abbott

SOCIETY NEWS

Companion to British Road Haulage History.

As some members will be aware, for six years Richard Storey has been a member of a team of five contributing editors of a pioneering work on the history of road haulage. The project was successfully completed this year when the Science Museum published the Companion to

British Road Haulage History. Priced at £39.95, its 437 pages include several hundred cross-referenced entries. It contains in addition an eight page bibliography and 128 photographs. Member Roger Cragg contributed entries on the civil engineering infrastructure supporting modern road transport.

Programme.

The programme for the remainder of 2003 is as follows:

11th September

Dr. Michael Hodder: *The Industrial Archaeology of Birmingham*

9th October

Mr. John Boynton: *Railways to Stratford-upon-Avon*

13th November

Regional Survey: A presentation by members of the Society on the industrial archaeology of the Warwick District.

11th December

Dr. Barrie Trinder: *The Industrial Archaeology of the Market Town*.

Details of the programme for the remainder of the 2003/2004 season will be published once all the speakers are confirmed.

Subscriptions.

Members are reminded that subscriptions for the 2003/2004 season are now due. As agreed at the AGM, the amount due remains at £10.00 per member (including partner). Cheques should be made payable to Warwickshire Industrial Archaeology Society please. Prompt payment is appreciated thank you.

NEWSLETTER

Favourite Industrial Archaeology

Richard Storey

Malting in Ware

My favourite piece of industrial archaeology is a whole town, Ware in Hertfordshire, where I grew up. Situated at the crossing of the London-Cambridge road and the River Lea, it developed as one of the major malting centres for the London brewing industry. Barley was grown on the boulder clays of the area and brought down by the road to the maltings, which initially developed mainly along the northern bank of the river. The malt produced was transported along the Lea Navigation to London as were locally made bricks, with grain and manure as return cargoes. Gradually awareness of these activities and their physical manifestations dawned on me. A key experience was the local Festival of Britain exhibition in 1951, where a large sectioned model of a malting gave me some idea of the processes of barley steeping, spreading on the germinating floor and kilning, which malt-making involved. I had left the town before industrial archaeology had begun to take shape as a concept and activity, but when I became aware of it, many memories of the distinctive malting buildings surfaced, prompting observation and recording, photography and reading, to reveal a complex local economy.

Malting was seasonally related to brickmaking, for which suitable clay was available locally and for which the large malting buildings created a special demand; small foundries and metal workers developed locally to meet the demand for tie plates, kiln wire and window grilles. Barge owning and banking were also an integral part of the malting scene; although obviously not so directly related to IA as bricks and metal products, they were important components in this complex local economy with its direct and obvious links to the wider world.

An interesting question, to which I have never found a satisfactory answer, is why brewing developed on a large scale in Hertford (McMullens), but only resulted in a small-scale undertakings in neighbouring Ware. Perhaps being the county town made a difference.... On a recent visit to Ware I was pleased to see that what must have been the smallest brewery in the town, serving one outlet on New Road, still survived, only just, but partly shrouded in sheeting, which suggested there was an intent to restore.

Physical features taken for granted as part of the place where one lived began to stand out in their significance as part of an industry which was in fact in process of deserting the town, despite the

construction of one automated malting after the Second World War.

The rectangular brick slabs of the malting buildings were given variety by the different types of cowl: fixed and louvered, the *Chinaman's hat* (an apt term invented by one of my fellow-researchers in the 1960s), and, most attractive of these variants, the subtly curved and tapering rotating cowls, clad in painted corrugated iron and with a projecting wind vane, often with a heart shaped terminal. The horizontal aspect would be punctuated by projecting sack-hoist installations (lucams) and by a variety of cast-iron tie plates, which could be recorded and their legends correlated with local directories. The most exciting IA breakthrough was to recover one of these plates, with a short, hooked rod, from a malting site across the border in Essex and to find that, instead of holding a tie-rod in place, its function was to hold the wire floor of the kiln in tension.

On the ground the surface of the access yards to the riverside maltings was also in evidence: paved strips for the cart wheels between the setts the horses walked on and the round axle-protecting stones at the entrances. The yards themselves fitted into a recognisable pattern, as deep barge plots, maximising access for numerous undertakings to the main road at one end and the river at the other, with room for narrow maltings or workshops in the yards themselves.

Some of the results of recording went into the *Journal of Industrial Archaeology* and *Industrial Archaeology* and it was a privilege to be able to supply Branch Johnson with material for his Council-sponsored survey of Herts. IA, which resulted in a county volume in the David and Charles series.

Other interests have subsequently eased aside direct concern with IA in Ware and district, but I still visit family there and was recently delighted to discover the statue of the Ware maltman, erected in front of the parish church as a millennium project. Having moved away from Herts malting, it was something of a relief to me when Brown and Clark's works appeared, to document in permanent form a much changed industry.

Further Reading:

1. Mathias, *The Brewing Industry in England 1750-1830* 1959
2. W. Branch Johnson, *The Industrial Archaeology of Hertfordshire* 1970

Continued on page 4

Meeting Reports *by Arthur Astrop*

June 2003 Dr. Anne Langley

The Brandon Silk Mill

Rather like pulling one end of a loose thread which gradually unravels, Dr. Anne Langley's original interest in a 'silk mill at Brandon' turned out to be a much longer and more fascinating research project than she could have imagined. The 19th century 1-inch map of Daventry and Coventry certainly showed a silk mill at Brandon but that proved to be only the start of the story. Research showed that there had once been a variety of mills, for different purposes, in and around the same area, and the Domesday Book recorded one in Brandon itself which, in 1086, was 'worth 26 pence a year in rent'.

A map of Brandon dated 1630 shows 'Mr Wilcocke's Mill', and in 1711 it is recorded that a Mary Wilcox (Wilcocke?) had a 'life interest in a fulling mill and mill house at Brandon'. Fulling, as Dr. Langley explained, is a 'consolidating' process in cloth making. Towards the end of the 18th century, the *Coventry Mercury* newspaper advertised an auction of a paper mill at Brandon, and a few years later an estate map dated 1792 showed the millstream, the mill itself, floodgates and outbuildings. By 1828, a Trade Directory was listing George & William Herbert as 'silk throwsters' at Brandon Mills, and such entries continued for the rest of the century.

During that period, the mill was extensively developed, had various owners, and began to employ increasing numbers of workers, including young children. The 1851 census lists Hannah and Fanny Clarke, aged 10 and 13 respectively, living in Stretton-on-Dunsmore and working as 'silk winders'. Dr. Langley found evidence of continuing friction between local schools and local mills over the employment of children by the latter. In 1872, the Stretton school log reveals that two fatherless pauper children (one only 8 years old) were compelled to work at Brandon Mill as part-timers.

Five years later, a Stretton school teacher was writing to the Factory Inspector about children working at the silk mill, and at the same time sending a letter to their parents 'ordering them to send their children to school half-time'. By the 1860s, the workforce in the mill was over 100 and in 1867 it was sold by auction, with its particulars being given as 'of 3-storey construction with a 16-ft diameter iron waterwheel, a 12-hp steam engine, and quantities of spinning, winding and doubling machinery'.

In 1877 a Mr Iliffe was listed as a 'silk throwster', with mills at Brandon and Brinklow, employing 150 and 50 respectively, and was clearly running a

substantial business. However, by 1905 the Brandon mill is listed as 'disused' and today its site is the 11th green of the Brandon Wood golf course, with only a very few ruins remaining to be seen.

The June meeting concluded with a report by WIAS member George Sayell on the latest position regarding *Miranda*, the cast-bronze mermaid which once graced the forecourt of the AP factory in Leamington Spa and which mysteriously vanished one night. Apparently Monsieur Pierre Haneuse, a French documentary maker, is interested in filming a 'life' of *Miranda's* sculptor and as a result of his researches the file on her theft has been 'reopened'. M. Haneuse has traced the sculptor's widow, now in her 70s, and discovered that she still has the molds from which *Miranda* was cast. A campaign is being planned to reawaken interest in *Miranda's* disappearance with the hope that eventually she may be rescued from her kidnappers.

Society Website

Thanks to the efforts of member Peter Riley, the Society now has a world wide web presence at www.warwickshireias.org. At the moment this is a fairly low key presence, but at least the Society now has a website. This is something which the committee were keen to develop, but lacking the time, and what is more important the necessary skills, our grateful thanks are due to Peter for taking the initiative and making an excellent job of creating the site.

The address was the subject of much trial and error to find something that flowed well, but was not already reserved. All the obvious variants have already been taken, although perversely, none seem to be in use. The *.org* suffix is generally used by charities and non-profit making organisations, so is entirely apt for the Society.

Content is one of the keys to a successful website, especially updating the content on a regular basis. It is initially hoped to achieve this by posting successive Newsletters and previous editions of the same and by keeping a changing gallery of photographs of local IA. Which is where members can help. A supply of images of Warwickshire IA is needed, either transparencies or negatives. If you can help with these please speak to Peter Riley or Mark Abbott. We can arrange the necessary scanning and would prefer to do so to maintain consistent picture quality. Thank you in anticipation.

Mark W. Abbott

Local Brickmaking Overview

July 2003 Toby Cave

Brickmaking in Warwickshire

It is a curious fact of brickmaking that from its beginnings, even up to the present, it has remained an industry based largely on the use of relatively simple technology. Despite the fact that today its output is measured in multi-millions, the brickmaking industry has largely either resisted, or has not proved to be appropriate for, the use of any of the really advanced technologies. Even its use of automation and mechanisation is fairly modest compared with other high-output industries.

This was the starting point for our President's address to the Society's July meeting when he took a broad sweep over his subject and reminded us that the origins of brickmaking lie in the basic application of sweat and muscle. 'Brick works' originally sprang up wherever a suitable supply of clay, however small, had been found. Clay was dug in the autumn to be used in the following spring, and when enough bricks had been made they were simply piled up in 'clamps', covered with brushwood, and the latter was then ignited. Some days, or even weeks, later (and following regularly replenishment of brushwood), the bricks were deemed to be 'done'. Consistency of quality could hardly be guaranteed!

Brickmaking was an occupation that carried very little prestige, and censuses show that those engaged in it often tried to disguise that fact by registering as maltster/brickmaker, farmer/brickmaker etc. In order to counter 'cheating', standard sizes for bricks were eventually needed, and by the early years of the 19th century something which was just about recognisable as a brickmaking industry began to emerge. Patents associated with the trade began to appear, most of them based on minor modifications to existing practice, and in 1841 a major step forward appeared in the form of wire-cutting to length clay which was extruded in standard section. One man and three boys could now produce a steady 1000 bricks per day.

Gradually brickworks proper began to appear, kiln development progressed, and with the arrival

first of the canals, and then what is more important, the railways, the national demand for bricks soared. A typical Victorian railway bridge would call for at least 300,000 bricks, and as the railway network expanded it proved to be a major customer for the country's brickmakers. Better furnaces were developed but the industry remained reliant to a very great extent on sheer muscle power. Clay mixing was still regularly performed by 'treading' and it was not uncommon for children to be given time-off school to work in the trade. In 1871, an Act of Parliament was introduced to regulate and inspect the brickmaking industry, the working conditions within which were officially described at the time as being 'hard for men and cruel for children'.

In the late 19th century, Websters of Coventry was considered to be the largest and most advanced brickworks in the UK, with five kilns operating and an output of at least 600,000 bricks per week. In fact, an output of 1,000,000 bricks per week was at one time contemplated. Finally, Toby gave a summary of the subsequent rationalization and changing structure of the British brickmaking industry. The meeting ended with a short video of the Oak Farm Brickworks in the Black Country where the various skills and crafts required in the production of specially shaped handmade bricks are still employed, and the only concession to mechanisation appeared to be the use of wheelbarrows!

Further Reading, *Malting in Ware, Continued:*

3. Brown, *Steeped in Tradition. The Malting Industry in England since the Railway Age* 1983
4. Parker, *Nothing for Nobody. A History of Hertfordshire Banks and Banking* 1986
5. C. Clark, *The British Malting Industry since 1830* 1998

* * * *

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

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Mark W. Abbott

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Arthur Astrop

Richard Storey

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WARWICKSHIRE

Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ End of an Era
- ☉ Favourite IA
- ☉ Spring Programme

EDITORIAL

One hundred years ago this month man first achieved controlled powered flight in a heavier than air craft. Now, at the beginning of the 21st century, the aeroplane is an accepted part of life and a crucial component in the global economy. During those one hundred years, the speed of development in aviation technology has been rapid, in so far as the link between that first frail Wright Flyer and the modern high capacity airliner following a computer controlled course, would appear tenuous. Yet a link there is, however unclear.

That the history of aviation and its technology is a branch of industrial archaeology is unquestionable. However, how well industrial archaeology as a discipline has served the understanding of the development of aviation technology, is perhaps a matter of less certainty.

Those with an interest in aviation are no doubt aware that the aircraft enthusiast is well served by a continuous torrent of publications, and numerous museums. Yet serious original

research is not as common amongst all this material as might be imagined. The Society, for example, has a full set of AIA annual and quarterly publications dating back to 1997. A quick skim through these reveals no article on any aspect of aviation, apart from short abstracts of publications. The Society's complete set of *Archive* shows more promise, with a number of articles on aviation over the years. Specialist societies often do produce good work, for example the Society of World War One Aero Historians; Cross and Cockade, while some of the publications of the Smithsonian Air and Space Museum are exemplary; witness the books published about the restoration of specific aircraft by that Institute.

Perhaps, in truth, the research is done and published, but not under the banner of industrial archaeology. Why should this be? Aviation might be considered an upstart compared with many industries, although this should not make it any less worthy as a subject for academic study. There are too, plenty of historical tangible remains to investigate. The answer might be that the industry is extremely complex, encompassing aeronautics, engineering, manufacturing, civil engineering, architecture and social history. Therefore, of necessity any study of its historical aspects is fragmented and undertaken by specialists in fields not obviously related to industrial archaeology or even aviation.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme for the Spring meetings of the Society is as follows:

8th January

Dr. Anthony Streeten: *Industrial World Heritage Sites in the UK: Successful Nominations and Future Prospects.*

12th February

An Evening Led by Members of the Society: *The Stratford District.*

11th March

Dr. Alan Cooke: *Once Upon a Time - the World's Thickest Coal Seam. The Geological Story of the Warwickshire Coalfield.*

8th April

Mr. Ken Chapman: *Troth and Hillson: The Langley Ploughmakers.*

Subscriptions

Members are reminded that subscriptions for the 2003/2004 season are now due. The amount payable, as agreed at the AGM, is £10 per member. Cheques payable to *Warwickshire Industrial Archaeology Society* please. If you are in doubt about your subscription status please ask the Treasurer. Receipts for payments received by post will be available at meetings.

Speakers

The search is now on for speakers for the 2004/2005 season of meetings. With the Chairman's impending retirement from Warwick School and subsequent holiday, he is keen to have the programme arranged as soon as possible, so recommendations for speakers will be gratefully received.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

September 2003 Dr. Michael Hodder

The Industrial Archaeology of Birmingham

Birmingham was once a 'new town' and a hive of industry long before it became famous as the 'workshop of the world', and certainly long before it became synonymous with metal-bashing. As Dr Michael Hodder, Planning Archaeologist with Birmingham City Council, pointed out at our September meeting, evidence of pottery manufacture as early as the 12th century has been uncovered in what is now the City centre, and in fact represents classic exploitation of the very few natural resources the area possessed. In its earliest times, Birmingham needed to rely heavily on only three raw materials, namely clay, water and wood (for firing), all of which it had in abundance. Pottery manufacture was therefore an obvious choice to maximise those three resources. Rope and textile manufacture, also tanning, were other early industries for which Birmingham's limited natural resources would later be used.

Dr Hodder has been exceptionally busy in recent years as the massive redevelopment of Birmingham's Bull Ring area has continued and almost every square-metre has been scanned for possible archaeological finds. During the Bull Ring's development in the late 1950s and early 1960s, developers paid little or no heed to the disturbance of archaeological remains, even if they noticed their existence in the first place. These days, site work cannot be started until the archaeological 'all clear' has been given, and the costs of the work needed to recover or preserve finds must be met by the developers. Finds of early pottery show the use of typical Birmingham yellow clay, together with the decorative use of white clay brought in from other areas. There was also, Dr Hodder explained, a very large and thriving brick, tile and pipe-making industry in Birmingham in the 18th and 19th centuries. From very early times, Birmingham had a cattle market and this was the source of raw material for its tanning industry, which prospered in the 16th and 17th centuries. Hides arrived at the tanneries with heads, horns and hooves still attached, which the tanners discarded. Other industries, however, soon found a use for them. The use of water in copious quantities is essential in tanning, as it is in rope making, and Birmingham's plentiful supply was used for those industries, also later for driving waterwheels.

Waterwheels were first used to drive small machines, for polishing buttons and coins for example, but later the entire machinery of Boulton's great Soho Manufactory was driven the same way.

Even when steam arrived it was initially used to lift water to reservoirs feeding waterwheels, and it was only later that Watt's engines were employed to drive Soho Manufactory's machines direct. Today nothing survives of Soho Manufactory (although thankfully Boulton's residence Soho House still stands), but in the gardens of residential housing near the site of the Manufactory evidence of how water was once piped to the works has been discovered. (Members may recall there was a TV programme in the *Time Team* series that featured a search for evidence of the Soho Manufactory).

Finally, Dr Hodder turned his attention to another of Birmingham's almost 'forgotten' industries, namely glass making. Flourishing in the 19th century, the glass makers made full use of the City's complex canal system as a mean of both bringing in their raw materials, and then 'gently' shipping-out their fragile finished products.

End of an Era

September marked the end of an era in aviation history. Overshadowed by the impending withdrawal of Concorde from service, another aircraft made its final flight; the LVG CVI owned by the RAF Museum and based at the Shuttleworth Collection. This too is a very special aircraft. It is a genuine World War 1 survivor of German origin, one of very few such machines left still capable of flight. That so cumbersome and vulnerable a device should even have survived the war is remarkable. Still to be airworthy 80 years later, makes LVG CVI No.7198/18 an extremely rare aircraft.

Sadly, the machine was only on extended loan to the Collection and has now moved to RAF Cosford to be prepared for museum display. The final official flight took place during Shuttleworth's Twilight Air Display of 20th September; strong winds preventing a sortie, as planned, at the October event, although the aircraft appeared on the flight line and had its engine run for the benefit of the crowd.

However, I was extremely privileged to see the actual last flight of the machine late on the evening of the 20th September. In the deep purple twilight, by the Collection's Hurricane, gently ticking as it cooled in the evening chill, I watched as Air Commodore Keith Dennison piloted the LVG into the air: his first and only flight in the machine. A fitting finale for a fascinating relic of aviation history.

Mark W. Abbott

Railway History

October 2003 John Boynton

Railways to Stratford upon Avon

Railway sidings and a wharf where the Stratford-on-Avon canal basin is today, and before that a very primitive horse-drawn tramway, were some of the milestones with which John Boynton started his talk on railways to Shakespeare's birthplace. Relics of the tramway, of course, remain on display in Stratford to this day; a wagon standing on a short section of track mounted on stone setts, rather than sleepers, so that the horses could walk in relative comfort. Some of the setts, John pointed out, can also be seen incorporated in the walls of the rose gardens in front of the theatre. The tramway bridge over the Avon remains too, now a footbridge. Principally, however, John concentrated on the Stratford & Midland Junction Railway (the SMJ). He traced the route of this line from its beginning in Birmingham and followed its meandering through a series of stations, some of which genuinely warranted that title whereas others were no more than either 'halts' or 'platforms'. He touched on the historic main line stations in Birmingham, mentioning their current restorations, and then took us on a wander down the SMJ calling at stations of particular interest *en route*.

The 'halt' at Earlswood for fishermen visiting the lakes; the station at Danzey with its elegant stone bridge designed to be 'in sympathy' with nearby Umberslade Hall; the use of pine trees to provide shelter for passengers on station platforms; and the Bearley aqueduct. All these and many others had honourable mentions and featured in excellent colour slides. John also stirred memories with shots of historic locos, signal boxes, station canopies, footbridges, and even station furniture, including a penny-in-the-slot platform ticket machine.

Newport Transporter Bridge

The meeting concluded with a talk by John Selby on the Newport Transporter Bridge over the river Usk, which he visited while attending this year's IA Conference in Wales on behalf of WIAS. Opened in 1906, the bridge has been the subject of a major restoration project, after many years of neglect, and is well worth a visit. It carries vehicles and foot passengers on a 'platform' which is suspended above the Usk on cables and is moved across the river by an overhead 'traveller', rather like that of a gantry crane. The motor house with its huge cable-winding drum is on the east bank of the river, while on the moving platform itself there is a charming control house the design of which is not unlike that of a Victorian ice-cream kiosk! John's

slides showing the structure of the transporter and its supporting columns outlined against a brilliant blue sky were quite memorable.

A Subject for the Tip?

A neighbour recently approached me explaining that, although her husband died over three years ago, she had only recently got round to sorting out his 'hobby'. The latter turned out to be a collection of books, photographs, slides and other items associated with the history of the airship. There was even a small section of the frame of R101!

Everything was carefully catalogued, and there was even a monograph he had written on lighter-than-air craft in the 1930s. She confessed to having no interest whatsoever in the subject, and neither, she added, had her children or her grandchildren. Did I think anyone else would possibly be interested, or should she just take the lot round to the tip?

Fortunately, I was able to put her in contact with someone who was delighted to take over the collection. However, the incident gave me cause to think. Most amateur industrial archaeologists have 'collections' of one sort or another. How many, I wondered, had thought to make sure there is some indication as to whom they might at least be 'offered' before they eventually end up in the skip?

Favourite IA

Continuing the recent Newsletter theme of favourite IA, members might like to consider a visit to the following sites:

Grassington Moor, North Yorkshire. Extensive and well preserved remains of lead mining including an impressive condensing flue and chimney. Follow the narrow road up through Grassington town centre and park on the verge where the tarmac stops, near a house called *Yarnbury*.

Cwm Bychan Copper Mines, North Wales. Remains of a concentration plant and aerial ropeway up the valley. The upper terminal of the latter is largely intact. Park at the Nantmor National Trust car park, near Beddgelert.

Menai Suspension Bridge. A classic, best appreciated by a walk from Church Island, Menai Bridge; along the Belgian Promenade; under the bridge approach viaduct and then up Cambrian Road to the Anglesey end of the bridge. Complete the excursion by a walk across the bridge and back.

Members' Presentations

November 2003 Members' Evening

Some Aspects of the Industrial Archaeology of Warwickshire

So great was the amount of material presented by members to the November meeting that it considerably overran its allotted time. The evening started with a rallying cry from Martin to the effect that surely the time had now come for our Society to stop hiding its light under a bushel and to publish some of its accumulated data, thus letting others have the benefit of its researches to date. Martin suggested that our Society should henceforth not just aim to list and record but should then go on actively to publish. And as far as the latter was concerned, he suggested that the release of its records of IA sites in the area defined as 'Warwick District' would be the ideal place to begin.

That there is an abundance of data for our Society to publish was made very clear when Roger Cragg stepped up to review the work already carried out by members on bridges, canals and water towers alone in the area. As always, Roger's unrivalled collection of slides on all three subjects splendidly illustrated the points he was making, and in addition served as examples to members of precisely the types of IA sites we all should be researching, photographing, and where appropriate recording in detail. Roger added a fourth category to his list, naming it 'miscellanea', and then showed several slides of the unusual roof structure which once covered the swimming baths in Leamington's Pump Rooms. Designed by de Normanville, it has been beautifully preserved, refurbished, and today it shelters the town's new library.

To give members some typical examples of the types of IA sites associated with railways in Warwick District, Peter Chater then dipped into his extensive 'library' of slides. He showed subjects as disparate as the London Illustrated News's 1844 picture of Kenilworth's station (part of which is now incorporated into Drummonds night-spot in the town!), to Leamington's Avenue station in 1861; and from the coal yard at Claverdon station to a loco picking up water from a between-the-rails trough.

To round-off the evening, Denis Crips concentrated on the splendid example of IA which lies within the walls of Warwick Castle, namely the electricity generating plant which was opened in 1894. Its inaugural task, which at first switch-on must have caused the Mill Engineer Mr Bissell great anxiety, was to light the Castle for A Great Celebratory Ball. The plant supplied current at 100 V DC from a massive array of batteries which, in turn, were charged-up by dynamos. The latter were driven either by the mill wheel or by one of a pair of gas engines. There was also an underwater turbine, driven by the river, which was used to charge a pressure accumulator that forced water up from approximately river level to serve the Castle. The subject of recent extensive restoration, the complete electricity generating plant is open to view by the public and, being extremely well presented, is highly recommended for a visit.

Warwick Gasworks

The distinctive structure that once housed the gas holders associated with Warwick Gas Works, and now converted to offices, has been empty for some time. Over the months it has gradually become more shabby, culminating recently in a more concerted attempt at vandalism. Windows were broken and a small fire started in the ground floor of the right hand tower that once housed a gas holder. Now, smoke stained, the building scarcely looks the important industrial monument that it is; probably the earliest extant gas works structure in the UK.

However, salvation is seemingly at hand. A sold board has appeared on the building, so hopefully it will soon be restored to its former self. The structure is of course of particular interest to the Society since it was the subject of the Society logo for a number of years.

Mark W. Abbott

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road
Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

SECRETARY

D. M. Crips

27 St. Nicholas Church Street
Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive
Southam

Warwickshire

CV47 1NZ

(01926 813155

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Mark Abbott

Printing: Southam

Office Supplies,

Market Hill,

Southam, CV47 0HF

WARWICKSHIRE

Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ AIA Conference
- ☉ Bridge 129
- ☉ Summer Programme

EDITORIAL

I particularly enjoy walking and this year resolved to make more of an effort to get out into the countryside. Coincidentally, there were moves within the Society towards publishing some form of guide to the Industrial Archaeology of Warwickshire and this led me to realise how little I really knew of the IA of my local area. I have a few favourite locations that I visit regularly, but apart from these, I probably know more of the significant IA sites on Anglesey than I do of any in the area around Southam.

This is to do with familiarity I suspect. Anglesey is a regular holiday destination, somewhere different to be explored and photographed. Time is limited. In contrast, Southam is familiar and the surroundings can be visited at any time. There is always tomorrow, which of course never comes, while today there is always something more pressing to do. So with an impending change in personal circumstances, I decided to set aside a weekend afternoon as walking, thinking and exploration time, with walking all the canal

towpaths in my immediate area as an initial target.

So what have I discovered? Well, in truth, not much of real IA significance that is not already generally well known. Oxford Canal bridge 129 is written up elsewhere in this Newsletter, while the only other intriguing detail of note is a small long disused excavation and sleeper built wharf behind Wormleighton Grange. Any comments on this would be welcome.

However, I have come to appreciate the distinct atmosphere of the Oxford and Grand Union Canals.

The Oxford Canal, south of Napton Junction, retains its largely contoured course. It has an intimate atmosphere. Meadows slope down to the water, trees overhang the water and the canal feels part of the landscape; indeed with its meandering course it could be mistaken for a river. It seems to belong to an unhurried rural past.

In contrast the Grand Union Canal, heading off from Napton Junction, has a far more engineered feel. The impression is of a waterway cutting through the landscape, imposing itself upon the landscape on its engineer's terms, much like the later railways would do. One senses an industrial monument with a purpose.

As intended, I have learnt something. However, the most memorable occurrence had nothing to do with IA; it was the time spent near Marston Doles watching a barn owl hunting.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme for the remainder of the current season, to July 2004, is as follows:

April 8th

Mr. Ken Chapman: *Troth and Hillson: The Langley Ploughmakers*

May 13th

Mr. Mike Rumbold: *Some History of the Weedon Royal Ordnance Depot.*

June 10th

Dr. George Noszlopy: *The Public Sculpture of Coventry, Solihull and Warwickshire Some Industrial Connections.*

July 8th

Society AGM and Members' Contributions.

August

No Meeting.

A programme for the meetings from September to December 2004 will appear in the June Newsletter.

Subscriptions

Reminders have been sent to members who still owe their 2003/2004 subscriptions.

Thanks to all who have paid promptly upon receipt of the reminder. Please can any outstanding payments be made as a matter of urgency. Cheques payable to Warwickshire Industrial Archaeology Society please.

Thanks

The Committee would like to thank all those members who contributed to the February meeting, by speaking on aspects of the Industrial Archaeology of the Stratford upon Avon district of Warwickshire. It proved an informative and enjoyable evening.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2003 Dr. Barrie Trinder *The Industrial Archaeology of the Market Town*

The market towns of Britain were often the 'incubators' in which first crafts and then minor (and sometimes ultimately major) industries were born, nurtured and brought to maturity. It was this aspect of many of our historic market towns on which Dr Trinder concentrated in his December lecture to the Society.

The typical 'market town' often tended to emerge where any cluster of dwellings had some form of communal open space which lent itself to the display and trading of locally made goods and services. Next, around the periphery of this open space, began to be built houses in which the ground floor was a rudimentary form of shop. Some of these houses then began to be occupied by the professions, such as the law and banking. Later, the classic multi-storey merchants' houses started to border the market square, with the ground floor providing a proper shop, the first and second floors offering spacious living accommodation for the trader and his family, and the top floor housing the live-in servants. Many of these merchants' houses survive in market towns to this day and, where they have been conserved and cherished, are elegant additions to the environment.

Dr Trinder pointed out that some trades and crafts were to be found in almost every market town, including milling, tanning, malting, wheelwrighting, saddlery, brickmaking, brewing, shoe making, printing and so on. In other instances, areas centred on market towns tended to specialise, as for example with shoe making in Northamptonshire, furniture making in Buckinghamshire, and clock and watch making in Coventry. It was also important, Dr Trinder suggested, to distinguish between the products of crafts and trades intended principally to serve the town and its locality itself, and the production of 'manufactures', that is, products intended to be distributed and sold over much larger areas, and even in some instances to be sent overseas.

There were also instances where one trade or craft literally gave birth to others. The blacksmithing trade, for example, frequently led to the establishment of specialised forges and often to the start of an iron-founding industry in a given locality. In turn, the advent of the ironmonger as a thriving retail trade gave a boost to the trade of the forges and the iron-founders, and there were other instances of a similar kind. To illustrate his points, Dr Trinder showed a large number of excellent slides of market towns, and especially those where buildings originally used to house long-lost crafts

and trades can still be seen, albeit they are now used for quite different purposes.

To follow Dr Trinder's talk, it was appropriate that the meeting should conclude with the showing of a video of one of the oldest crafts of all, namely brewing. It dealt in considerable detail with the history and practice of the Hook Norton brewery which has been in the hands of the same family for several generations. In many instances, belt-driven equipment powered by a splendid horizontal steam engine is still being used but, as its present manager succinctly said, 'Hook Norton brewery lives with its history, but it does not live in its past'. Indeed, as he spoke a computer was visible on a desk in the background!

Oxford Canal Bridge 129

Amongst the slides shown by Roger Cragg at the February meeting, was one of a curious and very dilapidated wooden footbridge over the Oxford Canal at Wormleighton Grange; Bridge 131A. It can be confirmed that this bridge still stands and is one of a pair of similar structures in the area.

Here, at Wormleighton Grange, the Oxford Canal makes one of its occasional 180 degree changes in direction to detour around Wormleighton Hill and on the far side of the hill to Bridge 131A, stands Bridge 129. This structure is a modern version of its wooden neighbour. Carrying a concrete plaque with the date 1952, blue brick piers support a single girder across the canal, which in turn carries a wood plank walkway, reached by steep wooden ladders at each end. Strangely the girder is not one piece, but apparently jointed at the one-third / two-third span point with substantial riveted fishplates reinforcing the join.

It can further be confirmed that there are now no other such bridges on the southern Oxford Canal in Warwickshire, although broadly similar footbridges do occur elsewhere on the canal system; for example the so called *Black Bridge* behind Flavel's works in Leamington.

The purpose of these two Oxford Canal bridges is a mystery too. No public footpath directly communicates with either, so it is probably reasonable to assume they were built as occupation crossings, despite there being 4 other brick occupation bridges nearby. This is borne out by Bridge 129, where the access ladder on the towpath side crosses the boundary hedge into farmland.

UK Industrial World Heritage Sites

January 2004 Dr. Anthony Streeten

Industrial World Heritage Sites: Successful Nominations and Future Prospects

World Heritage Sites are places or buildings of outstanding universal value, and it is the duty of the international community to co-operate in order to protect them. Well over 700 sites have already been inscribed on the World Heritage List, covering cultural, natural and mixed locations, and new ones are being added each year. The first meeting of WIAS in 2004 welcomed Dr Anthony Streeten who spoke briefly on WHS's in general and touched briefly on the 24 listed in the UK, which range as widely as the Giant's Causeway and the Tower of London, to Stonehenge and Maritime Greenwich, and from Ironbridge Gorge to Saltaire.

He then focussed on *industrial* WHS's in the UK, and selected for detailed description the Derwent Valley Mills. This 24-kilometre stretch of the Lower Derwent Valley is rich in industrial sites of genuine world historical significance. The jewel in the crown is undoubtedly Sir Richard Arkwright's 1771 Cromford Mill, where so much pioneering work in the textile industry was carried out, but the string of mills and other buildings along the valley at Belper, Milford, Darley Abbey and Derby are of equal importance.

It was in the Derwent Valley in the 18th century that waterpower for driving manufacturing processes on an *industrial* scale was first truly harnessed, with innovators like Arkwright, Strutt and Evans pioneering the required technologies. It was the sheer scale of the mill buildings designed and erected by such men, together with the methods they developed and the numbers they employed, which transformed the manufacture of textiles forever, and introduced 'factory production' to the world.

The social effects of the new technology as it spread through the valley were immense, and examples are preserved as part of the area being listed as a WHS. The growth of communities of weavers, the use of 'top shops' by framework knitters, the rise in employment of child labour, the emergence of ancillary industries such as nail making, the growth of nonconformist religion and its associated chapels and Sunday schools, all these and other knock-on effects were described by Dr Streeten in his talk.

It is obviously an honour for any country to have its World Heritage Sites listed, but with that honour come responsibilities. Not least the burden to maintain each site and to have an approved management plan for the latter. Obviously, no

WHS can be completely cocooned in isolation. The host country, therefore, must also have a systematic programme of protecting each site against the adverse pressures and encroachments from neighbouring areas, where 'everyday 21st century life must go on' as usual.

Other industrial WHS's in the UK touched on by Dr Streeten in his talk included Ironbridge, Saltaire and Blaenavon. The UNESCO web site for World Heritage Sites is www.UNESC.org and members are recommended to visit it.

AIA Conference

Notice has been received of the 2004 AIA Annual Conference. This year it is to be held at the De Havilland Campus of the University of Hertfordshire, Hatfield, and will feature the industrial archaeology of the Hertfordshire and Lea Valley area. The dates are somewhat earlier than is usual; Friday 13th August to Thursday 19th August, with the main part of the conference occupying the weekend of 13th, 14th and 15th of August.

The provisional programme is varied and interesting, with emphasis upon the important local industries of malting and gunpowder. However, other less obvious industries are not forgotten with a visit, for example, to the Leighton Buzzard Railway; a once important transport system for local sand quarries and a lecture on watercress growing in Hertfordshire.

Aviation is perhaps the only local industry not well represented in the programme. Hatfield is of course the former home of De Havilland, who built the world's first commercial jet airliner; the *Comet*, a design that still lives on in essence in the RAF's *Nimrod* maritime patrol aircraft. Since there is nothing left of De Havillands in Hatfield, this is not surprising and a scheduled visit to the RAF Museum and its newly opened Claude Graham White building does something to redress the balance.

Full details and a booking form for the Conference are available from the Treasurer. Any WIAS Member, whether individual an AIA member or not, can attend the Conference, as the Society is affiliated to the AIA. However, it should be made clear that the cost to attend the full Conference on residential terms is high; almost £600, although there is this year a 'first timer's discount' of £25 for the conference weekend or £50 for the full week. A welcome innovation that will hopefully encourage new attendees.

Members' Presentations

February 2004 Members' Evening

Some Aspects of the Industrial Archaeology of South Warwickshire

Returning to the theme of the November 2003 meeting, namely the growing importance of our Society publishing data on its own behalf, chairman Martin Green reviewed recent decisions by the Committee regarding the Society's Gazetteer. Recognizing that the latter can never claim to be totally comprehensive it has been decided to re-title it accordingly, and it will now appear under the heading *A Guide to the Industrial Heritage of Coventry and Warwickshire*. Its contents will be arranged by 'district' (as distinct from by industry) so that anyone can quickly and conveniently identify the sites to be found within a given area.

While it is obviously important to decide what to include in the Guide, it is equally important to know what to exclude. In the latter category will largely fall what may be termed 'social' archaeology, such as hospitals, prisons, schools, Town Halls, housing etc. Exceptions could be made, however, where any outstanding historical connections with such structures are found to exist. Practical help from Society members in compiling text for the Guide will be vital, and to assist in that respect the Committee proposes to prepare a typical sample 'paragraph', and a sample 'chapter', to show the type of format to be aimed at. Members are also urged to provide illustrations to accompany their text where appropriate, ideally in the form of colour slides but others formats can also be accommodated.

As an example of the type of 'guide to IA sites' which can be produced based on the use of relatively short paragraphs of text, Martin cited that compiled by members of the Alcester & District Local History Society. This piece of work covers IA sites to be found in the Lower Arrow Valley, Warwickshire, and in approach, format and coverage is very close to that envisaged by our Committee for our own Guide. For members without access to the Internet, printouts of this piece of work by the Alcester group are available from Martin.

The meeting then moved on to consider 'The

Stratford District' as one of the most important to be covered in our Guide. This area is surprisingly large, as a proportion of the County as a whole, and the diversity of IA sites within it is extensive, ranging from the rural/agricultural to the intensely industrial and including a variety of different types of transport and early forms of power generation. Contributions by members on sites to be found within the Stratford District included a talk by John Brace on stone field markers of the type used when ridge and furrow farming was practiced, and examples of different designs of 'sheep washes'.

Peter Chater contributed a talk on aspects of the Edgehill Light Railway which operated from 1919 to 1925. Covering the 5 ½-mile stretch Burton Dasset/Edgehill, the line handled the output of an ironstone quarry and part of its route passed over what is today the site of CAD Kineton. Roger Cragg then took a broad sweep over selected bridge, aqueduct, windmill, watermill, rail and canal sites of archaeological interest in the Stratford District, illustrated as always by some of his excellent slides.

The meeting also saw a most interesting video on the Charlecote Mill which is still working and producing flour. This video included some fine close-up shots of the gear transmissions between the waterwheels and the millstones, also to auxiliary belt-driven processes, thus giving dramatic illustration of the immense power which can be produced by a controlled flow of water.

VuePrint

In response to questions about the slide shows run via an LCD projector at the February meeting, the application used is called VuePrint. This is an image viewer and basic image editor, with extra options to keyboard control, or automate, the showing of a specified selection of images on screen. VuePrint is available for download from www.hamrick.com. Unregistered, the programme runs in demo mode and applies a watermark to all images shown. The web site details the cost of registration.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

E-mail: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Mark Abbott

Printing: Southam

Office Supplies,

Market Hill,

Southam, CV47 0HF

WARWICKSHIRE

Industrial Archaeology Society

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THIS ISSUE

- ☉ Meeting Reports
- ☉ Napton Engine
- ☉ Early Wooden Wheel
- ☉ Autumn Programme

EDITORIAL

This edition of the Newsletter appears a month later than the heading date of June 2004, so that an abstract of the May meeting could be obtained from the speaker, Mike Rumbold. The delay has also meant that it is possible to present a programme of speakers through to December 2004.

I trust that this delay has not caused any inconvenience or confusion to members. The next edition of the Newsletter will appear on schedule in September 2004. Members are reminded that, as usual, there will be no meeting in August.

Mark W. Abbott

Erratum

The reference to the Black Bridge, in the article about Oxford Canal Bridge 129 in the March 2004 Newsletter, was incorrect. The footbridge over the Grand Union Canal behind Flavel's works, is of course known colloquially as the Ladder Bridge. My apologies for the error and thanks to Roger King for pointing out the mistake.

Mark W. Abbott

* * *

NAPTON ENGINE

Water supply was often a problem for canal companies, a point exemplified by the summit pound of the southern section of the Oxford Canal, between Marston Doles and Claydon. This pound was dug deeper than usual to provide a reserve of water and three reservoirs were built: Wormleighton, Clattercote and Boddington, to replenish the water lost through the locks at Napton and Claydon. There was also a pumping scheme to back pump water up the Napton lock flight.

This scheme is little known and rarely mentioned in the Oxford Canal company records. However, much can still be traced in the field and it was these remains that Peter Chater, John Willock and I set out to investigate on the last Sunday in March.

Water was taken from the canal immediately below Napton Bottom Lock at GR458607 and conveyed by surface feeder to a point near GR463600. At the point the feeder crosses under the minor road between Chapel Green and Napton Holt; GR461601, it was observed to contain a strong flow of water.

Beyond the road, the course of the feeder is clear around an area of marshy ground, but eventually becomes indistinguishable from a small stream flowing in the opposite direction. Somewhere hereabouts a tunnel, some half a mile in length, took the water to the pumping engine at

Continued on page 2

SOCIETY NEWS

Programme.

The programme, through to December 2004, is as follows:

July 8th

Society AGM and Members' Contributions.

August

No Meeting.

September 9th

Mrs. T. Demidowicz: *The Birmingham Jewellery Quarter.*

October 14th

Mr. D. Fowler: *The History of Cheese and Cheese Making in Warwickshire* Includes cheese tasting!

November 11th

Mr. J. Boynton: *The London and Birmingham Railway.*

December 9th

Mr. J. Burton: *Ribbon-weaving and Hat-making in the Bedworth Area.*

A programme for the meetings from December 2004 into the New Year, will appear in the September Newsletter.

Web Site

Members with an Internet connection are reminded that the Society has a web site at www.warwickshireias.org.

The site is updated at least quarterly, with each Newsletter, and details of forthcoming meetings may also be found there. Occasional features on other aspects of Warwickshire industrial archaeology are also posted, most recently some pictures of the remains of the Cherry Orchard brickworks site, before its recent clearance. Other contributions are welcome, but please check these are in the correct format before submission.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2004 Dr. Alan Cooke

The Geological Story of the Warwickshire Coalfield

The Warwickshire coalfield, once the world's thickest seam, was laid down some 300 million or more years ago, when our County was lying a considerable distance south of the Equator! Over millennia, continental shift and drift has brought the coalfield to its present position on the globe but its seams were, in fact, the product of tropical rainforest-type conditions.

This fascinating slant on our County, and in particular on the coal fields of north Warwickshire, was the starting point of Dr Cooke's talk to the Society at its March meeting. The coal field stretches from approximately Tamworth in the North to Berkshire in the South, and as a result of the continental shift and drift mentioned above it has a number of major discontinuities in its run. Consequently, some seams are relatively close to the surface and others lie very deep, sometimes too deep to mine. Moreover, the discontinuities in seams mean that they can suddenly die out and, just as suddenly, can reappear some distance away.

Dr Cooke traced the exploitation of the coal field from its earliest days, when the available technology meant that virtually only the surface of the seams could be worked. Even in the 18th and 19th centuries, when pits could be dug to greater depths, the yield was still comparatively small, and the industry consisted of large numbers of very small workings. Flooding was a constant problem, and even the technological leap of Newcomen's atmospheric pumping engine was a mixed blessing. As Dr Cooke pointed out, these engines were so inefficient that sometimes they almost consumed coal at a greater rate than it could be mined!

It was the 20th century, and its quantum leaps in mining technology, which allowed the Warwickshire fields to be exploited properly for almost the first time. Automated and mechanised coal-cutting together with hydraulic pit props allowed pits to be dug deeper and seams to be worked virtually 100 per cent. Other industries grew up close to the pits, some very large and with considerable workforces. The Stockingford Brick & Tile Works, for example, occupied a very large site, had its own transport system connecting to main routes, and employed 1,400 people.

The decline of the coal industry is, of course, recent history and although mining as such has effectively ceased there are still massive deposits beneath Warwickshire lying untouched. Dr Cooke hinted intriguingly at modern research into extracting methane from the coal, a process which

would provide an energy source without the need to bring the coal itself to the surface.

Dr Cooke's main thrust, as the title of his talk suggested, was on the geological aspects of the Warwickshire coal field, which included the consequential effects of mining on surface topography. From time to time, old mine workings have caused sudden and serious subsidence in some parts of the County, and as a consequence dreadful 'planning blight' and 'inability to sell houses' have grievously affected some areas. It is only in relatively recent times that comprehensive, minutely detailed and highly accurate maps of mine workings in the County have been produced, and are now freely open to all for inspection.

Napton Engine continued:

GR467591. Although the tunnel appears on large scale Ordnance Survey maps of the 1930s, its entrance is not now visible. This map evidence shows the feeder apparently intercepting the surface stream near the tunnel entrance, presumably to augment the supply of water.

The site of the pumping engine is still obvious, at the end of a short arm off the canal, although the building remains have been heavily adapted for agricultural use. The original engine was a Newcomen design, installed about 1790 and in operation by 1792. In 1800, Boulton and Watt produced plans to replace it with one of their own 48 inch cylinder engines, but using parts of the original installation. However, this was probably not carried out as eventually only £150 was spent on improving the engine.¹ It is not known when the engine ceased work, although an Oxford Canal survey of 1840 notes the engine as "pulled down".

Anecdotal evidence points to a cottage on the site too, demolished in the 1970s. There is also a well, which is rather elaborate for a domestic water supply.

Beyond the engine house it is possible to trace the dry feeder, brick lined in places, to the nearby road. This it paralleled for a short distance, before heading off across the fields to reach the Priors Marston road at Marston Doles. It eventually emptied into the canal just above Napton Top Lock at GR465583, having passed under the garden of the canal side cottage (once a public house), although a modern back pumping outlet has obliterated the outfall.

Mark W. Abbott

1. Andrew Jim *Canal Pumping Engines* Industrial Archaeology Review XV 2 Spring 1993

Troth and Hillson

April 2004 Ken Chapman

Troth and Hillson: The Langley Plough Makers

Troth & Hillson was a Warwickshire firm of agricultural engineers which started life in the 18th century and survived well into the 20th, not finally closing down until 1964. The phrase "quite simply the finest ploughs ever made" was not an advertising claim dreamed up by T & H. It was the unsolicited opinion of plough users themselves, and they were all shrewd professional farmers given neither to making hasty judgements, nor to saying anything they didn't mean.

Ken Chapman has made an intensive study of Troth & Hillson, the Langley ploughmakers, and set the scene for his talk by showing a family tree to explain how successive generations of Troths, Troth-Hillsons and Hillsons led the firm and developed both the range and the designs of its products. The use of a family tree as a starting point was particularly helpful because, like so many 'dynasties' of the period, there was a propensity to replicate the same forenames, generation after generation. (In this case, there seemed to be a disproportionate number of Williams!).

Originally, T & H started by making two basic types of ploughs, the long-tail and the short-tail, suitable for Autumn and Spring ploughing respectively. Gradually, however, the Company widened its range and eventually three models were to become both the foundation and the key to its continuing success. Essentially, it made the type A1, the No 60 and the No 80 ploughs, each designed to handle specific types of soils and conditions, and over the years many thousands of each type were built. The T & H plough was distinguished by its clever combination of wood and iron construction, a design which exploited the unique qualities of each material to their maximum. Photographs and drawings of T & H ploughs shown by Mr Chapman also illustrated the beautiful lines of the wooden components, which were elegantly curved, tapered and shaped to make them things of beauty as well as of utility.

It was a proud boast of T & H that everything needed to manufacture their ploughs was made in-house, except for the paint! Great attention was paid to the selection and seasoning of the timber used for the wooden parts of the plough. Ash and pear wood predominated, and was taken only from the butts of pollarded trees and seasoned for two years on site before use. The potential of the Langley iron foundry in which T & H cast the metal parts for its ploughs was also progressively exploited. Iron parts for ploughs manufactured by

other companies were made at Langley, and over the years T & H widened its own range of cast products. These eventually included gratings, fire backs, fencing, manhole covers and guttering. Iron garden seats were also produced in the foundry, and T & H showed examples of the latter both at the Great Exhibition of 1851 and, 100 years later, at the Festival of Britain in 1951.

T & H also made horseshoes, and the Company was very proud of the fact that its products had been fitted to the hooves of winners of the Grand National in three successive years, namely 1884, 1885 and 1886.

An Early Wooden Wheel

Although not an avid railway enthusiast, I found the March 2004 edition of the *Railway Magazine*, which contained a special feature commemorating 400 years of Britain's railways, particularly interesting. In the Prehistory section, (1604-1803), of the feature article, a very early flanged wooden railway wheel was described and illustrated.

This split, and subsequently repaired, elm flanged railway wheel, was found by my maternal Great Grandfather in about 1900, during exploration of some very old mine workings at Caughley, Shropshire. Its precise age has not been established. However, Dr. Michael Lewis, in his work, *Early Wooden Railways*, published in 1970, tentatively ascribed to the wheel a date of pre-1729, and possibly even seventeenth century! It should be stated that the Coalbrookdale Company started to produce cast-iron flanged wheels in 1729, and these probably supplanted wooden ones quite rapidly. Several other early Shropshire flanged railway wheels were once known, but these seem to have disappeared over time, leaving the Caughley wheel the sole, and possibly the oldest, example extant.

The Transylvanian mine wagons with flanged wooden wheels, preserved in the museums of Berlin and Bochum, also described in the *Railway Magazine* article, are of a much later date than their English counterparts. Very early European mineral railways used a variety of curious guiding systems, but seemingly not the flanged wheel. Born of the humble coal mining areas of Nottinghamshire and Shropshire, the flanged railway wheel was a very simple, but elegant English invention, that went forward to conquer the rest of the world!

J. F. Willock

The Great Works at Weedon

May 2004 Mike Rumbold

Some History of the Weedon Royal Ordnance Depot

The most prominent structures at Weedon are the early nineteenth century Stores Buildings of the former Royal Ordnance Depot. Surrounded by a high brick wall, the eight original Stores are arranged in two lines on each side of a branch of the canal. The cut between the main channel and the Depot has now been filled.

When in 1803 war broke out with France again, it was realised that the storage of military supplies near to the coast was no longer prudent, and plans were made to set up a depot for the storage of arms and ammunition near to the centre of the country. A site in Weedon Bec was chosen, because of the proximity of the Grand Junction canal, which had reached Weedon in 1796, and Turnpike. An Act of Parliament of 1803 provided for the acquisition of 53 acres of land and the government later extended their estate to about 150 acres.

The military branch canal entered the Depot under a portcullis, set in a building known as the East Lodge, forming part of the surrounding wall, and still standing. At the west end there is a similar Lodge and the canal originally extended beyond to serve the Magazine, used in the early years to store gunpowder brought in by canal. The Magazine storage buildings, each separated from the other by a building filled with earth, can still be seen from the high ground within the Trading Estate off the Daventry Road (A45). From here can also be seen a ninth Storehouse standing isolated to the west of the main enclosure. Intended to relieve pressure on the existing Clothing Depot at Pimlico, caused by the South Africa War, it was completed in 1900, just as that War ended.

The Trading Estate stands upon the site of another of the former military establishments of Weedon, The Barracks. Built at the same time as the Depot, this comprised a group of buildings arranged about a Barrack Square. Some of these had stables on the ground floor, as the purpose of the Barracks was to house a Troop of Artillery and in those days,

guns needed horses to pull them. Between the two World Wars, the Barracks became the Army School of Equitation, and an extensive indoor riding school and further stables were constructed. The Barracks was demolished during the winter of 1955-6.

The other Government buildings in Weedon have led to one of the local legends. Constructed to house the Storekeeper and other principal officers of the Depot, these were three well-proportioned white brick buildings with connecting garden walls, presenting an imposing frontage to the east resembling a single structure. This led to the name, The Pavilion. Two of the buildings were divided into two dwellings, so that provision was made for five officials in all. These were civilian appointments of the Board of Ordnance.

It became popularly understood that these buildings were intended to house the King if there was a Napoleonic invasion, but there is ample evidence that this story is a myth. They were later used for the Officer's Mess of the Riding School. During the Second World War, together with the Barracks, they formed part of the Royal Army Ordnance Depot, when all parts of the military estate, together with other buildings in surrounding parts of the County were dedicated to the provision of weapons to the Army. The Pavilion buildings were demolished in the 1970s and replaced by Regents Park housing estate.

The Royal Army Ordnance Corps moved out of Weedon Depot on February 16, 1965. Following a period of use by the Ministry of Supply, the surviving Depot Storehouses passed into private hands in the 1980s and are now occupied by a number of small companies. These buildings and the perimeter wall are Listed Grade II*.

In late 1995, the Depot was bought by Cavalry Centre Limited, who applied for planning permission to change the use to an integrated heritage, tourist and commercial centre. Following a Public Inquiry, permission was granted in May 2000.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

John Willock

Mark Abbott

Mike Rumbold

Printing: Southam

Office Supplies

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- ☉ Meeting Reports
- ☉ Napton Engine Update
- ☉ IA and Landscape
- ☉ 2005 Programme

EDITORIAL

With this Newsletter entering its fourth year of publication, I feel the time has come to re-evaluate the layout and design. The one major change I would like to make is to use photographs. This always was a planned intention, but reproduction constraints: production is by photocopying which does not reproduce continuous tone images well, and cost considerations, have so far prevented this. However, software is now available to the Society that will yield masters that can be laser printed, a process that will reproduce photographs acceptably.

Therefore, I intend to print some proofs to see if photographs can be used in the future. This will require some major changes to the master pages that underpin each Newsletter, an ideal opportunity to make other changes to the design. I am happy with the current 'look', but would nevertheless welcome feedback from members as to any perceived shortcomings in the layout that might be rectified.

Mark W. Abbott

NAPTON ENGINE UPDATE

One feature of the Oxford Canal's Napton pumping engine scheme, described in the last Newsletter, which could not be located on site, was the tunnel that conveyed the feeder water the last half mile or so to the engine at GR467591. Assuming the tunnel was bored conventionally for the time, by means of working outwards from a series of shafts sunk along the intended line, some surface evidence of these shafts and the resulting spoil might be expected to remain.

The land under which the tunnel ran is farmland, so casual field research was not possible. However, the farmer of the land was fortunately encountered during the site visit and he confirmed there were occasional patches of lias clay in the fields over the tunnel, which could represent the remains of spoil raised from tunnelling shafts. This is the type of feature that could show as a crop mark, given favourable soil conditions, so it was thought that evidence of the tunnel might show up on an aerial photograph.

Getmapping plc photographed the whole of England from the air as a millennium project and images from this survey are available on the internet from a number of sites; for example www.multimap.com. Searching eventually located a good quality aerial shot of the required location at www.old-maps.co.uk. This proved to be a revelation.

Continued on page 2

SOCIETY NEWS

Programme.

The programme to July 2005, is as follows:

October 14th

Mr. David Fowler: *The History of Cheese and Cheese Making in Warwickshire* (Includes a tasting of Warwickshire cheeses!)

November 11th

Mr. John Boynton: *The London and Birmingham Railway*.

December 9th

Mr. John Burton: *Hat Making and Ribbon Weaving in the Bedworth Area*.

January 13th

Dr. Mike Hodder and Mrs. Toni Demidowicz: *The Birmingham Glass Industry*.

February 10th

Mr. George Sayell: *The Old Mineral Line, West Somerset*.

March 10th

Mr. David Depledge: *Coventry Airport: Past, Present and Future*

April 14th

Members' Evening: *The Industrial Archaeology of the Rugby District*.

May 12th

Mr. Peter Cross-Rudkin: *William James: Father of the Railways?*

June 9th

Mr. Martin Green: *Aspects of the Industrial Archaeology of New Zealand*.

July 14th

Mr. Mike Buxton: *Milestones: Warwickshire and Beyond*.

Subscriptions

Members are reminded that subscriptions for the 2004/2005 season are now due. The amount due remains at £10.00 per person or couple. Cheques payable to *Warwickshire Industrial Archaeology Society*, please.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

June 2004 Dr. George Noszlopy

Public Sculpture in the Midlands: Some Industrial Connections

There was a time when the first appearance of any piece of public sculpture was unthinkable without a solemn ceremony, a formal unveiling, a gathering of local dignitaries, and an outbreak of civic pomp (not to say pomposity). The public was expected to attend, but to restrict its participation to polite applause, and at the most to 'three (appropriately respectful) cheers'.

The second half of the 20th century has seen all that change, as has the subject matter which today is considered appropriate for a 'public sculpture'. Gone are equestrian statues of Dukes, generals and mayors and in their place have appeared sculptures which celebrate achievements, and not infrequently local industries. In his address to the June meeting, Dr George Noszlopy, Professor of History and Art at the University of Central England, illustrated this change in subject matter, and attitude towards, public sculpture with an outstanding selection of slides.

Professor Noszlopy has written two books on his subject (*Public Sculpture in Birmingham* also in *Warwickshire, Coventry and Solihull*), and further publications are in preparation. He started his talk with illustrations of 19th century public sculptures, some of which he suggested tried to pass themselves off as 'fine art', and the contrast with 20th century ideas for public sculpture was thus all the more marked. The beam engine, for example, which stands proudly on a ring-road roundabout in Birmingham, commemorates the vital part the City played in the development of steam power; and the sculpture of winding gear for a pithead, commissioned by the Nuneaton and Bedworth Council, celebrates the importance that mining once held for those towns.

Coventry, Dr Noszlopy pointed out, is particularly rich in examples of modern public sculptures, which commemorate many subjects from the arrival of the canals to the silk ribbon and motor car industries. In many cases it is an industry product which is represented, but for the waterways it is the splendid slightly larger than life-size bronze statue of James Brindley which dominates the canal basin in the City centre. Other examples of public sculpture in Coventry include: *The Journeyman*, *Children Playing* (which has echoes of Peter Brueghel the Elder), *The Coventry Boy* and, of course, the controversial *Ribbon Sculpture* which rears skywards on a traffic island in the Foleshill Rd.

Further afield, Professor Noszlopy illustrated a sculpture in Redditch which is a stylized water wheel

of the type used to power factories making the needles for which the town was famous. In Burton-on-Trent there is a powerfully realistic sculpture of a cooper making a beer barrel; in Dudley another of a man 'legging' a canal boat through a section of tunnel; and in Telford a striking sculpture in steel of a pit pony pulling a truck in a coal mine. His final slide, however, was perhaps the most impressive of all. In Newcastle-under-Lyme there is a sculpture of a coal miner pushing a loaded truck on rails in which every muscle is taut, and the 'effort' being applied to move the load is simply palpable. This slide alone showed the distance public sculpture has come in the second half of the 20th century.

Napton Engine Update *continued*:

Not only did it show a clear linear crop mark in the grass of uncultivated fields above the tunnel line, but also a number of small circular depressions along this feature, which might be interpreted as evidence of the tunnelling shafts. At its southern end the crop mark connects with the small enclosure where the engine was sited, while in the other direction, extrapolating the feature across cultivated fields gives an intersection with the small stream where the flow of this and the surface feeder were noted to meet.

If this crop mark does show the line of the tunnel, it does not match the line as drawn by the Ordnance Survey or the different line shown on the sketch map accompanying the article in *Industrial Archaeology Review XV 2* Spring 1993, previously quoted.¹ The crop mark line is closer to the latter map; including an intersection with the small surface stream further south and before the possible intersection point where the stream and surface feeder now meet (the stream has a right angled bend hereabouts, hence the two possible intersection points). However, anecdotal evidence suggests the tunnel entrance was at the pool where the water flows now coincide, although there is now no evidence of this.

Final proof of the tunnel line will require further field work in the future. Meanwhile, members with an internet connection may request a copy of the aerial photograph by email from myself, or visit www.old-maps.co.uk to view the photograph. Search for the map extract first and then choose the aerial photo option.

Mark W. Abbott

1. Andrew Jim *Canal Pumping Engines* *Industrial Archaeology Review*, XV 2, Spring 1993.

Members' Evening

July 2004

AGM and Members' Evening

Following the Society's 2004 Annual General Meeting* members settled down to enjoy a series of presentations by speakers drawn from within their own ranks. As always, this exercise served to remind us of the depth of knowledge which resides, often insufficiently tapped, among our members.

Mike James took us back to 1959 and the building of Leamington's reservoir, a major civil engineering undertaking with which he was intimately involved. Situated adjacent to Welch's Meadow, the reservoir was required to serve Leamington's expanding population, for which the supply coming hitherto from wells in the Campion Hills was no longer adequate.

Designed to hold 25 million gallons, the new reservoir presented a number of tricky problems from the start. Alluvial clay excavated to form the reservoir itself was unsuitable to be used for the earth banks around its perimeter, and an 'exchange' of more suitable soil from another area nearby, transported via a temporary Bailey Bridge over the Leam, had to be arranged. The alluvial clay beneath the earth banks was also unsuitable as a foundation for the latter, and advice on how that problem could be overcome was eventually provided by consultation with the Soil Mechanics Dept at Birmingham University.

Work continued throughout the winter of 1959/60 when the weather, and particularly a greater than average rainfall, produced some truly dreadful working conditions. Indeed, ground conditions eventually became so bad that the tractors and scrapers originally used for earth-moving were totally defeated, and drag-lines had to be brought in to replace them.

Following Mike's talk, Denis Crips explained how, on his return to England in 1999 from working in Saudi Arabia, he decided to start looking at some IA sites of interest in Warwickshire. As a result, he was able to show a variety of slides taken in the north of the County, notably around the Atherstone/Mancetter areas. Items of interest included remains of a granite quarry, canal facilities, watermills, and evidence of a tramway near Mancetter.

A topic on a totally different scale, namely the classic 'painting of the Forth Bridge' problem, was Roger Cragg's chosen subject. Following the introduction of the Health & Safety at Work Act, maintenance of the bridge in fact came to a stop for several years, because, of course, the practices used

so successfully and satisfactorily in the past were now totally 'illegal!' Under the terms of the Act, for example, no work could be undertaken except with the aid of scaffolding and, as many of Roger's slides showed, the amount and complexity of scaffolding needing to be erected looked almost like another bridge in itself!

Much of the surface of the steelwork needed to be sandblasted down to bare metal before priming and painting, and for this work huge curtains of plastic sheeting had to be stretched over the scaffolding. Roger was one of a very small number of those chosen by ballot to have a conducted tour of the work, and he made the most of his privileged position to take some truly spectacular colour slides, not least from the very top of one of bridge towers.

The evening was concluded by a series of slides presented by Martin Green and covering a wide variety of IA sites, including Bluemel's Wolston factory (now demolished); the workshops of Newman Bros, coffin makers in Birmingham; and the remains of the recently demolished Potterton boiler works in Warwick.

* For those not present at the July meeting, copies of the Chairman's and Treasurer's Reports, together with the presentation of accounts, can be had on application to the Secretary.

Publications

The following publications have been recently received by the Society, and are available for loan from the Treasurer:

1. Smith T. and Carr B. *A Guide to the Industrial Archaeology of Hertfordshire and the Lea Valley*, Association for Industrial Archaeology, 2004.

This is the latest in the series of guides produced by the AIA to tie in with annual conferences. This year's conference was based in Hatfield and the guide not only covers the county of Hertfordshire but also the Lea valley from Luton to the head of Bow Creek in Greater London. As ever, a useful overview.

2. *Archive*, Issue 43, Lightmoor Press, 2004.

The usual fascinating photograph-led selection of articles on aspects of industrial archaeology. Noteworthy for its local connection is an article about James Starley and the Coventry Sewing Machine Company. The lead article about the Hetton Railway and the operation of its inclined planes, is also particularly interesting.

Industrial Archaeology and Landscape *by Mark Abbott*

A Personal View of Industrial Archaeology in the Landscape

The term Industrial Archaeology can refer to many different things; artefacts, structures, sites, social history and even landscapes and it is the latter that I find of greatest interest.

My earliest introduction to industrial archaeology was as a landscape; a mining landscape, albeit on a small scale. During the late 1960's, family holidays were taken in a rented house at Praa Sands in Cornwall. Obviously the main attraction was the nearby beach, but fortunately my parents were also believers in walking as a recreation and a favourite route led eastwards along the coastal footpath to Rinsey Cove. Here there was an engine house. As often in Cornwall, it was perched impossibly close to the sea and in those less safety conscious times was complete with a crumbling open shaft surrounded by ramshackle wire, an open adit on the beach and a complement of tips full of minerals. I was fascinated. On numerous occasions I peered as closely as I dared into the shaft, scoured the tips for interesting samples, and wondered how something so industrial had come to be built in so remote and beautiful a location.

The mine was the Wheal Prosper and its workings are over 450 ft deep. The engine house dates from 1860 and housed a 30 inch engine which pumped to the adit level on the beach. However, the mine had worked earlier in the 19th Century and raised an average of 860 tons of ore per annum between 1832 and 1849. It finally closed in 1865.

Yet despite the engine house's industrial origin it did not, with hindsight, and from recent photographs, seem out of place. Its monumental presence added something to the landscape and built as it was from the local slate, known as 'killas', it had weathered to be part of the landscape from which it had been built. Far from being piece of industrial blight, it was a visual asset.

And this is the key to my personal perspective of industrial archaeology as landscape.

The remains of past industry can be a visual blot,

but often if left to gradually decay and weather, a distinctive and sometimes not altogether unattractive landscape will emerge. Something that, in its own way, can be as visually stimulating as the grand view or a mountain landscape. Those parts of the local flora and fauna that can adapt do so and gradually take over the remains, soften the harsh outlines and integrate the remains into the surroundings. As an example take the remnants of the lime and cement industry around Southam. While most of the concrete built works structures have gone, the quarries have flooded and the spoil banks have become overgrown. The result is a distinctive lime rich landscape, sometimes so distinctive that nature reserves and SSSI's have been designated. This would not have happened without the intervention of industry in the natural landscape.

Sometimes however, the remains are on such a massive scale that they are a landscape before the intervention of nature. Prime examples may be found amongst the remains of extractive industry. To stand high in Dinorwic Quarry amongst the barren wilderness of broken rock and low cloud is to experience an altogether alien landscape. There is nothing else like it. It has a smell, sounds and sense of place all of its own.

The copper workings of Parys Mountain or the lead workings around Grassington Moor have that similar alien sense of place that is exciting. Industry has created something that is unique. Something that is worth conserving for future generations to experience. Reclamation may not be satisfactory, even if it is viable or necessary. One of the most melancholy places I know is the former Allt Ddu district of Dinorwic Quarry where the admittedly dangerous workings and tips have been replaced by carefully graded but artificial looking slopes of anaemic grass and struggling stands of silver birch. Planning has created a soulless environment. Safer, but not a replacement for the original, or a gradual return of the industrial landscape to nature.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

53 Stowe Drive

Southam

Warwickshire

CV47 1NZ

(01926 813155

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Mark Abbott

Printing: Southam

Office Supplies,

Market Hill,

Southam, CV47 0HF

WARWICKSHIRE

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- ☉ Meeting Reports
- ☉ Napton Engine Update II
- ☉ Digital Archives
- ☉ 2005 Programme

EDITORIAL

In the September 2004 edition of the Newsletter I raised the idea of changing the design of the publication.

I also canvassed the opinion of members as to any shortcomings in the Newsletter. No comments have been forthcoming, so I assume that the current design meets with the approval of the readership. Therefore, I see no reason to change anything for the moment, and that includes the inclusion of photographs. Adding pictures to the Newsletter would entail considerable extra work and production of the established design is already a time consuming task, often requiring original material to be written by myself.

This additional material is something I do consider a possible shortcoming. There is a danger that, apart from the excellent meeting reports written by Arthur Astrop, the Newsletter reflects my personal interests rather than the interests of the membership.

There have been no complaints, but I would prefer a variety of material to draw upon, so written contributions from

Society members would be very welcome. Articles need not be long. 500 words is ideal, but shorter filler pieces are also needed, with as few as 100-150 words. Preferably these should be submitted on disc in rtf format, but I can transcribe printed work if necessary.

Mark W. Abbott

TOM CHARMAN

Tom Charman, who sadly died recently, was a long standing and loyal supporter of the Society. Therefore the Committee, after discussion with Tom's close friends, and taking into account the wishes of Tom's widow, have decided that a donation in Tom's memory would be appropriate.

Tom was a lover of the steam engine and a member of the Tal y Llyn Railway Preservation Society, for whom he acted as a volunteer train guard in the early days of that Society. Therefore, the plan is that the Society and the Warwickshire Steam Engine Society, of which Tom was a founder member, will make a joint donation to a specific Tal y Llyn project. Ideally this will be a small project associated with the Narrow Gauge Railway Museum at Towyn, that will be identified as sponsored in memory of Tom.

Peter Coulls has agreed to liaise with the Tal y Llyn Railway with the aim of identifying a suitable preservation project and a contact with whom to raise the idea of sponsoring the project in Tom's memory. The amount considered as a suitable donation by the Society is £50.00.

SOCIETY NEWS

Programme.

The programme to July 2005, is as follows:

January 13th

Dr. Mike Hodder and Mrs. Toni Demidowicz: *The Birmingham Glass Industry.*

February 10th

Mr. George Sayell: *The Old Mineral Line, West Somerset.*

March 10th

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Details of the programme for the new season of meetings starting in September 2005, will be published in the June 2005 Newsletter.

Subscriptions

Members are reminded that subscriptions for the 2004/2005 season have been due since September. If you are unsure about your subscription status please ask the Treasurer. The amount payable remains at £10.00 per person or couple. Cheques payable to *Warwickshire Industrial Archaeology Society*, please. Prompt payment would be appreciated.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

September 2004 Mrs. Toni Demidowicz
The Birmingham Jewellery Quarter

From about the middle of the 18th century a relatively small area just north of Birmingham city centre began to emerge as the focal point for the manufacture of what were then known as 'toys'. Not toys in the sense of children's playthings but quite small items such as buttons, brooches, knick-knacks, fashion accessories and ultimately jewellery in precious and semi-precious metals. Such goods were eventually to be produced in very large numbers, and the trade was extremely labour intensive. At its peak, the 'jewellery quarter' as it was to become known, was employing some 70,000, many of whom were women whose natural dextrous skills were ideally suited to the intricate work involved.

Today, the jewellery quarter (which still employs some 3,000) is an important focus for conservation efforts in Birmingham's city centre, and it was to this aspect that Mrs Demidowicz chiefly addressed herself at our September meeting. The origins of Birmingham's jewellery quarter lay in the wide use of 'home working' with manufacture being sub-contracted to scores of small in-house workshops, often the top rooms in back-to-back dwellings. Natural light from windows, so necessary for the close intricate work involved, was of the essence and this imperative remained even when eventually small 'factories', purpose built to suit the industry, began to appear. Nonetheless, the design of these small manufactories, intended for multi-occupancy, still maintained a flavour of the earlier 'home working' traditions.

In the 1770s, the Birmingham canal system was extended to serve the jewellery quarter and even though the French wars of the 1790s slowed the industry down it still continued to be vital to the City. By the 1830s it was really booming, and sufficiently well-established to merit the official title of 'Jewellery Quarter'. Specialization of manufacture was appearing and any plot of land large enough to site a manufactory for a few score workers (and it did not need to be very large) was soon snapped up and the density of jewellery firms in the City increased rapidly.

Mechanisation never really made much impact on the industry, which remained stubbornly labour intensive and heavily dependent on manual skills. However, simple machines such as hand-operated flypresses, and small power presses, were eventually employed. The electro-plating processes for depositing gold, silver, cadmium, chromium etc were also required, with the result that specialist

plating companies soon sprang up to serve the trade.

Mrs Demidowicz showed some excellent slides of small domestic manufactories in the jewellery quarter which have already been successfully preserved, and the drive to save others, in the face of intense pressure from property developers, is being firmly maintained. Birmingham's jewellery trade reached its peak in the immediate post-war period but then gradually, and inexorably, began to decline. This decline was caused by many factors, but chief among them was intense competition from overseas. Nevertheless, the conservation of Birmingham's jewellery quarter is extremely well established, many unique properties have been permanently saved from the bulldozer, and the impetus to save more is undiminished. Indeed, as Mrs Demidowicz pointed out, the strictures which the City has imposed to preserve remaining properties, and on the design of any new properties proposed for the quarter, are so severe as to make developers think very hard before even a single brick is moved!

Napton Engine Update II

Thanks to Hugh Compton, further snippets of information about the Oxford Canal's Napton Pumping Engine have become known.

According to the Oxford Canal Company's Distance Book in the National Archives at Kew (Ref: RAIL855/148), the $\frac{3}{4}$ mile canal arm to the engine site had Bridge No. 117 over its entrance. There is no bridge extant at that location now. Further, the arm is described as terminating at a wharf near a pumping house with a brickworks adjacent.

The reference to a brickworks is interesting. There is a flooded excavation across the minor road that now runs close to the engine house site, that could be a source of clay for bricks for the pumping scheme. That there was a documented brickworks at the end of the canal arm makes it more likely that this pit was the source of the brickmaking clay.

The canal arm is now used as residential moorings and tails off into a marshy area near the engine site. The Getmapping aerial photograph that shows the possible feeder tunnel line, does not show any crop mark that might indicate the site of a brickworks. However, the nearby excavation is small, so if it was a clay source it would suggest the brickworks was short-lived; possibly only established to provide the bricks needed by the pumping scheme.

Mark W. Abbott

Warwickshire Cheese

October 2004 Mr. David Fowler

The History of Cheese and Cheese Making in Warwickshire

There are mentions of cheese-making being practiced as far back as 8,000 BC, and many references to the industry are also to be found in the Old Testament. But at our October meeting we heard of the activities of Fowlers of Earlswood, proudly able to boast of being the oldest family based cheese-makers in England. Founded in 1840, the company still produces hand-crafted cheeses and David Fowler, grandson of the founder and current head of the firm, explained the basic stages in cheese manufacture and their importance in the maintenance of quality.

His family started as milk suppliers and at a time when it was merely the surplus milk which was used to produce cheese and butter rather than allowing it to go to waste. Today, the situation is the complete reverse, and the Company produces nothing but cheeses. It has a 110-head herd of cows, offers a range of 14 different types of cheeses in four ranges of 'strength', and it has approximately 5 tons of cheeses in store, at various stage of maturity, at any one time. In cheese manufacture, 'strength' of flavour is a product of time. Cheeses marketed as 'mild' are matured for about 4 months. Others mature for seven to eight months, and the extra-extra mature cheeses are kept for as long as 20 to 24 months before being marketed.

Many of the multiple processes involved in the hand-crafting of cheese are 'time and temperature' dependent and much of the equipment and controls employed are more akin to a laboratory than to a food-processing plant. Control of the processes, and of the procedures at every stage, are most rigorous and are also subject to strict audit by independent inspectors who can demand access to all stages at any time. They also expect to be shown the 'traceability' records of all materials used in cheese making, so that any batch can be tracked back to its origins.

Fowlers of Earlsdon have a countrywide distribution of their cheeses but it was noteworthy that today some 18 per cent of output goes to Farmers' Markets and approximately 20 per cent to the supermarkets.

Digital Archive; A Misnomer?

The term 'archive' might be defined as: A collection of documents or records or the place where such a collection is kept. Further, the term implies a collection that is conserved for use as a historical study resource.

Techniques of preserving existing paper and artefact archives are well proven and one might reasonably expect to access such collections in the future. However, a trend towards digital archives, especially amongst amateur researchers, is perhaps less welcome. The term digital archive is really a misnomer, and a better term might be digital record management.

The digital archiving of material typically occurs in one of two ways. First, there is the digital record of an existing collection. This uses digital technology as an extension of existing record management methods. The original material remains intact, while access to it for study or research is made easier. Further, the problems of conservation of the original material are eased, as it rarely needs to be removed from storage. As technology advances all that needs to be ensured is that the digital management of a collection keeps pace with technology to maintain efficient access.

Second, there is the true digital archive. This is a technique that is common amongst amateur researchers. The documents and records are stored only in a digital form. Whilst this is exceptionally convenient in the short term, it is really only digital asset management. It is an archive in the sense that it is a collection of documents, but if 'archive' also implies conservation, then a digital archive falls short of this aim.

Anyone who has owned a computer will testify to the ephemeral nature of digital data. Corruption and loss is commonplace and only avoided by systematic back up of data. This in itself is not straightforward for archival storage and access.

CDs are often recommended as a means of archiving files, but these are not a proven long term solution. Currently, ten years is thought the likely life of laser written CDs and DVDs. Also, it is unlikely that devices to read data CDs will be available in as little as ten years.

Removable hard drives are another option. However, long term stability of such data remains unproved and a change in technology could render the data unrecoverable.

So for the amateur researcher, what might be a solution to archiving information? Realistically, the answer is to keep paper copies of everything and use film for images. This will ensure a lasting record that does not rely upon technology for access. View the computer only as a means of record management and transmission.

Mark W. Abbott

Rails to Birmingham

November 2004 Mr. John Boynton
The London and Birmingham Railway

Undeterred by the fact that there was effectively a substantial 'gap' in the rails, large numbers of people in Birmingham nevertheless queued in 1838 for tickets on a newly opened railway in order to be in London on 28 June that year for the coronation of the young Queen Victoria. The discontinuity in this historic line, the construction of which was masterminded by Robert Stephenson, was caused by delays in completing the 1½-mile long Kilsby tunnel, a mammoth civil engineering undertaking at the time. To span the 'gap', passengers *en route* from Birmingham to London had to de-train north of the tunnel and travel by coach before rejoining the railway some distance further south.

The 110-mile London and Birmingham railway, John Boynton reminded us, was historic in a number of ways. It was certainly the most important in Britain at the time, could claim to be the first long-distance railway in the world, and it laid the foundations of a nationwide railway network in the UK. Unlike Brunel's Great Western railway, the route of the L & B line lay 'across the grain' of the countryside's topography and so, besides the challenge of the Kilsby tunnel, numerous cuttings and embankments also needed to be built. John's description of the excavation of the cuttings, using only picks, shovels and wheelbarrows and with the spoil being hauled up steep slopes by roped donkeys, made them seem an inconceivable, if not an impossible, task today. A major obstacle encountered in driving the Kilsby tunnel was unexpected ingress of water, which was a serious cause of delay. John pointed out that more than 30 different contractors were involved in the tunnel, and at least 10 of them were bankrupted by the project before it was completed.

At its London end, the line had Euston station, with its proud Doric entrance arch incorporating 45 ft high pillars. At the Birmingham end of the line stood Curzon St station, equally impressive in its

way and with its pillars just 12 inches taller, at 46 ft! John also pointed out that the L & B line was extremely concerned with safety and security of passengers, and was the first to have 'railway police'. Men stationed along the line could signal to each other when necessary, and were in fact the forerunners of the railway signaling system we know today.

Two years after the L & B line opened, Bradshaw published the first edition of his railway timetables, which was an attempt to integrate the services offered by all the routes in the UK. A copy of the first 'Bradshaw' can be seen in the Birmingham City Library, and is noteworthy for the number of advertisements for 'quack medicine cures' which it contains! To round off his talk John showed a fine collection of slides, tracing the L & B line northwards from Euston to Birmingham, and including many early photos of stations, locos and rolling stock in the Midlands.

Publications

The latest edition of *Archive* has recently been received by the Society: *Archive*, Issue 44, Lightmoor Press, 2004. Steam locomotives and railways feature heavily in this issue, in celebration of the 200 years since Trevithick demonstrated his Penydarren locomotive, thereby showing the way forward for railways and industrial railways in particular.

However, perhaps of more interest to members is a further article in a developing series on Coventry's industrial history, on this occasion an account of William Arthur Weaver and the Coventry Victor Company Limited. The Victor Company specialised in horizontally opposed IC engines and made a range of motorcycles and cycle cars between the Wars. An excellent selection of photographs accompanies the article.

The journal may be borrowed from the Treasurer.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	53 Stowe Drive
Leamington Spa	Warwick	Southam
Warwickshire	Warwickshire	Warwickshire
CV32 5LT	CV34 4DD	CV47 1NZ
(01926 313782	(01926 401072	(01926 813155
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

Design and editing:
 Mark W. Abbott
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 Arthur Astrop
 Mark Abbott
Printing: Southam
 Office Supplies,
 Market Hill,
 Southam, CV47 0HF

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Industrial Archaeology Society

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THIS ISSUE

- ☉ Meeting Reports
- ☉ Warwick Gasworks
- ☉ Bill Gibbons
- ☉ 2005 Programme

EDITORIAL

Elsewhere in this edition is a short article about Warwick Gasworks, included for two reasons.

First, the remains of this works are of great historical importance. This led the Society to use a drawing of the street frontage buildings as its first logo, and many in the Society retain an affection for the structure. So I hope this opportunity to add a little to members' knowledge of the site is welcomed.

Second, this style of article is exactly what is required for the planned guide to Warwickshire IA. So the article is also included to serve as inspiration to any members contemplating contributing to this guide.

Mark W. Abbott

2005 AIA CONFERENCE

Notice has been received of the forthcoming 2005 Annual Conference of the AIA. This year the location is Derbyshire, with accommodation at Nottingham University. The main programme runs from Friday 2nd September to Sunday 4th September, with a full additional programme of visits

and lectures through to Thursday 8th September.

First-time attendees are entitled to a discount of £25.00 off the main weekend programme (full price £150.00 residential), or £50.00 off the complete week package (full price £450.00 residential). The Treasurer holds details of the programme and a booking form. The deadline for bookings is 6th August 2005.

TOM CHARMAN

After a short delay, the proposed memorial to the late Tom Charman has been finalised thanks to the efforts of Peter Coulls. Funds donated by Warwickshire Industrial Archaeology Society, the Warwickshire Steam Engine Society, and some of Tom's close friends, will be used to sponsor a restoration project at the Tal y Llyn Railway's Narrow Gauge Railway Museum. As mentioned in the last Newsletter, Tom was a supporter of the Tal y Llyn Railway Preservation Society from its early days, so sponsoring a project at that Society's museum was considered to be a fitting tribute.

The specific project that is being sponsored is the restoration of a narrow gauge slate wagon from the Tal y Llyn Railway. This is already underway. When placed in the museum there will be an accompanying plaque stating that restoration was sponsored in memory of Tom Charman. Members will be advised of the completion of the project.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme for the remainder of this season, to July 2005, is as follows:

March 10th

Mr. David Depledge: *Coventry Airport: Past, Present and Future*

April 14th

Members' Evening: *The Industrial Archaeology of the Rugby District.*

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NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2004 Mr. John Burton

Hat-making and Ribbon-weaving in the Bedworth Area

As revealing as a fingerprint is the telltale presence of a disproportionately large window frame in an otherwise rather humble building. It's a sure sign that at one time its inhabitants needed all the natural light they could get, because their livelihood depended on it. None more so than the outworking weavers who clustered in and around Bedworth and its environs.

John Burton has made an extensive study of the ribbon-weavers who once flourished north of Coventry, and his ability to spot the clues to their previous existence in even the smallest of villages made for a fascinating evening. The faintest of outlines on the outside walls of cottages which suggest there was once a larger window installed is enough for John, and if its outline cannot be detected on the outside then sometimes traces on the inside of the building can give the game away as well!

John's presentation started with brief reference to weavers' top-shops in Coventry, including those in Hillfields which are already recorded in some detail. The Coventry industry is, of course, closely bound-up with the arrival of the Huguenots, but there is evidence that ribbon-weaving in the Bedworth area predated that time. It was based on the use of small hand-loom installed in cottages in the villages around Bedworth, such as Shilton, Bulkington, Ansty, Barnacle etc. But in due course, from one-third to one-half of the population of Bedworth itself depended for its livelihood on ribbon weaving, notably in the Spitalfields area.

It was the development of the power loom, and not least the 'automation' made possible by the Jacquard punched-card system, which eventually finished the out-workers and their hand-loom. Weaving mills employing steam power and hundreds of workers took their place, and they in turn merged and amalgamated until the industry rested on a small number of large companies. One such, Toye Kenning & Spencer, survives in Bedworth to this day, has a Jacquard loom still in use, and is an important manufacturer of caps as well.

Hat-making was the second part of John Burton's talk. There is an important link between ribbon-weaving and hat-making, for practically every hat or cap has some sort of ribbon on it as well. Hat-manufacture is very labour intensive, and John explained the basic manufacturing stages involved, some of which survive fundamentally unchanged to this day. Slides of the insides of hat-making factories in the late 19th century showed

the conditions under which the workers laboured, including unprotected exposure to many chemicals which would be forbidden today. His slides also showed that the workforces included children as young as 10 to 12, who worked long hours in clearly hazardous conditions.

One of the most prominent hat-makers in Bedworth was Pickering's, which was founded in the 1880s and became a major employer. It had the most up-to-date machinery for its time, including steam-raising plant. The once-splendid factory was demolished in the mid-1950s, and on its site stands a Tesco supermarket.

W. G. (Bill) Gibbons (1921-2004)

It is with great sadness that we report the death, at the age of 83, of Wilfred George ("Bill") Gibbons.

Although not a member of WIAS, Bill was well known to many within the Society and will be fondly remembered by all those who knew him. He was a great local historian, whose profundity of knowledge on Leamington and its environs was unsurpassed.

He was born in Leamington and, apart from his wartime service in the Royal Navy, lived all of his life in the town. Although Bill only rarely talked of his wartime experiences it is known that he served on the escort carrier HMS *Unicorn*, and saw action with the Fleet at Salerno, in 1943.

Bill will probably be best remembered for his numerous publications on Leamington and other related local history subjects; there being far too many to enumerate here in this brief summary of his life. His annual calendars, usually featuring photographs of Leamington through the ages, were also extremely popular. In addition, Bill was a gifted photographer and it is believed that his considerable collection of pictures, particularly those relating to Leamington, has been secured for posterity.

Ever generous, Bill would willingly provide information on local history matters, whenever requested and if, unusually, he did not know the answer, he would endeavour to find out very quickly. He also supplied information to many organisations, including the All England Club at Wimbledon, whose museum of Lawn Tennis benefited from his local knowledge.

Although in some respects a very private person, Bill was a very congenial man, whose passing will be greatly mourned by many.

J. F. Willock

Birmingham Glass

January 2005 Dr. Mike Hodder & Mrs. Toni Demidowicz

The Birmingham Glass Industry

In 1997, Mrs. Toni Demidowicz and Dr. Mike Hodder researched the now defunct glass industry in Birmingham to see what tangible (if any), remains have survived and to pinpoint the most important sites. In presenting the results of their work, they approached the subject from two angles, namely, investigation of the documentary sources, in the form of maps, trade directories, adverts and catalogues; and secondly the hard physical evidence, such as the remains of walls, foundations etc.

Toni kicked-off with the documentary evidence which revealed at least 18 discrete glass house sites in Birmingham, and evidence that the first glass manufactory appears to have been that of Mayer Opnaim in 1757, in the Snow Hill area of the city. Important clues came from the various 'prospects' (steel engravings) of Birmingham, where the telltale 'brick cones' of glass houses appear in increasing numbers through the 18th and 19th centuries.

These cones, which fundamentally were massive chimneys, were very large in diameter and tall, and stood out unmistakably among other important buildings such as churches and steeples. Brick-built, the cones were large in diameter because they housed not only one or more furnaces but also provided enough space around the furnaces for numbers of skilled glass workers and their assistants (often no more than children) to pursue their crafts. In addition, arranged internally around the periphery of each cone there were separate spaces for ancillary glass-making processes, such as holding and annealing furnaces. The temperature in which the craftsmen laboured, the air they breathed, and the overall effects of working long hours literally 'inside a huge chimney', can only be guessed at today.

The products of the Birmingham glass industry were predominately small items, typically for instance the large numbers of individual plain and coloured glass 'drops' which went to build up the complex chandeliers so beloved of the Victorians. It was the glass-makers of Birmingham who produced the 20-ft high glass fountain that was the centre piece of the Great Exhibition of 1851, and which survived until the Crystal Palace fire of the 1930s.

Mike Hodder's presentation, as mentioned earlier, focused on the physical evidence of glass making remaining in the city. Parts of several sites have been excavated but many more lie beneath modern developments and, as a result, might be considered unreachable. But as Mike pointed out, these days modern buildings of the types found on

industrial estates, for example, have relatively short lives before they are demolished to make way for more modern types. Moreover, the sites on which they stand were often prepared by simply clearing down to ground level, so that important subterranean features of glass houses, such as the underground caves and tunnels which fed air to the furnaces, were not disturbed. Today, therefore, those applying to redevelop sites on which the city's glass houses once stood are subject to onerous conditions before planning permission is granted.

Warwick Gasworks

The following entry appeared in the recently received *West Midlands Archaeology*, 46, 2003 and is reproduced here by kind permission of the editor, Sarah Watt and of the authors, Catherine Coutts and Christopher Jones of Warwickshire Museum.

Warwick Saltisford Gasworks (SP 278 653)

A survey was carried out on the street frontage buildings of the former Gasworks in September-October 2003 on behalf of Jayson Hollier, prior to their proposed conversion to flats. The gasworks is a Grade II Listed Building and includes a pair of octagonal gasholders dating from 1822, possibly the oldest surviving examples in the world and therefore of international importance. Six major phases of building work were identified. The initial phase includes the two octagonal gasometer buildings and what may be elements of the original central gateway. The gasometer buildings were constructed of hand-made bricks, while all subsequent works used machine-made bricks. Wings running on either side of the central gateway were developed by at least 1851. By 1905 the central gateway had been blocked by a single-storied structure and the two gasometer buildings were thus linked by a continuous structure. Little further major development took place until the central single-storied structure was raised to two stories in the 1970s and the whole of the frontage re-fenestrated to give a unified appearance. During the later 20th century the interior was partitioned off into rooms and corridors by stud walling. The building is currently derelict.

The original article is accompanied by front and rear view elevation drawings and interested members may borrow the relevant Society copy of *West Midlands Archaeology* from the Treasurer.

As of February 2005 the building remains derelict. Some work seems to be underway to the rear of the structure, presumably in connection with the eventual conversion to flats, but the street frontage is fire damaged and boarded up.

Some Somerset Industrial Archaeology

February 2005 Mr. George Sayell

The Old Mineral Line

One of the most pleasing ways of presenting a talk on an aspect of industrial archaeology is to use illustrations which show alternately 'the way it once was' followed immediately by 'how it is now'. WIAS members George and Liz Sayell used this approach very effectively at the February meeting, when their subject was the railway line originally built to carry iron ore from mines in the Brendon Hills, Somerset, to Watchet on the coast, whence it could be shipped to South Wales. The line also carried passengers, of which more will be said later.

The systematic way the Sayells researched the line, which had a relatively brief working life, is an excellent example of what the amateur archaeologist can achieve, armed only with enthusiasm, a camera, a notebook and an enquiring mind. This combination, the Sayells found, also invariably evoked a sympathetic response from the locals, who went out of their way to share their knowledge of (and pride in) their area.

Important milestones in the rise and fall of the line included the initial formation of the Brendon Hills Mining Co in 1852. This venture did not prosper and was succeeded, a year later, by the Brendon Hills Iron Ore Co in partnership with The Ebbw Vale Co. In 1855, an Act of Parliament sanctioned the building of a standard gauge 13 1/4-mile long railway which included an incline from Comberow to the top of the Brendon Hills. Vestiges of this incline, opened in 1858, can still be seen. It was designed by Rice Hopkins, was 1,100 yards long, had a gradient of 1 in 4, and climbed 800 ft in the process. At the time, it was the longest and steepest standard gauge incline in the country. If passengers elected to remain on the train as it negotiated the incline then they did so, they were informed, 'strictly at their own risk'!

Empty trucks were originally pulled by cable to the top of the incline by the weight of trucks loaded with iron-ore descending, a system which worked

well until the mines ceased to be economically viable, and in 1883 were closed. To continue operating a passenger service, therefore, an engine house and Robey steam engine driving cable drums were installed. But by 1898 even that venture could no longer be sustained, and the line was closed. The Robey steam engine was removed and transferred to Washford, where it operated an ore-briquetting plant.

In WW1, the railway lines were ripped up and sent for use in munitions manufacturing and, as George wryly observed, must now be dispersed over the fields of France. Evidence of the 'Old Mineral Line' can still be seen in Somerset however, including the remains of the winding house, parts of stations and platforms, level crossing gates, and remains of bridges. And examination of the harbour at Watchet, including the west pier, can also yield evidence of the 'mineral line'.

Particularly recommended is the Watchet Museum, a guidebook by Sellick *The Old Mineral Line* and a visit to the *Raleigh's Cross Inn* on the Brendons where there is a splendid display of photos. The Sayells can recommend *The Well House* in Watchet (01984 634514) for overnight stay.

Subterranea Britannica

Subterranea Britannica (www.subbrit.org.uk) is an organisation dedicated to the study and investigation of all man-made and man used underground places. Their web site contains a well produced resource of site studies, the majority of which are industrial archaeology related.

Added in January 2005, is a short article about Newbold Tunnel on the old line of the northern Oxford Canal. Unfortunately there are no underground views, but otherwise this is an excellent short piece, illustrated with a map and good photographs. The only other Warwickshire site covered is Rugby Radio Station.

Mark W. Abbott

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M. J. Green	D. M. Crips	M. W. Abbott
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CV32 5LT	CV34 4DD	CV47 1NZ
(01926 313782	(01926 401072	(01926 813155
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

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- ☉ Meeting Reports
- ☉ Warwick Gasworks
- ☉ Early Steam Engines
- ☉ 2005 Programme

EDITORIAL

I am compiling this Newsletter during one of those periods of major change and resulting stress that sometimes crop up in life.

One of those changes is one of change of address and while the exact details are not settled as this is written, what is certain is that by the time this Newsletter is published, my contact details on page four will be out of date. I also anticipate a short period when I will not have a telephone line. Thus, I will not be able to collect email from the Society account. Any emails sent will remain on the server until I am able to download them, but please do not expect an immediate response. I would also ask that members *do not* use the phone number given for me at the end of this Newsletter.

Members who have provided the Society with their email address will be informed of my new details when they are available. Otherwise, I hope to have the information available at the July meeting and it will of course be published in the September Newsletter.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme through to December 2005, is as follows:

July 14th

Mr. Mike Buxton: *Milestones: Warwickshire and Beyond.*

September 8th

Mr. Hugh Compton: *The Oxford Canal.*

October 13th

Dr. Michael Harrison: *Highlights of Recent Annual Conferences of the Association for Industrial Archaeology.*

November 10th

Mr. David de Haan: *Ironbridge*

December 8th

Prof. Marilyn Palmer: *Technology in the English Country House and Estate*

Details of the programme for the first quarter of 2006 will appear in the September 2005 Newsletter. Please also note that Prof. Marilyn Palmer is not confirmed for December 2005. Her other commitments may mean that this talk is deferred to a date in 2006. Members will be advised at the November meeting of any change to the December programme.

Subscriptions

So that the AGM fits within this year's planned programme of meetings, it has been brought forward one month from the usual July date, to the June meeting. However, as in previous years, subscriptions for the next season of meetings will become due from September.

Web Site

The Society Web Site, which may be found by tapping in

www.warwickshireias.org, has been running for nearly two years under the care of Peter Riley, who recently decided that an update was needed. The redesigned site is now on line and has a much more streamlined and professional look than the previous incarnation.

The content includes back copies of the Newsletter; recent ones in the published format as pdf files for which Adobe Reader is needed (a free download from www.adobe.com or via the link on the Society site homepage), as well as the current published programme of meetings, some aspects of Warwickshire IA, and an excellent links page.

Summer Walk

This year sees the reinstatement of the annual Society summer walk under the guidance of Peter Chater. Peter will lead a short excursion from Marston Doles on the Oxford Canal (OS Landranger 151 GR 466583), on Thursday 16th June, at 7.15pm, to the site of the Napton Pumping Engine (as featured in recent back editions of the Newsletter) to look at the remains of the engine house and its watercourse. The walk will only be about a mile in length. Limited parking is available by the roadside, immediately over the canal bridge on the Southam to Priors Marston road.

Peter has an excellent knowledge of local history and his guided walks are always interesting and informative, so please support him and the Society in this venture.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2005 Mr. David Depledge

Coventry Airport: Past, Present and Future

In 1906, only three years after the Wright brothers had demonstrated controlled flight, Coventry took its first tentative steps into the aviation industry. The firm of Morton & Weaver (later to become Coventry Victor), designed, built and flew a monoplane*. Eight years later, by the outbreak of WW1, Siddeley-Deasey was already building planes and engines in very large numbers. The planes were flown off Coventry's very first airfield, at Radford.

The city's second airfield was established in 1920 at Whitley by Armstrong Whitworth (that Company having taken over Siddeley-Deasey), and in 1923 a flying school was opened there. The Whitley airfield was not ideal, however, either for size or for location, and in 1933 Coventry decided to follow the national trend and to have its own Municipal Aerodrome. The site chosen was at Baginton, where 237 acres of a 1,300-acre site already belonging to the City were made available.

There is often an element of 'prestige' attaching to a city having a Municipal airport but, as David Depledge explained, they are also nearly always financially precarious undertakings. Because the fixed overheads of any airport are relatively high it depends critically on the number of aircraft 'movements' (i.e. takeoffs and landings), it can attract. Few civic airports are able to reach the required number consistently, and over the years Coventry airport has been no exception to that rule.

Between the wars, Armstrong Whitworth established a large factory next to the airport, and Alvis were also building aero engines in large numbers nearby. The second world war years saw both Companies, and the airport, thriving and new large hangars were rapidly erected. AWA was soon producing aircraft at a prodigious rate. Over 1,800 AWA Whitley bombers, over 1,300 Avro Lancasters and nearly 300 Avro Lincolns were built. As the war continued, Baginton airport played a vital part in the formation and commissioning of fighter squadrons which, in due course, departed for other airfields.

In 1946, the airport was handed back for civil use, under the management of AWA, and in 1948 its first control tower, destined to be used until the mid-1990s, was built. Two years later, in 1950, Coventry City Council took over running the airport, a responsibility it was to carry for the next 47 years. There followed a long period of uncertain futures, ambitious plans, short periods of profitability, longer periods of unprofitability, and a general striving to find a viable role for the airport.

Its first use for scheduled passenger work came in 1952, when DH Dragon Rapides of Jersey Airlines came into service. Other hopeful ventures included hosting the King's Cup Air Race and the Lockheed Aerobatic Championships. In 1960, a 5,300-ft hard runway was built, part of an ambitious 4-stage expansion plan the rest of which never transpired.

As the years passed freight services seemed to be the answer to the airport's problems, and for a period were successful. In 1998, however, the Council handed the airport over to the Atlantic group who, in 2003, persuaded TUI (UK) that passenger services could be run profitably. In 2004, in fact, over 460,000 people flew from Baginton to a variety of destinations, and at present it would appear that low-cost airline operation may be the viable future for the airport.

* *Issue 44 of Archive, available on loan from Mark Abbott, carries an article on Morton & Weaver with details and a picture of this aeroplane.*

Warwick Gasworks Addendum

Following the reproduction of the *West Midlands Archaeology* report on the remaining Warwick Gasworks buildings in the March edition of this Newsletter, Peter Chater has kindly supplied the following description of how coal was supplied to the Gasworks:

About sixty years ago when I was working on the footplate my mate and I used to shunt Warwick Cape Goods Yard and this included setting the wagns of coal in a siding for the Gasworks.

This siding where the coal-wagns were set was adjacent to the Down Mainline just west of Cape Road bridge, and would hold about ten wagns. At a point near this siding was a narrow gauge railway, which took a curving course on a falling gradient to the Gasworks.

To unload these coal wagns the Gasworks used one open topped manually propelled truck. This was positioned close to the coal wagns and a man would shovel the coal out of the wagn into this truck until full, possibly about a couple of tons. As it was a falling gradient, once the brakes were released, this truck would start to roll and the man in charge would step onto the back of it and ride to the Gasworks, a distance of about 150 yards.

I would guess that the Gasworks used about forty tons of coal a day.

Does any member know the period over which this narrow gauge line operated? It was almost certainly not an original feature of the works and does not appear on the 1889 1 inch OS map.

Rugby District

April 2005 Members' Evening

The Industrial Archaeology of the Rugby District

The area of Warwickshire designated the 'Rugby District' is among the smallest in the County but among the richest in industrial archaeology, much of which still needs recording. Indeed, as Martin Green pointed out, it is a veritable 'mine' waiting to be dug. As such, it is a splendid prospect for members of WIAS to tackle with notebook and camera, and Martin urged members to think seriously about what they can do to increase our records of the area.

To set the scene, he gave an overall view of the subject, touching briefly on the wide variety of IA topics to be found both in the town of Rugby itself and in its environs. As far as the town is concerned, three features dominate historically, namely: the railways and their associated activities; engineering works, some of which operated on a very large scale; and of course the manufacture of cement. Rugby featured prominently in the railway 'fever' which gripped Britain in the first half of the 19th century. The London & Birmingham line was the first to affect the town and among others which followed were the Midland Counties, the Trent Valley, the LNWR and, at the end of the 19th century, the Great Central. Rugby had no fewer than three rail stations over the years.

Heavy engineering started in the town when Willans & Robinson transferred there from Thames Ditton, and eventually came to be dominated by such giants as English Electric, British Thomson-Houston, GEC, AEI and, today, Alstom. The Boughton Rd works of BT-H had associations with Frank Whittle's early experiments with jet engines. Modern manufacturing technology means, of course, that the giant factories of Rugby's past, employing many thousands of workers, are no longer needed. But residual evidence of their existence still survives and should be recorded.

The Rugby Cement Works is to be the subject of a talk by our President, Toby Cave, later in the year, but other topics touched on by Martin included the factories of Lodge Plugs, Bluemels, Peugeot (at Ryton, in the Rugby District), the Rugby Radio Station and its masts, also the town's cattle market.

To augment Martin's talk, Peter Chater and Roger Cragg then gave presentations which reinforced the view that Rugby District is rich in IA subjects. Peter showed slides of a number of fine houses and other items of architectural and technological interest in the vicinity of Rugby town, including Newbold Lodge, the gates to Newham Paddocks, and Pugin's splendid Princethorpe Priory.

Roger Cragg dealt with 'civil engineering aspects' of Rugby District, especially examples of its canals, railways, roads and bridges. As far as roads are concerned, Rugby can boast two by the Romans (the Fosse Way and Watling Street), and of course Telford's Holyhead Road. A perennial problem in the recording of IA topics is trying to decide what merits a passing mention, what warrants extensive detailed recording, and what really doesn't need recording at all! So Roger concluded his presentation by looking at the criteria which The Institution of Civil Engineers (ICE) uses for assessing and 'grading', the significance (or otherwise), of an industrial archaeological 'find'.

Roger's presentation of that subject is too extensive to be included in this report, but is a system which member's could obviously use to advantage in their own investigations. It will be detailed further at the June meeting.

The Construction History Society

The Society has recently been supplied with details and membership application forms for the Construction History Society, an organisation that may not be familiar to members, despite its field of interest having links to industrial archaeology.

The CHS is a registered charity founded in 1982, the aims of which are: To disseminate research findings and general information about historical buildings and construction techniques, mainly, but not exclusively concerning Great Britain; to encourage contemporary industry to pay more attention to the safe keeping of its records, and to demonstrate the fascination and cultural value of construction history through an active programme of visits, lectures, symposia and conferences.

The CHS is not solely concerned with famous monumental buildings and major construction projects, but with all types of building and building methods as evidence of the material culture of a people. The Society is open to everyone with an interest in construction history, irrespective of their professional specialism. An annual journal, supervised by a specialist editorial board, is published to international academic standards.

Further information about the CHS may be found at their web site address at www.constructionhistory.co.uk, and an information leaflet and membership application form is available from the Treasurer.

Mark W. Abbott

An Early Railway Engineer

May 2005 Mr. Peter Cross-Rudkin

William James: The Father of the Railways?

The son of a Henley-in-Arden solicitor, William James (1771-1837) initially followed his father into that profession and began his practice in the same town. But William was not long content with the humdrum work of a country lawyer and was soon casting his eye on wider horizons. In a very well-crafted talk to our May meeting, Peter Cross-Rudkin drew a picture of James as a man whom today would be undoubtedly be recognized as an *entrepreneur*; a visionary and, some might say, also as something of a social climber.

His first 'step-up' came in 1801, when he was made Land Agent to the Earl of Warwick, an appointment which subsequently gave him the *entr e* to such luminaries as Lord Redesdale, the Earl of Dartmouth, the Duchess of Dorset and the Archbishop of Canterbury. Through successfully advising such clients how best they might exploit the mineral resources of their huge land holdings James began to build up his personal wealth, and by 1816 he owned several coal mines. His career advanced through further prestigious public appointments, but he had also caught, through a meeting with Richard Trevithick, the 'railway' bug. Later, after meeting with George Stephenson, James became convinced that the steam locomotive was to be the motive power of the future.

He was now set on a different course, namely the vision of a rail network spreading across Britain, and turned his enormous energy to planning, and actually surveying, a variety of potential routes. He had already played a part in the Stratford Canal and the Moreton tramway, and his early work on railways proper included schemes for lines between Canterbury and Whitstable, Chatham and Portsmouth, and Padstow to Fowey.

His most significant venture, however, was the projected 35-mile long line between Liverpool and Manchester, for which he produced a highly detailed survey. He now had an agreement with George Stephenson for the supply of steam locos for this

line, but perhaps for the first time in his career James was about to meet with obstacles to what had so far been a series of successes. Financial problems arose, not just in raising money for the venture but also deriving from a family feud, and there was the difficulty of getting the necessary Acts through Parliament. Suffice to say that in 1823, at a critical point in his career, James was declared bankrupt and even spent some time in gaol.

Disputes also arose over who should be in overall charge of the Liverpool-Manchester work, with Stephenson or the Rennie brothers being alternately 'on top', but with James now necessarily in the background. He eventually settled with his creditors and retired to Cornwall, where he died. James has been rather sidelined in the histories of 'great Victorians' but some claim he was the real 'Father of the Railways'. An important figure of his time certainly, in Peter's view, but not quite up to the claim 'the man who invented passenger railways'.

18th Century Steam Engines

Members in search of a day out with an Industrial Archaeology bias, might like to consider a visit to Julie and David Hulse's Eighteenth Century Steam Engines in Miniature. This collection of working model stationary engines comes highly recommended by John Selby and consists of seven model engines ranging from Newcomen's Dudley Castle Engine of 1712 to a typical beam engine of 1860. The models represent over 20 years work and employ the same materials and construction techniques as the originals.

A preview of the engines is available at www.btinternet.com/~historical.engines and David Hulse may be contacted on 01785 818773 or at david.hulse1@btinternet.com. The address of the collection is Quern House, 133 Oulton Road, Stone, Staffordshire, ST15 8DS. Visits are strictly by appointment only.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	53 Stowe Drive
Leamington Spa	Warwick	Southam
Warwickshire	Warwickshire	Warwickshire
CV32 5LT	CV34 4DD	CV47 1NZ
(01926 313782	(01926 401072	(01926 813155
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

Design and editing:
Mark W. Abbott

Additional material:
Arthur Astrop
Mark Abbott
Peter Chater

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Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ Canal Wharves
- ☉ Mystery Tramway
- ☉ 2005/2006 Programme

EDITORIAL

First, I would like to apologise for the slight hiatus in the administration of the Society affairs that fall to my responsibility and in particular for the failure of the Annual Accounts to be prepared in time for the AGM. Other pressures and commitments meant that something had to give way and inevitably that something was voluntary responsibilities, in particular WIAS commitments.

However, by the time this Newsletter appears, the accounts will have been prepared for presentation at the September meeting, and my Society administration should be back on track. Again my apologies for any inconvenience caused to members.

One item of administration that was overlooked was the mailing of the July Newsletter to members who were not present at the meeting and to outside agencies. If you missed a copy, just ask. There are back copies available. If the Newsletter normally reaches you by post, the July edition should accompany this copy too.

I can also now provide new personal contact details, which are as follows: Mark W. Abbott, 3 Holmes Court, Bridge Street, Kenilworth, CV8 1BP; Telephone 01926 540114, Mobile 07890 485190. My email accounts are also being accessed regularly again and the addresses remain as before: WIAS@photoshot.com for Society business and mwa@photoshot.com for personal contact. Members are asked to please ensure that they *do not* attempt to contact me using my previous address and phone number.

Mark W. Abbott

SOCIETY NEWS

Programme.

The programme through to March 2006, is as follows:

October 13th

Dr. Michael Harrison: *Highlights of Recent Annual Conferences of the Association for Industrial Archaeology.*

November 10th

Mr. David de Haan: *Ironbridge*

December 8th

Prof. Marilyn Palmer: *Technology in the English Country House and Estate*

January 12th

Mr. Roger Cragg: *Thomas Brassey.*

February 9th

Mr. Tim Booth: *Emscote Mill*

March 9th

Mr. Jeromy Hassell: *White and Poppe*

Please also note that Prof. Marilyn Palmer is not confirmed for December 2005. Her other commitments may mean that this

talk is deferred to a date in 2006. Members will be advised at the November meeting of any change to the December programme.

Subscriptions

Members are reminded that subscriptions for the 2005/2006 season are now due. Provisionally, and subject to agreement by the membership at the September 2005 meeting, the amount payable will remain as for the last season: £10.00 per person or couple with an additional meeting payment of £1.00 per person to help cover refreshment expenses. Payment should preferably be made at a meeting, but payments by post are acceptable. Please note that receipts for postal payments will not be sent out, but instead will be available for collection at a subsequent meeting. Cheques should be made payable to Warwickshire Industrial Archaeology Society please.

Disposals

Due to a house move the Treasurer has a quantity of model railway equipment for disposal. This is mainly 4mm narrow gauge kits, all unmade, but also a small quantity of Roy C link 7mm narrow gauge equipment, including an unmade Ruston LAT rail tractor kit. There are also a number of Wills Finecast 4mm scale building kits and a quantity of detailing accessories such as Grandt Line nut and bolt mouldings scale wood sections. All is available as one lot for inspection and a reasonable cash offer.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

June 2005 Mr. Roger Cragg

A Scheme for Industrial Monument Assessment and Grading

The formal business of the Society's AGM having been speedily dispatched, the June meeting of WIAS then turned its attention to the question of how to assess, and to grade, the importance of industrial archaeological sites in our County. As promised at the May meeting, Roger Cragg explained in detail a system devised for such work on a national scale and suggested that, with little if any modification, it could equally be applied on a local scale. In particular, it could be of assistance in selecting those IA sites suitable to be included in the Society's Gazetteer.

The system is based initially on a set of seven assessment criteria, namely: Landmark, Rarity, Age, Size, Engineer (or Contractor or Architect), Aesthetics and Condition. For a given IA site, each of these criteria is allocated a grade, from *A* through to *D*. The next step is to extract the three 'best' grades from the seven, and to use these to allocate a final grade, in the range 1 through to 4. The four final grades are: 1 = *AAA* to *AAB*; 2 = *ABB* to *AAC*; 3 = *ABC*, *AAD* and *BBB*; and 4 = *Others*.

To illustrate the process, Roger gave some examples. One was the Bearley (Edstone) Cast Iron Aqueduct, and his assessment of this site was as follows:

Landmark: No. Of 'old-fashioned' design.	<i>D</i>
Rarity: Several CI aqueducts in Warwicks.	<i>C</i>
Age: 1816, second oldest in the County.	<i>B</i>
Size: The longest in England.	<i>A</i>
Engineer: W. Whitmore (W. James).	<i>A</i>
Aesthetics: Not considered.	
Condition: In full use, and restored.	<i>B</i>

Selecting the 'best' three grades, the aqueduct earns *AAB*, and is therefore **Grade 1**.

Another example was the cast iron bridge at Hampton Lucy, which Roger rated as follows:

Landmark: No. Of 'standard' design.	<i>D</i>
Rarity: Few CI bridges in Warwicks.	<i>B</i>
Age: 1829, probably oldest in the County.	<i>B</i>
Size: 60 ft span, thus 'quite large'.	<i>B</i>
Engineer: William Mackenzie (?)	<i>A(?)</i>
Aesthetics: Not considered.	
Condition: In full use, and original.	<i>A</i>

Selecting the 'best' three grades, the bridge earns *ABB*, and is therefore **Grade 2**.

Roger concluded his presentation with a caution. The system works effectively only if each criterion is

judged objectively, and independently, of each of the others.

The meeting concluded with a presentation by WIAS member George Sayell. It was in 1957 that George entered the Willans Works of English Electric, Rugby, as a student apprentice, and Dunchurch Lodge, the main EE apprentice hostel, became his 'home' for the next five years. There were some 100 apprentices in his year and George described both the official regime they followed, and gave some insights into the unofficial pranks they also got up to! At that time, EE was designing and building steam turbines and large, slow-running diesel engines, and it was with the latter, both in building and installing them on site, that George gained much of his early experience. His slides included many shots of EE diesels installed in pumping houses in north London and other locations in the UK.

Cherry Orchard Brickworks

Kenilworth's Last Brickworks is the title of a recently published volume from Dialhouse Press of Kenilworth, featuring the photographs of WIAS member Derek Billings.

This 24 page booklet contains a collection of black and white photographs taken by Derek about a month after the Cherry Orchard Brickworks closed in June 1977. Then the site existed in a time warp, before clearance began a month or so later. The claypit was subsequently used for landfill and the perimeter of the site for housing and light engineering. Once a familiar sight to the people of Kenilworth, with the chimney something of a landmark, today there is virtually no trace of the site where manufacturing took place as far back a Roman times.

Recently, the last vestige of the works has been cleared, with the closure and demolition of the light engineering works on the site, to be replaced by yet another housing development. Some pictures of these final remains prior to demolition are posted on the Society web site.

There are now only about 40 copies of the booklet left, so any members who would like a copy are advised to act fast. The price is £2.50 to WIAS members and £3.50 to non-members. Contact Peter Riley or Richard Storey at the Society bookstall in the first instance, or visit Peter-Richard Books at www.peter-richard.co.uk.

Mark W. Abbott

Milestones

July 2005 Mr. Mike Buxton

Milestones: Warwickshire and Beyond

To move their soldiers and their supplies quickly and efficiently across their Empire, the Romans put down a large cylindrical stone to mark every 1,000th 'double marching-step' along the roads they built. Thus they established the idea of 'milestones' and, according to Mr Mike Buxton, National Co-ordinator for The Milestone Society, 117 of these Roman stones survive in the UK to this day.

The Milestone Society* was founded in 2001, currently has over 300 members, and has established a network of County Co-ordinators to '*identify, record, research, conserve and interpret, for the public benefit, the milestones and other waymarkers of the British Isles*'. In his talk to our July meeting, Mike Buxton conveyed not only the enthusiasm he feels but also the depth of knowledge he has for the wide variety of designs of milestones to be found in our islands.

Earliest milestones were, as their name suggests, made from stone on which was cut, sometimes quite crudely, basic information on distances to and from towns and villages. Indeed, the data on these stones suggests that some of the carvers were close to being illiterate, but their work is of no less historical importance for that. Mike traced the effects of the shifts in responsibility for maintaining the nation's roadways on the design of milestones. Initially local parishes bore the burden of road maintenance, and in this period understandably an extremely wide variety of different designs of milestones, including their shapes and the amount of data they carried, emerged. Gradually, however, as a result of various Acts of Parliament, responsibilities for roads changed, as did the road markers themselves.

One of the major changes came when technology allowed flat plates to be cast in iron and to carry more elaborate, and finely detailed, data than could be carved in stone. Such plates were first simply attached to the fronts of existing carved milestones, but eventually the complete marker itself was produced as a one-piece cast-iron casting. Moreover, as speeds of travel along roads increased, it was necessary to present the data 'angled' towards the oncoming traveller, and markers which are vee-shaped (in plan) were cast in very large numbers.

In an excellent slide presentation, Mike Buxton showed examples of milestones from some of the very earliest to the end of the 19th century, from which point milestones as we know them gradually ceased to be made. From 1945, indeed, their very survival became largely a matter of chance. The passion of Mike Buxton, and of The Milestone

Society, is to see that those 'stones' which do survive are cared for, conserved, and do not 'disappear' from time to time, ultimately to reappear in auctions, on e-Bay, or in someone's private garden collection! Mike was able to quote various instances where such 'disappearances' have occurred in recent times, but was also able to point to cases where, through the vigilance and initiative of members of The Milestone Society, Local Authorities have been prevailed upon to conserve and protect these fascinating relics of days gone by.

One wonders whether today's white on blue motorway 'milestones' will eventually be the cause of such laudable concern!

* Website at www.milestone-society.co.uk

'Cuttle Tramway'

An intriguing item of local industrial archaeology near Southam, is what I have termed the 'Cuttle Tramway'.

Modern maps still show embankment features running roughly north from the present railway houses on the Southam to Coventry road, to the Grand Union Canal behind Cuttle House and downstream of Itchington Bottom Lock. Early editions of the OS 1 inch series mark 'Old Limekilns' here, and my assumption has been that this was an early lime works; the tramway bringing limestone from the vicinity of the disused Rugby Cement works with the downgrade favouring loaded wagons, and the canal providing coal and a means of transporting the final product.

However, I recently visited Warwick Buildings who now occupy this site and discovered that the canal is embanked 2 to 2.5 meters *above* the lime works site. This is not unreasonable if off loading coal, but not a situation that favours the loading of lime. Furthermore, despite OS map evidence suggesting the tramway was disused before the railway to Daventry was built, there is, or was, evidence of brick bridge abutments where the tramway would have crossed this newer line. Yet the LNWR railway houses obscure the course south of the branch and what was to become Kaye's lime and cement works was already working before the standard gauge branch was built.

So the history of this obscure relic seems more complex than first thought. Can any members add anything that might help unravel the mystery a little?

Mark W. Abbott

Canal Wharves

The Warwick and Napton Canal

A list of wharves that existed in the year 1910 at Warwick and Leamington Spa

To give some idea of the location of these wharves, the following bridges are located at these mileages: Coventry Road 23m.34c, Tachbrook Road 25m.40c, Clapham Tr. 25m.78c, Radford Road 26m.71c. The miles are counted from Birmingham.

<i>Miles</i>	<i>Name</i>	<i>Type</i>	<i>Length in feet</i>	<i>Owner</i>
22.57c	Cape	Brick walled	144	Public
23.30c	Packmores	Not walled		Private
23.50c	Guyscliffe (Brewery)	Brick walled	67	Private
23.51c	ditto	Basin		Public
23.53c	ditto	Brick walled	327	Public
23.60c	Emscote Lime	Brick walled	219	Semi public
23.70c	Nelson Dale	Brick walled	350, 284, 126.5 71.5 & 164	Private
24.10c	Emscote Old Wharf	Brick walled	135	Semi public
24.15c	Emscote Mill	Brick walled	76	Private
24.15c	Electricity Works	Brick walled	138	Private
24.70c	Myton Road	Brick walled	83	Public
25.50c	Nelson Lime	Brick walled	143	Private
25.50c	Leamington ?	Brick walled	156 & 77.5	Private
25.50c	Priors Gas Works	Brick walled	84.5	Private
25.70c	Ranelagh St	Brick walled	119.5	Private
	Eagle Mills Foundry	Brick walled	302 & 157	Private
25.75c	Corporation of Leamington			
26.10c	Malt House, Clapham Tr.	Brick walled	184	Private
26.10c	Newbold, Clapham Tr.	Brick walled	162	Semi private
LEAMINGTON BASIN, WHARFAGE FOR EIGHT BOATS				
26.54c	Gullimans Lime	Timber	100	Private
26.54c	Gullimans Leamington	Timber	98	Private
27.50c	Butt Lane (Radford)	Brick	42	Semi public.

This information was taken from a survey that was done on the Canals and Inland Navigations of the United Kingdom by Sir John Wolfe Barry and Partners in 1910.

Peter Chater.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	3 Holmes Court
Leamington Spa	Warwick	Bridge Street
Warwickshire	Warwickshire	Kenilworth
CV32 5LT	CV34 4DD	CV8 1BP
(01926 313782	(01926 401072	(01926 850114
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

Design and editing:
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- ☉ Meeting Reports
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also became noticeable.

Strictly these remains represent landscape archaeology, but the inference for field industrial archaeology is clear. Snowfall, low sunlight and an area of known past industrial activity may reveal more to careful inspection than might be apparent under more usual weather.

Mark W. Abbott

EDITORIAL

The value of snow for industrial archaeology in the field was not something I had considered until the snowfall around Southam at the end of November.

Out and about in the course of my job, I had to travel to Burton Dasset and then Avon Dasset. This was an interesting exercise in itself as the minor roads had not been cleared and the temperature was below freezing, but the necessary slow pace of travel gave more time to notice the countryside. What was immediately apparent was that the covering of snow, and the low winter sun, accentuated patterns in the landscape. Ridge and furrow that was normally only vaguely defined was thrown into sharp relief as a striking pattern of white and blue-grey stripes across hillsides. Previously unnoticed track ways through the field patterns were similarly visible and it was possible to make out whole field systems where usually only indistinct bumps were visible.

Similarly very distinct were old quarry pits, while vague suggestions of platforms where buildings may once have stood

SOCIETY NEWS

Programme.

The programme through to March 2006, is as follows:

January 12th

Mr. Roger Cragg: Thomas Brassey.

February 9th

Mr. Tim Booth: Emscote Mill.

March 9th

Mr. Jeromy Hassell: White and Poppe.

Subscriptions

Members are reminded that subscriptions for the 2005/2006 season are due. The amount payable remains as for the last season: £10.00 per person or couple with an additional meeting payment of £1.00 per person to help cover refreshment expenses. Payment should preferably be made at a meeting, but payments by post are acceptable. Please note that receipts for postal payments will not be sent out, but instead will be available for collection at a subsequent meeting. Cheques should be made payable to Warwickshire Industrial Archaeology Society please. If you are unsure of your subscription status for this season please ask the Treasurer.

Reminders for outstanding payments will be sent out after Christmas.

Newsletter mailing

Those members who are unable to attend meetings regularly may have noticed the absence of the usual Newsletter mailings during the latter part of this year. This is due to a computer upgrade, which has made the address databases used for this mailing inaccessible, along with the database that holds subscription records. This should be a temporary problem, albeit one of rather longer duration than was originally envisaged! In the meantime, a stock of past Newsletters is always available at meetings, so please ask if you think you have missed a copy. All being well the usual pattern of mailings should resume in the New Year and apologies for any inconvenience caused in the meantime.

Tom Charman memorial

As reported previously in the Newsletter, the Society has partially funded the restoration of a narrow gauge slate wagon from the Tal y Llyn Railway in memory of late member Tom Charman; a long term supporter of the Tal y Llyn Railway Preservation Society. It can now be confirmed that the wagon to be restored will be one of the original TR wagons, fleet number 101. Restoration is about to begin in the Gunpowder Store at Wharf Station. The web address www.ngrm.org.uk/news should yield a photograph.

* * * *

NEWSLETTER

Meeting Reports *by Arthur Astrop*

September 2005 Mr. Hugh Compton

The Oxford Canal

The Oxford Canal, one of the most beautiful of our inland waterways, was a vital link in the great system which, in the late 18th and early 19th centuries, was constructed to join the north-west of England to the south-east, and specifically to London. Our members were fortunate to have Hugh Compton, current President of the Rail & Canal Historical Society and author of *The History of the Oxford Canal*, to relate the triumphs and the disasters which accompanied its construction.

Like many of the ambitious civil engineering schemes of that time, those who put up money to build the canal had some years to wait before they were to see a proper return on their investments, but when the profits, and then the dividends, began to arrive they did so in abundance. The delays on the road to profitability, however, must have sorely tested both the nerve and the patience of the shareholders.

There were the usual Parliamentary delays, while Bills were haggled over and passed, together with the inevitable wrangles with land owners and local authorities who were affected by, or who saw financial opportunities in, the new 'cut'. The areas of Hawkesbury Junction and Coventry were great centres of dissension and opposition and Coventry, not least, wanted its share of the spoils, and tried hard to resist any attempt to by-pass the city by building 'shortcuts'. In the end, of course, compromises were reached and Coventry got some, but not all, of its wishes.

The Oxford Canal has approximately 100 locks, and various tunnels, including the Napton, which is wide enough for two boats to pass, and has a towpath at each side. Napton brickworks was ideally placed to supply the millions of bricks required for canal bridges, tunnels, locks, etc. Braunston gradually became a very important trans-shipment area for goods being carried on the Grand Junction and Oxford canals, and Banbury soon had an important boat yard, which is still in operation.

Hugh Compton spoke about the arrival, in 1860, of the Henshaw steam tug which could pull as many as 12 boats. The railway companies protested and managed to get the speed of the tug limited to 3 ½ mph. South of Banbury on the Oxford canal, in a bid to keep costs down, many swing bridges were built instead of using traditional brick and/or stone construction. The mill at Heyford, however, eventually invested in a steam traction engine, which

proved too heavy for the wooden swing bridge over the canal. A cast iron bridge was eventually built to take its place.

Other aspects of the Oxford canal mentioned by Hugh Compton, included the building by the canal owners of pubs alongside the waterway, where canal business could also be conducted; the growth of coal yards adjacent to the canal; and the various types of dredgers used, from early versions which were largely dependent on sheer manual effort to the later more efficient steam-driven types.

Cob

Recently noted by Peter Chater in Claverdon is an example of cob construction, in this instance a boundary wall approximately 72 feet long, 6 feet high and 2 feet wide. It has a shaped corrugated iron coping with a good overhang to keep the cob dry. The wall is next to Wheelbarrow Lane (OS Sheet 151 GR 291648).

Cob is an old Devon word for a mud wall, and Devon probably has more cob than anywhere else in Britain, with cob being Devon's traditional construction material since the fourteenth century. However, cob is not restricted to Devon and examples may be found elsewhere in the UK. In Warwickshire cob is now quite rare, although there is a fine example of a row of cob built cottages in Dunchurch.

One reason for the popularity of cob in Devon may be the quality of the Devon clay sub-soils, many of which have a consistency and low shrinkage factor that makes them ideal for cob construction.

Traditionally, straw and sometimes dung, were added to the clay subsoil to reduce cracking problems during drying. Often cattle would be used to tread the mixture, so the addition of dung was inevitable!

Once the mixture was ready to use, the walls were usually built up in layers, typically by forking lumps of wet cob onto stone plinth foundations 450–900mm wide. This was heeled together by a team of people to form a horizontal layer up to 1000 mm thick. Each layer was given time to dry, to enable placing of the next one without the walls compressing and bulging. Sometimes shuttering would be used; the exact technique varied according to the quality of the cob mixture, the weather and local tradition.

Lintels and beams were seated and openings

Continued on page 4

AIA Conference Highlights

October 2005 Dr. Michael Harrison

Highlights of Recent Annual Conferences of the Association for Industrial Archaeology

Our Society has long been affiliated to the Association for Industrial Archaeology but relatively few of our members manage to attend the AIA's annual conferences. WIAS is therefore deeply indebted to those who do attend, and especially for their subsequent reports on the proceedings. Such firsthand reports from members however must, of necessity, be rather short but at our October meeting, Dr Michael Harrison, past-President of the AIA, was able to take a wider view and to cover in considerable detail the proceedings at two of AIA's most recent annual events.

He dealt first with the 2003 Conference, held in Cardiff, and then with the 2004 event, held in Hertford. The annual conference is, of course, the occasion of the Association's annual general meeting, but that essential business occupies only a small part of the total event. The 'host' town or city always prepares for delegates a special programme of visits to important IA sites in its area, and it was that aspect of the 2003 and 2004 events on which Dr Harrison mainly concentrated. South Wales has a rich history in the technologies of coal and iron, and early sites for both industries were visited, described and splendidly photographed by Dr Harrison.

He took us through museums associated with both industries, also a working pit for anthracite, and traced the routes from the pits and iron works to docks and export shipping. The wealth that both these industries once produced for South Wales was boldly expressed in the architecture and grandeur of the region's municipal buildings, which reflected the success and self-confidence of the area. We were reminded, for example, that the Taff Valley iron works was founded in 1765 and less than 40 years later could proudly claim to be the largest in the world. In Wales, the links between industry and adult education were always particularly strong, and were a proud by-product of the region's wealth.

A complete change of environment and range of industrial archaeological sites met those delegates who, in 2004, attended the AIA's annual conference held in Hertford. As Dr Harrison pointed out, Hertfordshire's industrial history lies in a very wide variety of activities, ranging from paper-making to gunpowder production and from brewing to flour milling. The development, during WW2, of the computer which cracked German's Enigma codes also took place in the county, at Bletchley Park

The production of gunpowder in a works at Waltham Abbey began in 1650, by private

enterprise, but by 1787 the entire site was Crown Property. Photos of early gunpowder production buildings, with a variety of different designs of 'blow-off' roofs and walls were shown. The New River, started in the 1600s to supply water to the rapidly expanding population of London, also originates in Hertfordshire, and examples of some splendid early water-pumping stations were illustrated.

In conclusion, Dr Harrison spoke about the typical structure of an AIA annual conference. Basically, each consists of three parts, namely the Annual General Meeting, seminars, and site visits arranged over a weekend. Obviously with an eye to the future, Dr Harrison ended his presentation by commenting on the fact that Warwickshire is rich in industrial history!

Society Website

The Society website is, as of October 2005, a member of the Industrial Archaeology and History Ring, managed by I A Recordings. This is collection of 104 vetted websites (at December 2005) all devoted to aspects of industrial archaeology and history. Membership is worldwide and not surprisingly the quality of sites varies from rather amateur looking to very professional. Each member site has a link to the main listing of sites as well as the ability to link to a random choice and previous or next links.

A quick few tries at the random link turned up sites as diverse as a business specialising in railway books to a site featuring photography of underground New York!

How useful the service is for locating sites on a particular specialist subject is debateable, but as a means of investigating the diversity of industrial history available on the Internet, it undoubtedly has some value and is recommended.

Incidentally, some excellent pictures of the old Kenilworth railway station, taken by Derek Billings, have also recently been added to the Society website. This building has long been demolished, but as these images show, it was a surprisingly imposing red brick structure with a beautiful glass roof to the main building.

Again well worth a look for members with an Internet connection, as is the News page, which is regularly updated with items of local and general IA interest.

Mark W. Abbott.

Ironbridge: Recent Research Results

November 2005 Mr. David de Haan

Ironbridge

There can be few 'monuments' more familiar to industrial archaeologists than Abraham Darby III's unique 100-ft span cast iron bridge over the Severn, but David de Haan's talk to the Society in November kept members enthralled for the entire meeting. Even to the point where, at the end, there was barely time for 'any other business'!

David is Programme Director of the Ironbridge Institute, also Deputy Director of the Ironbridge Gorge Museum, and his knowledge of Darby's bridge, down to the smallest detail of design and construction, must surely be unequalled. He described how the modern technique of photo-grammetry has been used to measure and 'map' the bridge and to enable rotatable computerised views of it to be created. His illustrations included fascinating examples of the latter, with the bridge being seen from a continuously moving viewpoint.

It is only in relatively recent times that the methods used to erect the bridge have been established, and what is more have been proved in practice. It was in 1997 that de Haan gave a lecture on Darby's bridge to the Newcomen Society. Among his slides on that occasion was a rather impressionistic water-colour by a Swedish artist recording a very early stage in the erection of the bridge. WIAS-member John Selby was present at that lecture and subsequently suggested to de Haan that what appeared in the painting to be rudimentary scaffolding could, in fact, be a twin-upright wooden derrick by which the five sets of semicircular castings were raised into position. In short, there might be much more to that painting than first met the eye!

The accuracy of John's theory was borne out only a few years later, in 2001, when television's *TimeWatch* programme set out to build a half-scale replica of the bridge using, as far as possible, the methods Darby had employed. A team of Royal Engineers successfully tackled the challenge, using

exactly the type of derrick seen in the water-colour.

David de Haan described how the 21st century iron castings were made using strickled moulds in the foundry floor, as were Darby's originals, and showed details of the cast dovetail joints whereby major castings were joined, without the need for bolts. He also spoke about the 'missing ribs', lower-end portions of the second and third sets of curved castings, which were originally absent but were subsequently completed by inserting individual castings.

The second and third sets of curved castings pass through slots in both vertical and horizontal members, and the slots were made large enough to allow for assembly, and to accommodate expansion and contraction. The gaps were then filled with cast-iron blocks, and molten lead was run in. The bridge originally had masonry abutments, but these proved to be too heavy for the river banks and were subsequently removed and replaced by towers.

The work carried out on this priceless bridge in recent years has also been aimed at establishing a programme of ongoing preservation and maintenance which will ensure its survival for posterity.

Cob continued:

formed in the cob as it was built up. The cob needed to dry to some extent before any frames were placed in the openings since the walls shrink in height with drying. This would cause a window or door frame placed too early to be compressed and become load bearing.

A good quality cob can survive quite well without rendering, but normally it is coated with a render made from quicklime putty and coarse sand, followed by a lime wash. These traditional coatings have the important property of being breathable, so that any moisture that does get into the cob, by penetrating rain or rising damp, can evaporate out.

Mark W. Abbott

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

3 Holmes Court

Bridge Street

Kenilworth

CV8 1BP

(01926 850114

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Mark Abbott

Peter Chater

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- ☉ Meeting Reports
- ☉ From the Chairman
- ☉ Harbury Windmill
- ☉ 2006 Programme

This edition of the Newsletter sees the start of a new regular feature: *From the Chairman*. Written by Martin Green, I anticipate a series of observations and personal thoughts on the direction of the Society and industrial archaeology generally. Comments are of course welcome!

Mark W. Abbott.

FROM THE CHAIRMAN

Ever since its inception in 1989, the Society has sought to fulfil its primary function of promoting the study and recording of the remains of our industrial past, with particular reference to the local area of Coventry and Warwickshire. The principal vehicle employed in this respect has been the regular monthly meeting which seeks to provide speakers on a range of issues (both local and beyond), and to offer a forum for discussion and the opportunity for contact between members. Attendances at these meetings now regularly exceed 50, and this is a very gratifying response by the membership to the programme laid on by the Committee. Long

may it continue!

Less fully embraced has been the more challenging task of seeking to record all the industrial sites in our area and to present these in some form of gazetteer. This has taxed the minds of the Committee for a long time, and no obvious solution offers itself which cannot avoid a considerable amount of labour from individuals in the Society.

There have, of course, been some excellent examples of individual study and recording by members which have added to our knowledge and understanding of the area's industrial past. For example, under Roger Cragg's leadership, the civil engineering heritage has been well covered – including the creation of the Warwickshire Bridges Database, whilst Arthur Astrop's research into the machine-tool industry of Coventry has improved our knowledge as well as identifying the (few) remaining sites of that once highly significant industry.

In fact, civil engineering, transport (especially canal and rail) and wind and water power have attracted considerable attention from other groups, and it is no surprise that these industries are well-documented. Part of the reason for this is, of course, that many continue to carry out their original, highly specific function (e.g. canal aqueduct; restored watermill) but this is not the case for many other sites. Many structures – though still standing – may have little link with their original function, being

Continued on page 2

SOCIETY NEWS

Programme.

The programme through to July 2006, is as follows:

March 9th

Mr. Jeromy Hassell: *White and Poppe*

April 13th

Mr. George Demidowicz: *The Soho Foundry*.

May 11th

Mr. Martin Green: *Aspects of the Industrial Archaeology of New Zealand*.

June 8th

Mr. Mel Thompson: *Woven in Kidderminster*.

July 13th

AGM and Members' Evening to include: *Aspects of the Industrial Archaeology of North Warwickshire*

Subscriptions

Members are reminded that subscriptions for the 2005/2006 season are due. The amount payable remains as for the last season: £10.00 per person or couple with an additional meeting payment of £1.00 per person to help cover refreshment expenses. Payment should preferably be made at a meeting, but payments by post are acceptable. Please note that receipts for postal payments will not be sent out, but instead will be available for collection at a subsequent meeting. Cheques should be made payable to Warwickshire Industrial Archaeology Society please. If you are unsure of your subscription status for this season please ask the Treasurer. Reminders for outstanding payments will be sent with the current Newsletter mailing.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2005 Prof. Marilyn Palmer

Technology in the English Country House and Estate

Largely through the efforts of the National Trust and English Heritage, the architecture, furnishings, paintings and grounds of very many of Britain's country houses and estates have been preserved and made accessible to visitors. This is sterling work, but until relatively recently it has been concerned principally with conserving what may be termed the 'upstairs' of such national treasures. But what of life 'downstairs'?

For on the other side of the 'green baize door', as it were, are to be found many hitherto neglected jewels of the industrial archaeology of our great houses. It is through the persuasion of Professor Palmer, and others, that efforts to preserve and make these treasures equally accessible to the public are increasingly bearing fruit, and it was on this aspect of IA that she addressed our December meeting

When the wealthy of the late 18th and 19th centuries, including the new industrialists, built their grand houses many chose sites deliberately distant from the 'madding crowd'. And if the site also happened to be on elevated ground, how was water to be supplied to the kitchens and bedrooms? Hence the eventual installation of different types of powered pumps and hydraulic rams to lift water from lower levels. What if, when the inconvenience of oil lamps became too irksome, the great house was remote from supplies of gas and, later on, the advent of electricity? Then, dedicated gas-producing or battery-charging facilities were needed. And when central heating became *de rigueur* then that also had to be installed.

Such equipment, visually so different from the other splendours of the great houses, was initially considered unfit to be on show to the residents, and especially to visitors. As a result, it was always installed either well 'below stairs' or in its own buildings out of sight in the grounds. Even hot water radiators were thought best concealed behind special casings in reception rooms in case they offended the eye. Much of what was once thought of as 'ironmongery' in our great houses and estates still exists and, in the nick of time, is being recorded, rescued, conserved, and in some instances even brought back to working order for brief demonstration purposes.

The installation of various types of technology in our great houses, Professor Palmer pointed out, was driven by two important societal 'forces'. The first was largely hedonistic, namely to provide greater comfort and convenience for the residents, together

with a desire to impress their visitors. By the end of the 19th C, domestic staff was already becoming more difficult to obtain, and the second driving force came immediately after the Great War of 1914-1918. Owners of the great houses then found there was no longer an apparently inexhaustible supply of manual labour, especially young maids- and men-servants. In short, they needed to use a steadily diminishing workforce much more efficiently, and turned to technology to fill the gap.

Professor Palmer's view of the industrial archaeology to be found in many of our country houses was illustrated by some splendid slides of what lies on the other side of the 'green baize door'.

From the Chairman *continued*:

occupied with activities unrelated to the past. Indeed, the nature of the structures may place limitations on their adaptability to modern industrial or commercial usage. The task of the industrial archaeologist is to make sure that what remains is recorded, and, if circumstances demand it, to try to press for conversion rather than demolition.

This is not such a simple task as it sounds. The phrase 'if circumstances demand it' begs many questions. What criteria might we use to judge whether an industrial building merits inclusion in our gazetteer and deserves- if possible - to be preserved? Here are some ideas which may deserve attention:

- Date of construction
- Significant technology and/or processes remain intact
- Important building in the history of the industry in the UK
- Only example/one of few remaining in Warwickshire
- Crucial building in an local/industrial/urban landscape
- Particular features of construction
- Architectural merit

Readers of this newsletter may feel there are other criteria to consider. Feel free to make your views known!

The great danger for the future is that an 'industrial heritage walk' through an area will simply be a stroll through housing estates with the guide only able to refer to the buildings and industries that used to be there. Careful retention and sensitive conversion of industrial buildings must have a role to play in future landscapes.

Martin Green

The Foremost 19th Century Railway Builder

January 2006 Mr. Roger Cragg

Thomas Brassey

A commemorative plaque to Thomas Brassey, the bicentenary of whose birth occurred in 2005, carries the words 'The world's foremost builder of railways in the 19th century'. This statement is undoubtedly true but it scarcely does justice to the energy, range of projects, skill and sheer genius of a man who by the time he died in his 65th year had masterminded railways (and many other related projects) in Britain and in no fewer than 14 other countries. A 36-in diameter silver gilt shield exhibited at the Great Exhibition of 1851 carried portraits of 12 of the eminent engineers with whom Brassey worked, 12 views of some of his greatest projects, and the names of 36 of his worldwide network of agents.

The son of a yeoman farmer, and born into a fairly wealthy Cheshire family, Thomas Brassey was 16 when he was apprenticed to Mr Lawton, a local land agent. He soon found himself on survey work for Telford's improvements to the Holyhead Rd in Cheshire, and by the age of 21 he was made a partner in Lawton's firm. He was sent to Birkenhead to run Lawton's business there and seeing the potential of the area as a future port he borrowed money from his father to found a brickworks to provide building materials. At that time, George Stephenson was building the Liverpool and Manchester railway and he asked Brassey to quote for supplying stone for a viaduct. That quotation was not accepted, but it led to another for the Penkrige viaduct, in which he was successful. He was also awarded a contract for a further 10 miles of railway. Brassey was 'on his way'.

From this point, Roger Cragg unfolded Brassey's astonishing career, originally in Britain but soon extending across the Channel into France. There, the 82-mile Paris to Rouen railway was one of his first overseas projects and at the same time Brassey switched from financing projects himself to working with partners. First there was William Mackenzie and later he also joined forces with Samuel Morton Peto and Edward Ladd Betts, a triumvirate which prospered for 18 years. By 1834 Brassey had 13 major contracts in England, Scotland, Wales and France and soon he was working in Norway as well. In 1852, Brassey, Peto and Betts undertook a survey of Canada, which led to the building of the Grand Trunk Route railway. And in 1855 he masterminded the construction of a 29-mile long railway in the Crimea to facilitate transport for Britain's war there. More than 20 ships ferried the materials from the UK, and in the first 10 days a huddled camp was built

and 5 miles of track was laid.

But not everything he touched was successful. He had several financial crises, losing substantial sums of money, and in 1846 the base of one of the piers on the Chappel viaduct shattered and consequently the remainder of the structure collapsed. The viaduct had to be completely rebuilt at Brassey and Mackenzie's expense. The sheer magnitude of his projects which, in addition to the 6,583 miles of railway track, included docks, bridges, waterworks, part of London's sewer system, involving work in countries from Russia to Australia and from India to South America, prompted Roger to wonder why Brassey is not as well known in the UK as another engineer whose name also starts with a B!

Harbury Windmill

Harbury windmill is of the tower type mill; it is situated in the village and is visible from many positions.

It was erected in the first decade of the 19th century and the tower is constructed of brick and stone. Chesterton Manor house was demolished in 1802 and it is thought that the stone used, originated from there.

The walls of the two lower floors are of stone (probably limestone) and the upper four floors are of dark red brick giving a total of six floors. There is a considerable batter on the walls. The height of the tower is sixty feet and the cap is another ten feet making it the tallest in Warwickshire. It formerly had a cap in the shape of an up turned boat; this has been altered in recent years to a pitched roof type.

It was originally fitted with four common sails of about thirty feet in length; these were reached from a furling gallery, which encircled the tower. The sails ceased operating the mill before the First World War and were removed in the early 20s, but the stocks were not removed until 1934.

From 1912 different forms of engines powered the mill, the first one being a steam engine, followed by an oil engine and from the early 30s by electricity.

At different periods the mill housed two and sometimes three pairs of stones these being of millstone grit or the French burrs. These stones were on the fourth floor.

There have been about eight different millers over a period of one hundred and fifty years. Over these years two were accidentally killed, George

Continued on page 4

A Vanished Landmark

February 2006 Mr. Tim Booth

Emscote Mill

In the Emscote Road, Warwick, there is a modern residential development called Fleur-de-Lys Court, where a 20th century pie factory once stood. But the pie factory was in fact housed in the buildings of a 19th century flour mill. And the only trace of *that* enterprise today is one small archway or culvert in the bank of the nearby Warwick & Napton canal through which excess water was taken, for a nominal payment of £30/year *in perpetuity*, to drive the mill's water wheel. It was with that shrewd annual contract, entered into in 1803 by Charles Handley and John Tomes, that Tim Booth started his story of a milling business which flourished for over 150 years and once provided the people of Warwick and Leamington with plenty of work.

The mill (initially known as Navigation Mill) was formally opened in late 1805 with power to drive five sets of stones and with a capacity for producing 500 sacks of flour per week. The water wheel was 24 ft in diameter by 7 ft wide and was in cast iron, that material having advanced to the point where the overall weight of such a wheel was no greater than one made from wood. With the new mill placed almost precisely midway between Warwick and Leamington, and with the impending prodigious increase in population of the latter town, its future success as a supplier of high-quality flour was hardly in doubt.

By 1830, millers Kench and Cattell were operating the business, probably as lessees to Handley and Tomes, and in 1841 Cattell seems to have withdrawn and the firm traded as P. Kench & Son. Tim Booth's immaculate research then led us through the successive generations of Kench's who ran the mill, extending and updating it. In the late 1860s, for example, a steam-driven mill was added to the water mill when the latter reached its maximum output. Towards the end of the 19th century, Sheldon Kench, grandson of the founder was facing up to changing technology with the introduction of

roller milling in place of mill stones. This process produced high-quality fine flour by gradual-reduction milling through diagonally arranged chilled-iron rolls.

In 1904, Sheldon Kench employed Briddon & Fowler to remodel the Emscote Mill and a large block of additional buildings appeared on the site. In 1908, Leonard Sheldon Kench joined his father in the business, having served his apprenticeship at the Albion Flour Mills, Worcester, but Leonard fell in WW1, and his father died in 1926. The mill continued working until 1961, when in due course most of its buildings were converted for the manufacture of Fleur-de-Lys pies.

A highly detailed, illustrated history of the Emscote Mill, written by Tim Booth, appeared in Issue 22 of *Wind and Water Mills*, 2003, published by The Midlands Wind and Water Mills Group, and is still in print. Copies were on sale, price £3.00, at the February meeting and are also available from Mr A. Bonson, 14 Falmouth Rd, Congleton, Cheshire, CW12 3BH.

Harbury Windmill continued:

Verney in 1890 by being caught up in the internal machinery, and another miller when out on the furling gallery being struck by a sail.

Milling ceased in 1952 and after some years it was used as an engineering workshop. In 1982 a rather larger looking pitched roof type replaced the boat shaped cap. In 1988 the lower floors became part of a home.

REFERENCES

1. The Warwickshire Museum Publication, *Windmills in Warwickshire* by W. A. Seaby and A. C. Smith.
2. *Wind and Water Mills*, Number 10, Midland Wind and Water Mills Group.

Peter Chater

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	3 Holmes Court
Leamington Spa	Warwick	Bridge Street
Warwickshire	Warwickshire	Kenilworth
CV32 5LT	CV34 4DD	CV8 1BP
(01926 313782	(01926 401072	(01926 850114
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

Design and editing:
Mark W. Abbott
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Martin Green
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Industrial Archaeology Society

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THIS ISSUE

- ☉ Meeting Reports
- ☉ From the Chairman
- ☉ Whittle Anniversary
- ☉ 2006 Programme

FROM THE CHAIRMAN

The Association for Industrial Archaeology (AIA) is the UK's main national and international body for the research, study and promotion of industrial archaeology. WIAS's contact with the Association comes through the Society's group membership and individual AIA members who also belong to WIAS.

In addition, two conferences are of importance in maintaining these links. The annual conference takes place in September each year, and is well known to members, but also in April each year the AIA Societies Weekend is held in Ironbridge. This gives an opportunity for representatives from local societies to meet together, to share ideas and experiences, and to present material from their local area. This is built around a predetermined theme, and is co-ordinated by Dr. Ray Riley. This year, for example, the theme taken was brewing, and a number of talks were delivered on the subject. These included brewing processes, brewing architecture, brewing in Somerset, vinegar brewing, the refurbishment of

Southwick brewery, medieval malting and brewing, and the IA of consumption: The Pub.

The Brewery History Society also had a strong presence, and the BHS represents another organisation whose work is very much complementary to that of the AIA. Membership details can be gained from Mr. Jeff Sechiari, Manor Side East, Mill Lane, Byfleet, West Byfleet, Surrey KT14 7RS.

The final part of the Conference was made up of members' contributions, and the only disappointment was that Ms Sarka Jirouskova from the Czech Technical University, Prague (who had prepared a Powerpoint presentation on Czech breweries) could not show her material because the AIA had not laid on the necessary equipment - a surprising omission in the modern world. She also highlighted the work of the Research Centre for Industrial Heritage (founded in 2003), and the "Vestiges of Industry" Biennial Conference, with the next one being held in Prague and other industrial areas of the Czech Republic in 2007. Details are available from Pod Juliskou 4, Prague 6, 166 00, Czech Republic for anyone who fancies an overseas trip!

The Ironbridge weekend is designed to be informal and non-threatening, with talks supplemented by a local walk on the Saturday afternoon and a relaxed Dinner on the Saturday evening. John Brace and myself represented WIAS. One interesting feature was the

strength of representation of societies from the south of England - apart from one representative from Manchester, Warwickshire was the farthest north! I have been to several of these conferences and - depending on the theme chosen next year - it is probably time for the Society to make a presentation of some sort to raise our profile and that of IA in Warwickshire. When next year's theme is known, we will inform members, in the hope that this will stimulate potential input.

Martin Green

SOCIETY NEWS

Programme.

The programme through to December 2006, is as follows:

July 13th

AGM and Members' Evening:
Aspects of the Industrial Archaeology of North Warwickshire

September 14th

Mr. Brian Jones: *The Birmingham Pen Trade*

October 12th

Mr. Mike Beech: *Foxton Locks and the Foxton Inclined Plane*

November 9th

Mr. Anthony Coulls: *Locomotion: NMR at Shildon*

December 14th

Members' Evening: *Brund*

Please note that, as usual, there will be no meeting in August. September will mark the start of the new 2006/2007 season of monthly meetings and subscriptions for the season will be due. Subject to the outcome of the AGM, subscriptions will be £10.00 per person or couple.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2006 Mr. Jeromy Hassell

White and Poppe

In late 1899, Alfred White, son of distinguished Coventry watchmaker Joseph White, and Norwegian-born Peter Poppe went into partnership and founded the small firm of White & Poppe. They opened a very modest workshop in Drake Street, off Lockhurst Lane, Coventry, with two employees and the intention of developing a single-cylinder engine for motor cycles. Barely had they started, however, than the demand for munitions in the Boer War secured them a substantial contract for making fuse bodies.

W & P were soon employing some 60 girls and 30 men. Fuse production was dominant, but the Company also developed machine tools for their own use and for sale. With the end of the Boer war orders for fuses ceased, so W & P returned to producing engines. Using clever design and interchangeability, W & P produced a range of one, two, three, four- and six-cylinder engines, also a novel design of carburettor of which 10,000 had been sold by 1910. Eventually, no fewer than 48 vehicle manufacturers were using White & Poppe engines, and in 1912 two of the firm's large 108-hp engines were powering the British army's Delta airship.

1912 was also the year in which the Company expanded into a new factory, fronting on to Lockhurst Lane. Here there were a drawing office, machine shops, engine erecting bays and engine and carburettor testing facilities. When William Morris sought an engine for his first car, the world-famous Bullnose Morris, he settled on White & Poppe. The car made its debut in March 1913, priced £175, and W & P received £50 for each engine. The contract with William Morris was clearly a *coup* for W & P, but the close association with him proved to be double-edged.

When a larger version of the car was proposed, William Morris went to the USA ostensibly 'to study mass production techniques', and he persuaded W & P to allow their chief designer (Hans Landstad) to accompany him. But Morris then placed orders for engines with an American supplier, and Landstad never returned to W & P. With the Great War imminent, W & P were soon back into munitions work and a new and much larger factory was built in Holbrook Lane specifically for that purpose. In 1914, W & P's workforce was 350. By 1918 that figure had risen to a peak of 12,000. The factory site on Holbrook Lane eventually extended to 141 acres, included hostels for 3,000 single women and 400 single men, together with 450 'cottages' for married

workers. On the site there were also 300 allotments, a 350-seat cinema, sports and social clubs, a full-size swimming pool and three canteens.

With the end of WW1, White & Poppe faced formidable problems. Munitions work ceased abruptly, they had lost the contract for Morris engines, and they were uncertain of their future. Should they produce their own car? Go into mass production? Buy the Holbrook Lane site? Or should they play safe by taking an offer for the Company which had already been made by Dennis Brothers of Guildford? That offer was accepted in November 1919, with Alfred White and Peter Poppe joining the Dennis board, but their firm's connection with Coventry gradually declined from then on. Today there is no evidence that it ever existed.

Jeromy Hassell is a descendant of Alfred White, has published a book on W & P, and his presentation was infused both with an intimate knowledge of his subject and an enthusiasm which made for a memorable evening.

Frank Whittle

Sixty-nine years ago, on April 12th 1937, an event occurred in Warwickshire that eventually was to have far reaching consequences for most of the developed world. The event took place without fanfare, in an atmosphere shrouded in secrecy and was witnessed by a mere handful of somewhat intrepid observers.

On that day, on a gallery of the B. T. H. Turbine Factory, at Rugby, Flight Lieutenant Frank Whittle operated for the first time his own creation: the world's first operational gas turbine turbojet. The engine, called WU (for Whittle Unit), was mounted on a rudimentary test-bed, with the jet pipe projecting through a window, from which a suitable pane of glass had been removed! Thick metal plates surrounded the test-bed to contain flying debris in the event of an engine explosion. Under these severely cash-strapped conditions Whittle brought his new engine to life.

Virtually uncontrollable over-speeding of the turbine and large patches of red heat appearing on the combustion chamber casing attended the early test runs of the engine. Flames leapt from the jet efflux and fuel vapour from leaking joints was ignited when it came into contact with the very hot combustion chamber casing. This inferno did little

Continued on page 3

The First Specialised Engine Building Works

April 2006 Mr. George Demidowicz

The Soho Foundry

Between 1775, when James Watt entered into partnership with Matthew Boulton, and 1795, some 300 steam engines had been built in Boulton's Soho Manufactory in Handsworth, then on the edge of Birmingham. But by 1795 the partners recognised that Watt's patent had only five more years to run, royalties would then vanish, and the field would be open to competitors. Moreover, the Soho Manufactory, built in 1762, had been designed to make a variety of small products including jewellery, buckles, buttons, silverware etc. Not the ideal plant in which to build massive steam engines.

The partners therefore decided to build a special factory, the Soho Foundry, just a few miles from the Manufactory. This brand new plant, opened in Smethwick (now Sandwell) in 1796, was the world's first specialised engine-building facility and can justly claim historic significance as a key element in the history of the industrial revolution. In 1895, when Soho Foundry was sold to W & T Avery, it had a covered area of 220,000 sq ft and a multiplicity of buildings. Today, after a perilous period in which wholesale redevelopment of the site was threatened, it is now largely Grade II listed and much of the area has been identified as an ancient monument.

George Demidowicz has devoted many years to exhaustive investigation of the history of Soho Foundry, and is a recognized authority on the subject. He illustrated his talk with slides of many plans representing different stages in the development of the works, most of which came from the Boulton & Watt Archives now in the custody of the City of Birmingham. That archive also contains large numbers of unique photographs of the exteriors and interiors of the workshops when they were in their heyday, some of which Mr Demidowicz showed our meeting. An important feature of the Foundry was that it should be able to produce virtually all the components required to make Watt engines on site, including casting and machining the huge cylinders and flywheels.

Prominent among machine tools used in Soho Foundry were a massive cylinder boring machine and a very large-capacity lathe for turning flywheels. There were also large planing, slotting and drilling machines, and initially such equipment was designed and built by B & W for its own use. It was only in later years that machines from other makers were installed. Soho Foundry was also the first factory in Britain to be lit by gas. The system was developed by William Murdock, a brilliant Scottish engineer who

joined B & W in 1777. A row of cottages, now preserved buildings, stands in the main drive of the Foundry, and one was occupied by Murdock from 1817 onwards.

Control of the business eventually passed to the sons of Boulton and Watt, who enlarged it and increased its prosperity and importance as a centre of manufacturing excellence. Important marine engineering work carried out by B & W included the engines for Brunel's ship *SS Great Eastern*.

The remains of the Foundry came perilously close to being flattened in the late 1990s and were saved only by public protest and the unstinting efforts of those such as George Demidowicz. However, many of the original buildings which survive are in a parlous condition, and some have actually been classified as 'unsafe'. Highly specialised care and attention will be needed to preserve them for future generations.

Frank Whittle continued:

for Whittle's nerves and those of his trusted assistants. The few B. T. H. observers who witnessed these early test runs usually disappeared very rapidly, some seeking the relative safety of large cast-iron steam turbine exhaust casings!

The development of the gas turbine turbojet was a long and lonely road for Whittle. Official indifference, insufficient finance, the machinations of some of Britain's technical élite, all conspired to deny for this country the considerable technical lead conferred on it by Whittle. Germany was not nearly so hampered and thus was able to claim the prize for producing the world's first turbojet powered aeroplane. At the end of the Second World War Germany's technical lead in jet aircraft was overwhelming.

Nevertheless, we must not forget that it was a Warwickshire man, working against all kinds of opposition that started the world's first successful gas-turbine turbojet engine, in Warwickshire; an event that was to change our world.

John Willock

Apologies

Work commitments and a delay in the supply of copy because of holidays, have conspired to slightly delay production of this edition of the Newsletter. Hence it was not available at the June meeting as would be usual, so a post distribution has been undertaken to all members to ensure receipt.

Industrial Archaeology in New Zealand

May 2006 Mr. Martin Green

Aspects of the Industrial Archaeology of New Zealand

Popular visions of New Zealand as an agricultural country belie the diversity of industrial activity that has taken place in this small, isolated country, and our Chairman Martin Green revealed some of the remaining sites in his talk at the May Meeting.

New Zealand's first industries were associated with the exploitation of the country's natural resources. The sealing and whaling gangs that visited from Australia, America and Britain led to few permanent settlements, and it was the timber trade - particularly kauri timber in North Island - that gave the impetus to economic activity. Expanding demand for timber in the frontier economy took workers deeper into the forest and placed pressure on the methods of transportation to the coast. Bullock teams, log chutes, and driving dams were just a few of the methods utilised, before tramways and their locomotives became a familiar sight in the forests.

The kauri tree also produced a resin - kauri gum - that would ooze from the tree, solidify, and periodically fall into the undergrowth. The collection of kauri gum became commercially viable as new uses were developed, particularly in high grade varnish, and later in linoleum. Photographs of the gum-diggers and their working and living conditions emphasised the arduous nature of life on the gum-fields.

Fortunately, although only 0.3% of the forest remains, a strong conservation movement now exists for the kauri, and a Museum of the Kauri industry can be visited at Matakoho.

Gold was discovered at Gabriel's Gully in Otago in 1861 and brought a surge of prospectors. Familiar tales of a 'get-rich-quick' mentality were complemented by details of the role of the Chinese community in the Otago goldrush and the attempts to preserve their special heritage. Subsequent rushes took place on the West Coast of South Island - with many relics preserved as part of 'Shantytown' - and

on the Coromandel peninsular in North Island, with its water-powered stamping batteries.

The discovery of coal soon meant that Brunner was a hive of activity and the west coast coal communities established - and have retained - a special place in NZ industrial and labour history. One particularly impressive engineering structure was the Denniston Incline, bringing the thrills of the Big Dipper to the transport of coal!

An isolated copper mine on Kawau Island, and the Dominion Salt Works at Lake Grassmere, both provided powerful images of the way New Zealanders had sought to make the most of natural resources available. However, it was in the world of agricultural engineering that the resourcefulness and ingenuity of new arrivals found a real champion. Ernest Hayes emigrated from Warwickshire to assist with mill engineering at Rough Ridge in Otago in 1882. He discovered that agricultural implements were scarce, and began designing and manufacturing implements himself. He developed a vast range of items - from windmills to portable rabbit smokers - and his parallel wire strainer for fences became world-famous. The works are now preserved by the NZ Historic Places Trust.

The design and decoration of the white stone buildings of Oamaru indicate a thriving industrial past. This was a crucial area for the expansion of agriculture, and on the nearby Totara Estate the buildings used for the slaughter and storage of the first frozen meat to leave NZ have been preserved.

The final part of the lecture took a rapid look around some of the other sites that the Chairman had visited - the site of the first production of Portland Cement in NZ at Warkworth; the magnificent Dunedin railway station and the associated Taieri Gorge railway; the gasworks museum at Dunedin where virtually all the equipment originated in the UK; the baths at Rotorua; the steam ship T. S. S. Earnslaw on Lake Wakatipu; and the Art Deco architecture of Napier.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

3 Holmes Court

Bridge Street

Kenilworth

CV8 1BP

(01926 850114

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Martin Green

John Willock

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Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ From the Chairman
- ☉ Mine Explorer
- ☉ 2006 Programme

FROM THE CHAIRMAN

The start of September and a new 'season' of meetings for the Society is always a time when thoughts turn to the possibilities of building one's own knowledge of the subject by attendance at courses at local colleges and universities. This process was brought particularly to mind this year when the Newsletter of the AIA - under the headline *'Where are those IA courses?'* - asked its members to send in details of courses or conferences, for there seemed to be a lack of such opportunities in comparison with previous years.

In fact, my earliest experiences of industrial archaeology began with WEA courses held locally, and I remember meeting with fellow students who were later to become stalwarts of WIAS. I was greatly impressed by both their enthusiasm and their knowledge, and showed me how much I had to learn.

Carrying out a search for courses for 2006/7 did not initially bear significant fruit. Further investigation has produced a small number of possibilities (see below), but I would be very eager to hear

details of any other courses or conferences that might be of interest to members.

Such courses and conferences are crucial in promoting the subject as well as providing possible research projects, and, of course, potential members and speakers for WIAS. They are all part of the process of preventing the subject becoming a one-generational experience, with impetus and commitment evaporating once the founders of the subject are no longer with us. It is quite a challenge to consider ways in which a wider (and younger) audience might be tempted to a study of relics of our industrial past. Perhaps WIAS should make a greater effort to spread the word. Should we have a ready-made presentation on the *'Industrial Archaeology of Warwickshire'* that could be taken around local societies and groups, and even taken into schools?

One interesting possibility is the example provided by the Bristol Industrial Archaeology Society. The University of Bristol offers a regular course on industrial archaeology and this is run by Bristol Industrial Archaeology Society who provide different speakers on a number of topics for the duration of the course (six fortnightly meetings). Could WIAS organise a similar venture via one of the local universities?

Some local courses

Two courses on railways run by the University of Warwick Centre for Lifelong Learning and led by Martin Bloxson:

1. *'Railway to Shakespeareland' - the Stratford and Midland Junction Railway 1864-2005*. 10 sessions Tuesdays 13.30 - 15.30, starting Tuesday 3rd October at Shakespeare Birthplace Trust, The Shakespeare Centre, Stratford Upon Avon. Apply via CLL, University of Warwick, Coventry. CV4 7AL 02476 573739 Quote 1288/AU06

2. *'When the Great Central came to town 1890 - 1922'*. 10 sessions Wednesdays 19.30 - 21.30, starting Wednesday 20th September 2006. Apply direct to Percival Guildhouse, St Matthews Street, Rugby. 01788 542467. Quote 1406/AU06

Black Country History Day. 14th October 2006: University of Birmingham Day School: Contact Sandra Ilott, School of Public Policy, University of Birmingham, Selly Oak Campus, Weoley Park Road, Selly Oak, Birmingham B29 6LL.

Martin Green

SOCIETY NEWS

Programme.

The programme through to January 2007, is as follows:

October 12th

Mr. Mike Beech: *Foxton Locks and the Foxton Inclined Plane*

November 9th

Mr. Anthony Coulls: *Locomotion: NMR at Shildon*

December 14th

Mr. Peter Cross-Rudkin: *I. K. Brund*

January 11th

Mr. Ron Speddings: *The Rolls Royce Heritage Trust, Coventry*

NEWSLETTER

Meeting Reports *by Arthur Astrop*

June 2006 Mr. M. Thompson and Mr. R. Pugh-Cook

Woven in Kidderminster

‘Carpet Capital of the World’. That was once the proud claim made by Kidderminster when carpet making was the town’s single (indeed only) important manufacturing industry, and when the overwhelming majority of its citizens, male and female, depended on it for a living.

The presence of the slow-running river Stour, ideal for washing and dyeing skeins of wool, together with a climate suited for wool conditioning, initially gave Kidderminster everything it needed to become a centre of weaving. Soon, one of its principal products was ‘Kidderminster Stuff’, a heavyweight multipurpose woven material which, in 1735, led to the first manufacture of Kidderminster carpet proper, using converted hand looms. Melvyn Thompson and Richard Pugh-Cook have spent a lifetime in the carpet manufacturing industry and together, in a delightful ‘double-act’, they presented our June meeting with a history of Kidderminster’s most famous industry, from its earliest days, through its peak of prosperity, to today, when carpet making survives relatively residually.

Initially, weaving was done on an out-worker basis, families using a handloom (rented from a ‘master’), and usually installed in an upper room, not unlike the watchmakers’ top-shops in Coventry. Long hours were worked to produce the basic 25 yards of 27-inch wide carpet each week which, in those days, was the essential minimum for a family to survive financially. With the arrival of power looms, outworking gradually decreased as weavers were drawn into large mills built by ‘carpet masters’. Attempts to organise mill workers into a union were vigorously resisted by the masters, and a strike by the weavers in the 19th century against the imposition of a brutal wage cut failed, after having lasted for 21 weeks.

Successive boosts to Kidderminster’s carpet industry came from the arrival of the canal system, then from steam power to drive looms, and finally the railways. To these advances were added changes in carpet weaving technologies and the productivity of looms, so that the skyline of Kidderminster was soon transformed. Throughout the 20th century, despite wars and recessions, the industry continued to prosper, reaching its peak in terms of number of companies trading, and numbers of weavers employed, in the 1950s and ‘60s. But the 1960s also saw a major change in manufacturing technique, namely the introduction of the tufted carpet.

Initially, Kidderminster carpet makers stood aloof

from this upstart process (not proper weaving!), whereas mills in other parts of the UK, including those in Lancashire and Yorkshire, embraced it. When Kidderminster eventually accepted tufted carpet it was too late, and by the 1970s the town’s dominant position in carpet manufacture was already waning fast.

Whereas employment in its mills was once measured in very many thousands, today it stands at less than 1,200. The principal market now is for ‘contract carpeting’, for laying in buildings such as airports and casinos, also for cruise liners, and the increasing fashion for plain ‘wooden’ floors in houses has further severely cut into the demand for domestic carpeting.

The enthusiasm of Melvyn and Richard for the industry they both served was most infectious, and shows itself further in the Kidderminster Carpet Museum Trust which they have founded and is dedicated to displays of all aspects of carpet manufacture. The Museum is open every Saturday from 10.00am to 12 noon, and has an excellent website at www.CarpetMuseum.co.uk

Melvyn Thompson will return in June 2007 to continue the story of carpet manufacture in Kidderminster with *Woven in Kidderminster: Part 2*.

AGM: Matters Arising

At the Society AGM, held during the first half of the July 2006 meeting, it was agreed that the Society subscription should remain at £10.00 per person or couple for the 2006/2007 season. Members are therefore reminded that as of September 2006, the subscription for the 2006/2007 season of meetings is due. Payments may be made to the Treasurer at meetings or by post, although since I am unsure how regularly I will be able to attend meetings over the next year, the post route might be preferable. Cheques should be made payable to Warwickshire Industrial Archaeology Society.

Please also note that the budget projections presented in the Treasurers report at the AGM contained an error. The actual 2005/2006 budget column should total £1143.21, not £899.17; my apologies for this error. The significant difference between the actual and projected totals for 2005/2006 may be mainly accounted for by the variance in speakers’ expenses, which are difficult to accurately project.

Mark W. Abbott

An Overview of North Warwickshire

July 2006 Members' Evening

The Industrial Archaeology of North Warwickshire

Following this year's AGM, at which reports on all aspects of the Society's activities were presented by Officers*, our Chairman Martin Green introduced the subject for the remainder of the meeting as *Aspects of IA in North Warwickshire*. The northern sector of the County, Martin suggested, was probably the least well known by our members, and in terms of industrial archaeology possibly also the least well-recorded.

As a starting point he distributed copies of a large-scale OS map of the sector, which extends from Middleton in the West to Caldecote in the East; and from Newton Regis in the North to Great Packington in the South. Within those extremes lie many sites with evidence of past industries, notably mining and other extractive activities; of transport, including canals, railways and historic roads; and of various manufacturing industries, including hat-making in Atherstone. Hat-making in that town has virtually ceased and there is no museum to give evidence of a trade which once employed large numbers. But Martin had a few slides showing some of the processes involved and the conditions under which some hat-makers at times had to work.

Martin also showed a number of slides of IA sites in north Warwickshire including Daw Mill colliery, which in the 1950s employed 12,000, and Pooley Hill colliery. The end of mining in many parts of the County posed the problem of what should be done with the surface remains of collieries, and aerial and ground shots illustrated how these difficulties have been overcome, and mostly to the benefit of the countryside. Other sites covered included Baggeridge Brick Works, Kingsbury Water Park (formerly a sand and gravel working), and the splendid Atherstone railway station.

Picking-up from that point, Roger Cragg then presented a Historic Civil Engineering Review of North Warwickshire, starting with the Roman road Watling Street, which sweeps across the county and a part of which is now the A5. The Coventry canal, extending over 38 miles and with 13 locks, was started in 1768 and not finished until 1790, mainly because the original estimates of cost were soon exceeded and additional cash had to be raised from somewhere. (Nothing new there then!).

Roger then moved on to the Trent Valley railway, opened in 1847, whose engineers included Robert Stephenson and George Bidder. Finally, Roger homed-in on historic bridges in north Warwickshire together with water towers at Tuttle Hill, Nuneaton and at Corley.

Roger was succeeded by Peter Chater who had a score of interesting slides, many concerned with railways and railway stations but also some showing unusual items such as 30-cwt wooden jib cranes once used in Coventry Goods Shed. The Harley tunnel had needed to be modified, by lowering the track, to pass modern rail container traffic, and other shots showed Atherstone canal wharf, Hawkshill boat repair yard, and Stockingford brick and terracotta works. Peter finished with a slide of the pillory and whipping-post at Coleshill, an early version of an ASBO!

The meeting was drawn to a close by a DVD from our Chairman of the Dunedin NZ Gas Works, the site of which is now dedicated to a museum of steam. Wonderful shots included huge stationary engines rotating slowly and majestically, and massive steam shovels working in a quarry. One felt the shade of the late Fred Dibnah would be nodding approvingly.

* For those unable to be present at the AGM, copies of the Chairman's and the Treasurer's reports are available on application to the Society's Secretary, Denis Crips.

The Old Pumphouse Avon Dasset

Close to the summit of the road between Fenny Compton and Avon Dasset, there stands a building now converted into a house called *The Old Pumphouse*. Next to it is a cottage carrying a date stone for 1852 called *Pumphouse Cottage*. This has unusually large diamond paned windows and an ornate tiled roof. Does any member know anything more of the history of these structures?

Presumably water was pumped, but to what end, and was the pump steam powered? There is no obvious reservoir or tank and Avon Dasset seems a small village to merit such a mains supply scheme. Perhaps the answer lies with one of the two large country houses in the village, *Avon Carrow*. This dates from 1889 and in architectural detail is very similar to the original portion of the pump house. Was perhaps the pump house part of an estate water supply scheme, rather than to benefit public health?

The cottage has some features in common with service buildings at the other big house, *Bitham Hall*. These and its location suggest a connection with that estate, standing as it does at the end of a long thin enclosure, parallel with the road, that leads back to the top gate to the house.

Mark W. Abbott

Mine Explorer *by Mark Abbott*

An appreciation of a web site featuring mining exploration and industrial archaeology

I have long had a fascination for underground places, born it would seem out of curiosity and a dread of the dark and unknown. Many times in Yorkshire, Wales and Cornwall, I have peered into the cold dank adits and down the shafts of some of the numerous mining remains that litter the landscape of these counties and have wondered at what lay underground beyond the light and familiarity of the landscape around.

Therefore the chance discovery of the Mine Explorer web site at www.mine-explorer.co.uk was a welcome find.

The aims of the site are succinctly summarised by its own home page statement:

“This website provides photographs and information on many of the disused mines found across the UK. It is intended as a comprehensive resource for not only Mine-Explorers, but cavers, historians, industrial archaeologists and professional bodies. It relies on content provided from Mine-Explorers out in the field who continually update the database.”

In practice, the database amounts to 213 mines with posted content. The majority of these are metaliferous mines (principally lead, copper and iron ore) and slate mines. In terms of content, slate mines predominate. This is perhaps not surprising as the Webmaster lives in Penmachno, and the slate mines of North Wales are amongst the most easily accessible and impressive underground workings in the UK. Not all the mines in the database are mines in the accepted sense. As an example, while the slate quarries around Blaenau Ffestiniog did undoubtedly develop as mines, sites such as Dinorwic were quarries with a limited amount of tunnelling, but are included in the database nevertheless.

The one major criticism that might be made of the site given its aims stated above is perversely its greatest strength too. Information other than photographs is distinctly lacking and the site is far from a comprehensive source. True, there are some

useful notes about access and recent collapses in important mines, but much of the other ancillary content consist of scans of information probably already available to the serious enthusiast. However, the photographic content, once beyond the obvious surface pictures, is good and for some locations superb.

The Webmaster in particular is an accomplished and developing photographer and there are many underground images, mainly from slate mines, that are quite simply excellent. To convey the huge scale of a typical slate extraction chamber, together with a sense of mystery and danger in one photograph is difficult, but a feat that is accomplished in many images. There is poignancy to some pictures too, especially those of the rather sad remnants of the closed Gloddfa Ganol mine tour in the now eviscerated Oakley Quarry.

Further excellent features of the site are the downloadable illustrated trip reports in pdf format. Again these nearly all feature slate mines, and the best are outstanding in content. That for the infamous ‘Everest’ of mine exploring, the Croesor Rhosydd through trip makes terrifying reading, worthy of the opening quote: “This trip is dangerous. In fact it’s the most dangerous thing I’ve ever done.”

It should also be noted that access to some of the posted material requires registration, seemingly to ensure only ‘responsible’ visitors can view it.

Few of us with an amateur interest in the industrial archaeology of mining will ever venture underground, and the value of this web site is the pictorial insight that it gives into just what lies in the darkness of some of the classic mining sites in the UK. It is too, an admirable advert for the digital image. Little of what the site contains would be so easily accomplished with a film camera or so easily made available to such a potentially wide audience. Altogether a highly recommended web site and one for repeated visits, as the site is updated almost daily.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	3 Holmes Court
Leamington Spa	Warwick	Bridge Street
Warwickshire	Warwickshire	Kenilworth
CV32 5LT	CV34 4DD	CV8 1BP
(01926 313782	(01926 401072	(01926 850114
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

Design and editing:
Mark W. Abbott
Additional material:
Arthur Astrop
Martin Green
Printing:
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WARWICKSHIRE Industrial Archaeology Society

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THIS ISSUE

- ☉ Meeting Reports
- ☉ From the Chairman
- ☉ Pump House Follow Up
- ☉ 2007 Programme

FROM THE CHAIRMAN

Your committee is constantly monitoring ways in which services to members of WIAS might be improved and the New Year seems an appropriate time to bring some potential changes to the attention of the membership. Despite more grandiose ambitions set out in the past, we have come to realise that the monthly meeting is the mainstay of the Society and we are delighted that these are so well supported.

Increasingly, speakers for these meetings are delivering lectures with the aid of digital pictures and/or PowerPoint presentations. This requires a digital projector and laptop. Sometimes the lecturer brings their own equipment, but increasingly speakers expect venues to provide these facilities. The equipment can be provided by Warwick School as part of the room hire, but this has not been without the occasional hitch. It is infuriating when all seems to be in order, and then the actual delivery of the evening lecture is frustrated by technological problems, compounded by the Chairman's

lack of ability to rectify the situation.

There seem to be two ways around this situation. Perhaps a member of the Society might be prepared to spend some time with the Warwick School technician to develop expertise. This has time implications, not least for the Warwick School technician, and no guarantee that we would have the same equipment for every meeting.

A more radical step would be for the Society to purchase its own laptop and projector. This would be available for all meetings and, of course, would also be available for speakers from WIAS when going out to other organisations. Indeed, the Society could develop a series of presentations, stored on laptop and CD, that could be available on request. This would do much to ease the pressure of preparing individual lectures, and would support the long-term goal of spreading the IA word.

The cost implications are considerable. The Society does have funds in reserve, in the region of £1500, and purchase of equipment could take at least £1000 of this. This significant step will not be taken without full consultation with the membership, but the committee felt it should be brought to members' attention to give adequate time for thought and debate. We would seek to make a decision at the AGM in July 2007.

Given that the monthly meeting is the mainstay of the Society, any recommendations for speakers, or topics that

members would like to see covered, are vital to continuing success. You might even be willing to offer a 15-minute presentation yourself for the last part of a meeting. Furthermore, it is important that all aspects of the meeting go smoothly, and there are areas where assistance from members would certainly ease the pressure on the committee. Refreshments is one example: Is there anybody out there willing to take on responsibility for purchasing refreshments (fully reimbursed of course!) and organising the rota for refreshments? Do feel free to contact any member of the committee if you have any ideas for improvement, or would like to be more actively involved.

SOCIETY NEWS

Programme.

The programme through to July 2007, is as follows:

January 11th

Mr. Ron Speddings: *The Rolls Royce Heritage Trust, Coventry.*

February 8th

Mr. Roger Cragg: *Thomas Telford.*

March 8th

Mr. Jeromy Hassell: *Joseph White Watchmaker.*

April 12th

Mr. Hugh Jones: *The Building Stones of Warwickshire.*

May 10th

Mr. Derek Billings: *Aspects of the Industrial Archaeology of Cornwall.*

June 14th

Mr. Melvyn Thompson: *Woven in Kidderminster Part 2.*

July 12th

AGM and Members' Evening: *The IA of Nuneaton and Bedworth.*

NEWSLETTER

Meeting Reports *by Arthur Astrop*

September 2006 Mr. B. Jones

The Birmingham Pen Trade

*"They come as a boon and a blessing to men,
The Pickwick, the Owl and the Waverley pen"*
(And most of them were made in Birmingham!)

In the 19th century, when the steel pen industry was at its peak, Birmingham had very many different pen makers producing an estimated 100,000 different types. Most of the firms were small and specialised, but there were some giant companies who dominated the trade and whose names became known the world over. Today, most of them are represented only in the Birmingham Pen Museum in Frederick St, whence historian and author Brian Jones came to address our September meeting, together with his colleague collector Colin Giles.

After a brief reference to the early history of 'writing tools', Brian Jones focused in on Birmingham and on the arrival there in 1790 of Samuel Harrison. Harrison introduced steel pen manufacture to the city already famous for the production of small items in metal, and its existing workforce and their skills offered a natural home for steel pen manufacture. John Mitchell soon came down from Sheffield to join the fray, and shortly afterwards Joseph Gillot also appeared on the scene. These names, together with others which included MacNiven & Cameron (originators of the advertising jingle above), Brandauer & Petit, and Josiah Mason (destined to become the largest company making pens in the world), eventually employed many thousands of workers. Their founders were also to be numbered among Birmingham's great philanthropists.

For most of the 19th century the production of steel pens, mainly by women, was highly labour intensive. A typical pen factory, designed to maximise the entry of natural light, had multi floors and rows of long benches at which young women sat, shoulder to shoulder, operating hand presses. The work required manual dexterity, for each pen was dealt with individually, and required a number of different single-stroke operations. These included blanking, piercing, splitting, raising the form etc, and typically only two seconds were allowed for each operation. Typically also, an operator would specialise in just one type of press operation for the whole of her working life!

Male operators were used only for the heavier work, such as barrelling (deburring) and heat treatment of the pens. Brian Jones showed many slides of pen factories, externally and internally, and

together with the amazing collection of different types of pens brought to the meeting by Colin Giles, also examples of the boxes in which they were packed, they combined to bring the whole subject to life. At its peak, the industry was noted not just for its output but also for the proportion of its products which was exported, and which made their makers' names famous internationally.

The advent of the fountain pen, the first attempt to 'separate' a pen from an inkwell, was the initial wind of change to blow through the industry. But at least fountain pens still needed nibs! But it was, of course, the arrival of the ball point pen in the mid-20th century which finally saw the end of the steel pen industry as it had once been known. Pen manufacture still survives, to serve specialist needs of artists, calligraphists, map makers etc, but the days when virtually everyone, from a child at school to an OAP, needed a steel pen, a holder, and an inkwell, are long gone. The Birmingham Pen Museum, however, is devoted to preserving their memories.

Pump House Follow Up

Thank you to both John Brace and Peter Chater who provided some information about the Old Pump House, Avon Dassett, following my query in the September 2006 Newsletter.

The pump house was built to provide water to Avon Carrow house, possibly around 1899 rather than the originally quoted date of 1889. At the pump house, water was pumped by a Ruston and Hornsby oil engine, as required, from a borehole to a header tank in the pump house and then gravitated by a feed pipe to the house. The house had several lead lined water tanks in the roof space, enough to hold a number of days water supply, although these may not have been part of the original supply scheme, but rather a response to severe water shortages experienced in the village until a mains supply was provided. Water was also supplied to other properties on or adjoining the estate. A wind pump was added to augment the oil engine some time after 1925. In 1913, the water supply was extended to Bitham Hall, but seems to have become disused fairly soon after.

The pump house is now a private dwelling although the original structure is obvious despite a not altogether sympathetic extension. Avon Carrow house has also been converted into a number of individual properties.

Mark W. Abbott

Foxton Inclined Plane Progress

October 2006 Mr. M. Beech

Foxton Locks and the Foxton Inclined Plane

Throughout the 19th century competition from Britain's railways as a freight carrier was hitting working boats on the country's waterways very hard. The reduction in time required to get freight from *A* to *B* was a trump card played by the railway in its competition with waterways, and a typical 'choke point' for the latter was, for example, the 10 narrow (7-ft wide) staircase locks at Foxton. These locks could accommodate one boat only at a time, and it took a boat 45 minutes to negotiate them.

So it was proposed to build an inclined plane which would transport four narrow boats at a time, two-up and two-down the 75 ft 'rise', in only 12 minutes. The plane would not only speed up passage of boats but would also save loss of water. It was not surprising, therefore, that there was considerable support for the scheme. Work on the inclined plane, designed to completely circumvent the Foxton locks, was started in 1898 and was completed in 1900, at a cost of £37,500.

Mike Beech, Museum Keeper of the Foxton Inclined Plane Trust, is a leading authority on the subject and delivered an excellent talk to our October meeting. The design of the inclined plane was innovative in that it carried each pair of boats *transversely* in a water-filled 'dock', and boats going 'down' effectively counterbalanced those going 'up'. Each wheel-mounted dock measured 80 ft by 15 ft and they were connected by steel hawsers running around large pulleys at the top and bottom of the incline. A 25-hp steam engine drove a hydraulic system, providing the extra power needed to assist movement of both sets of docks.

For a few years, the inclined plane worked well and for a time it staved off some competition from the railways. And in 1909 refurbishment work on the Foxton locks was started, aimed not least at increasing the width to allow two boats to enter side-by-side, and to allow for overnight passage. This work was completed, and the staircase was reopened in 1910. But both the Foxton ventures, that is the inclined plane and the refurbishment of the locks were, of course, too late to save competitive commercial traffic on the waterways. In 1911, the inclined plane was closed, and in 1928 it was demolished. By the time the waterways were nationalised in 1948, Nature had effectively reclaimed the entire site, and when the Foxton Inclined Plane Trust was founded in 1980 a truly mammoth task faced its volunteers.

Very many trees needed to be felled just to reveal

the foundations of the inclined plane, and many more had to be planted elsewhere to compensate for them. In 1989, the Trust opened the reconstructed boiler house, now housing a museum, and in 1998 major refurbishment work was carried out on the lock side ponds. The Trust has been successful in obtaining a grant of £1.8million from the Lottery Fund, and in addition has raised a further £1m from its own efforts. This money will enable it to undertake a number of additional restoration projects, including re-watering part of the canal, reviving the stop lock and building a bridge identical to one erected in 1900. The long-term aim, however, is to rebuild the inclined plane complete.

The Trust has a website www.fitp.org.uk, which organises guided tours and runs the Museum.

Action Needed

Recently, both my personal email address, and the Society email address, have been targeted by a large number of junk emails. A certain amount of spam email is inevitable, but the majority of the emails that have caused concern, up to 70 at one time, are not unsolicited advertising, but the product of a computer virus.

The characteristics of a false address at a real domain and a subject and message body of random words, indicate the culprit is probably a mass mailing worm. However, the point that has to be made is that the unwitting source of all this email traffic is probably a computer belonging to a Society member, as only such a computer is likely to hold both email addresses.

The solution is simple. Please make sure your computer has up to date and working anti virus software. All such software must be kept up to date to detect new virus threats as they are identified. These updates normally take the form of a small download from the software suppliers web site, and recent anti virus software can usually be configured to automatically download and install updates as they are available. Typically, such updates are free for the first year and thereafter by annual subscription, or a new version of the program should be installed. Do not think that because your computer had anti virus software installed at purchase, no further intervention is required!

If need be, there are very good free anti virus programs available. Try AVG at <http://free.grisoft.com/doc/1>.

Mark W. Abbott

NMR Outstation

November 2006 Mr. A. Coulls

Locomotion: NMR at Shildon

As a schoolboy (and a one-time pupil of our Chairman), Anthony Coulls developed a great interest in industrial archaeology in general, and for 'steam' in particular. That youthful enthusiasm was, in fact, destined to determine his career path, and today he is Collections Care Manager of *Locomotion*, the National Railway Museum at Shildon, County Durham.

Opened in 2004, *Locomotion* is an £11m joint venture between the National Railway Museum at York and Sedgefield Borough Council and has three principal themes. Namely, to be custodian of vehicles which are national icons; to house vehicles of particular significance to the North-east; and to cherish vehicles in need of conservation. Its collection started with some 70 to 80 vehicles which were transferred from the National Railway Museum at York where, for lack of covered space, they stood open to the weather. Today they are under cover, far safer and their conservation is assured. The position of *Locomotion*, in Shildon, puts it at the very heart of locomotive history in the UK. Indeed, it includes refurbished buildings of Timothy Hackworth's Museum, and although it is still very young it has already logged 300,000 visitors. Its arrival can also justifiably claim to have reinvigorated Shildon, one of the world's oldest railway towns.

Locomotion is very much a 'live' collection and while it is designed to appeal to all ages, it has a special eye on the young (and the young at heart!). At one end of the spectrum it has a working replica of the famous *Non-Parail* loco, which took part in the 1829 Rainhill Trials, and at the other end there is a diesel-electric Deltic 50 loco, the introduction of which in 1955 was effectively to signal 'the end of steam' for UK's railways. Other 'live' attractions include demonstrations of shunting (a truly arcane art to the young!), and 'Cab It' events where, for a fiver, one can stand on the footplate alongside the driver of a steam loco.

The centre piece of *Locomotion* is undoubtedly its splendid purpose-designed Collection Hall, a very large open-span building housing seven tracks. Mr Coulls showed a series of shots of items in the collection, including such locos as an APT (tilting train), a Great Northern Atlantic, an underground train for transporting miners to a coal face beneath the North Sea, a Severn Valley line loco currently on 'exchange' for a Shildon 1901 contractor's engine, and many others. Shots of rolling stock in the collection included a flat wagon carrying a WW2 Crusader tank and an 1886 coach the reconditioning of which will be a project for apprentices from Ettington College.

There is a loco built by Hawthorne Leslie on the Tyne, to celebrate that area's contribution to railways, a 'fireless' engine, a North Eastern loco and snow plough and a Kent coast electric loco. Space in this Newsletter is insufficient to cover Mr Coull's lecture in full, for he gave members an exceptional wealth of information. Suffice perhaps to say that the content of his presentation, and the enthusiasm of his delivery, must surely have ensured that many present at our November meeting have made a note of *Locomotion* in their diaries! The museum has a website www.locomotion.uk.com which is also well worth a visit.

Local information source?

Spotted recently in W. H. Smiths in the *Local Books* section were reproductions of old Ordnance Survey maps under the Old Maps title. Only two sheets were in stock, those for north and south Leamington Spa. These proved to be excellent reproductions of 1923 twenty-five inches to the mile maps, and contained much detail of interest, including the brickworks that stood at the end of Campion Road and the once quite complex railway network within the town.

At around £2.00 each they represent excellent value for money and are recommended.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	3 Holmes Court
Leamington Spa	Warwick	Bridge Street
Warwickshire	Warwickshire	Kenilworth
CV32 5LT	CV34 4DD	CV8 1BP
(01926 313782	(01926 401072	(01926 850114
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

Design and editing:
Mark W. Abbott

Additional material:
Arthur Astrop
Martin Green

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Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ From the Chairman
- ☉ AIA Conference
- ☉ 2007 Programme

FROM THE CHAIRMAN

Of all the industries with which Coventry and Warwickshire are most closely associated, the motor industry must take pride of place. Sadly, of course, in step with the decline of the motor manufacturing capabilities of the country as a whole, the motor industry of our region is a pale shadow of its former self. Most recently, the closure of the Ryton plant has delivered a very painful blow to the industry's presence in the area, with the loss of 2300 jobs.

The decline of an industry has many physical dimensions, with demolition the most likely outcome for many of the production facilities. However, it should be remembered that the personal element is a crucial ingredient as well, and it was interesting to note that the BBC ran a series of radio programmes on the human impact of Ryton's closure. These had the feel of earlier documentaries about the fate of other UK industries such as mining.

On a similar theme I was interested to read the obituary notices of local motor manufacturer, Harry Webster,

who sadly died in February aged 89. I was drawn to the description of the route that his life had taken and the various institutions and firms with whom he had been associated. Such a career is difficult to imagine for a young Midland engineer of today. The obituary published in *The Times* of February 12th, 2007 makes fascinating reading.

Perhaps the engineers at Aston Martin can carry the tradition forward. It was indeed gratifying to read the confirmation of the future of the Aston Martin plant at Gaydon – a real exception to the generally depressing news about developments in the motor industry.

The presence of the motor industry is also felt by way of two hugely important museums: The Museum of British Road Transport in Coventry and the Heritage Motor Centre at Gaydon. Both collections have a great deal of local interest, and deserve our full support. For example, the Heritage Motor Centre has a collection of archive photographs that provide a unique historical record of some of our most famous factories - Cowley (Morris & MG), Solihull (Rover & Land Rover), Canley (Standard-Triumph), Foleshill (Riley), Adderley Park (Wolseley) and Longbridge (Austin).

One industrial plant that remains in Warwickshire is the Ford foundry in Leamington. The plant makes 10 million castings a year of Ford brake drums and discs for distribution in Europe, Mexico and the US. At the time of writing, local newspapers

contain worries expressed over the future of the plant - in particular whether the brakes for the new Ford Fiesta would be produced in Leamington. This is an important plant of a multinational firm and its history deserves our attention. Perhaps there are members of the Society who would like to take on the task of building up our knowledge of the plant and its history. Some of our members are working on the history of Automotive Products in Leamington Spa and this, again, is a very important task, given the virtual disappearance of any physical remains.

The motor industry was vital to the economic development of the region and any contribution we can make to the recording of that history can only be of benefit to future students of the motor industry in Coventry and Warwickshire.

Martin Green

SOCIETY NEWS

Programme.

The programme through to July 2007, is as follows:

April 12th

Mr. Hugh Jones: *The Building Stones of Warwickshire*

May 10th

Mr. Derek Billings: *Aspects of the Industrial Archaeology of Cornwall*

June 14th

Mr. Melvyn Thompson: *Woven in Kidderminster Part 2*

July 12th

AGM and Members' Evening: *The IA of Nuneaton and Bedworth*

Subscriptions

Outstanding subscriptions for 2006/2007 are now due please.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

December 2006 Mr. P. Cross-Rudkin
Isambard Kingdom Brunel

The year 2006 was the bicentenary of the birth of Isambard Kingdom Brunel. It was fitting, therefore, that at our last meeting of that year WIAS member Peter Cross-Rudkin should help our Society to celebrate the anniversary with a splendid talk in which he took a broad view of the life, times and achievements of arguably Britain's greatest engineer. Greatest in many senses, and not least in the number of his projects which today, nearly 150 years after his premature death at the age of only 53, are still standing as testament to his genius.

IKB's father, Sir Mark Brunel, was an eminent engineer in his own right, and all too often history records that the son of a great man is destined to be overshadowed by his father. In IKB's case, however, precisely the reverse was true, and his achievements outshone those of his father, great though they were. IKB was in his early 20's when he took over the construction of the Rotherhithe-Wapping tunnel under the Thames, a project which had been started by Sir Mark. The tunnel nearly claimed the young man's life, on two occasions, but he survived and was destined for greater achievements.

The thrust of Peter Cross-Rudkin's presentation was to illustrate the astonishing, possibly unique, range of IKB's talents. Driven by an urge to innovate, and to succeed in achieving what lesser men considered 'impossible', IKB deployed those talents over a breadth of field encompassing bridges, buildings, tunnels, docks, railways, and ships. His output in terms of original designs alone was staggering, and covered virtually every known technology of the time. When to this is added his skills in management, often involving controlling several major projects simultaneously, his stature has probably never been equalled.

IKB's self belief was such that when his design for a suspension bridge over the Clifton gorge came second he arranged to meet the chairman of judges (the President of the Royal Society, no less!), and to convince him that the committee had obviously made a mistake. A correction was duly put in hand and work on IKB's design was started, although the bridge was not, in fact, completed until after Isambard's death. Using a fine set of slides (albeit exercising exemplary self-discipline in deliberately avoiding the one of IKB standing in front of ship's chains!), Peter took us through the great man's work.

A persistent thread in IKB's life was an insistence on not just 'doing things differently' to accepted practice, but in doing them in an innovatory way as well. His dogged, albeit unsuccessful, campaign to

make broad-gauge railway track a standard was a typical example, an idea which had many practical advantages, both in terms of safety and comfort of 'ride'. The many different types of IKB's bridges to be found on the GWR line, together with the associated tunnels, their striking portals, and the architectural beauty of the line's stations – both main termini and local – all reflect the towering genius of the man.

And then there were IKB's three great ships, the largest and most advanced of their time. Peter stressed the grandeur and innovatory design of these vessels which, although none of them completely fulfilled its promise, remain to this day examples of original engineering thinking well before its time, and were not to be surpassed for many years to come. With his astonishing grasp of so many different technologies and disciplines, and his ability to bend them to his command, Isambard Kingdom Brunel was possibly the last of the great polymath engineers of the western world.

Southam Gasworks

Unlikely as it might seem, the small town of Southam once had its own gasworks. This was situated on Welsh Road East, on the far side of the River Stowe from the town. A house and a number of associated buildings remain on the site, but in recent years these have become overshadowed by new housing and now stand almost hidden on the truncated old route of Welsh Road, itself cut by the town bypass and reduced to a footpath.

Recently, the site has been advertised for sale as a development opportunity, with outline planning consent for two detached houses. It is unclear if the existing cottage will be retained.

I have one picture of the site, taken from across the Stowe from what was then the car park for the local health clinic. This in itself is a good argument for photographic recording of the everyday scene, as this view predates the Southam bypass and all the subsequent new housing on the eastern edges of the town. The view cannot now be repeated; the new health clinic stands over the original viewpoint and subsequent new housing on what is a now Pound Way, obscures the view across the Stowe valley.

If any members have photographs of the gasworks I would be pleased to see them, and possibly scan them for use on the Society web site.

Mark W. Abbott

Engineering Heritage

January 2007 Mr. R. Speddings

The Rolls Royce Heritage Trust Coventry

For those of us who recall the steady decline in Britain's manufacturing industry in the latter half of the 20th century, and who remember the cries (often made much too late) of "But what happened to all the photos, drawings, documents etc?", the knowledge that not merely the records but also many historic products of Rolls-Royce are being lovingly preserved and maintained is good news indeed.

Indeed, for over a quarter of a century a dedicated band of volunteers has worked to promote and preserve the history and engineering excellence of Rolls-Royce. Founded in 1981, The Rolls-Royce Heritage Trust has five individual but inter-linked groups, based at Derby, Hucknall, Scotland, Bristol and Coventry. The Trust, handsomely supported by R-R in a multitude of different ways, is designed to act as a focal point for maintaining all aspects of the engineering heritage of the Company, also its corporate predecessors, and to be the guardian and authority (on behalf of R-R) of all relevant historic material. The effort and range of skills which are being employed by the Trust to that end was explained by Ron Speddings at our first meeting of the New Year.

He gave a brief summary of the work of the Trust as a whole and then concentrated on the Coventry branch, with its collection housed in premises at R-R Light Alloy Foundry, Derby. On display there are motor cars (Siddeley and Armstrong Siddeley), aero engines, rocket motors, torpedo engines, also marine and industrial products spanning almost 100 years. These items are restored and preserved by volunteers, principally retired R-R personnel but including some currently working for that Company. They use two workshops, the larger one at Derby, to which retirees are taken by coach once a week, and a smaller workshop located at Ansty.

The jewel in the crown of the Coventry branch is undoubtedly a 1904 Siddeley Autocar, but cars by that maker also include a 9-hp Stoneleigh light car, made in 1923 at Parkside, Coventry, and the last to be launched, in 1960, the Armstrong Siddeley 4.2-litre Star Sapphire. The major theme of the collection, however, is centred on aero engines of which it has very many. They include examples of the Python turboprop, all marques of Double Mambas and the Adder, and successive generations of the Viper, the first engine to celebrate 50 years of production.

The Trust also has collections of rocket engines built at Ansty, de Havilland and Rolls-Royce,

including a Stentor with its Avro Blue Steel stand-off rocket. There is a growing collection of industrial and marine engines of types used in boats, electricity generating sets and for gas pumping duties. In addition to the large quantity of historic documents which it has deposited for safe keeping with Coventry City Archives, the Branch maintains an expanding library of technical documentation, again worked on by volunteers. Transfer of drawings and other paper-based data to computer storage is in hand.

Items for preservation arrive at the Trust in a variety of conditions, some of them in a very poor state indeed. They may be corroded, damaged or dirty, but they are dismantled and restored with care and pride, often by retired R-R employees who had worked on them in the first place. Exhibits are prepared either for display in the Trust's collection, or for return to outside bodies. Membership of the Trust, Ron Speddings pointed out, is already more than 2,000, is world-wide, and is open to current and past employees as well as to enthusiasts for engineering heritage with a connection to Rolls-Royce and its ancestral Companies. The Trust has a website at www.rolls-royce.com

AIA Conference

Notice has been received of the 2007 AIA Annual Conference. This year it is to be held at the University of Central Lancashire in Preston and will feature the industrial archaeology of Lancashire and the Lune Valley. The dates are Friday 10th August to Thursday 16th August, with the main part of the conference occupying the weekend of 10th, 11th and 12th of August.

The provisional programme is varied and interesting, with emphasis on the important local industry of weaving. Other highlights include the Lancaster Canal, Preston Dock, glass making in St Helens, unusually, some aviation industrial archaeology with a visit to BAE Systems', local manufacturing sites and the history of aircraft manufacture in the Preston area, and a look at Blackpool as the first Working Class Seaside Resort.

Full details and a booking form are available from the Treasurer. Any WIAS member, whether an individual AIA member or not, can attend the conference, as the Society is affiliated to the AIA. The full residential package costs £500, with discounts for AIA members (£5) and first time attendees (£25 weekend, £50 full conference)

Thomas Telford

February 2007 Mr. R. Cragg

Thomas Telford

Roger Cragg, giving his tenth talk to the Society, spoke on the subject of Thomas Telford, the Civil Engineer. This year was an appropriate time to be looking at the great man's life and works as he was born on 9th August 1757, making 2007 the 250th anniversary of his birth.

Roger began by describing Telford's humble origins as the son of a shepherd in the remote Eskdale valley in the Scottish Border country. Sadly his father died in the autumn of the year of Thomas's birth. Following schooling, young Thomas was apprenticed to a stonemason in nearby Langholm where he was put to work on the construction of Langholm Bridge, which still stands today. After a short period in Edinburgh Telford moved to London where he worked on the construction of Somerset House. Shortly afterwards he moved to Portsmouth to oversee the construction of new dockyard buildings. In 1786 he travelled to Shrewsbury to superintend alterations to Shrewsbury Castle for William Pulteney, then MP for Shrewsbury and the owner of the Castle. Soon Telford had secured several appointments in the area including Surveyor of Public Works for Shropshire and as an engineer on the construction of two local canals – the Ellesmere Canal and the Shrewsbury Canal. He was also engaged in the design of new churches at Bridgnorth and Madeley.

Roger showed slides of several of the bridges built by Telford in Shropshire including his first, Montford Bridge. Telford was also engaged on the rebuilding of many of the bridges on the River Severn following the devastating flood of 1795. For the Shrewsbury Canal Telford designed the Longdon upon Tern Aqueduct in a new material, cast iron, in 1795, quickly followed by high level aqueducts on the Ellesmere Canal at Chirk and over the Vale of Llangollen.

Lack of time prevented a detail review of all Telford's many civil engineering works but brief mention was made of his work in Scotland,

including many miles of roads, harbours and the Caledonian Canal. Turning to the Holyhead Road, Roger discussed Telford's rôle in the improvement of this important route during the 1820s.

Next in his talk Roger detailed Telford's works on the improvement of the Birmingham Canal including the deep cutting at Smethwick with its fine bridges and aqueducts.

Finally, in his long career, Telford returned to Shropshire and to canal building for the construction of the Birmingham and Liverpool Junction Canal. This canal was built in a bold style, with deep cuttings and high embankments. Among the many engineering challenges the most difficult was the construction of Shelmore Bank, up to 60 feet high and this was not finally completed until 1835, one year after Telford's death at his house in Abingdon Street, Westminster at the age of 77.

He was buried in Westminster Abbey, one of only two Engineers to be so honoured, and Roger's final slide was of the portrait of Telford, which hangs in the Institution of Civil Engineers of which Thomas Telford was the first president.

From The Chairman: Footnote

Since the writing of this edition's *From The Chairman* Ford have announced that their Leamington Foundry will close on 21st July 2007 with the loss of 387 jobs. Ironically, and allegedly, this is because of the plants failure to win the contract for casting brake drums for the new Fiesta model due in 2008.

If there was one vehicle component that was once synonymous with Leamington, it was brakes, thanks to the presence of the now defunct Lockheed, later Automotive Products factory. This is reflected in the local football team's nickname of *The Brakes*. If current trends continue this will soon become the only tangible reminder that Leamington once had an automotive manufacturing industry.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

3 Holmes Court

Bridge Street

Kenilworth

CV8 1BP

(01926 850114

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Martin Green

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- ☉ Meeting Reports
- ☉ From the Chairman
- ☉ Driving On
- ☉ 2007 Programme

FROM THE CHAIRMAN

It is very reassuring to know that at least one member of the Society reads the Newsletter, and we publish a response by one of our members, Richard Storey, to the Chairman's notes of the last edition.

Mark Abbott

I am sorry to report that Mark Abbott wishes to hand over the responsibilities of Treasurer and Membership Secretary of the Society after many years in the dual posts. Mark does a tremendous amount of unseen work, and has been a crucial cog in the smooth operation of the Society. He has done everything in a quiet, unassuming but highly effective manner and the Society has benefited enormously from his diligence and efficiency. The good news is that he is willing to carry on as editor of this Newsletter!

Martin Green

DRIVING ON

The Chairman's elegiac survey of our local motor industry in the last Newsletter has prompted me to submit these few extra thoughts.

Shortly before the bad news

about the Ford Foundry broke, some good news appeared when David Cameron opened a new factory at Binley in March for the production of the Modec electric van, which was previewed in 2006. With a payload of two tonnes and a range of 100 miles on a single charge, it had attracted orders for over 100 vehicles by March, including 15 for Tesco. Glimpse of a prototype in Coventry last summer indicates that it is a handsome machine.

Amongst the commercial vehicles which can now be displayed in the Coventry Transport Museum (as we must now remember to call the former MBRT) following its makeover is the one-off 'Ecomobile', a utility van prototype of 1937, the brainchild of Alfred Wild of Leamington. This was apparently offered, without success, to both Austin and Morris; 'Eco' referred to its alleged economy, rather than to our current ecological preoccupations.

It is a sad, but unavoidable, fact that few physical remains of motor manufacturing survive (P. Collins & M. Stratton, *British Car Factories from 1896*, 1993). This makes archive collections, especially those in the public domain, of even greater importance. As well as the archive collections in Coventry and Gaydon, it is worth remembering Warwickshire County Record Office, with such sources as the excellent series of vehicle licensing registers and the records of Eagle Engineering, and the Modern Records Centre of the University of Warwick Library.

Amongst the Centre's holdings is a very large sequence of records of the Standard Motor Co. (MSS.226/ST), which are perhaps unique in their detail on post-war operations. At the other end of the scale, the present writer's modest collection in the Centre includes a fine 1938 catalogue of Midland Vehicles of Leamington, electric van makers, and a scrapbook of collected material relating to Buckingham of Kenilworth, tanker makers (MSS.457). Outside the geographical remit of WIAS, but central to any study of the UK motor industry, were Rubery Owen of Darlaston, suppliers of chassis frames and numerous pressings to many vehicle manufacturers. It awaits a business historian to take up the major task of producing a company history, but in the meantime its records are held in the Centre (MSS.338) and are described in the Sources Booklet on sale on our monthly bookstall. Next door to the Modern Records Centre is the BP Archive, which is, of course, world-wide rather than just Warwickshire-oriented.

Richard Storey

SOCIETY NEWS

Meeting Location

The consistently high attendance at recent Society meetings, typically around 50 people, has been difficult to accommodate comfortably in the original meeting room in Warwick School's Sixth Form Centre. This, coupled with the proximity

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NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2007 Mr. J Hassell

Joseph White, Coventry Watchmaker and Business Man

When Britain's clock and watchmaking industry was at its peak, in the 19th and early 20th centuries, the main centres of the craft were to be found in the north-west (Prescot and Liverpool), in London (Clerkenwell) and midway between, in Coventry. In Coventry its practitioners were clustered in the Spon Street/Spon End area, in Chapelfields and in Earlsdon. At its peak, several thousand were employed, some by relatively small firms in equally small premises and others in much larger numbers by one or two dominant companies, among whom Rotherhams was possibly the best known.

In his address to our March meeting, Mr Hassell spoke vividly about the life and career of his ancestor Joseph White, born in 1835 the son of weavers and who, in 1851, was set to an apprenticeship with watchmaker Nathaniel Hill in Chapelfields. His apprenticeship was for seven years during which he worked a 12-hour day, six days per week. In 1860, two years after his apprenticeship ended, Joseph married, moved to a small house in Mount Street, Chapelfields, and started his own business. He was thus on his way to a notable career in the manufacture of high-quality high-precision timepieces, and subsequently to remarkable achievements in other areas as well, including bicycle production, land development and (through one of his sons), engine manufacture (White & Poppe).

His watchmaking business prospered and after a series of house moves, each one 'upwards', he eventually bought Earlsdon House, Earlsdon, together with a row of workers' cottages. The British watchmaking industry was now nearing its peak, and by the 1870s Coventry was producing two-thirds of all timepieces made in Britain. Joseph White was specialising in the higher quality sector of the market, striving always to meet the most exacting demands. His company regularly entered watches and chronometers for the rigorous timekeeping trials organised by the Greenwich Royal Observatory and the Admiralty, and consistently featured high in the tables of performance published by both. In 1911, in fact, a White watch was placed first in trials by the Admiralty. The highest quality watches made by White incorporated the famous *tourbillon* device developed by Breguet and designed to compensate for variations in timekeeping which occurred when a watch changed its position from vertical to horizontal.

But the British watchmaking industry was coming

under increasing competition from abroad. Import tariffs were being abolished, and the USA in particular was 'automating' watch production, introducing interchangeability of components, and by launching the 'dollar watch', for example, was bringing a pocket timepiece within the reach of all. White continued to produce the highest quality watches but his business acumen also made sure his Company diversified, firstly by taking an interest in Coventry Machinists Works (later Swift Cycles), and then by buying land in Earlsdon and developing it for upmarket houses.

In 1899, one of his sons, Alfred James White, went into partnership with Peter August Poppe, to found White & Poppe, and Joseph was involved in that venture as well. As Jeromy Hassell explained in his talk to our Society in March 2006, W & P went on to prosper mightily. At its peak, that Company was producing petrol engines in very large numbers for use by a number of world-famous car makers. After WW1, White & Poppe was bought by Dennis Brothers, Guildford, and in 1926 Harry Harley (later Sir Harry) bought Joseph White & Son and with it Earlsdon House. Harley eventually discontinued watch manufacture, and Earlsdon House became the HQ of his own company, Coventry Gauge & Tool Ltd.

Society News *continued:*

of the refreshment facilities giving unacceptable levels of background noise, has prompted a search for a better location. Recent use of the Pyne Room has proved quite successful and will continue for the time being, but with some effort to overcome the poor audibility of speakers. Use of the Society's existing radio microphone, or the purchase of a new portable radio microphone and amplifier system are being investigated.

Programme.

The programme through to December 2007, is as follows:

September 13th

Mr. Ron Moss: *Chain-making in the Black Country.*

October 11th

Mr. Martin Bloxson: *Stratford and Midland Junction Railway.*

November 8th

Mr. David Bright: *The Mill and Engine House at Warwick Castle*

December 13th

Mr. John Frearson: *The Lime and Cement Industry of North Warwickshire*

Warwickshire Building Stones

April 2007 Mr Hugh Jones

The Building Stones of Warwickshire

Our County was blessed with both an abundance and a variety of different types of naturally occurring stone, all of it laid down many millennia ago, and most of it suitable for building purposes. But little of it is immediately visible to the eye, since there were only small outcrops to give a clue to the presence of seams potentially suitable for quarrying. And of course, well below even the deepest of our seams of stone lie even more valuable seams of coal, some of the richest deposits of which are at depths which make mining both difficult and economically doubtful. Nevertheless, economically viable or not, many of us will recall the time, a few years ago, when the prospect of deep mining the Warwickshire part of this coal seam was real enough to cause considerable anxiety among residents.

Hugh Jones is not just an accomplished geologist. He is a geologist with such an engaging passion for his subject that he kept our meeting spellbound for an hour and a half, followed by questions. Starting by displaying a map of our County with its many and various stone deposits shown in different colours, Hugh then showed diagrams of the seams in cross-section, revealing how they stack one on top of the other, curving gently down from visible surface outcrops to considerable hidden depths.

Our County has basically sandstone and limestone, and a number of different variations on each, producing typically distinctions such as a blue and white lias, etc. Some are soft, and suitable mainly for facing, other are hard and can do service in supporting buildings. However, for a comprehensive view of what our County can offer in varieties of stone, the real evidence is clearly on show in its use externally and internally in our historic buildings. And it was that approach to his subject which Hugh predominantly took.

By concentrating on the exteriors, and to a lesser extent the interiors, of Warwickshire churches, mansions, stately homes and other types of public buildings, he was able to show both the diversity of Warwickshire stone employed and the different ways in which it was exploited architecturally. Many of the examples shown were familiar to his audience, but familiar or not it is doubtful if the significance of the stone used to build them had been adequately appreciated before Hugh pointed it out.

First the Romans and then the Normans exploited Warwickshire's stone for their buildings, and many Norman churches proudly display it to this day. Stoneleigh Abbey, parts of which date

from 1500, is built principally in red sandstone, and Haseley church shows three different types of Warwickshire stone side-by-side. Warwick Castle is an example of the use of stone cut to blocks and surface dressed, as is Mancetter church. Wootton Wawen church has a Saxon stone tower and Loxley church is, in Hugh's words, 'a positive museum of stone'. The quarry at Southam provided blue and white lias, clay and limestone used principally for the manufacture of Portland cement.

It is fair to say that, following Hugh's talk, many WIAS members will probably take a fresh look at many of our County's historic buildings, seeing their exteriors in a new light.

Southam Gasworks Addendum

From the Warwick Advertiser of 8th November 1856 comes the following piece:

'Southam Gas Company. We find that the report of this Company, lately published by the Directors is very favourable in its results, and there appears every reason to anticipate that ere long it will be a very lucrative undertaking. Southam is a small parish in Warwickshire, containing only 2,770 acres, and numbering no more than 1,711 inhabitants; yet it has an established gasworks which pay four per cent on the outlay. The accounts are small in amount, but rigidly correct, with the right figures in the right place. The works were commenced in September, 1853. The drawings being furnished by Mr. T. A. Hedley, engineer of the gasworks, Banbury. The Company's engineer being Mr. Alfred Penny, of London. The total cost, including the buildings, apparatus, and mains was £1,380. The capital being £2,000 in 400 shares of £5 each. The buildings were executed by Messrs. Taft and Reynolds, builders, of Southam, and the apparatus was constructed and erected by Mr. G. E. Deeley, engineer of London. The total length of the main is 3,000 yards; the trunk main being four inches in diameter. The works commenced working in February, 1854, and have now been in operation two and a-half years; during that period no renovations whatever have taken place. The retorts, which are 12 inches by 7 feet six inches D.'s, cast and supplied by Messrs. Cochrane and Co. of Woodside, Dudley, are up to this time in working condition. The works are compact, and every credit continues to be accorded to Mr. Hedley for his design, and to Mr. Deedley for the efficient manner in which he executed his contract.'

With thanks to Roger King.

Cornish Industrial Archaeology

May 2007 Mr. D. Billings

Aspects of the Industrial Archaeology of Cornwall

If the English counties were to be rated according to the density of their industrial archaeological sites per square mile then Cornwall would surely come very close to the top of the list. That much was evident from WIAS member Derek Billings's talk to our Society in May when he took a sweep through our westernmost region, during which the accompanying slides illustrated his expertise with a camera.

He started his talk by entering the county from Devon, over Brunel's Saltash bridge, and left it with a shot of a typical Cornwall sunset. In between, he visited a multitude of sites representing the many different industries of the county. Shots of a Peerless lorry built in the USA in 1917, used first in WW1 and subsequently in Cornwall's china clay industry were followed by a slurry pumping engine originally installed in 1852 and now restored and driven by compressed air. The Calstock viaduct, opened in 1908 he explained, was built from cast concrete blocks delivered to site by a then unique overhead wire-rope system.

The Delabole slate quarry, first worked in the reign of Elizabeth 1, is now 1.5 miles in circumference and 425 ft deep, and using modern technology still delivers an average of 120 tonnes of slate per day. Slides of the Sennen Cove capstan house, used to haul boats up a slipway, were followed by views of the iron girder bridge crossing Petherick Creek, and a shot of the Marconi Memorial at Poldhu Cove. Many slides of Cornish tin and copper mines followed, including one of the ill-fated Levant Man Engine which, in 1919, failed when carrying a full load of miners and 31 men fell helplessly to their deaths.

Richard Trevithick was a Cornishman and Derek showed several shots of the events which are staged annually in his honour on Trevithick Day, always held in Camborne on the last Saturday in April. Slides of the impressive 92-ft high, 21-span, 443-yard long GWR Truro rail viaduct, built in 1904

to replace Brunel's wooden version, were followed by views of Devoran where tin-smelting works, railway repair shops, and boat yards once flourished.

A splendid example of a late 18th C industrial harbour is seen at Charlestown, from which copper ore was once shipped to smelters and china clay to potteries. At Calstock again, the remains of some 20 lime kilns can be seen and in nearby Danescombe Valley there are remains of a saw mill. Perran Foundry was one of Cornwall's earliest engine works and in it were cast, for example, many great beams for steam engines. Later, the partnership of Hayle and Perran built the massive engines used to drain Dutch dykes. Derek showed many examples of tin mines in Cornwall, also the Basset Mines from which ore was taken to feed no fewer than 96 crushers driven by two connected steam engines.

The St Just area is one of the oldest mining areas in Cornwall, and is believed to be the home of cliff and coastal mining. Derek's pictures of engine houses, perched perilously on the rocks with their shafts (especially at Botallack), leading miles out under the sea, were as impressive as they were frightening. Space in our Newsletter is unfortunately insufficient to do proper justice to the full scope of Derek's record of industrial archaeology in Cornwall, which is really deserving of publication as a booklet.

Disposals

Model Railway Journal. Issues 0 - 76.

The Treasurer has for sale an almost complete unbound run of the *Model Railway Journal*, from issue 0 to issue 76 (numbers 69 and 74 are missing), including the two additional compendium specials published within that period. It is preferred that this collection goes as one lot to a good home, so any realistic offer will be considered. A figure based on the original cover price of £1.50 to £2.00 each would probably be acceptable for the magazines.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

M. W. Abbott

3 Holmes Court

Bridge Street

Kenilworth

CV8 1BP

(01926 850114

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Martin Green

Richard Storey

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Industrial Archaeology Society

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- ☉ Meeting Reports
- ☉ AGM Report
- ☉ Railway Memories
- ☉ Meetings Programme

SOCIETY NEWS

Programme.

The programme through to December 2007, is as follows:

October 11th

Mr. Martin Bloxson: *Stratford and Midland Junction Railway.*

November 8th

Mr. David Bright: *The Mill and Engine House at Warwick Castle.*

December 13th

Mr. John Frearson: *The Lime and Cement Industry of North Warwickshire.*

At the Society AGM (see below) it was agreed that the Society subscription should remain at £10.00 per person or couple for the 2007/2008 season. Members are reminded that as of September 2007, subscriptions for the 2007/2008 season of meetings are due. Until members are advised otherwise, Mark Abbott will continue as Treasurer and payment may be made to the Treasurer at meetings, or by post. Cheques should be made payable to Warwickshire Industrial Archaeology Society please.

AGM.

A well-attended annual general meeting heard our Chairman,

Martin Green, describe the year under review as 'a buoyant period for our Society' during which average attendance at meetings had been such that it had been necessary to negotiate with Warwick School for larger accommodation. The venue for recent meetings, therefore, had been transferred from the V1th Form Centre to the Pyne Room. A projector had been bought by the Society for use by WIAS members and visiting speakers. Martin had spoken on the activities of WIAS to a number of organisations in the past year, and in addition had appeared on BBC 1's Countryfile programme.

In thanking the Society's committee for its work during the past year, Martin paid special tribute to the contribution of Mark Abbott. Mark had for many years served as Treasurer, Membership Secretary, and as Editor of the Society's quarterly newsletter but now wished to relinquish the first two areas of responsibility. Our chairman acknowledged the 'tremendous amount of unseen work' undertaken by Mark over the years, always in a 'quiet and unassuming manner', and spoke of the extent to which the Society had benefited from 'his diligence and efficiency'. Our profound thanks were extended to him, and it was indeed good news for WIAS, Martin said, that Mark had agreed to continue as Editor of the Newsletter.

The programme of speakers in WIAS's 2007/2008 session is almost in place, Martin reported, and it was hoped that a small

number of site visits, possibly follow-ups to some of the talks delivered in the past, might be arranged.

Presenting his final Treasurer's report, Mark Abbott said that at the end of the 2006/2007 session the Society's financial position was excellent. The year's expenses had been comfortably covered, despite the expenditure of £100.00 on a second-hand digital projector, and the Society's cash reserves had increased by almost £90.00. The annual subscriptions for membership would be held at the current figure, as would the contributions per meeting for members and for guests.

For WIAS members who were unable to attend the AGM, full copies of the Chairman's and Treasurer's reports, complete with annual accounts and budget, can be obtained on application to Mark Abbott, 3 Holmes Court, Bridge Street, Kenilworth, CV8 1BP, WIAS@photoshot.com.

David Gee

It is with regret that the Society notes the death on 18th July 2007 of David Gee. Residents of Broadwell, both David and his wife Thelma were loyal supporters of the Society almost from its inception; their recent absence from meetings being due to David suffering from Parkinson's Disease. Belated condolences are offered to Thelma and their son Stephen. The Society has made a donation of £25.00 to the Parkinson's Disease Society in memory of David.

NEWSLETTER

Railway Memories *by Peter Chater*

Recollections of Working as a Booking Clerk at Leamington Avenue Station

Due to health reasons I was strongly advised by my doctor to change my occupation from the footplate to something lighter, and providing more regular hours. After being on the footplate for nearly 12 years, giving up a job I liked was rather upsetting.

A vacancy appeared in the local press advertising for a booking clerk at Leamington Avenue station, so I went to see Station Master W. Bland, and he said he would be pleased to have me if I could pass the clerical entrance examination. I took this examination at Worcester Shrub Hill station and passed. As there was no line of promotion from the Locomotive Department to the Clerical Department I had some difficulty in making the change, but eventually I was told to report to Mr. Bland in February 1954.

I met Mr. Bland at his office, and we walked from the General station to the Avenue station where he introduced me to Alan Vaughan the chief clerk. His parting words to me were, "The money in your pocket is yours, and the money in the booking office is the railways".

Alan was about my age of 28, and he worked a middle turn of duty, the other two clerks worked 06.00 to 13.00 and 14.00 to 21.00 Monday to Saturday alternate weeks.

I commenced with six weeks training before taking up my duties. I found it a vastly different life working indoors and in one location.

The booking office was quite large, approximately 20` square with a high ceiling. Lighting was by gas, and it had an open coal fire for heating. The main desk was high with a sloping surface where you would stand to work or sit on a high stool. There were no mechanical aids such as adding machines.

There were three ticket cases; two held Edmondson type card tickets and there was a smaller one for the season tickets. Probably about 500 different tickets in all.

These tickets comprised of single tickets and ordinary returns at full fare. Workmen's tickets issued where you must reach your destination before 08.00. Day return tickets were issued, Coventry being the busiest destination. Commercial travellers tickets which allowed the traveller to carry extra luggage/equipment. Forces on leave tickets, which were at a reduced rate, Government tickets permitting Forces to travel free. Reduced rate tickets for rail staff. Tickets for dogs, bikes and prams. One higher fare dog ticket used to be in the form of an

envelope where a pull-out slip advertised Spratts dog biscuits.

Season tickets, which could be issued for a period of a week, one month, three months or months and odd days up to one year.

Most tickets issued were third class but where demand justified a few first class were held.

The bookings were varied, many tickets were issued via Holyhead to Dun Laoghaire and interior Irish stations, also Liverpool and Belfast, and Heysham / Belfast.

Sleeping berths were arranged and booked to Scottish destinations for passengers joining at Rugby, Birmingham or Crewe.

A certain amount of accountancy work was done here, and then totals transferred to the Leamington General station.

The parcels traffic received was considerable and livestock of one form or other were dealt with daily. Day old chicks arrived in biggish numbers, mainly from Mytholmroyd.

Guide dogs arrived for the Blind Association Training School, which was at Leamington and young sheep dogs, often collies, arrived for local farmers. Many farmers were not on the telephone and a telegram was sent to advise them to collect.

Racing pigeons in baskets arrived to be released as part of their training.

Once a year, a train load (probably a dozen vehicles) of pigeons in baskets consigned from stations in the Erewash Valley arrived in the early hours of the morning accompanied by many helpers. During the morning these helpers would unload the pigeons and stack the baskets about five high along the unloading dock. The pigeons were fed and watered and at 13.00 if the weather was fair, all would be released in the space of a very few minutes. The pigeons did one circle above the station then headed in a northerly direction, and for a few moments the sky was full of birds.

The forwarded traffic at passenger rates was quite varied, from small packages to machine parts weighing several hundred weights. Live stock (from pigeons to prize cattle) were regularly dealt with, also the occasional corpse, which was charged at three shillings a mile on the journey made.

One incident I remember where a very small package was in transit to an address at Daventry. This package was only the size of a matchbox and clearly marked with a live stock label. A live stock label measured about four inches by two and this

Continued on page 3

Meeting Reports *by Arthur Astrop*

June 2007 Mr. M. Thompson and Mr. R. Pugh-Cook

Woven in Kidderminster Part 2

Twelve months after their first presentation* of *Woven in Kidderminster*, Melvyn Thompson and Richard Pugh-Cook returned to WIAS to give an update on events in the life of the Kidderminster Carpet Museum Trust, and to continue the story of the rise and fall of carpet manufacture in their town. Their presentation this time picked up the story at the point where carpet manufacture in Kidderminster was now firmly established on a factory basis, with the town dominated by mills located cheek by jowl, and with its skyline punctuated by scores of tall chimneys. The carpet weaving industry at that time was providing employment for many thousands of men and women, and the early 20th century pattern of sons and daughters following their fathers into the mills was commonplace.

The story of the development of Kidderminster's carpet factories, their design, their architecture, and the care which was taken to make them attractive to the eye – including the widespread use of polychromatic facing brickwork – was splendidly illustrated by a series of slides, many of which showed the mills at the height of their prosperity in the early decades of the 20th century. These slides demonstrated vividly the crucial importance of recording by photography, and other means, the buildings and equipment of any industry when it is at its peak. Indeed, Melvyn Thompson's talk pointed this lesson very strongly, because time and time again he needed to add, as a dismal postscript, "this factory, of course, is now demolished and on its site stands a massive supermarket" (or a DIY store, or a multi-storey car-park, or a retail park, or whatever).

Without the photographic records held by Melvyn and the Kidderminster Carpet Museum future generations would have little idea of what the town looked like when it was recognised as being 'the carpet capital of the world'. It was in the 1960s and 70s that the industrial heart was torn out of Kidderminster, much as was the case in Coventry. 'Redevelopment' was the thing and historic buildings including most (but mercifully not all) Kidderminster's carpet factories were torn down, often willy-nilly, in the drive to build ring-roads, shopping precincts, pedestrianised areas, multi-storey car parks, and the like.

Melvyn's pictures covered most of the stages in the manufacture of carpets, from the shearing of sheep, through skeining, dyeing, bobbin winding, weaving, and finishing. Finally he included pictures of the showrooms in which they were displayed, one

of which he explained escaped the bulldozers and is now a nightclub! In the 1920s, when most of Melvyn's photographs were taken, there were large numbers of women employed in the mills, the objections to their presence which had caused serious rioting 20 years or so earlier having been overcome. Machinery was driven by scores of belts from overhead shafting, the noise was overwhelming, and the conditions in which the weavers worked would today be a safety inspector's worst nightmare. Mercifully, not all of Kidderminster's carpet-weaving buildings succumbed to the demolition ball, and in the nick of time a few have been listed and preserved. In one of these, in fact, the Kidderminster Carpet Museum (www.carpetmuseum.co.uk) will almost certainly soon find a permanent home.

* Reviewed in WIAS Newsletter No 24, September 2006

Note that back copies of Society Newsletters are available on the Society web site (www.warwickshireias.org) in pdf format and may be downloaded and printed if required. Back copies are also available from Mark Abbott at the address given overleaf, although some editions are now out of print. No 24 is still available at present.

* * * *

Railway Memories *continued*:

wrapped completely around it. Bert Jarrett the parcels porter brought it into the office during the morning and placed it on the office desk in a conspicuous place ready to be put on the only train of the day to Daventry at 14.43. Everybody who came into the office tried to guess what was in it as a buzzing noise could be heard from inside. The favourite suggestion was a queen bee. Station Master Bland always visited the station about 11.30 and he also examined this package. The 14.43 train regularly stood in the platform for about ten minutes and some member of the staff was calling out, "Anymore for the sunshine line," and the next moment the train departed without this package. The next service was in twenty-four hours time.

Mr. Bland came at his usual time the next day and instantly saw this little box. He addressed Jarrett and said, "What's this still doing here?" and Jarrett instantly said, "Its another one sir".

Peter Chater.

Industrial Archaeology Miscellany

July 2007 Members' Evening

The Industrial Archaeology of Nuneaton and Bedworth

As is customary, the Society's AGM was followed by the annual members' evening, when those who normally 'sit and listen' are encouraged to 'stand and deliver'! This year, Richard King started the evening by offering an interesting miscellany of items of archaeological and general historic interest in our County which, over the years, he has seen, photographed and recorded. Some of them might come under the heading 'unconsidered trifles' but, as Richard said, they illustrated the truth behind Sherlock Holmes's gentle reproof that all too often 'people see but they do not necessarily observe'.

In Barford, for example, there is preserved a simple cast iron water pump made in the mid 19th C by T. Roberts & Son of Warwick, one of many such pumps originally used to lay dust on our roads. Built over a century later, a graceful footbridge spanning the M42 nevertheless today carries part of an ancient route whereby salt was once transported from Cheshire to Leicestershire. Near this bridge there is a tower erected in the 1950s for microwave communication in the Cold War period, and at Pailton there are radio masts originally used in WW2 but still in operation today.

From microwaves to canals, where Richard found an unusual boat, the Laplander, with a BCN (Birmingham Canal Navigation) plaque. Thought to be an icebreaker it has a 'bow' at each end. An abandoned section of the Oxford Canal at Newbold on Avon once looped through the village, and passed through a tunnel *underneath* the churchyard. A long-forgotten disused cutting near Willey, north of Rugby, once carried part of the only rail route from London to Yorkshire.

In WW1, the massive 980ft long by 200ft wide Ordnance Factory in Coventry manufactured 15-inch naval guns for the dreadnoughts of that age. They left the Works on specially built bogies by a railway line (still visible), which was laid to connect the Works to the Foleshill line, thence to a junction with the Coventry and Nuneaton line. In the back

streets of Leamington, Richard found a bridge on the former GWR line with a strangely complex arch-construction, and he concluded his talk with slides of a variety of different items which many of us may have 'seen' in our travels, but not necessarily 'have observed'.

Following Richard's presentation, Roger Cragg showed a 10-minute DVD, issued by the Institute of Civil Engineers, on Thomas Telford, its illustrious first president. A very professional production, the DVD covered the life, projects and legacy of this remarkable man, possibly the world's greatest civil engineer, many of whose works are still with us today.

The evening was rounded-off by an address from our Chairman, Martin Green, in which he took an overall view of the future of our Society. While our field of activity is Warwickshire as a whole it must be recognized, Martin said, that our records show we know a great deal more about IA in Warwick and Stratford districts than we do about it in Rugby, north Warwickshire, Nuneaton and Bedworth. Yet those areas once had many diverse industries which, even though the demolition men have wrought their usual havoc over the years, should still be potentially rich fields for us to plough.

Martin's plea was for greater attention to be paid by members to the former coalmining and stone quarrying industries of Nuneaton and Bedworth, to the railways and canal systems of those areas, and to such once massively productive firms as the brick-making companies founded by Reginald Stanley and James Knox. Textile related industries also once flourished in north Warwickshire, as did brewing, engineering and boot and shoe manufacture. Little remains to be seen of many of these enterprises, but there is still some evidence to be had for those diligent enough to find it. Only when we have recorded, however minimally, more of the IA of that part of our County, Martin suggested, can we really live up to our name as the *Warwickshire* Industrial Archaeology Society.

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN	SECRETARY	TREASURER
M. J. Green	D. M. Crips	M. W. Abbott
<i>Argyll</i> 2(b) Union Road	27 St. Nicholas Church Street	3 Holmes Court
Leamington Spa	Warwick	Bridge Street
Warwickshire	Warwickshire	Kenilworth
CV32 5LT	CV34 4DD	CV8 1BP
(01926 313782	(01926 401072	(01926 850114
AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY		

Credits

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Mark W. Abbott

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Martin Green
Peter Chater

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- ☉ Meeting Reports
- ☉ From The Chairman
- ☉ WCC IA Resource
- ☉ Meetings Programme

FROM THE CHAIRMAN

One of the great pleasures of my involvement in industrial archaeology has been to act as enthusiastic amateur. There has been nothing better than hearing about or discovering a site and then setting off to investigate, interpret and record that site in whatever way seemed appropriate at the time. I know many members of the society have shared this approach, and continue to do so. This amateur, individual type of assessment by our members may not have been very systematic but it has produced a great collection of material, particularly an excellent photographic record, some of which has been shown regularly at Society meetings.

I recently attended the Day School of the Council for British Archaeology at Worcester. My main reason for going was to hear a presentation on the Worcester Porcelain Works by professional industrial archaeologists John van Laun (of John van Laun Associates) and Alvaro Mora-Ottomano (of Archenfield Archaeology). This was the only 'industrial' talk of the day, and

they had trouble squeezing all that they wanted to say in the time allocation. It did make me realise how important these professional bodies are in recording industrial sites, particularly with the rigours of Health and Safety legislation making it very difficult for the amateur to engage in such activity on the larger sites. When does enthusiastic investigation (a.k.a. snooping around) become unlawful trespass?

Being part of that Day School also made me reflect on the differences and similarities that exist between archaeologists of a more traditional variety (no offence intended) and the merry band of industrial archaeologists that make up WIAS. This in turn reminded me of the Conference to be held at the University of Leicester April 4th.-6th. 2008 'Crossing Paths or Sharing Tracks: future directions for the archaeological study of post-1550 Britain & Ireland'. This aims to bring together representatives of the AIA, and the Society for Post-Medieval Archaeology, (together with representatives from similar organisations in Ireland), to explore commonalities between approaches as well as unique contributions made by each organisation to study of the material heritage of the post-1550 period. I shall ensure that the Society is represented at this conference.

Whatever future direction the subject takes, it really is vital that all of us continue to investigate, interpret and record any sites that come to our notice. It has been

the essential ingredient of what we have done over many years, and needs to remain at the heart of the Society's activities.

In a previous issue I bemoaned the absence of local courses on industrial archaeology that might be of interest and benefit to the amateur industrial archaeologist. One course that is being offered on a related issue – industrial architecture – is available in Oxford in April 2008, and details are included below.

Oxford University Department of Continuing Education

Course on Industrial Architecture

Thursday 17th. April to Thursday 26 June 2008

2.00 p.m. to 4.00 p.m.

10 Meetings

Course fee: £85

Course tutor: Hubert Pragnell

To be held at: Ewert House, Ewert Place, Summertown, Oxford

Course code: O07P659HCW

www.conted.ox.ac.uk/courses

PROGRAMME

Programme.

The programme through to April 2008 is as follows:

January 10th

Anna Stocks: *Listing and Planning Issues for the Industrial Archaeologist*

February 14th

Mr. Chris Holland: *Forgotten Hero: Joseph Elkington Agricultural Pioneer 1739-1806*

March 13th

Mr. Tony Green: *Mapmaking Past Present and Future*

April 10th

Mr. Michael Derby: *Coke Quakers and Charcoal*

Continued on page 2

NEWSLETTER

Meeting Reports *by Arthur Astrop*

September 2007 Alison Clague

Working Lives: Memories of Work and Industry in Nuneaton and Bedworth

The 'oral history' approach to recording past local and regional activities is growing in popularity among archivists and industrial archaeologists. One such project is currently in hand in Coventry, in respect of the former engineering industries in that City, and at our September meeting Alison Clague outlined the project she is heading which aims to capture, often in the nick of time, essences of the many trades once practised in Nuneaton and Bedworth.

Entitled *Working Lives*, the project is designed to collect, preserve and make accessible memories, images and information relating to the people who worked in the brick and tile making, quarrying, engineering and textile industries of those areas. The final 'product' of the project, which has been commissioned by the Nuneaton and Bedworth Arts Committee, and is financed by Warwickshire County Council's Well Being Fund, will be a collection of tape recordings, photographs and written work that can be preserved for posterity.

Alison, who is based at Nuneaton Library, showed a Powerpoint presentation which included many short 'clips' from lengthier sound recordings made by those who once worked in the relevant industries. Her idea was to give a summary of the scope and quality of the project, its aims, the progress so far, and the work which is scheduled for the future. Many of the industries and their buildings in Nuneaton and Bedworth have now disappeared, and there is an urgency in the project to capture the memories of the people who worked in them before they too, disappear.

An appeal was therefore made to local history groups and to residents of Nuneaton and district to volunteer to share their memories of working days. There was a gratifying response to the appeal, and almost invariably a by-product of most interviews, along with the sound recordings, was the production by the interviewee of a few photographs. These showed records of work places, working conditions, and working processes, which might otherwise never have been seen. Permission for Alison to include these priceless images was rarely refused.

The oral side of the project not only brings 'history to life', but also records local accents and dialects, technical phrases and terms which might otherwise have been lost, together with some of the emotions felt by workers at the time. Alison started her talk with the textile industry, and the works of major employers such as Courtaulds, Listers, Lester & Harris, Abbey Hosiery and Toye, Kenning &

Spencer (incidentally, still trading in Bedworth), featured prominently. In many instances, a photo of an interviewee and a brief sound recording recalled some aspect of his or her working and social life.

Turning to the brick and tile industries, Alison showed photos of Stockingford, for example, when its skyline was dominated by tall chimneys and brick kilns. Haunchwood Brick & Tile also specialised in making the very tall heavily ornamented chimney pots often seen to this day on stately homes. In the engineering field, Sterling Metals and Clarkson were prominent in Nuneaton, and the former with its works covering 26 acres was once the town's largest employer. Finally, Alison turned to the stone quarrying industry of Nuneaton and district. Judkins quarry started in 1840, and a worker who served as a driver and driller with various companies shared his memories of blasting and crushing procedures.

When the oral-history project is complete it will represent a comprehensive record in pictures, documentation and in sound of industries and companies long gone from Nuneaton and Bedworth, their buildings demolished and (in the case of quarries), with their sites filled-in and landscaped.

Some WIAS members may feel they have something to contribute to this project, and if so Alison Clague can be contacted on 02476 384027, or by e-mail on alisonclague@warwickshire.gov.uk

Society News *continued*

New Treasurer

Mr. Richard Hartree has agreed to become the Society's new treasurer, and our thanks are due to him for taking on this task. Richard has, amongst many other things, been the treasurer of the AIA in the past, so we are lucky to have such an experienced person to take on the job. It is intended that he will assume responsibility for the Society's finances from the New Year and contact details may be found at the end of the Newsletter.

Subscriptions

Members are reminded that subscriptions for the 2007/2008 season are due. The amount remains at £10.00 per person or couple and should be paid to Martin Green, acting Membership Secretary. Cheques should be made payable to Warwickshire Industrial Archaeology Society please.

Membership Secretary

The post of Membership Secretary remains vacant, but it is hoped to announce the name of the new nominee shortly.

Railway History

October 2007 Mr. Martin Bloxham

The Stratford & Midland Junction Railway

The Stratford-upon-Avon & Midland Junction Railway ambled its way cross-country, up hill and down dale, broadly from Towcester in the East to Shakespeare's home town in the West. Some cynics said that the initials (SMJ) of this 65-mile line stood for 'slow, miserable and jolty'. As lovingly described by Martin Bloxham, however, the line seems to have been more the potential subject for a poem by John Betjeman which he never got round to writing.

The name Stratford & Midland Junction Railway amalgamated four others, each with a name longer than the next, with the E. N. M. & T. R. & O. Junction Railway (sic!) triumphantly claiming to be the longest. The arrival of the initials SMJ, therefore, must have come as a great relief to passengers of the line, few though they were. Envisaged initially to carry iron ore, principally destined for South Wales, and only secondarily for carrying passengers, the line never had more than 15 coaches at its disposal for the latter, usually coupled in threes. The first section, opened in 1866, joined Blisworth to Towcester, and five years later Fenny Compton was joined to Kineton. Thus, bit by bit the line gradually inched its way westward to Stratford-upon-Avon, and the final section eventually linked that town to Bidford-on-Avon, at Broom Junction.

The single-track line passed through predominantly rural parts of the Midlands, calling at stations with such Olde-English names as Blakesley, Moreton Pinkney, Byfield, Fenny Compton and Ettington. Sometimes, *en route*, distinguished passengers like Lord Willoughby de Broke and the novelist Marie Corelli would leave their country houses to be welcomed aboard its coaches, but passenger-carrying business never paid for itself. Indeed, the whole venture, from laying the very first sleeper, seems to have been based much more on optimism than on hard-headed business acumen. For a start, the line ran 'against the grain', that is, it travelled east-west across the land when the real thrust of Britain's railways in the 19th and early 20th centuries, not to mention virtually all the serious financial backing, was focussed on developing the more profitable north-south routes. The SMJ always had powerful, and at times threatening, neighbours.

The traffic it found in iron-ore freight varied erratically, as sources beyond the reach of the line were exploited, and SMJ shareholders waited in vain for the dividends they had once been confidently promised. Instead, they were all too often appealed to for further 'investment', and at one time the line

went into receivership and passenger-carrying was suspended. When, some years later, passenger traffic was introduced once more, yet further substantial investment was needed in order for SMJ to bring its coaches up to the standards then set by the Board of Trade.

The two world wars saw periods of increased activity for the line, when it was called upon to carry troops and ammunition, and in WW2 it played its part in the build up to D-day. At one time, business was also found in carrying bulk supplies of bananas destined mainly for London, and spare heat from its steam locos was ingeniously diverted to the trucks to encourage ripening of the fruit, from green to yellow, during its journey.

But the SMJ was simply a sitting duck for Beeching. It stood no chance of survival, by 1965 it was gone, and all that survives today is a short section connecting Fenny Compton with the MOD's Ordnance Depot at Burton Dassett. As Martin Bloxham said, "The SMJ was good for views but bad for shareholders!"

www.windowsonwarwickshire.org.uk

The number of WIAS members who are 'on-line' is increasing. In light of our Society's special interest, perhaps one of the most rewarding for random surfing is Warwickshire County Council's *Windows on Warwickshire* site.

The site divides the County into five areas, named North Warwickshire, Nuneaton & Bedworth, Rugby, Warwick and Stratford-upon-Avon. It can then be explored by way of four main categories, namely Theme Viewer, Maps Explorer, Advanced Search and Spotlights. Clicking on Theme Viewer will open a list of towns in the County, and in turn a town can then be opened to show a list of streets. Thus, by clicking on Leamington Spa and then on Bath Street, pages of photos of premises in that street are displayed including, for example, some fascinating interior views of various departments in E Francis & Son taken in the year 1900!

The section of the site entitled Maps Explorer explains itself, and that labelled Advanced Search enables one to seek a specific photo by keyword, date or type. The Spotlights section offers a number of self-contained interactive web sites. Warwickshire County Council is to be congratulated on providing this site and on-line WIAS members are recommended to visit it.

Arthur Astrop

Industrial Archaeology at Warwick Castle

November 2007: Mr David Bright

The Mill and Engine House at Warwick Castle

In 1894, to celebrate the thirty-third birthday of his wife Daisy, Countess of Warwick, the Earl of Warwick laid on a rather special present. That evening, a massive switch was closed, and some 500 electric light bulbs throughout the Castle came on. Closing that switch meant that countless candles, oil lamps and gas mantles hitherto used to illuminate the noble pile, were on their way out, and there was doubtless much rejoicing 'below stairs'!

The bare wires carrying current (DC) to the bulbs could be traced back, through wooden (sic) twin-channel conduits, down to the mill house just outside the southern wall of the castle, and it was this structure which was the starting point for David Bright's talk to our November meeting. The first record of a mill on the Avon close to Warwick Castle locates it about 100 yards farther downstream, but at the end of the 14th century it was moved to its present location. Sketches and paintings of the castle, including some by Canaletto, show the mill house clearly and David had maps and drawings revealing how, over the years, various changes were made to the weir and mill race.

Up to the mid-1800s, paintings and sketches of the mill house were the only records, and 'artists' licence' aimed at showing the castle in its best light was always present to some extent. By 1860, however, the first photographs of the mill house appeared, and there was thus more certainty about its design. But in 1880 a fire destroyed the building. The building which replaced it, however, became known henceforth as the 'mill and engine house', because the water-wheel(s) were used firstly to work pumps to lift water to the castle and, ultimately, to drive the dynamos and charge the batteries which provided its electricity. Warwick Castle was embracing the latest technology.

Each day, the mill and engine house was busy charging the banks of batteries in readiness for the demand for electricity which would come from the castle when dusk fell. If distinguished company was

being entertained 'up above', then great was the responsibility on the Superintendent of the mill and engine house to have all the batteries fully charged. And there were also the batteries in the castle's Peugeot electric car to be kept ready for whenever the Countess wanted 'a spin' in the castle grounds. Soon, the demand for a totally reliable supply of electricity meant that the variability of water flow in the Avon was a problem, and even the dynamo driven by an underwater turbine was insufficient. Oil and gas engines were therefore installed and state of the art electrical switch- and control-gear was fitted to monitor the dynamos.

The final part of David's talk concentrated on the many year's work involved in the restoration of the mill and engine house, bringing it 'back to life' and ultimately to the condition where today it provides a permanent exhibition of how it once looked and operated. David played a leading part in that project, including working out how the complex circuits and electrical switchgear were arranged. Among the many impressive sights are: the restored waterwheel; the double-helical cast-iron gears which originally transmitted its power; a few of the original lead batteries; and the remains of the Thomson Vortex underwater turbine. A visit is strongly recommended.

Southam Gasworks Addendum

Redevelopment work has now started on the site of Southam Gasworks. The house has apparently been refurbished, at least externally, and has acquired some slightly inappropriate looking new guttering, together with a fresh coat of white paint on the rendering. Elsewhere, all other buildings have been demolished, although it is not known which, if any, of these related to gas production. The size of the site would suggest that further new houses may yet be built.

Mark Abbott

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

R. Hartree

Stables Cottage

Sibford Ferris

Banbury

OX15 5RE

(01295 788215

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Martin Green

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Industrial Archaeology Society

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THIS ISSUE

- ☉ Meeting Reports
- ☉ From The Editor
- ☉ *Link-up* Extracts
- ☉ Meetings Programme

FROM THE EDITOR

First, I must offer an apology for the absence of the December 2007 meeting abstract from this Newsletter. Normally, Arthur Astrop ably undertakes the role of Meeting Secretary and provides a written abstract of each meeting for the Newsletter. Unfortunately, Arthur was unable to attend the December 2007 meeting and so no abstract is available for publication. If it is possible to provide an account of the meeting later, this will be done. I hope this does not inconvenience members unduly. Meanwhile, if there is another member who would like to act as an occasional Meetings Secretary, I would be delighted to hear from them.

To replace the meeting abstract, I have elected to use some extracts from the Warwickshire Steam Engine Society's newsletter *The Link-up*. These appear courtesy of Peter Coulls, one time Chairman of that Society and its newsletter editor. Whilst I appreciate that the material may be familiar to some members, I also hope it will be of interest to the wider Society

membership and perhaps generate some comments that may be published in the future. Further similar material is available and will appear as space permits.

Another matter raised recently, and coincidentally, by Arthur Astrop, was the possibility of including illustrations in the Newsletter. This is something I have always hoped might become possible, especially given my personal interest in photographing industrial archaeology, and something that I raised in an editorial in September 2004. The reason I have not pursued the matter further is one of cost. Currently, the newsletter is photocopied to double-sided A3 from high quality A4 masters. This gives acceptable, if slightly variable, quality. However, photographs do not reproduce well using photocopying, so their use would mean having to publish the Newsletter by laser printing as a minimum standard. Whilst the software required to layout the publication, and to generate the required file type (pdf), is not a problem, Southam Office Supplies would charge £50.00 just to open the disc containing the file, before charging the cost of printing. This cost is typical, regardless of the company undertaking the printing. One hundred double-sided photocopies on A3, the current Newsletter print run, cost £22.00.

I have researched the cost of laser printers so the Society could be self sufficient in printing, but again the barrier is cost. A4 laser printers are considered home

office technology, and A4 machines for black and white reproduction cost from as little £100.00. However, A3 laser printers are professional level reprographic equipment and consequently much more expensive, typically £1000.00 or more just for black and white printing.

There is also a time element to consider. Using illustrations of any type in the Newsletter would require some document redesign, which would to advantage be better undertaken in a more recent and mainstream software package than I use at the moment, e.g., MS Publisher. Additionally, the preparation of images for reproduction would be a further time consuming task, above the considerable time already taken up in producing a text only edition. Unfortunately, I do not at the moment have the time available for the necessary extra work, but would not rule out being able to do the work in the future, subject to the cost problems being overcome.

Perhaps, if there is a need for a higher quality Newsletter, there is a case for a team of two to be responsible for the production: one person to co-ordinate and edit copy and one to prepare images and layout the publication? I would welcome the views of members on this matter.

Mark Abbott

See Page 2 for Society
News and Meeting
Programme

NEWSLETTER

Meeting Reports *by Arthur Astrop*

January 2008: Anna Stocks

Listing and Planning Issues for the Industrial Archaeologist

The need to preserve evidence of the 'past' cannot always assume it has the right to block progress in the present. Similarly, of course, neither has the needs of the 'present' the right to be insensitive to remains of the past. Finding a just and equitable balance between these two often conflicting forces is the delicate task of today's Planning Archaeologist.

Anna Stocks, who holds that exacting post with Warwickshire County Council, feared she might bore us with 'local and national planning laws and procedures'. She need not have worried. It quickly became clear that she was actively seeking the help and co-operation of archaeologists, professional and amateur, in our County and from that moment she had the meeting's attention.

Every planning application in Warwickshire these days not only goes before the relevant Planning Committee but is also automatically passed to Anna Stocks's Department as well. By simply tapping a grid reference of the proposed development into a computer, the relevant site is displayed on-screen, and all known (or suspected) items of archaeological interest (general or industrial) in the immediate area are shown at the same time. Such computerised data is, of course, largely the digitised equivalent of the multitudes of records once held only on paper and in voluminous files. And some items of obvious historical interest, such as monuments, abandoned quarries and what Anna called 'upstanding' structures, could hardly be missed.

But what of the archaeological evidence, some of relatively recent origin which, if not already overgrown, overwhelmed, or otherwise 'lost' to records, is in imminent danger of becoming so? Such evidence can often come only from the personal knowledge and memories of individuals, and it must not be lost to record. How long will it be, for example, before most if not all recollection of what once stood on the site of Ford's Foundry in Leamington has faded? Likewise Potterton's factory in Warwick? Or GEC Alstrom at Rugby, where Frank Whittle's early jet engines were run? Or the former car plants in Coventry? Anna touched a WIAS nerve when she showed shots of the Warwick Gas Works building, unaware (we suspect) that it is our logo. Fortunately digitised drawings of that site and of the remaining building, externally and internally, are on record, and judging from the decaying state of the frontage today it's just as well.

Other examples which Anna gave of her work

included recording the remains of a WW2 anti-aircraft battery site at Fillongley, for which plans for erection of stables had been made; and the foundations of brick kilns in New St, Bedworth, uncovered and recorded before site development was allowed. The final part of Anna's talk covered the type of delicate negotiations which are frequently required to achieve a fair balance between the needs of the archaeologist to record, and sometimes to preserve, and the reasonable expectations of the developer to build anew and to serve the needs of the community.

In maintaining the balance between the two the maximum amount of evidence on the history of a given site must be available if a fair decision is to be arrived at. Societies such as WIAS can play a vital part in accumulating that evidence, Anna said, and she urged us to be ever mindful of that fact. She may be contacted by e-mail at annastocks@warwickshire.gov.uk, by 'phone on (01926) 412734, or by post at Warwickshire Museum Field Services, The Butts, Warwick CV34 4SS.

Society News

Programme.

The programme through to July 2008 is as follows:

April 10th

Mr. Michael Derby: *Coke Quakers and Charcoal.*

May 8th

Mr. Peter Leather: *Industrial Birmingham 1760-1840*

June 12th

Mr. John Burton: *Nineteenth Century Industry in the Bedworth Area*

July 10th

AGM and Chairman's Lecture

Subscriptions

Members are reminded that subscriptions for the 2007/2008 season are now overdue. The amount remains at £10.00 per person or couple and should be paid to Martin Green, acting Membership Secretary, or treasurer Richard Hartree. Please make cheques payable to Warwickshire Industrial Archaeology Society.

Speakers

The selection and booking of speakers is an ongoing and sometimes difficult task. Most come from member's personal recommendation and Martin Green would welcome any suggestions of speakers with an IA subject bias for future bookings.

Agricultural History

February 2008: Mr. Chris Holland

Forgotten Hero: Joseph Elkington Agricultural Pioneer

For many people, the name Elkington most readily calls to mind the electro-plating process widely used for domestic items, including cutlery. But that mid-19th century technology was the brain child of Birmingham-based George and Henry Elkington and it was the work of their largely forgotten 18th century ancestor Joseph Elkington which was the subject of Chris Holland's talk to our February meeting.

Joseph Elkington (1739-1806) is buried in Staffordshire, but there is a monument to him in the churchyard at Stretton-on-Dunsmore, for it was in that village, and in nearby Princethorpe, that the Elkington family settled and farmed. On the monument, which is to the memory of Joseph, his wife and 11 children, he is described as a 'pioneer of land drainage'. Not, as Chris Holland admitted, a description to set the pulses racing; nor does it do proper justice to the important contribution he made in his lifetime to increasing the efficiency of land use not just in Britain but world wide.

On his father's death, Joseph inherited his land and on one portion, known as Long Harol Pits, he wanted to run sheep. But the land, which sloped fairly steeply, was poorly drained and really unfit for that purpose. Joseph's first attempt to drain it by having a deep ditch dug along the spring line was not wholly successful. Accepting this as a challenge, Joseph had bore holes driven deeper in the ditch. Soon water was flowing freely, could be diverted by ditches to the edge of the field, and the sheep were installed. This first attempt at land drainage in fact set Joseph on a career which was to bring him a considerable reputation.

It was remarked of Joseph that he 'had an intuitive feel for how to control water', either diverting it from where it was unwelcome or bringing it to the service of man. He developed theories on the strata beneath land surface, and how they affected the flow of water. He could also, it was recorded, 'read' the topography of land, thereby knowing where best to dig ditches, and at what depths. Joseph's advice was soon in demand as water was increasingly used to drive early machinery, and it is believed his skills were also sought by eminent landscape gardeners, including 'Capability' Brown.

Joseph's method of controlling water, known as 'spring-line interception', was the latest step in a series of man's efforts to drain land, and at the time (when clay drainage pipes were rare and expensive),

it proved to be the cheapest and the most effective. As his work developed so did his fame, and in 1797 a Mr John Johnstone wrote a treatise on Elkington's theory and practice in land drainage. At one point, the House of Commons even voted the sum of £1,000 'to be awarded to Mr Joseph Elkington to encourage him in his work'. There is some doubt, however, whether that money ever reached Joseph's pocket!

In due course, the mass manufacture of clay drainage pipes made the 'intuitive skills' of a man like Elkington no longer necessary, and by the end of the 19th century he was all but forgotten, save by those who erected the memorial in Stretton-on-Dunsmore churchyard.

To round-off Chris Holland's talk, WIAS member Trevor Daw displayed a number of items associated with the days when land drainage was predominantly a manual task, including special narrow-bladed spades (chads) and similar implements, an iron plate which could be strapped to a boot to protect its sole during heavy digging, and a variety of different types of hand-moulded clay drainage pipes.

www.warwickshireias.org

Members who have access to the Internet are reminded that the Society has a web site at www.warwickshireias.org. This is maintained by Peter Riley and is updated regularly, so is always worth checking to see what is new.

Amongst the content is an almost complete archive of Society Newsletters, which is updated, as each new edition is available to members. The majority of these are posted in pdf format, which means the pages on screen appear exactly as the printed edition and can be printed in the same style. All but the most recent Newsletters are out of print, so this is the ideal resource to consult if reference to a back copy is required or if a copy has been missed.

Newsletters also contain a quarterly meetings programme, so a check of the most recent Newsletter in the archive will reveal details of a forthcoming meeting. Also the home page always has details of the next meeting.

Another recent innovation is a photo gallery page, which contains a varied selection of Warwickshire IA related images. More are sought, so members who have digital images of local industrial archaeology are encouraged to seek advice about submitting them for inclusion from Peter Riley.

Local Steam Plant

Extracts from Warwickshire Steam Engine Society's Newsletter *The Link-Up*

Courtesy of Peter Coulls

The now defunct Warwickshire Steam Engine Society used to produce a regular newsletter known as *The Link-up*. The one time editor and Chairman, Peter Coulls thought some of the articles previously appearing in that newsletter may be of interest to WIAS members. These jottings were written in 1972 by the late Jim Durant, at a time when industrial steam was well in decline. The text remains unchanged, however where additional information is included, this appears in italics.

Assorted Steamery

Late March I must have had a dose of "Spring Fever" and decided to find out how much, if any, live steam was in use around Leamington Spa. I started by looking for smoking chimneys, found engines, managers were most helpful when approached, some results are listed below.

Leamington Pump Room & Baths.

Cochran Chieftan automatic oil fired boiler, 65 psi usually 100 psi used for heating. Weir pumps replaced approximately 4 years previously.

Leamington Spa Laundry, Hitchman Road.

Paxman Economic chain grate boiler on anthracite, 80-110 psi evaporating up to 8000 lbs per hour. One weir and one electric pump, both on HILO system. Ex GWR. engineer / stoker.

Heathcote Isolation Hospital.

Mercury automatic gas fired boiler 65 psi for laundry process and sterilizers. New in 1970 replacing coal fired boiler and weir pumps.

Warneford Hospital, Leamington Spa.

Three Danks Lancashire boilers, oil fired, fed by two weir pumps, electric pumps as stand by. Used for heating, laundry process and sterilizing. Enormous system of piping and calorifiers (heat exchangers). Steam condensed and returned to system.

Midland Counties Home for Incurables, Tachbrook Street.

Two Danks Lancashire boilers fed by two weir pumps, anthracite fired, chain grates. One set on and

one on standby. Steam used for heating and laundry, shift system – one engineer / stoker Ex - GWR.

These were visited at about one per fortnight – further travels as and when gardening, car repairs, etc. permit.

Napton Brickworks.

Sale of surplus machinery, Saturday, May 20th. Included in this sale was a steam engine by Pelham of Walsall. This was on a 20ft. bed, so a bit large for the majority of would be preservationists. Mr. Morton of Blists Hill Museum was notified, it is not known whether he was able to save it or if the torch and hammer squad moved in.

Postscript: Tuesday, 13th June. The engine is unsold. The owner Mr. Sheasby put a reserve on of £1000! There are two boilers, one now converted to a storage tank. The engine was used until about fifteen years ago and drove all the machinery, including the clay tubs by chain, the conveyors and the crushing pan. The exhaust steam was used for drying the 'green' bricks. Nothing wasted here.

According to George Watkins the engine was built by J. Wilkes of Pelsall Foundry, near Walsall, c1885? It was a non-condensing horizontal single cylinder engine operating at 80 psi. He suggests that the works were started in 1885 by Nelson, Watson and Co. producing traditional bricks and tiles. The engine was well built and was overloaded for many years, needing little but running repairs.

Twenty six years on the site remains largely derelict, despite several attempts to develop it. Most recently, it has been the subject of a locally contentious planning application for a craft village. This sought permission for a number of detached houses with adjacent craft workshops, the idea being to attract a community of self employed crafts people. However, general local opinion was that this was an underhand attempt to develop a housing estate in an inappropriate location, and nothing seems to have come of the proposal.

Meanwhile, fragments of the sites industrial past remain evident, most notably the clay extraction quarry on Napton Hill, now a fishery, and the house style office building at the site entrance

WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

CHAIRMAN

M. J. Green

Argyll 2(b) Union Road

Leamington Spa

Warwickshire

CV32 5LT

(01926 313782

SECRETARY

D. M. Crips

27 St. Nicholas Church Street

Warwick

Warwickshire

CV34 4DD

(01926 401072

TREASURER

R. Hartree

Stables Cottage

Sibford Ferris

Banbury

OX15 5RE

(01295 788215

AFFILIATED TO THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

Credits

Design and editing:

Mark W. Abbott

Additional material:

Arthur Astrop

Martin Green

Printing:

Southam Office

Supplies Market Hill

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THIS ISSUE

- ☉ Meeting Reports
- ☉ From The Editor
- ☉ Bridges Under Threat
- ☉ Meetings Programme

FROM THE EDITOR

My editorial in the March 2008 edition of this Newsletter concerning possible changes to its format brought an unexpected number of offers of practical help. These included the offer of a second hand A3 laser printer at a very attractive price; so attractive as to be almost too good an opportunity to ignore. So thank you to all who came forward. Despite none of these offers having been taken up (yet) they were all very much appreciated.

However, after discussion by the Committee, it has been decided that the current format of the Newsletter continues to fulfil the perceived need it originally sought to address. That is to ensure all Society members are kept informed of the activities of the Society, whether or not they can attend meetings regularly, the intention being to ensure all members feel included by the Society. In addition there has developed a secondary publicity role for the publication, as a copy is sent to local institutions such as libraries and to the AIA.

The inclusion of photographs

it was felt would do nothing to further these aims and might detract from them, as if the current four page layout were retained, images would reduce the space available for text and possibly compromise the meeting reports.

This does not mean that images will never appear in the Newsletter. If all goes to plan, this edition will be something of a milestone since it will be the first to contain an illustration; a diagram appending the report of the May meeting. Hopefully, similar illustrations will be possible in future editions, where appropriate and available, as the technology required to reproduce them is now quite straightforward. The inclusion of photographs is not entirely ruled out either. The option of printing these on a separate insert has been considered and will be employed should the need arise.

The one aspect of the Newsletter that might be reconsidered to advantage is the means of distribution. Until now, distribution has relied upon collection at the meeting following publication, with a copy being sent to those not at that meeting. Lately, this posting out of copies has not been particularly efficient, relying as it does on an accurate record of who has, or has not, picked up a copy from the meeting. This record is something that is difficult to maintain particularly if, as is increasingly common, I am unable to be at that meeting. Therefore, with each Newsletter also being posted on the Society

web site, and Internet access becoming more commonplace amongst the Society membership, what might be the feelings of members be towards stopping the practice of posting copies to those unable to collect them? Does this represent a conflict with the main stated aim of publishing a Newsletter, namely that of making all members feel included in the activities of the Society?

Mark Abbott

PROGRAMME

Programme.

The programme through to December 2008 is as follows:

September 11th

Mr. Lawrence Ince:
Engine-Building at Boulton and Watt's Soho Works.

October 9th

Mr. Michael Derby: *Coke Quakers and Charcoal.*

November 13th

Ms. Gillian Bardsley and Rev. Colin Corke: *Car-Making at Longbridge.*

December 11th

Mr. Malcolm Hancock: *The Rise and Fall of Rugby Radio Station.*

Subscriptions

Members are reminded that subscriptions for the new 2008/2009 season will become due from September 2008. The amount, subject to the outcome of the AGM, is likely to remain at £10.00 per person or couple and should be paid to Treasurer Richard Hartree. Please make cheques payable to Warwickshire Industrial Archaeology Society.

NEWSLETTER

Meeting Reports *by Arthur Astrop*

March 2008: Mr. Tony Green and Mr. Steve Walker

Mapmaking: Past Present and Future

The advent of digitization combined with GPS brings the imminent possibility of 'a single national seamless database for maps *without edges or corners*'. As a result, no longer will the very place you want to visit be on the extreme edge of a map, meaning that you probably need to buy at least two sheets; or in a corner, when you may need to buy four!

So predicted Tony Green and Steve Walker, both of whom have many year's service with Ordnance Survey behind them, in a presentation which traced the highlights of that famous organization from its foundation in 1791 to the present day. In fact they looked a little beyond 2008, for while the OS's 'single seamless database' is within sight it is not quite here yet.

It was the threat of invasion by Napoleon which triggered the formation of Ordnance Survey and Green and Walker described the early methods of surveying, by triangulation, the use of chains for accurate linear measuring, and the first mechanical theodolites. One of those early instruments was in fact displayed by the speakers, a masterpiece of 19th century precision engineering, but totally dependent on graduated scales, verniers, and therefore on the acute eyesight and interpretive skill of its operator to produce accurate readings. The speakers compared this instrument with its 21st century counterpart by demonstrating a computerized laser device which provides the operator with digital readings of much higher accuracy almost instantaneously with an observation being taken.

Ordnance Survey originally had its headquarters in The Tower of London, but in 1841 a fire forced its removal elsewhere and it settled in Southampton. The 20th century, with its periods of war and peace, brought an unprecedented demand for maps from OS, not least for artillery purposes on the Western front in WW1. In the interwar period, OS grew substantially, employed hundreds of highly skilled cartographers as well as surveyors, and had its own extensive map-printing facilities. In the same period, in 1938 to be precise, OS 'went metric'.

A year later, with WW2, the services of OS were once more in constant demand by Britain's armed services, and remained so until 1945. It was during that war that OS's headquarters at Southampton were heavily bombed. The Service therefore removed to premises in Chessington, Surrey, where it remained until new buildings were ready for occupation, once again in Southampton. But it is modern technology in general, and digital

technology in particular, which in the last 20 years or so has totally transformed the working practices of OS. Both those technologies have enabled massive relational data bases to be built which not only speed up map making but also allow so-called 'attributes' to be incorporated into maps. Moreover, such maps can now be displayed in various ways including 3-dimensionally, based on data gleaned from aerial photography.

Such attributes on maps provide the detailed and specialised data required by different users such as fire brigades, ambulance services, and the police etc. to be called up and displayed on screens, including Sat-Navs. Much of such highly detailed data is now also captured by OS through the use of simple portable 'targets', carried atop poles, which are recognised by GPS systems. The plotting of maps from digitised data is now also automatic, so that the number of cartographers used by OS is but a small fraction of that formerly required. On the other hand, the number of people needed for field work, and to deal with and manage such data, has to a large extent taken their places.

Bridges Under Threat

From the CPRE Warwickshire Annual Review 2007-8 comes news of the threat of demolition for two early railway bridges in North Warwickshire.

The two structures concerned are on the now freight only branch between Whitacre Junction and Kingsbury. They date from around 1838 and are built of local sandstone, to a classical design, and are rare examples of structures built at the end of the Georgian era, and the opening of the railway age. This line was once part of the Birmingham and Derby Junction Railway opened in 1839. Network Rail has sought to demolish and rebuild the bridges to allow high containers to reach the Birch Coppice Birmingham International Freight Terminal, and is apparently unaware that the structures are listed. Meanwhile, a local public meeting has passed a motion to oppose the demolition and North Warwickshire's planners have asked the railway management to reconsider the demolition proposal.

Roger Cragg hopes to take a look at the two bridges, and to investigate if any further similar structures still exist on the Stonebridge Railway, the now abandoned part of this route which took the B. & D. J. R. from Whitacre, to the London and Birmingham Railway at Hampton in Arden.

Mark Abbott (With thanks to Toby Cave)

Railway Preservation

April 2008: Mr. Roger Cragg

Operating a Preserved Railway

The first steam railway to be preserved in the UK by voluntary initiative was the Talylyn line, which was saved from almost certain closure in 1951 following the death of its owner Sir Haydn Jones. Today, the total number of preserved railways in the UK is no fewer than 153, of which 61 are standard gauge, 36 narrow gauge, 51 associated with museum and steam centres, and five are tramways. And the number of preserved steam and diesel locomotives associated with these railways is no fewer than 2,569.

Preserved railways range at one extreme to those with only one loco, a mile or two of track and a turnover of just a few thousand pounds, to relative 'giants' with many locos, substantial rolling stock and turnovers running well into six figures or more. By the same token, the magnitude of the tasks involved in operating a preserved railway is equally diverse, although the problems faced by those running them are remarkably similar. Who better to give our Society an outline of what is actually involved in operating a preserved railway than WIAS member Roger Cragg, who for over 30 years has been intimately involved with the preservation and running of the Welshpool & Llanfair Light railway in Wales.

Roger started by looking first at the men and women involved in these ventures, both volunteers and paid staff. In the volunteer sector there are (a) the 'pioneers', who tend to move on when a line on which they have worked is 'back in action', and (b) those whose passion and interest is in the actual day-by-day running of a railway. And today, the lady volunteers are no longer content just to staff the tea rooms: they want to be on the footplate as well. Volunteers, of course, are the backbone of any preserved railway and are 'cheap', but being volunteers they cannot be coerced, whereas paid staff, Roger said, although far fewer in number, can at least be 'ordered' rather than 'asked'!

An important first step for any railway preservation society is the acquisition of the powers required to operate a public passenger service, and leasing or purchasing the freehold of the line is essential. For this purpose a Company is usually formed which holds the lease or freehold. There are advantages for a line to acquire charitable status, but a separate company must then be set up to look after the line's 'trading' activities, if profits (however small) are made.

Roger dealt with the various levels of staff needed to run a line, from drivers and firemen to signalmen,

guards, maintenance engineers, track layers, booking clerks, refreshment and gift shop staff, and so on. A line offering a public service requires a timetable to be issued (and adhered to) and that implies complex rostering work for someone! A General Manager is also essential (usually a paid member of staff), and there is also a Deputy GM (often paid as well), who has responsibility for day-to-day operations and the running of the shops and tea rooms. Another crucial appointment is the Track Supervisor, whose duties are self-evident.

Structured training programmes for locomotive staff and signalmen must be introduced and will represent a 'ladder of progress' for volunteers working in those areas of activity. In short, a preserved railway which offers a public service must eventually have a structure which is in effect a scaled-down version of that used by its bigger, more famous brothers.

Roger finished his talk on a lighter note, namely the need for most preserved railways to mount 'special events', including for example *Thomas the Tank Engine Days* and *Santa Specials*. These occasions, he observed, are usually loathed by the serious steam loco volunteers but, they have to admit (albeit through gritted teeth), they are very lucrative and often make a major contribution to a line's annual income.

Looking Back

Looking back..... Working Life

Leamington Spa Art Gallery and Museum have a collection of objects from local businesses in the 19th and early 20th centuries. But they tell only a part of the story and an appeal has been made for memories which will help to bring the collection up-to-date.

Vicki Slade, from the Royal Pump Rooms, Leamington Spa, gave a short presentation to our May meeting on the project, which invites answers to such questions as: *What did you do for a living? How did you train for your job? What was your working day like? Did technology change your working life? Was your social life linked to your work?*

Vicki is especially interested in memories of 20th century working lives at Ford Foundry, Pottertons, Flavels, Automotive Products, Eagle Engineering, Cherry Orchard Brickworks, etc. But also, of course, in many other local businesses. So, have you any stories and memories about your working life you would like to share?

London Docks

May 2008: Mr. Martin Green

The London Docks

"I have seen the Mississippi. That is muddy water. I have seen the St Lawrence. That is crystal water. But the Thames is liquid history". John Burns 1858-1943.

The scheduled speaker for our May meeting was unfortunately indisposed by illness and Martin Green stepped in to take his place at a mere 24-hour notice. As members have come to expect from our Chairman, he did so not just with aplomb but with a splendidly detailed grasp of his subject. His topic, he announced apologetically, would perforce be merely a short history of London Docks, an area possibly unequalled as a source of industrial archaeology in the Capital. What followed, in fact, was a fascinating and detailed account of how London's docks, its associated warehouses, shipbuilding yards, and all the infrastructure required to support them, developed throughout the 19th century, reached its apogee in the early part of the 20th century, and sadly declined virtually to nothing from the 1960s onwards. The whole illustrated by photographs of the highest quality.

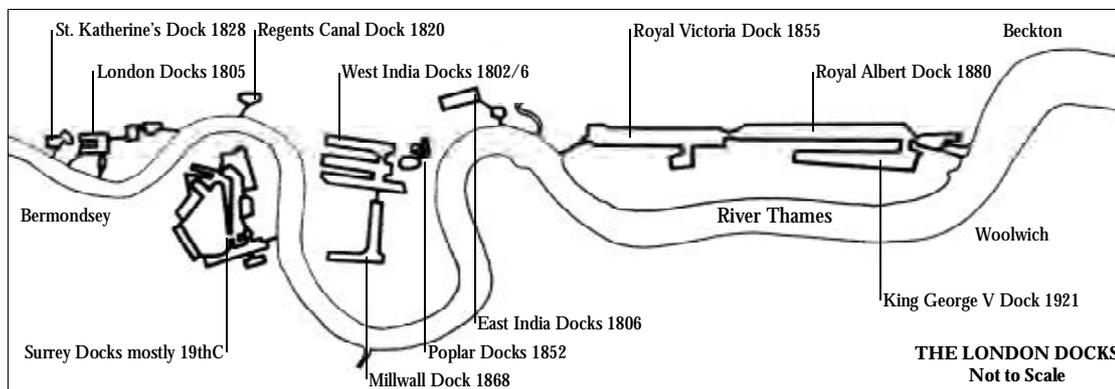
The West India dock was the first to be built on the Thames, in 1802, and the last was the George V, ultimately finished in 1921. In the intervening years a maze of world-famous docks, including the three 'Royals' (Victoria, Albert and George V), St Katharine's, the East India, Millwall, Surrey and Tilbury docks, was developed along a relatively short stretch of the Thames, each striving to outdo its predecessors in design, facilities and efficiency. Many in fact comprised a pair of docks, side-by-side, one for imports and one for exports. The former, incidentally, was invariably larger than the latter, reflecting the fact that Britain had a balance of payments deficit long before it became a well-known modern political problem!

The accompanying illustration shows the layout of the London Docks as they were between the world wars. They employed thousands of workers, many on a 'casual' basis, and some of the dock owners made considerable fortunes. But the construction of some docks caused great hardship to those whose houses were demolished to make way for them. Building St Katherine's Dock alone, for example, is recorded as having 'displaced' no fewer than 11,300 east-London residents.

The early docks in the complex were known as 'Legal Quays', were governed by the Port of London, and all trade had to pass through them. As the complex developed, problems arising from congestion arose, as did the level of pilfering. The latter eventually became such a problem that 'enclosed' docks were required, encircled with brick walls 20 or 30 feet high, and even in some cases with moats. By the end of the inter-war years, London Docks were fully developed (pictured below), but were to prove appallingly vulnerable to air attack. Consequently they suffered cruelly in WW2, German bombers merely having to follow the course of the River Thames to find their targets.

There was a brief post-war revival but then London's Docks gradually went into terminal decline. Much of the area has now been bulldozed and redeveloped into extremely prestigious (and expensive) office and residential occupation, but some remnants of Dockland's most historic buildings, also a few cranes, still stand as symbols of past glories. There is also an excellent Dockland Museum which is worthy of many more visitors than it currently enjoys, and our Chairman strongly commended it for a visit.

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WARWICKSHIRE INDUSTRIAL ARCHAEOLOGY SOCIETY

www.warwickshireias.org email: WIAS@photoshot.com

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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- From the Chairman
- Meetings programme
- Meeting Reports

FROM THE CHAIRMAN

Under new management

In what we hope will be a seamless transfer, responsibility for the production of the Newsletter has passed from Mark Abbott to Mike Hurn, and this issue represents the first production under new management. We are very grateful to Mark for his efforts over a long period of time, and delighted that Mike felt able to step in the breach. This responsibility comes in addition to Mike's willingness to co-ordinate the production of the monthly meeting reports produced so assiduously by Arthur Astrop over the years. I feel that it is imperative that we have a team of members willing to write up reports to help Mike, and I repeat my plea that anyone wishing to be involved should contact Mike or myself. My experience is that it really does concentrate the mind during a talk and ultimately means that one gets a lot more from it, as well, of course, as benefiting the members.

Publications

The process of transfer has had the side-effect of concentrating the minds of your Committee on the issue of the Society's publications. Taking a hard look at the work of the Society reveals that – with a few notable exceptions – we have not been very prolific in terms of published material. Those with long memories will recall the days of RETORT! – an (increasingly) occasional publication produced by the Society with myself as editor. This tried to fulfil several – perhaps too many? – functions and was replaced by the Newsletter which was launched to ensure that members would indeed receive regular information about

the Society and reports of the monthly meetings. What it does not do is to provide a vehicle for the publication of members' research of particular topics or specific sites in Warwickshire.

This is being given careful consideration by your Committee and the current feeling is that we should continue with the production of the Newsletter, perhaps with the inclusion of photographs and a brief section devoted to an individual site in Warwickshire. This latter opportunity would mean that a member might like to take a site and write it up for the Newsletter and thereby contribute to a longer list of the industrial archaeology sites of Warwickshire. Topics such as location, history, significance, current condition, access plus a photographic record would be such a useful addition to the work of the society.

In addition, we feel that we should make a real effort to try and produce more substantial Occasional Papers which might in time be included in a larger volume on the industrial archaeology of the county. The Occasional Paper has the added advantage of bringing the work of the Society to a wider audience, and the possibility of stimulating response and further research. Industrial archaeology societies elsewhere in the country provide many examples of such papers, with varying degrees of size, print quality, binding, illustration, photographs and all these matters would need to be carefully considered.

Twenty Years of WIAS

The Society was launched in the summer of 1989 and held its first meeting in September 1989. There are several members who have been with us from day one, and they will re-call the early days of meeting in a classroom at Warwick School with less than twenty in attendance.

Much has happened since then, but it is encouraging to report that membership and meeting attendances are at record levels. The Committee feels that the 20-Year Anniversary should be marked in some way and various options have been suggested. Perhaps the most useful step would be to produce the first Occasional Paper – 'An introduction to the Industrial Heritage of Warwickshire' – with a general article followed by the specific research that members have done over the twenty-year period. This would also be an effective use of the available funds that the Society has accumulated. It would be on sale to the general public, as well as being available to members. Food for thought ...

Martin Green

PROGRAMME

The programme through to June 2009 is as follows:

December 11th

Mr Malcolm Hancock: *The History of Rugby Radio Station.*

January 8th

Members' Research Evening.

February 12th

Mr Nicholas Billingham: *The early industrialisation of Stratford upon Avon.*

March 12th

Mr Brian Ellis: *Blinman: a nineteenth century South Australian copper mine and its environment.*

April 9th

Ms Joanne Gloger: *'There is more to a needle than meets the eye': Needle-making in Redditch and beyond.*

May 14th

Dr Jim Andrew: *The Smethwick Engine.*

June 11th

AGM followed by *The Chairman's Lecture.*

Summer Break

NEWSLETTER

Meeting Reports *by Arthur Astrop and Mike Hurn*

June 2008: Mr John Burton

Nineteenth-century Industry in the Nuneaton and Bedworth Areas

In his latest address to our Society, John Burton took a novel approach to the subject of 19th century industry in the Nuneaton/Bedworth areas by linking it with the life, times and works of novelist Mary Ann Evans (1819-80), aka George Eliot.

As a child, Mary Ann Evans enjoyed a lower middle class life. Her father, Robert Evans was agent to the large Newdigate estate and since she often accompanied him on his duties she was in a position to observe details of the lives of workers in the district's agricultural, mining, quarrying and weaving industries. Much of what she saw was to re-appear later in her novels and remains a valuable historical record. Her home life was deeply religious and her observations on clergymen were also to appear in her writing, although latterly not always in a complimentary fashion.

The Nuneaton and Bedworth areas, including their attendant villages, were rich with the industries mentioned above, and while agriculture, mining and quarrying were important it was weaving which, in the 19th century, provided the greatest employment opportunities. John Burton dealt extensively with the proliferation of home-based hand looms, predominantly used to produce single-width silk ribbons in an dazzling variety of designs, and he used many quotations from George Eliot's writing to describe the conditions of the loom workers. Each loom was, in effect, a 'family business', often operated by a mother and, once they were old enough, by her children as well. Weavers' children, and those of parents in other local industries, had little formal schooling, being needed to play their part in producing income for the family.

In the 19th century, ribbons were widely used for trimming ladies' dresses, were produced in enormous quantities and different designs, and the weavers of Nuneaton and Bedworth prospered. But ribbons were also victims of fickle changes in fashion, some advantageous some not, and demand could change almost overnight. The weavers were also highly independent folk, and when the trend towards multi-ribbon looms and the grouping of weavers into factories grew they resisted such changes vigorously. The advent of the Dutch engine loom and the Jacquard loom was likewise treated with suspicion and anger, yet competition from overseas was increasing.

The gradual and inevitable shift away from independent weavers with one hand-loom per house to large efficient factories with workers clocking on and off could not be resisted, despite the protests of weavers, and culminated ultimately in the establishment of a small number of large firms each with hundreds of looms. A compromise was attempted (in 1850) with the building of a so-called Cottage Factory. The idea was to provide facilities for a number of independent weavers each to operate a loom in the same building, taking power to run it from pulleys driven by a single

steam engine. The initiative did not prosper, however, largely because of the cost of needing to run the engine constantly regardless of the number of weavers who were at their looms.

The mining industry around Nuneaton and Bedworth was also a very important employer, and included the Charity Coal Mine from whose funds contributions were made to build almshouses in Bedworth. Robert Evans had a hand in designing these houses, which were built in 1839 for the sum of £9,000.

George Eliot's novels remain to this day as invaluable records of industrial life in Nuneaton and Bedworth in the 19th century, and in fact represent one of the few first-hand accounts of the conditions of the time. There is a thriving George Eliot Fellowship (of which John Burton is chairman), and a website at www.george-eliot-fellowship.com.

July 2008: AGM and HP

The AGM

The Annual General Meeting of WIAS was held in the Sixth Form Centre at Warwick School - a return to old haunts - because of problems over room hire at the very end of a busy summer term. This has prompted the Committee to decide to hold next year's AGM in June, and for the Society not to meet in July and August.

The Chairman reported on the healthy state of the Society - as judged by membership numbers and meeting attendances. Much of the energy of the Society is devoted to the monthly meetings, and the range of issues covered - both local and national - had generally been well received.

Richard Hartree, newly appointed WIAS Treasurer, reported on the (satisfactory) financial state of the Society and explained how this had followed very much the pattern of previous years. Subscriptions were held at £10 per head, with a rise to £12 for joint membership. Meeting fees were held at £1 for members, but raised to £2.50 for non-members.

The new membership secretary is Sue Hammon, and the Chairman reported that the Newsletter Editor (Mark Abbott) and the Meeting Reports Editor (Arthur Astrop) both wished to hand over their responsibilities to others for the 2008-9 season. Replacements would be urgently sought!

Opportunity was then given to members to discuss any matters they wished to raise.

Warwickshire Industrial Archaeology Society Newsletter: Number 32

September 2008: Mr Laurence Ince
Engine Building at Boulton & Watt's Soho Foundry

No Longer ... Made in Brum

For the second half of the meeting, the Chairman explored the history of three Birmingham-made goods that were British icons known throughout the world - Bird's Custard, Typhoo Tea and HP sauce. Shortage of time prevented examination of all three, and the Chairman concentrated on the rise and fall of HP sauce in Birmingham.

It was the decision of Edwin Samson Moore to set up a vinegar factory in Aston in 1875 that began the story, and he concentrated on making a high quality product, so much so that he claimed his Midland Vinegar Company had "the largest and most complete vinegar brewery in the world". Precisely how he got hold of the HP sauce recipe from Gartons of Nottingham in the 1890s is a matter of dispute, but once acquired, he and his son - Edwin Eastwood Moore - set about creating a sauce that would be popular with all. Further premises were acquired with the purchase of the Vulcan brewery in 1902. The company's marketing techniques were unusual - and ambitious - for the time, and success came quickly. The Moores also soon turned to export markets, with HP sauce sold to Canada in 1903, to New Zealand in 1905, and to the USA in 1913 - and, famously, to French troops in the First World War!

In 1924, the company was floated, and a period of growth and diversification occurred, with successive expansion of the Birmingham premises in the subsequent years. From the 1960s, the company eventually went through a series of changes of ownership ... Imperial Tobacco ... Imperial Foods ... amalgamation with Smedleys ... Hanson ... Danone ... Heinz. The current owners - Heinz - closed the factory in 2007 despite vociferous protests, and it was demolished in the same year, with production shifted to mainland Europe.

What issues are raised by this saga of the rise and fall of an iconic product? Certainly, there is a critical entrepreneurial role played by the Moore family, with both father and son blessed with great energy and business acumen. To some extent, the location of the factory in Birmingham is 'accidental' - Birmingham has no specific locational advantages for the production of vinegar - but the ambition, hard work and foresight of the Moore family meant that HP became a household name. Branding played a vital role in this success, and many advertisements were shown to illustrate this. Ultimately, however, the process of de-industrialisation took its toll and the power of multinational companies to decide the most appropriate location for their factories worked against the Birmingham operations. The buildings have all now disappeared, including, of course, the vinegar pipeline that used to cross the Aston Expressway.

Members wishing to learn more of the story might wish to consult 'The Road from Aston Cross: An industrial history 1875-1975' by Louise Wright.

It is a matter of lasting regret (some may even say of national shame), that only a few fragments of Boulton and Watt's historic works survive to this day; not least of their Soho Foundry, a pioneering purpose-built steam-engine building factory.

One of the most comprehensive research projects on Boulton & Watt in recent times, and in particular on its Soho Foundry, was carried out by Laurence Ince, and he brought the subject to life in his address to our September meeting. In 1769, James Watt was 33 years old, and heavily in debt, when he journeyed south from Scotland seeking support for his work on steam engines, on which he held valuable patents. *En route*, he visited the Soho Manufactory and there he met its owner, the already successful 41-year old Matthew Boulton. The entrepreneurial Matthew Boulton could recognize a business opportunity when he saw one, and Watt needed to look no further. From then on, he and Boulton were destined to form a formidable business partnership which, in time, was carried on by their sons.

Boulton's Soho Manufactory was highly successful before he met Watt, producing a wide range of relatively small items in different metals and in large quantities. So the sizes of the components in a Watt steam engine, and the materials from which they were made, must have been well outside Boulton's experience at the time. Nevertheless, undaunted he gave Watt all the technical support, manufacturing facilities, financial backing and encouragement he needed to develop his ideas, and eventually to make their Company Britain's leading producer of industrial steam-powered engines.

For a long time, indeed up to the point where Watt's patents were due to expire, the Company virtually had the field to itself. Not that competition was entirely absent. There were those who were experimenting with engines using 'high-pressure steam', a concept against which Watt firmly turned his face, considering it inherently highly dangerous. He held that view implacably, but the need to meet increasing demands for more power meant that his low-pressure steam engines were forced to incorporate cylinders and pistons of ever greater diameters. The problems associated with casting and machining these very large components were formidable.

Inevitably it became obvious that Soho Manufactory was simply inadequate for volume production of large steam engines. It was then that the specialized factory known as Soho Foundry was built. This factory, opened in 1796, was designed from scratch to suit engine building, and was equipped with what must have been the finest range of extremely large metal-cutting machine tools in Britain, if not in Europe. Britain's leading technical Journal *The Engineer* described this factory in detail in its issues of the time, and recorded many of its machines in a set of drawings unparalleled in their excellence. (Many of these drawings are reproduced in a book by W Steeds entitled *A History of Machine Tools 1700 - 1910*, Oxford University Press, 1969).

Matthew Boulton died in 1809 and James Watt 10 years later, but their sons ably continued the business. By the middle of the 19th century, however, Matthew Boulton Junior was ready to retire and James Watt Junior sought directors from outside the firm, including one H W Blake. Blake was eventually to head the Company, to which he was undeniably dedicated. But he also had a great admiration for I K Brunel which sometimes led him (even in the face of opposition from his fellow directors), to be unwisely drawn into some of the latter's less successful ventures, including engines for his giant ship *The Great Eastern*, for example.

James Watt & Co (as the firm was ultimately known) eventually embraced high-pressure steam technology for its engines, but its fortunes gradually declined. It built its last steam engine in 1885, and although there then followed a brief period of revival when it operated as a Mint, producing cupro-nickel coins of low denomination, it closed in 1895 and its works were taken over by Birmingham-based W & T Avery, weighing machine and scale makers of international renown. Today the Company is American-owned and is known as Avery Weigh-Tronix.

October 2008: Mr Michael Darby

Coal, Quakers and Charcoal:

Coalbrookdale and the Society of Friends from Ironworks to Museum and World Heritage Site.

There was a real sense of living history as Michael Darby, a direct descendant through eight generations, of 'The' Abraham Darby took us through the beginnings of the Industrial Revolution.

It was salutary to be reminded of how much was owed to Non-Conformism and to the Society of Friends or Quakers. Many Quakers were practical men, craftsmen and tradesmen. The river Severn played a central role, linking the various groups of 'Friends' from Chester to Bristol who met regularly for mutual support and to assist those suffering hardship or in need of education.

Michael Darby's journey began at Dolobran, near Welshpool, with the Lloyd family, who not only nurtured iron making but a later family member founded the bank of the same name. The first Lloyd in the story was imprisoned in Welshpool gaol for ten years because of his open observance of Quaker practices and whilst in prison met a number of people who were later associated with Abraham Darby I.

A small friends' meeting house near to Dolobran, which remains in use and in the Lloyd family's possession, was also home to John Kelsall, who was first employed as the school teacher but in 1713 was offered the 'clerkship' to the ironworks at Dolgellau under Abraham Darby I. In 1715 Kelsall went to the Coalbrookdale furnace but returned to Wales after Darby's death as clerk to various new forges set up around Dolobran and Dolgellau.

We followed the career of Abraham Darby I from his apprenticeship to W. Freeth, a malt mill maker in Birmingham through partnership in the Bristol Brass Works and a patent for iron bellied cooking pots in 1697 to his lease of the Coalbrookdale furnace in 1698 and the smelting of iron with coke in 1709 thus giving better quality and higher yields than smelting with charcoal.

Darby's choice of Coalbrookdale was probably due to a combination of factors: Quaker connections, Broseley was a flourishing Quaker centre; Shadrach Fox, a previous lessee of the furnace, had produced coal-run iron for shot ordered by the Board of Ordnance; Darby probably knew of coal usage in the brass industry and also that cementation steel had been produced at Madeley in the 1640s. Interestingly, Darby did not take out any patent on coke-run iron; possibly Fox or others had used coke for smelting as early as 1695 and thus established a prior use of the process.

The Quakers dominated the early iron industry. As pacifists the manufacture of armaments was an anathema to them but notwithstanding some 3,000 guns were cast at Coalbrookdale for use on merchant ships. However, there is later evidence of a refusal to cast cannon for use in the American War of Independence.

The Darby family was deeply involved in social welfare, sponsoring parks, housing, allotments and schools together with poor relief and food subsidies. Adult education was important and in Coalbrookdale a substantial building was provided to house an Institute for Design and Art - it is still in use as a hostel. The Darby connection with Coalbrookdale was broken in the 19th century when Abraham Darby IV moved to Ebbw Vale.

The rise of interest in Industrial Archaeology in the mid-twentieth century led to the creation of what is now a World Heritage Site at Coalbrookdale but in the 1940s the original furnace lay buried under the debris of later buildings. The history of the site was known to some specialists but few visitors came to view the industrial remains.

The area of the furnace, which was fortuitously intact, was cleared and we saw some evocative slides taken in the early 1950s around the time that the Shropshire Archaeological Society was bluntly advised that 'it was too late for anything to be done for the furnace ... preservation was impossible.'. Fortunately, others were less pessimistic and the work of preservation began.

In 1957 Allied Ironfounders, who then owned the site, funded the creation of a museum recognising the importance of the site and acknowledging that not much was then known about 18th century iron founding. The museum and the original furnace were opened to the public in 1959 celebrating the 250th anniversary of Darby's first coke-run iron and preparations are now in hand for commemorating the 300th anniversary in 2009.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

Anniversaries Abound

The opportunity to celebrate an anniversary inevitably becomes more popular as the years go by, but the industrial archaeology world probably has greater justification than many for identifying and celebrating such events or personalities. Certainly, festivities concerning some of the greatest engineers and industrialists have come thick and fast over recent years with Brunel and Telford leading the way – though not necessarily in that order!

2009 is no exception, with, our own twenty-year anniversary. 2009 also marks the Bicentenary of Matthew Boulton's death, with a range of celebrations, many of which will take place in Birmingham. A major exhibition, *Matthew Boulton – selling what all the world desires*, focussing on Boulton's life and times will be held at Birmingham Museums & Art Gallery, 30 May – 27 September 2009; *The Art of Making Money*, dedicated to Boulton's Mint, will be held at the Barber Institute of Fine Arts, Birmingham University, May - December 2009; The University of Birmingham and the University of Central England will co-host a major academic Boulton conference from 3-5 July 2009. Readers are referred to the Bicentenary website for details of these and other events – www.matthewboulton2009.org.

The society has tried to keep pace with these anniversaries and is extremely grateful to Roger Cragg for his input on the life and works of several of the engineers. 2009 also marks 150 years since the death of Robert Stephenson and Roger is preparing a talk on Stephenson for a WIAS meeting at the end of the year.

Other anniversaries are, of course,

of a much more modest and local level. For example, the Centenary Celebrations of Johnsons, the coach company based in Henley in Arden. The Society has never really explored the history of bus services of the county, and attention of readers is drawn to two transport books *Stratford Blue* by Robert L. Telfer and *Midland Red* by Malcolm Keeley.

Martin Green

Warwickshire's Civil Engineering Heritage

This is the first of an occasional series by Roger Cragg highlighting some of the Civil Engineering heritage of Warwickshire. All the structures featured are registered as Historic Engineering Works by the Panel for Historical Engineering Works of the Institution of Civil Engineers.

Bearley (Edstone) Aqueduct

This aqueduct, which carries the Stratford upon Avon Canal is the second longest cast iron aqueduct in Britain.

There are fourteen spans of about 34 feet with brick piers and a cast iron trough containing the canal giving a total length of about 498 feet. The aqueduct crosses over the road from Bearley Cross to Little Alne, the North Warwickshire railway line between Wootton Wawen and Stratford (opened in 1907) and a stream, a tributary of the River Alne.

The waterway trough is constructed from cast iron plates with flanged edges, connected with bolts, which form the sides and base of the trough. The one inch side plates are some 14 feet long and the base panels are half this length. The transverse joints in the sides and base are staggered. The base panel is extended on the east side to form the towpath which is therefore level with the base of the trough. There is an upstand 1 ft. 10 in. high at the side of the towpath to retain the filling which forms the towpath surface.

The brick piers taper from the base and have a stone capping at

the top. Each span has two cast iron beams to support the trough. There are brick abutment walls which are curved in plan and there are steps down to the road from the towpath at the south end of the aqueduct.

The Stratford Canal was built in three distinct phases, starting at the north end at Kings Norton. Bearley Aqueduct was constructed as part of the third phase of building from Kingswood to Stratford, being completed in 1816. The designer was William Whitmore (c. 1748 – 1816) who was appointed as Engineer to the Stratford Canal in 1811. His son continued to work for the canal company after his father's death two months after the opening of the canal.

Whitmore's design, described as 'idiosyncratic' was somewhat old fashioned. The placing of the towpath level with the base of the trough is similar to Thomas Telford's design for Longdon upon Tern Aqueduct on the Shrewsbury Canal, the progenitor of cast iron aqueducts, completed in 1795. However, Telford, in his design for the later Pontcysyllte Aqueduct of 1805, placed the towpath level with the top of the trough, the waterway extending underneath it and thus providing a wider trough which reduced the drag on boats crossing the aqueduct. Either this improvement was unknown to Whitmore or he chose to ignore it.

There are two smaller cast iron aqueducts on this section of the canal at Wootton Wawen and Yarningale.

Roger Cragg

PROGRAMME

March 12th

Mr Brian Ellis: *Blinman: a nineteenth century South Australian copper mine and its environment.*

April 9th

Ms Joanne Gloger: *'There is more to a needle than meets the eye': Needle-making in Redditch and beyond.*

May 14th

Dr Jim Andrew: *The Smethwick Engine.*

June 11th

AGM followed by *The Chairman's Lecture.*

NEWSLETTER

Meeting Reports *by Mike Hurn*

November 2008: Ms Gillian Bardsley & Rev Colin Corke
Car-making at Longbridge

Industrial Archaeologists have a very broad range of interests but there was probably more common ground covered in this presentation than in many we have enjoyed. Apart from the wide variety of end products shown, our speakers illustrated and talked about manufacturing processes, buildings and architecture, social history, war-time priorities and adapting to new conditions and then post-war recovery culminating with some inglorious financial engineering that led to the demise of a once proud business.

Gillian Bardsley is the archivist at The British Motor Industry Heritage Trust, now located at Gaydon, and Colin Corke is the Vicar of Longbridge and was also one of the Chaplains to the factory. Between them they brought us an unusual and stimulating examination of the Longbridge story.

Gillian opened with a review of the BMIHT from its small beginnings in 1975 at Studley Castle to its present position covering historical collections from over 100 companies from 1896 with an archive and reference library that is almost as broad and to which access by appointment is open to all. This led to the early history of Herbert Austin, his experiences in Australia with the Wolseley Sheep Shearing Machine Company, who he tried to interest in car manufacture but left in 1905 to start his own business in a disused tin printing works at Longbridge. We had an insight into his 'business plan' through a handwritten page outlining his start-up cost estimates, and his source of financing, one Frank Kayser. A first anniversary luncheon menu carries their two signatures and an indigestion provoking list of dishes.

Austin prospered as WWI approached and an evocative series of slides showed the transformation of a car factory into a weapons producer and, most notably, the employment of large numbers of women in skilled roles. The range of munitions produced was extensive including: shells, guns, aeroplanes and engines, lorries and armoured cars. To alleviate the housing problem the 'Austin Village' of 200 flat-pack timber houses from Michigan was built near to the factory. Austin was knighted for his contributions to the war effort but his only son was killed in action.

The post-war slump hit Austin and the firm was put into administration in 1921 but the instant success of the Austin 7 saved the company which then prospered through the inter-war years. A constant feature of the company's publicity was the theme 'as dependable as an Austin' which typified their cars and other products which included a successful tractor cum stationary engine. In 1937 the Aero Factory, later known as the East Works was built as part of the shadow factory programme following Herbert (now Lord) Austin's appointment as chairman of the 'shadow aero engine committee'.

The factory was distinctive for its interior space which minimised the use of pillars. The first aircraft built were the Fairey Battles which proved disappointing in service. Smaller planes could be flown from the factory's old flying ground but larger aircraft such as the Stirling bombers were

made as kits and transported by road to the nearby Elmdon airport for assembly and flight test. As well as aircraft a wide variety of wartime products came out of Longbridge between 1939 and 1945, from military vehicles to jerrycans. Lord Austin died in 1941 and thereafter the Company was effectively run by Leonard Lord who had been recruited in 1938 following a disagreement with Lord Nuffield.

The early post-war years were characterised by the drive for exports using the slogan 'Austins for Dollars', the major landmark launches of the 'Mini' and the Austin-Healey and the 1952 merger with Morris. However, the problems of badge engineering spread scarce resources too thinly and a badly weakened company was merged in 1968 with lorry builder Leyland under the auspices of the Wilson Government to form British Leyland.

A highlight of the evening was a compilation of archive film material, including some colour war-time footage, that illustrated the gamut of production at Longbridge from cars and aeroplanes in 1915 through to the robotised body assembly line for the Metro in 1980. The film also gave some fascinating glimpses of many of the personalities involved in the history of Longbridge.

Colin Corke then gave a very personal and enthusiastic review of the architecture of the Longbridge site. From the original White & Pike tin printing works we followed the expansion during the first war and subsequent consolidation through the second war shadow factories to the innovative CAB 1 (Car Assembly Building) of 1950; all glass and hope. A new exhibition hall in 1956, the largest multi-story car park in Europe in 1961, the new commercial vehicle showroom 'the Elephant House' in 1965 and thence to the beginning of the end with the demolition of the old water tower in 1998.

Colin also introduced us to a wide cross section of Longbridge people, illustrating the great sense of community that existed in much of British industry between the 1920s and the 1980s but which has since lapsed. This led into the concluding shots of the events following the final collapse of Rover in 2005. Stalled production lines then empty shells of buildings which the Heritage Motor Centre was allowed to record before final demolition.

It remains to be seen what will arise next on the Longbridge site, St Modwen, the property developer which now owns it, face a challenge in these very testing times. Will a Longbridge Technology Park and Heritage Trail lead to the revival of the area? Certainly more will be needed than the assembly of a few obsolescent MG sports cars.

Transport Open Day - Saturday 25 April 2009

Warwickshire County Record Office has many records to do with Warwickshire's transport history, including maps, plans and photographs. On 25 April from 2pm to 4pm some of the original records on transport, canals and railways will be available for inspection at the Record Office in Priory Park, Warwick. Tickets £5.00. Spaces are limited so booking is essential. Telephone: 01926 738959

December 2008: Mr Malcolm Hancock

A Short History of Rugby Radio Station

Malcolm Hancock is a rarity - he worked for forty years, from leaving school in 1964 until retirement in 2004 as its manager, at the Rugby Radio Station. Who better then to tell its history. A story that served to remind us of the technical debt that is owed to the General Post Office in it's several guises. In particular to the development of wireless technology. It is all too easy only to equate radio with the BBC and Malcolm gave us a most eloquent reminder that it was the GPO which pioneered many radio services that today we take for granted. Telephones, teleprinters and time signals, ship-to-shore and even spacecraft communications all began under the GPO.

When President Lincoln was assassinated in 1865, it took Reuters twelve days to convey the news to Europe. The next year saw the laying of the first transatlantic cable over which telegraphic signals in morse code could be transmitted and in 1891 a London to Paris telephone cable was opened. In 1901 Marconi made his first, historic transatlantic radio transmission. After the first war the need for an imperial wireless network strengthened and in 1924 the GPO acquired 900 acres, including the old Hillmorton Airfield outside Rugby as the site for its first Radio Station.

Historic slides and some old Pathé newsreel footage gave us a good idea of the problems in raising the twelve 820 foot high masts which supported the original aerial array. Other buildings housed the transmitter, at that time the world's most powerful using thermionic valves, giving Worldwide coverage, offices and the BTH generating plant. On 1 January 1926 the Long Wave service opened.

The transmitter, with a power of 350kW, was designed and built by the GPO and was gradually improved over the years. It suffered fire damage in 1943 but a partial rebuild and further improvements saw it continue through to 1965 when it completely replaced by a new three valve, 'latent heat of steam' cooled transmitter. Over this period the traffic moved from commercial telegrams to ships and diplomatic news broadcasts, to Air Ministry weather forecasts and finally played an important part in the Cold War for the Royal Navy.

In 1927 the first radio telephone service from the UK to the USA began. Later this service could carry a maximum of two telephone calls. The cost of a call, during the first year of service was £15 for three minutes, about £600 at today's prices.

Although circuits on Short Wave were not quite as reliable as Long Wave, the transmitters needed much less power and smaller aerials. This reduced costs and increased demand for short wave circuits. Therefore, a second building (Rugby 'A') was opened in 1929 and by 1935 Rugby was capable of transmitting many, mainly telephone, circuits to any country anywhere in the world.

The demand for long distance, point-to-point, radio links continued to increase. Rugby Radio peaked in 1955 when the third building opened. The size of the site was increased from 900 acres to 1600 by the purchase of land on the other

side of the A5. A new building, Rugby 'B', was opened in July 1955. Rugby now had 57 transmitters and was the biggest radio transmitting station in the world. In the mid 1960s Circuits at Rugby were set up for use by NASA on the Mercury and Gemini space flights.

When the first transatlantic telephone cable opened in 1956 some of the traffic started to move away from Rugby. Over the next ten years Rugby changed from carrying the high density telephone traffic of North America and Australasia into providing better telephone and teleprinter services to countries in areas that had no direct cable access. These countries, in Africa, South America, Asia, Iceland etc., only required a small number of circuits. Press services for Reuters and London Press Service continued with teleprinter news and picture transmissions.

With the advent of satellite communications, Short Wave International land based, point-to-point, radio services continued a slow decline between 1975 and 1987. Other Radio Stations closed, as the remaining services were concentrated at Rugby. Between 1987 and 1992 the station was converted to carry an improved long range maritime service.

Finally even the ship services started to transfer to satellite. The number of transmitters required reduced and the 'A' Building closed as a radio station in the early 1990s. The ship distress system moved over to satellite and maritime services finally closed at the end of April 2000. This left only two, telegraphy and the Time Signal services.

The contract for the remaining two telegraphy services, one of which was GBR, ceased on 31 March 2003 and eight of the twelve 820ft masts were demolished on the evening of 19 June 2004.

Time Signal Services were always an important function at Rugby, from 1927 to 1986, time signals were transmitted enabling ships anywhere in the world to synchronise their chronometers for navigation purposes. This service was run on behalf of the National Physical Laboratory. The time source improved over the years from Royal Greenwich Observatory land line, to local "Essen Ring" crystal, to Rubidium and finally to a Caesium Atomic frequency standard in 1976. The service moved to Anthorn Radio Station near Carlisle on 1 April 2007 bringing, after 80 years, an end the transmission of Time Signals from Rugby.

A temporary "Loran C" navigation service started in mid 2005. This used an American transmitter and a new "T" aerial, straddling the building, between two of the old 820ft masts. This temporary service ceased on 4 July 2007 and was the last radio transmission from Rugby Radio Station.

The remaining four 820ft masts were demolished on Thursday 2 August 2007 and the site awaits redevelopment - 6,200 new homes are a possibility.

January 2009

Members' Research Evening

This Members' Research Evening covered much ground - two local reviews, one of Victorian train accidents, the other of the little known airfields used by the Automobile Association's Flying Section; an unusual parade of steam-powered road vehicles and an historic canal tunnel; an American home movie record of a trip to England in 1934; the fields to factory to houses saga of a Wolston small-holding; and the untimely end of an experimental aircraft in another field near Broadwell.

Richard King teased at the beginning with a slide of a local man-hole cover which appeared to include several lines in an Eastern language but then drew on local newspaper sources to examine a number of accidents on the Victorian railway lines around Leamington between 1856 and 1895. His hand-drawn maps brought the various locations clearly to mind and the descriptions reminded us of both the mechanical frailty of the equipment and the hardship suffered by the dependants of the railway employees who died. A few pounds raised by a public subscription was the best that could be expected. Inadequate track maintenance also has a long history in the railway industry. Of the nine major accidents over the 40 year period under examination, three were due to mechanical failures, three were down to track defects and three to human failures.

Chris Barney reviewed the saga of Bluemels of Wolston. A factory was built in 1898 by Joseph Cash of Coventry on a small-holding to produce filaments for electric light bulbs from artificial silk but production ceased after only two years and the three Bluemel brothers purchased the works in 1902 and moved their successful business manufacturing umbrellas and walking sticks from Stepney. They expanded their product range to cater for Coventry's fast developing cycle and motor industry with a range of celluloid parts including mudguards, chainguards, handles and tyre pumps. From a small start the workforce had grown to some 200 at the time of the last Bluemel's death in 1938. Wartime production of small engineering components saw numbers rise to a peak of 800 and in 1949 Bluemels introduced steering wheels made from bakelite as a new product range. Sadly, the business underwent a series of takeovers in the 1960s and 70s and after making its highest profits of some £2 million in 1977 it went into receivership in 1985 blaming a lack of markets. The land subsequently became a 40 unit business park which in 2004 became a housing development.

Thelma Gee examined the crash in May 1949 of the experimental 'flying wing' Armstrong Whitworth AW 52. Field-walking for Roman remains had uncovered modern metal parts and thus sparked further investigation. Following a glider prototype, two jet-powered aircraft were built in 1947 expressly to evaluate laminar flow wings which promised much reduced drag but ultimately were beyond manufacturing capabilities. The aircraft had a 90 ft wingspan, a ceiling of 45,000 ft and a speed of 495 mph. The aircraft involved in the crash suffered uncontrollable wing flutter and the pilot, Flt Lt Lancaster an ex-RAF bomber pilot, became the first to use a Martin Baker ejection seat in an emergency. He landed safely near to Long Itchington

and the pilotless plane crashed into open fields half a mile from Leamington Hastings towards Broadwell. The second prototype was eventually scrapped.

Roger Cragg provided some highlights from the Bridgnorth Steam Festival in July 2008. Notably, the nearly completed replica of 'Catch Me if You Can' together with a number of other steam powered road going vehicles. These included the 1801 'Puffing Devil' owned by the Trevithick Society, another replica Trevithick chassis with an extraordinarily high mounted coach body that needed a ladder for access, Hancock's 1833 steam coach and a genuine 1801 Grenville steam cart. He then took to the water for the 150th anniversary celebrations of the opening of the Netherton Canal Tunnel on 20 August 2008. Designed by James Walker, the second President of the Institution of Civil Engineers, the 3027 yard long tunnel has a 17 ft waterway flanked by two 5 ft towpaths. Fully brick-lined and originally gas-lit, the tunnel took 2 ½ years to drive and was needed as a relief for the old Dudley tunnel (which took 7 ½ years to build). The celebrations were enlivened by many participants in period costume and the presence of the steam-powered narrow boat 'President'.

Derek Billings introduced a film 'My Trip Abroad' from the Bill Gibbons' collection. This recorded the 1934 visit of an American family to England and especially to Leamington Spa where a house (still extant) named 'Oversley' in Radford Semele featured prominently. Shot in black and white we followed the family's journey, first on the liner *Berengaria* then on the train to Leamington Spa and to Oversley and its extensive gardens. The film-maker recorded many local scenes as well as family events. An evident highlight of the visit was a trip to London which allowed us to see the old Leamington and Paddington stations and a tour that included many historic vehicles and landmarks, a completely scaffolded Palace of Westminster was notable as was Buckingham Palace, St Pauls, Ludgate Hill and Marble Arch. Returning to Leamington we toured the Jephson Gardens, Warwick - the town and the castle - before departing on the train to Southampton to embark on the *Majestic* for the voyage to New York. Southampton docks, including the massive floating dock and the scenes of arrival and docking in New York provided, as did the film throughout, much of industrial archaeological interest.

John Brace brought the evening to a close with information on a subject of which many must have been quite unaware. The Automobile Association with its motorcycle patrols is very familiar but the AA's Flying Section is less well known. Light aircraft must have been popular in the inter-war years because the AA produced a register of flying grounds that could be used by its members. The published data sheets were remarkably comprehensive and included details of topographical and other hazards such as the possibility of sheep or cattle as many seem to have been located on farmland. Photographs of some of the old hangars, some still in use as farm buildings, showed them as the forerunners of the well known RAF structures. Locally there were AA Flying Section airfields at Leamington Spa, Rugby, Stratford upon Avon and Banbury.

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FROM THE CHAIRMAN

Store, scan or scrap ... what will happen to those boxes of slides?

It was very disappointing that the AIA's Affiliated Societies April Conference was cancelled due to insufficient response from local societies, particularly as the theme for the Conference was the nature and destiny of resources held by Societies. WIAS has no responsibility for any industrial sites, but shares with many societies in the number of records (and memories) that individual members possess.

The most common form in which the photographic resources are held is the 35mm slide. There are several members who have been interested in industrial history and industrial archaeology for many years, and have amassed a large collection of slides. These are stored in a variety of ways, and probably have a varying degree of information attached to them. Some members will have been meticulous about naming, describing and dating their slides, others I suspect less so, with the Chairman residing very much in the latter group!

What will become of all these slides? Their importance lies in their role as components of the factual record of the industrial heritage of the County, and it would be of considerable value to know what exactly had been recorded and how they might best be made available to Record Offices/ Archives/Libraries as well as to a wider audience. From my own point of view, I used to think that I would jealously guard the copyright of some of my more significant photographs, but the information revolution has changed my thinking on this.

Many groups are seeking to deal with this matter, and the discussion at the March meeting demonstrated the range of possibilities available.

Chris Barney has written to me on this theme, and has listed a range of issues:

- How 'permanent' are digital images?
- Scanning – what level of resolution would be advisable?
- Format for storage – CD, memory stick or other?
- Copyright concerns?
- Labelling, referencing, indexing – is there an 'agreed' system?
- Funding – where might we secure funding to assist in the process?
- Responsibility and co-ordination?
- Could WIAS develop a system that might be useful to others?

This provides much food for thought. Any input from members about a potential way forward would be greatly appreciated. For the moment, I hope the presentations in the December 2009 Meeting – Twenty Years of WIAS – will provide a taste of the wealth of photographic material that exists within the membership.

Martin Green

The Association for Industrial Archaeology Annual Conference 2008.

The 2008 Conference at Luckham in Wiltshire was reviewed for us in February by the Chairman and John Selby.

The Rolt Memorial Lecture on the Industrial Archaeology of the Cold War reflected the considerable military activity to be found in the area. Other Wiltshire IA included the usual suspects of transport, especially steam locomotion, and civil engineering.

John Selby visited three very different venues, The Invicta Car Company in Chippenham, Ratcliffe & Sons in Malmesbury and Moulton Developments in Bradford-on-Avon.

Invicta is an early British sports car manufacturer. Initially, based in Cobham (1925/1933), then in Chelsea (1933/1938) and finally in Virginia Water (1946/1950). More recently, the name has been revived for a new sports car which

is being built in Chippenham. Much memorabilia of early sporting triumphs was in evidence including pictures of Donald Healey's winning car from the 1931 Monte Carlo Rally and Raymond Mays' Shelsley Walsh hill climb car. Today's car caused some envious sighs, quickly extinguished by the £150,000 price tag.

Ratcliffe & Sons began life as a foundry, in 1896. In the 1930s the business flourished as a Morris car dealer and, although the type of work has inevitably changed over the years, Ratcliffe still undertakes light agricultural machinery repairs using original machinery driven by a belt and pulley system. In addition, today an artistic blacksmith also works on the premises producing work such as gates for the Prince of Wales' Highgrove estate.

Alex Moulton needed no introduction as the inventor of the revolutionary rubber suspension for the Morris Mini. But it was his grandfather who introduced the rubber industry to the town of Bradford-on-Avon and Moulton was a well established vehicle suspension engineer before the Mini was launched. The Moulton estate houses a fine model collection and a greenhouse museum contains examples of many of the Moulton bicycles which are still in production.

PROGRAMME

May 14th

Dr Jim Andrew: *The Smethwick Engine.*

June 11th

Peter Bones: *The restoration of Chesterton Windmill.* followed by *The Chairman's Lecture.*

September 10th

David Close: *Chedham's Yard* Followed by AGM.

October 8th

Steve Bagley and Damian Kimberley: *Three Cycling Pioneers of Coventry – James Starley, William Hillman and George Singer.*

November 12th

Roger Cragg: *Robert Stephenson.*

December 10th

1989-2009: Twenty Years of WIAS A presentation by members.

NEWSLETTER

Meeting Reports *by Mike Hurn*

February 2009: Mr Nicholas Billingham

The Early Industrialisation of Stratford upon Avon.

Nicholas Billingham is steeped in the history of Stratford upon Avon. He was born and raised in a bargees' pub, now demolished, alongside the Stratford Canal. He has thus seen many changes in the town, its industry and its people. He gave us a comprehensive review of the industrial developments in the town from the early 17th to the turn of the 19th century.

The story begins with the contrasting lives and activities of the Royalist William Sandys, and the Roundhead Andrew Yarranton.

William Sandys' (1607-1669) principal fame was as the engineer who improved the Warwickshire Avon and the River Wye, and who was involved in several other river navigation schemes. He was born at Fladbury and after attending Oxford University he became a barrister of the Middle Temple. He left London in 1633 to live at Fladbury where he improved his own lands at Tewkesbury and Strensham, notably with lock building at Fladbury. In 1635, Sandys was authorised to improve the river Avon. Within a few years, he had made the river navigable at least to Stratford upon Avon, and possibly beyond. This was done by constructing 'sluices', which seem to have been pound locks (not flash locks as often supposed). The navigation was complete to Stratford by 1640, but its cost had stretched his resources and his estates and the navigation passed into the hands of his creditors.

Sandys also had a patent to farm a new duty on coal exports but the project was a failure and he surrendered the grant. During the Civil War he acted as a Royalist agent purchasing munitions at Dunkirk. After the Restoration, he was again elected to the House of Commons where his interests included the promotion of navigation schemes.

Andrew Yarranton (1619-1684) was an important English engineer in the 17th century who was responsible for making several rivers into navigable waterways. He was born at Astley and was apprenticed to a linen draper in Worcester, but left after a few years. During the Civil War he served in the Parliamentary army. After the war, he speculated in forfeited crown and royalist estates. He set up a blast furnace at Astley but he is also known for a project to make tinfoil. He was commissioned to go to Saxony to find out how tinfoil was made. On his return, experiments were undertaken, including rolling. This was sufficiently successful to encourage two of his sponsors to set up a mill for the process on the Stour at Wolverley.

Yarranton is mainly remembered as a navigation engineer. His first interest in this was a proposal in 1655 to make the River Salwarpe navigable from the Severn to Droitwich. His second was on the River Stour where the proposal was that coal should be brought down railways (known as footways) and loaded on to barges for transport down the river. Several attempts were made to improve the river, but each time money ran out, either before it was finished or before a trade could be got going.

Yarranton's work on a third navigation, the Warwickshire Avon, was far more successful. William Sandys had improved the river in the late 1630s, but it had passed into the hands of William Say and then to James, Duke of York, later King James II, who sold them to Lord Windsor in

1664. The navigation had languished under its previous ownership and needed substantial further investment. Lord Windsor retained the Lower Avon (below Evesham) himself, but employed Yarranton to maintain it, and also to rebuild Pershore sluice. The Upper Avon Navigation (above Evesham) needed much more to be spent on it, and he took partners, including Yarranton. Within a couple of years, the river was again navigable, and remained so for over two centuries above Evesham, and ever since below that town.

Yarranton had been a leading Roundhead before the Restoration and was imprisoned several times during the 1660s. At the end of his life he was involved in pamphleteering and also published a book in 1677, *England's improvement by sea and land, or how to succeed against the Dutch*, describing some of his achievements and suggesting various other improvements, including river navigations, *inter alia*, canalising the Warwickshire Stour and Cherwell to create a route to London.

As regards Stratford upon Avon, the town had stagnated since the Black Death in the 14th Century when the population sank from 5,000 to 2,000, where it remained into the 1670s. Furthermore, the country was in deep recession following the Civil War. Nonetheless, Yarranton had a blueprint for Stratford which included brickworks, textiles (spinning and bleaching), timber and coal yards, and especially granaries for which he planned a nationwide network and transport system to balance good and bad years. Yarranton had many other ideas that were ahead of his time: he was active in promoting the growth of clover, a fodder crop which also fertilises the land; he saw the need for credit for farmers, but with no existing valuation process he proposed a land registry and a central Bank of England. Always a forthright man he died violently after a brawl and being thrown into a hogshead of water.

Stratford, however, had changed little by the 18th century but with the shifts in attitude to a more 'can do' outlook new activities developed. Most especially to exploit Stratford's potential as the birthplace of William Shakespeare. The first tourist Jubilee was held in 1769 with the focus of interest on Shakespeare's grave rather than the properties associated with his life. Nevertheless, the idea was born that tourism could be profitable. Nick Billingham closed by bringing the industrial history of Stratford into the modern era with the development of the Stratford Canal built by William James, another visionary who also introduced the railway age with the Stratford Tramway which led to the Stratford Midland Junction Railway. He used a series of slides from the archives of the Shakespeare Birthplace Trust to illustrate the range of industrial activity in the town at the turn of the 19th Century. These included: Cox's Mill, Scott & Co., the lock at Wilmcote, Flower's Brewery (worth a lecture on its own?), and a variety of canal-based activities.

Stratford upon Avon has never been an industrial town and with the decline in the importance of the canal it has relied increasingly upon tourism as its industry. It occupies an important place on the National scene and seems likely to remain a significant place on any tourist's itinerary.

March 2009: Mr Brian Ellis*Blinman - A Nineteenth Century South Australian Copper Mine and its Environment.*

Brian Ellis was drawn to Industrial Archaeology through geography - what stories do landscapes tell? He suggested that a Darwinian approach to the subject requires an examination of extinctions through the fossil record which can also reveal the development and evolution of a species. A recent visit to South Australia gave Brian the opportunity to record the remains of the short-lived copper mine at Blinman and to entertain us with its history.

The story of Blinman has to be seen against the background of the exploration and development of Australia. In 1802 Flinders had first charted the coastline, followed in 1830 by Sturt's navigation of the Murray River which in turn led to the foundation of South Australia (by colonists not convicts) where settlement began in 1836. In 1837 the Adelaide City Plan was drawn up. By 1860 the settlement had expanded into the wheat lands to the North and the opening up of land was controlled by the government. By the early 1860s most of good farmland had been sold and the Government came under pressure to extend settlement northward into more arid lands. General George Goyder, the Government surveyor, was charged with assessing the feasibility of northward expansion.

An earlier survey made in 1856, which estimated the amount of rainfall from the type of vegetation, had led to the 'Goyder line' south of which rainfall was deemed reliable enough for agriculture but north of which it was deemed suitable only for grazing. Brian used a series of slides to illustrate the history of a large sheep grazing station founded in 1851 by the third son of an Irish Earl, who took out leases which were the beginning of the Kanayaka station (he sadly drowned in a creek flood). Then one John Phillips took over and built the homestead, woolshed and surrounding dwellings. The station now extended to 360 square miles, carried 50,000 sheep (about 400/square mile), and employed 70 men plus their families. Between 1864 and 1867, 20,000 sheep were lost in a drought and the station was temporarily abandoned. Phillips later returned with 20,000 sheep but only 15 single men and the land was subdivided into smaller units. In 1888 Kanayaka was finally abandoned. Not only because of drought, but also due to changes in economic circumstances in South Australia.

In 1862 John McDougal Stuart had made the first South to North crossing of Australia thus opening up the feasibility for similar links. In 1870 - 1872 Charles Todd (Government Astronomer and Telegrapher) oversaw the construction of the first overland telegraph from Port Augusta to Darwin (and thence via Java and India to London). This endeavour required 1800 miles of galvanized wire, had repeater stations every 120 to 180 miles, was powered by glass batteries, and needed 'countless' telegraph poles of Callitris pine which is resistant to white ants and other insects. In 1878 construction of the Old Ghan Railway began and by 1891 it was open well to the north of South Australia and is relevant to the Blinman story. We saw some splendid examples of railway history in the restored stations on the line, plus a bullock-shoeing pen.

Minerals were an alternative source of economic activity with the importance of copper being realised early.

Fortunately, the basic geological conditions for copper deposits were present and these were exploited in a series of small, and short-lived, mines. In 1859 a copper outcrop was discovered by a shepherd on the Angorichina Sheep station, one Robert Blinman. In 1861 a lease was granted to Blinman and three others and a mine called 'Wheal Blinman' was born.

In 1862, the lease was sold for 150 times its purchase price, one of the few profitable events in its history, and in 1873 the mine closed for the first time. It was reopened, better capitalised by the Tasmanian Mining Company, in the 1890s with substantial investment in mechanisation, pumping, electrification and transport (none of which was recouped) and was worked until the copper was exhausted in 1918. A total of only 10,000 tons of copper was produced during the lifetime of the mine, the majority during the First World War.

Brian's pictures of the few remnants of the mine's infrastructure allowed us to get a feel for the workings and the nearby township. In 1863 there was only a tented settlement but by 1864 the government surveyor laid out 62 allotments (house plots) about 3 km. from the mine. By 1868 the population had grown to 1500. The first school opened in 1869 together with shops. There was a regular water supply from the mine but the inhabitants suffered many problems; notably relating to transport, water supply, fire wood and dust which led to lung problems and the failure of many pregnancies.

As the name, Wheal Blinman, suggests there were probably Cornish workmen employed and there remains 'The Captain's House'. The industrial archaeology of the mine has been partially preserved with some interpretation boards for visitors, including pictures of the mine in 1907. We saw the evidence for the shaft and head works, an adit, the foundations for the ore crushing and sorting plant, the location of the circular buddle, tailings and slurry pond, and the foundations for the furnaces, stokeholes and boilerhouses together with the slag heap. Most of the archaeology is from the mine's heyday at the end of the 19th century up to 1918.

Mule trains were the means of moving rock and supplies within the mine complex and also for transporting the refined ore to the Old Ghan Railway line at Parachilina some 25 km. away. Exporting the ore was always a problem, and before the Old Ghan railway was built the ore was taken 200 km. to Port Augusta (Adelaide) by bullock cart.

Today, water from the mine still appears to be the water supply to the remains of the village, which is now much reduced in size. There is some historic evidence in buildings which remain from the mining days. We saw evidence of restoration, including the Blinman Memorial Hall and what appeared to be a genuine 1850's miner's shack made from split logs and flattened tin cans.

Some of the old houses have been modernized. The community is active in trying to develop tourism, as is typical of the whole marginal pastoral area exploiting its spectacular scenery. The Old School House is typical, housing a cafe and an arts and crafts shop. Copper may no longer be mined in Blinman, but the name lives on.

April 2009: Ms Joanne Gloger

"There is More to a Needle than Meets the Eye". Needle Making in Redditch and Beyond.

Joanne Gloger has been Keeper of the Forge Mill Needle Museum in Redditch for twenty years. It is salutary to think that for many of the needle makers in the 19th century, this was also about their working life-span.

Joanne opened with a review of Redditch's industrial heritage which has its roots in the Cistercian Bordesley Abbey, where evidence of metalworking can be traced to around 1175. In later years some 90% of the world's needle production was centred on Redditch. An associated product using many of the same techniques was fishing tackle. What is a fish hook if not a curved needle with a barbed point? Well known names including Millwards, John James and Samuel Alcock made both products. Also produced in Redditch were springs, notably by Terry (whose iconic Anglepoise lamp was created in 1933), and Royal Enfield motor cycles.

The origins of the Redditch needle industry are uncertain but there is evidence that Queen Elizabeth 1 sought self-sufficiency for England and Nicholas Throckmorton of Coughton Court, her ambassador to France, brought back Huguenot artisans who established the industry. Later, during the Commonwealth, needle making was concentrated in London with severe Guild restrictions over the craft. People 'escaped' to establish the nucleus of the Midland's needle industry and its associated users - carpet makers in Kidderminster and glovers in Worcester to name but two. Finally, the Victorian transport revolution gave a boost to Redditch. Sadly, today only a few small manufacturers remain and the world now buys its needles from Czechoslovakia and India.

The Needle Museum is housed in the listed Forge Mill which dates from early Victorian times and tells the fascinating and sometimes horrific story of the needle maker's trade. A water colour of the Mill in the 1800s shows little change from the building as it is today. However, what went on inside would give 'Elf n safety' nightmares.

Steel wire from Sheffield was hand-drawn to the size required. A wire-drawer could usually be identified by the lack of several fingers and other injuries caused when the wire snapped and sprang back.

The wire was then cut to double the length of the finished needle using a large, body-operated set of shears. These blanks required straightening at a low, dull red, heat before pointing. Pointing was one of the most highly skilled and hazardous operations. A pointer sat crouched over a dry grinding wheel and sharpened a handful of needles at a time. His lungs were attacked by the dry dust mixture of grit from the wheel mixed with metal and his eyes and face were vulnerable to larger fragments, especially if a grindstone fractured.

Pointer's Rot was the popular name for damaged lungs and most were dead by the age of 35 from silicosis. However, the local lore said that anyone suffering from something in the eye should seek out a pointer since they

had great skill in extracting foreign bodies from that organ! With the risks came high rewards and pointers could earn 2 to 3 guineas a week and strikes against the introduction of safety equipment which would have reduced output and thus income are recorded.

After pointing, the initial impression for the eye was created using a 30 lb kick-stamped drop hammer at a rate of 50 strokes per minute. Clearly physical fitness was a necessity for that job! Women and children then pierced the eyes using a small fly press. A more modern machine combines these two operations.

The needles were then sent to out-workers for 'spitting' or threading two bars through the eyes before the flash was filed off, and the needles divided in a process known as 'heading and cheeking'. The eyes were then cleaned out and made smooth using fine copper wire.

Next, the needles needed to be hardened and tempered. Initially the process of heating to cherry red and quenching in water resulted in some 30% of the needles being curved. The curvature was corrected by another out-working group known as 'cruck-straighteners' who used a hammer and small anvil. However, to the anger and concern of the cruck-straighteners, it was found that quenching the needles in whale oil gave a straight needle that needed no rectification. Progress always disadvantages someone!

Finally, the needles needed cleaning and polishing, the process in which the Forge Mill specialised with its water-powered scouring beds. The mill took in needles from all the local manufacturers, some three million every week, for finishing. Needles, all of the same size, were bundled into heavy cloth 'setts' with a mixture of soft soap and powdered stone. The setts were then placed under a heavy reciprocating platten (powered by the water-wheel) which rolled them on a fixed bed thus cleaning the individual needles with a lapping action. The needles were then polished in the same process but olive oil and putty powder were substituted for the soft soap and powdered stone. Later, nickel plating replaced the polishing process. After polishing the needles were dried in barrels of sawdust, weighed (the scourers were paid by weight) and returned to the original factory for packaging.

To make threading a needle easier, the eye was often gold-plated, a process involving the use of potassium cyanide in open vats with the obvious risks to the operators! Joanne closed with another gruesome reference to early surgical needles - surgeons preferred to use glover's needles because the triangulated points cut through flesh rather than tearing it.

Amongst the Industrial Archaeology uncovered in the nearby Cistercian Abbey was a huge oak timber trough which formed part of the 12th century mill sluice. This timber, which resembles a long, narrow dug-out canoe, has been preserved by the Mary Rose Trust and can be seen at the Visitor Centre.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

The start of a new season of meetings provides the opportunity for some reflection on the progress and prospects for the Society. It is also the occasion when WIAS will be 20 years old, and that in itself is something worthy of celebration. After an initial meeting addressed by Barrie Trinder in St. John's Museum, Warwick, in 1989, the Society began its regular monthly meetings with a small number of enthusiasts gathering in a classroom at Warwick School. With various changes of venue within Warwick School over the past 20 years, the meetings now held in the Pyne Room regularly attract between 50 and 60 people. Indeed, some of those members who established the Society in its infancy are still members, regularly attending the monthly meeting. Talking to the secretaries of other societies, I realise that our meetings are extremely well supported, and that we have a very high percentage of our membership that regularly attends the meetings.

As mentioned in previous Newsletters, the Society has embraced industrial history, heritage and archaeology, always seeking to combine local interest with sites further afield, and to draw on the expertise of members as well as outside speakers. Publication of material has not been the strongest element in the Society's activities – with some notable individual exceptions. The fact that little has been published is a matter of some regret, but in my view has been compensated by the interest and enthusiasm of the membership at our meetings, including the number and range of questions posed to our speakers.

The December meeting will be an occasion for a fuller reflection on the Society's work and, as the main part of that meeting, a presentation will be made on sites that have been lost, sites that have converted to other uses, and sites that have been retained over the past 20 years. To this end – and to follow up issues raised in previous Newsletters – any member who would like to investigate a particular site (information, photographs, illustrations, references) and present these findings to the meeting, please get in touch with the Chairman as soon as possible. This could even

become the starting point for a small 'Archive Group' that would gather these findings in a format that might be published and presented to members and possibly to Libraries/Record Offices as a permanent record. This would include a suitably digitised copy of those slides that many of us possess.

Journals

As a result of subscriptions and the generosity of John Selby, the Society now has a (virtually) full collection of *The Industrial Archaeology Review* (and its predecessor *The Journal of Industrial Archaeology*) 1964 – 2009, a full collection of the magazine *Archive – the Quarterly Journal for British Industrial and Transport History* 1994-2009, and copies of many of the *Newcomen Society Transactions* 1978-1998. The index to each of these journals is available on line, and should any member wish to borrow a copy then please get in touch with the Chairman.

Conferences

Many members will recall the presentation made by Michael Darby to WIAS earlier in the year. An extended version of this talk was the opening address of the *Fe09 Footprints of Industry Conference* held at Coalbrookdale in 2009 to commemorate the 300th Anniversary of the first commercial use of coke to smelt iron. It was a joint conference between the Association for Industrial Archaeology, the Historical Metallurgy Society, the Newcomen Society and the Society for Post-Medieval Archaeology. There were 40 papers presented - a test of stamina for some! - and the Chairman hopes to report on some aspects of these in the latter part of forthcoming meetings.

The Annual AIA Conference is to be held in Lincoln this year, with the last day of the Conference coinciding with our first meeting of the year. A small number of members will be attending and we look forward to their reports back to the Society.

Annual General Meeting

The AGM of WIAS will be held in the latter part of the September meeting. I am glad to report that all officers have agreed to stand again, and no change is planned for the subscription and meeting charges. In

fact, the cost of the hire of the Pyne Room has risen, but we hope that a high level of subscription renewal and full attendances at meetings will enable us to cover this.

Officers

President: Toby Cave
Chairman: Martin Green
Secretary: Dennis Crips
Treasurer: Richard Hartree
Membership Secretary: Sue Hammon
Newsletter Editor: Mike Hurn
Committee members: Roger Cragg, John Selby

Reviews

An additional feature of this Newsletter could be a regular review of recently published books and articles, plus reviews of websites of interest to members. Again, contributions from individuals would be most welcome – please contact the editor of the Newsletter.

PROGRAMME

September 10th 2009

David Close: *Chedham's Yard*
Followed by Annual General Meeting of WIAS

October 8th 2009

Steve Bagley and Damian Kimberley: *Three Cycling Pioneers of Coventry - James Starley, William Hillman and George Singer*

November 12th 2009

Roger Cragg: *Robert Stephenson*

December 10th 2009

A presentation by members of the Society: *Twenty Years of WIAS 1989-2009*

January 14th 2010

Dr Amelia Pannett: *Warwick Gas Works*

February 11th 2010

Richard Hartree: *The Aluminium Works at Banbury 1929-2009*

March 11th 2010

A joint meeting with the Leamington Society: *The works of William Louis de Normanville*

April 8th 2010

Dr Malcolm Dick: *Matthew Boulton (1728 – 1809) and the celebration of industrial technology*

May 13th 2010

Peter Coulls, Adrian Foote and John Willock: *Willans Works*

June 10th 2010

A presentation by members: *Industrial Archaeology Abroad*

NEWSLETTER

Meeting Reports

May 2009: Dr Jim Andrew
The Smethwick Engine

Jim Andrew's absorbing presentation on the history of the Smethwick Engine was a fine example of industrial archaeology in practice. He demonstrated a passion for his subject, painstaking thoroughness in researching archive material in old company accounts, maps and local historical sources, and hands-on trowel (or hydraulic drill) archaeology when required.

In 1897 a steam engine was preserved because it was old but its preservation was justified by some pretty dubious stories. It is now known that it was put to work at the end of May 1779 and worked for a hundred and twelve years. It was erected by the Birmingham Canal Company to return water up the locks at Smethwick, and the Canal Company archives have yielded the best set of accounts and costs for any eighteenth century steam engine - there is even an estimate of the cost of the alternative proposal of a reservoir. The engine was used by James Watt in 1779 to evaluate the effect of expansive working. It gave a 14% saving in fuel, leading to details of how to get this saving being circulated to Boulton & Watt's engine erectors. The Canal Company preserved the engine in 1897 and in 1959 the British Waterways Board presented the engine to Birmingham Museums & Art Gallery. Funding for relocation and installation was a problem but the engine was steamed for its bicentenary in 1979, becoming the world's oldest working steam engine, and it was put on regular public view from 1983. In 2001 it was again moved when the industrial collections moved to Thinktank, Birmingham Science Museum, where it can be steamed or demonstrated in a gentle way by a hydraulic system.

Dr. Jim Andrew's lecture detailed the engine's history and how it contributed to the Birmingham Canal. The work to extract the engine's costs was described together with how the engine worked and the results of the tests on expansive working. In the 1980s the original site of the engine was identified, leading to the excavation of the half of the engine house which remained below ground and a greater understanding of the construction of engine houses at that time. Finally, the talk outlined the way the move to Thinktank allowed the restoration of the engine closer to its original layout, giving better performance on steam, but also explained why the engine cannot be run representatively off load yet must not be operated under load - an interesting conundrum. Maybe the most startling point to emerge was that the engine, which lifted the equivalent of 1,500 buckets of water each minute allowing 250 boats to pass through the locks every week, cost about £2,000 in 1779, between half and three quarters of a million pounds today, yet it only delivered 28 horsepower, some half the power of many small cars today. Could we seek a better illustration of the desperate need for reliable power at the start of the Industrial Revolution.

Looking at the engine and its purpose in more detail we learned that originally, it was one of two engines used to pump water back up to the 491 ft summit level of the Old Main Line (Birmingham Canal) canal at Smethwick, not far from the Soho Foundry where it was made. The second

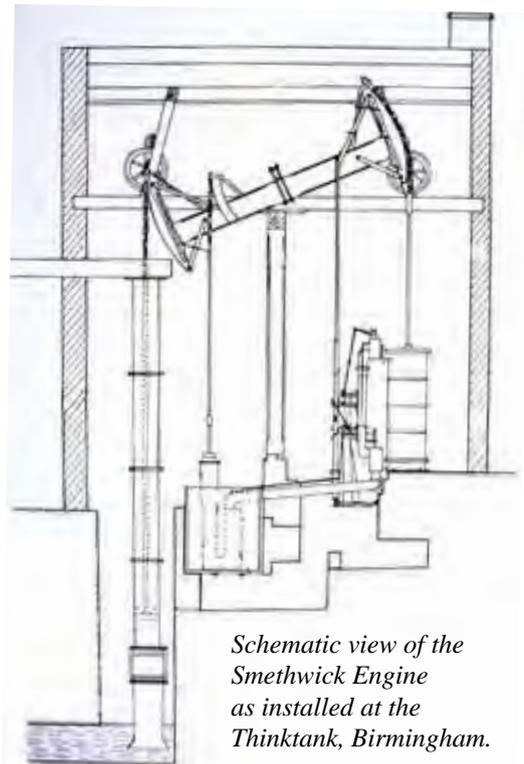
engine, also built by Boulton and Watt, was at the other end of the summit level at Spon Lane. In 1804 a second Boulton and Watt engine was added alongside the 1779 engine.

The engines were needed because local water sources were insufficient to supply water to operate the six locks either side of the canal's original summit. The locks could have been avoided if a tunnel had been built, but the ground was too unstable for a tunnel to be built using the techniques available at the time. In the 1780s, a cutting was constructed by John Smeaton, enabling three of the six locks on each side to be removed.

In the 1820s, Thomas Telford constructed a new canal parallel to the old in a deeper cutting, at the 453 ft Birmingham Level, creating the largest man-made earthworks in the world at the time. It was spanned by the Galton Bridge. The engine was still needed, despite both these developments, and Thomas Telford constructed the Engine Arm Aqueduct carrying the Engine Arm branch canal over his New Main Line so that coal could still be transported along the arm to feed the Smethwick Engine.

In 1892, a replacement engine was built in a new pumping house, now Grade II listed, next to Brasshouse Lane, as the original Smethwick Engine was considered uneconomic to repair. This new pumping house is now part of the nearby Galton Valley Canal Museum. The original Smethwick Engine was then removed to British Waterways Ocker Hill depot where it remained until acquired by Birmingham City Council.

The engine house was demolished in 1897. Its original site and foundations, which are a Scheduled Ancient Monument, can still be seen on Bridge Street North in Smethwick, just north of the junction with Rolfe Street.



Schematic view of the Smethwick Engine as installed at the Thinktank, Birmingham.

June 2009: Peter Bones

The Restoration of Chesterton Windmill

Peter Bones is a (Morris-dancing) restoration engineer with Warwick County Council who was in charge of the repairs required to Chesterton Windmill after a stock broke during the open day demonstrations on 9 September 2006, causing one of the sails to crash to the ground. Fortunately without seriously injuring anybody. He gave us great insight into the mill, its history and its restoration.

Before detailing the latest repair programme, Peter described the history of the building. The ornate limestone structure with decorative sandstone features was built in 1632. It was commissioned by Sir Edward Peyto, Lord of the Manor of Chesterton and a member of a prominent Roman Catholic family. A staunch Royalist, he was Governor of Warwick Castle from 1630 until his death during its siege in 1642.

Peyto was a flamboyant mathematician and astronomer also a friend of Inigo Jones, whom he may have accompanied on a visit to Italy and who may have had some responsibility for the design. Certainly there is an Italian influence to the building with elements of the dome and columns of St Peter's being recalled. The building appears to be unique although a Round Tower built in America at Newport, Rhode Island has strong similarities. (If members care to Google Newport Round Tower they will uncover a wealth of interesting material including references to Chesterton)

There remains speculation as to the original purpose of the building. Was it an astronomical observatory? A working mill? Or simply a folly? Other classical cylindrical buildings usually had eight (or multiples of) columns whilst the Chesterton building has only six. This has reinforced the suggestion that its original purpose was as an observatory with the sight-lines between pairs of columns aligned to the solstices. Certainly, it soon became a working mill and continued as such, with major work on the machinery being recorded in 1776 and 1860, until 1910 when it ceased working.

The mill was derelict in 1965 when Warwickshire County Council, who have since been made custodians of the mill, were asked to undertake restoration by the Ministry of Works. The Society for the Protection of Ancient Buildings undertook with Warwickshire County Council to restore the machinery. Work was finally completed in the spring of 1975 and a Civic Trust Heritage award of Exceptional Merit was made to the County Council. The first public open day was held on 30th October 1971.

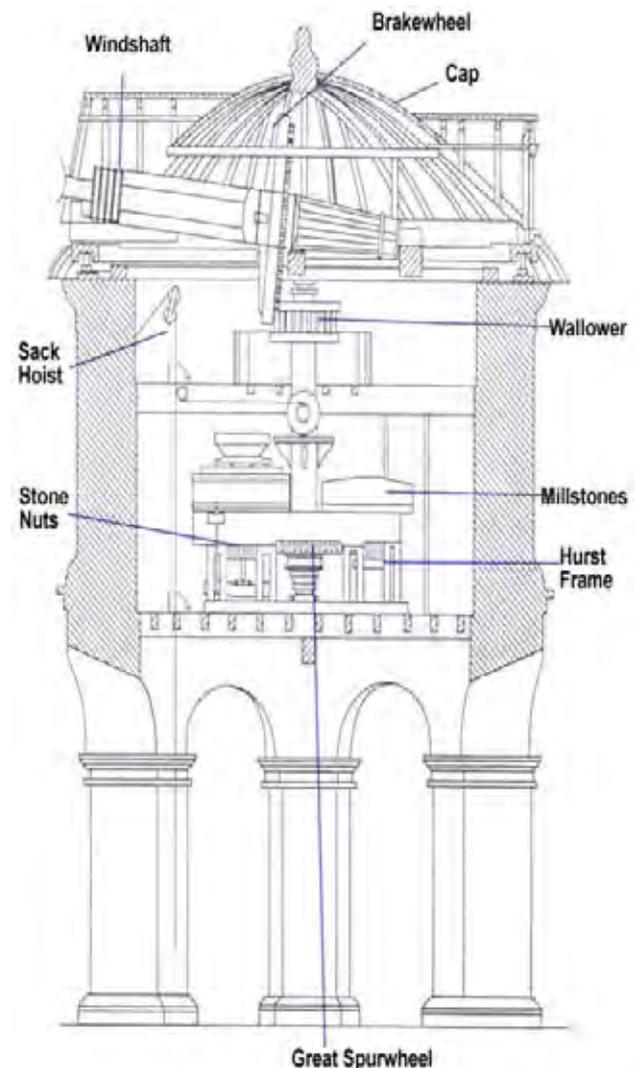
Peter used a model of the Mill's working parts to give us a very detailed explanation of the mechanism. Members now know about sail-cloth frames, whips, inner and outer stocks, the canister as well as brake wheels, windshafts, wallowers and Hurst Frames. Some of these features are unique to the Chesterton Mill.

Between 1999 and 2001 many of the components of the four sails and the stocks that carry them were replaced. However, an attempt to replace the routine inspections, that would have been made by the miller, of the security of the

wedges used to secure the inner stocks in the canister (by bolting the wedges to the stocks with steel coach screws) led to the disaster of 2006. The screws corroded and caused rot to weaken the stocks leading to one fracturing soon after the sails began to rotate. So much for modernity! Happily, Peter has devised a much more elegant solution for wedge security that will not compromise the integrity of the new stocks.

At the same time as repairs were being made to the sail mechanism the opportunity was taken to replace joists and other timbers of the working floor that were in poor condition. Siberian red pine, pressure treated after drilling and machining was used for the new stocks and the woodwork is finished with a linseed oil-based paint. In the future the mechanism will be monitored with quarterly inspections.

Chesterton Windmill will be open during the Heritage Open Days in September.



A cross section of the Chesterton Windmill

June 2009: The Chairman's Lecture

The Olympic Games Site

The decision to award London the 2012 Olympic Games was met with a range of responses, from unparalleled delight amongst sports enthusiasts to utter dismay from those seeking to preserve the unique atmosphere of this little known part of London. It also attracted the interest of industrial archaeologists, as this site is – and has always been – an area of industrial activity and public works provision. The scale of the project and the limited time available meant that any recording took on great urgency, and this need was reflected in the subsequent archaeological surveys.

The Olympics site is in the Lower Lea Valley, originally marshland, but now traversed (in a broadly north-south direction) by a series of natural and man-made water courses. These have been utilised for water supply, navigation, flood control and as a source of power. Names such as Three Mills River, Waterworks River, and Pudding Mill River give an indication of the importance of water to the economic activity of the area. Improvements to these water courses in terms of access, navigability and environmental quality is an important component of the Olympic Plan, although some of the more ambitious plans for the use of water as a means of transporting materials have had to be reduced in scale.

The water courses have been crossed by road and rail routes, often creating enclosed pockets of land which have taken on their own particular identity and usage. They have been the location for a multitude of industrial activities, many of them in the 'less attractive' category, with very little of the area devoted to residential accommodation.

This pattern has continued through to the recent past, and the sites had become occupied by an eclectic mix of manufacturing, storage and distribution facilities, bordering the often neglected waterways. It would be difficult to justify the retention of many of these on industrial heritage grounds, but archaeological investigation of what may have preceded them certainly does.

All the firms have been given the opportunity for re-location. Some have chosen to move further afield, whilst others have remained in the area, perhaps the most notable example being H. Forman (purveyors of smoked fish) established in London by immigrant Aaron Foreman in 1909. Stratford, of course, has long been an important railway centre, and the incorporation and development of rail links via Stratford is an important ingredient in the Olympic Plan.

There are already two highly significant sites that occupy locations close to the south of the Olympic Site – namely Three Mills and Abbey Mills Pumping Station. There have been mills on the Three Mills site for a very long time, and the 'Three' referred to are House Mill, Clock Mill (both of which still stand) and a (now demolished) windmill. Both House Mill and Clock Mill were tidal mills, and House

Mill contains much of the machinery and fittings associated with the milling process. It is Grade 1 listed, and run by the River Lea Tidal Trust.

Abbey Mills Pumping Station is another well-known site. Constructed in the 1850s as part of Bazalgette's monumental scheme for the installation of London's sewer system, it quickly earned the title of 'Cathedral of Sewage'. Various sewers feed into the pumping station which then lifts the water into the Northern Outfall Sewer which carries it - by gravity – to Beckton for treatment. The Northern Outfall Sewer is itself a magnificent feat of engineering and its path can be easily traced over the area. It now forms a cycling/walking route 'The Greenway', currently being upgraded in time for the Olympics.

Elsewhere on the site, the archaeological investigations is being/ has been carried out by the Museum of London Archaeological Services (MOLAS) and PCA Pre-Construct Archaeology (PCA) under an extremely tight timetable. Various sites have been unearthed – for example extensive remains of Sayne's Mill beneath a site later occupied by the box factory for the Yardley Perfume Company. A small part of the Yardley site has been retained, with the Yardley flower girl advertisement a welcome respite to the rather bleak and busy Stratford High Street.

One of the most interesting recordings has been of an unusually complete Edwardian group of buildings known as King's Yard. This comprised the manufacturing premises of Clarke Nickolls and Combs (Clar-ni-co), the confectionery suppliers formed in 1872. One of the buildings has been retained for posterity on the site which is now largely given over to the Olympic Energy Centre.

As well as industrial activity, the area has long been a location for recreational activities, and – given the nature of what is to be created – one might anticipate these being greeted with open arms. The problem, of course, is the loss of the individuality of the area, and many bemoan the loss of Hackney Greyhound Stadium, the Eastway Cycle Track and simply the opportunity to walk, observe and enjoy a splendidly isolated part of London. Even more resentment has surrounded the relocation of the Manor Garden allotments, originally created by three Old Etonians for local people, but now very much a symbol of local identity and independence.

There has been much talk of 'The Legacy' of the Olympics, with an area dramatically transformed and hopefully rejuvenated. There will have been casualties, but - with a few notable exceptions - the harsh reality for the industrial archaeologist is that there were in fact few sites worthy of retention, although investigation and recording are important. Prospects for the area have been enhanced and perhaps the Olympics has stimulated far more interest in the history and archaeology of the area than would otherwise have been the case.

WARWICKSHIRE

Industrial Archaeology Society

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FROM THE CHAIRMAN

Annual General Meeting ... and beyond

It was good to be able to report at the AGM in September that the Society had experienced a successful year, with membership numbers and meeting attendances both revealing some encouraging statistics. The treasurer reported that the financial position was also healthy and a very modest surplus had been generated over the past year. On this basis he saw no reason why subscriptions should be increased and that these would remain at current levels for the next twelve months. The major expenditure of the Society is the of hiring of the Pyne Room and speakers' expenses, and given the high proportion of members taking to the floor in the coming twelve months, it seemed likely that a similar surplus would emerge in twelve months time.

The Society operates with a small number of officers and committee, and Richard Hartree agreed to do the Treasurer's job for three years. At the end of the coming year he will have completed his term of office and we shall be looking for a replacement. This is a crucial responsibility within the Society, but it is not a hugely onerous task, and Richard would be very willing to talk to any member about what is involved.

Looking back over the past twelve months, I feel that we have had a good variety of meetings, we have maintained our contact with outside organisations (particularly the AIA) and knowledge of the Society is growing. Instrumental in this is the role of the web site. Never has information been so accessible for us to explore industrial history and

archaeology sites via the internet, but others can, of course, seek information about the industrial archaeology of Warwickshire from our own website. Peter Riley has done – and continues to do – an excellent job in updating the site. However, he relies very much on the contributions of others, and several members have been generous in their donation of time and information.

Linking this with the practical difficulties of publishing written material in pamphlet or book form, I feel that the current year could be an occasion for boosting the amount of material on the WIAS website. Writing text and inserting new digital images or scanning photographs taken in the past on film strikes me as being an easy, cheap and efficient way of boosting the stock of material available on the website. More significantly, perhaps, it can be downloaded and printed by others with the costs of that printing carried by the user and not by the Society. Many societies similar to our own have a list or database of sites which can be accessed by all.

This step requires an acceptance of the impact of the information revolution, and that knowledge and photographs, once on the website, are accessible to all. Not all may be happy with this – particularly with regard to treasured photographs – and it may be possible to explore issues of copyright, but there really is a strong case for WIAS to contribute to the amount of material on Warwickshire that could be available to others. Indeed as I write these notes, the fact that the WIAS Newsletter will be available not just to the membership but, once on our website, to a potentially vast audience is an exciting prospect.

Inland Waterways Association – Urgent Action Required

The importance of the internet as a means of communication is brought home with the arrival of an e-mail from Jo Gilbertson (IWA Campaigns and Communications Manager) via Derek Billings concerning the potential sale of British Waterways' assets. An extract from the e-mail reads:

The Government is seriously considering taking British Waterways' assets and selling them in a Treasury 'fire sale' to raise cash - a decision will be taken in the next few days. Selling off its assets would mean that BW would be £85 million short of the £120 million it needs to run the canals and waterways of this country. That will mean inevitable decay and disrepair and will undoubtedly lead to closure as the organisation contracts to preserve a core network.

An e-petition is available - Please sign up as soon as possible!!

<http://petitions.number10.gov.uk/protectourcanals/>

PROGRAMME

December 10th 2009

Roger Cragg: *Robert Stephenson*

January 14th 2010

Dr Amelia Pannett: *Warwick Gas Works*

February 11th 2010

Richard Hartree: *The Aluminium Works at Banbury 1929-2009*

March 11th 2010

A joint meeting with the Leamington Society: *The works of William Louis de Normanville*

April 8th 2010

Dr Malcolm Dick: *Matthew Boulton (1728 – 1809) and the celebration of industrial technology*

May 13th 2010

Peter Coulls, Alain Foote and John Willock: *Willans Works*

June 10th 2010

A presentation by members: *Industrial Archaeology Abroad*

NEWSLETTER

Meeting Reports

September 2009: David Close, Charlie Gilbert, Heather Cox
Chedham's Yard

The members of Wellesbourne Parish Council must have felt as though they were holding the proverbial tiger's tail when the BBC chose their conservation project for Chedham's Yard in the heart of the village as a contestant in the 'Restoration Village' programme in 2006.

The story, however, begins a few years earlier and provides a good example of industrial archaeology in practice. Chedham's Yard is a purpose-built, but unlisted, wheelwright's workshop and blacksmith's forge within the Wellesbourne conservation area. It is located at the end of a narrow lane, in an area of predominantly historic buildings, many of which are listed, and largely surrounded by residential property.

The Chedham family's association with the site dates from 1813 when Thomas Chedham moved to Wellesbourne and began to work as a wheelwright, renting a yard and accommodation. The business remained in the Chedham family from that time and operated as a wheelwright, blacksmith and general agricultural engineer until the late 1960s when the Yard ceased to be used commercially. It then entered into a state of suspended animation until 2002 when Bill Chedham, the last owner of the Yard and who had started work there in 1942, approached Wellesbourne Parish Council (WPC) in November 2001 and offered to sell the property for £10,000.

David Close was Chairman of WPC at the time and after setting the scene with some of the history surrounding Wellesbourne Hastings and Wellesbourne Mountford, which included links with Joseph Arch and the agricultural workers movement, he explained how the Parish Council approached this unusual offer. From the outset it was driven by the belief that in Chedham's Yard there was something worthy of preservation and whose loss would have been regrettable. WPC, therefore, purchased the Yard in February 2002.

A working party was established which included members of WPC, neighbours to the site, other residents of Wellesbourne and, critically, experts from the Warwickshire and Worcestershire Museums. The working party soon had a clear vision of what they wanted to achieve. This included: the preservation of the existing atmosphere, the maintenance of the Yard in the context of Wellesbourne, the creation of a lively working environment, the enablement of the wider community to understand and enjoy the work of historical crafts and the inclusion of the Yard into the broader tourist aspect of Wellesbourne.

To achieve this vision, a specialist consultancy, PLB, was appointed. PLB offers a complete range of heritage consultancy and design services and soon produced a conservation statement which concluded that Chedham's Yard was a time-capsule of rural craft skills dating back over the centuries. When work at the Yard ended the workshop, benches and equipment remained untouched for decades. With over 7000 original tools, it was a nationally significant collection of rural life and trade.

In 2004 English Heritage became involved, beginning with a preliminary photographic record and subsequent site visits and culminating with a Statement of Significance in November 2004. This concluded that, in terms of the local context, there was no doubt that Chedham's Yard was highly significant in representing the community's rural past and the type of small-scale craft industry that stood at the centre of village life and the local rural economy and as such was well worth preserving.

With this endorsement behind them, WPC moved to

appraise its options. To repair and preserve the site for research or to move the buildings to another site were rejected but it was agreed that to create a visitor attraction for traditional crafts and to re-use as workshops could be a viable option. By early 2006 WPC had spent some £100,000 (largely funded by English Heritage) and PLB was estimating that upwards of £1,000,000 would be needed to achieve the objective. Furthermore, the issues of management and an ageing membership (a familiar refrain) only added to the problems now facing WPC. It looked as though moth-balling was the only option when the BBC announced that it was seeking entrants for a new series of 'Restoration'.

An application was duly submitted, the BBC representative sent to investigate had 'never heard of this place' but thought that it held possibilities. This led to a hectic round of interviews, open days, exhibitions and local media interest for the Midlands Heat which was won, thus leading to a place in the final. This resulted in much more of the same promotional activity plus managing the growing local concern at the invasion of Wellesbourne by so many outsiders.

At the final in September 2006 it was felt that Chedham's Yard was an also-ran but when Griff Rhys Jones interviewed the feisty Iris, a lady in her mid-80s who knew Bill Chedham and had a wealth of anecdotes, then interest ignited, the telephone lines grew hot with supporters' votes and Chedham's Yard ran out the surprise winners with access to £1,000,000 of funding.

WPC now had to set up a steering group and put in hand essential repairs, submit the application for Heritage Lottery Funding and organise contracts and briefs for further work. Clearly, some outside help was needed and after interviewing three possible consultants PLB was reappointed to manage the process of writing the necessary policies, supervising the archaeological and bat surveys, updating the conservation statement and much else. All the 7,000 tools had been removed for cleaning and restoration before the site was flooded in July 2007, fortunately without causing any serious damage to the buildings.

Charlie Gilbert and Heather Cox brought us up to date with the activities of The Friends of Chedham's Yard and vividly demonstrated the trials and tribulations facing an amateur and volunteer organisation when it is thrust into the national spotlight. Some sixty members, of which only twenty five are active, were responsible for the organisation needed for the BBC programme. They now are preserving and cataloguing the artefacts as well as producing the newsletter *Chedham's Chatter*. Any new members will be very welcome.

Whilst the frantic pace has settled down, much is still to be done and the workload will accelerate again now that planning permissions have been granted (announced mid-November) which will lead to the release of funds for the preservation work and the construction of visitor amenities in anticipation of an opening in October 2010. Four working groups are in place covering: garden, website, collections and Chedham's on the Move. Other possible activities are a book based on the history of the Horse and Chedham's Yard, a shop and educational visits to schools.

It would be very sad if the work and enthusiasm of the Friends of Chedham's Yard were not to have concrete results but during the discussion following the presentation members voiced concerns about the future of the project and its long-term viability. The unfolding story of Chedham's Yard will indeed be watched with great interest.

October 2009: Steve Bagley*Three Cycling Pioneers of Coventry - James Starley, William Hillman & George Singer*

Steve Bagley, the Head of Collections, and his colleagues at the Coventry Transport Museum have delved deeply to unearth the extensive links that bind together three pioneers of Coventry's cycle industry - Starley, Hillman and Singer.

The research had been prompted because, whilst much has been written about the Coventry cycle industry, there were many errors and inaccuracies that could only be resolved by going back to the original sources. These included: census returns; birth, marriage and death records; wills and not least trade directories.

The story began with James Starley (1830-1881) who was born in Albourne, West Sussex but moved to London where he worked as a gardener to John Penn, a marine engineer with works in Greenwich (and well known to some members). Starley developed a reputation for his abilities with mechanical devices and when Penn bought a sewing machine for his wife which broke down, James effected a repair and devised improvements to the mechanism.

Penn knew Josiah Turner, one of the makers of the machine, and Starley was taken on at the London factory. In due course, Turner and Starley moved to Coventry, where workers employed in the failing watch industry were considered able to adapt to the intricate work of sewing machine production, and started their own sewing machine company in the early 1860s. First called the European Sewing Machine Company, later the Coventry Machinist's Company.

William Hillman (1848-1921), as evidenced by the census returns, lived close to Starley in Lewisham and was also apprenticed to Penn. He is then found in 1871 in Coventry in partnership with Starley making their first bicycles and registering numerous patents.

The last member of the triumvirate, George Singer (1847-1909) also lived in Lewisham in the 1860s and was apprenticed to Penns. He is found listed as a bell ringer and unsurprisingly on the same programme is one W Hillman! Early evidence of the social contact between the men which continues when Singer moves to Coventry in 1871 and is found lodging with Hillman.

Looking in more detail at the development of the cycle industry Bagley first traced the progress of Starley, known today as 'the Father of the Cycle Industry'. Starley had been captivated by this new mode of transport, and began making improvements to its design. Before long he decided to work for himself, making sewing machines and working up designs for cycles in collaboration with William Hillman in St John Street where he is recorded as a 'machinist' employing 4 men and 2 boys. There is evidence of advertising for the 'Ariel' cycle, the first all-metal cycle fitted with 'Lever Tension' wheels, which was a vast improvement on the previous French designs.

Hillman, who married in 1873, left to pursue his own future but Starley carried on the business until he teamed up with W. B. Smith in 1873 as Smith & Starley - located on a site in St Agnes' Lane where Coventry Transport Museum now stands. This enterprise lasted until 1878 when Starley began working for a cycle business that he helped to establish with his sons - Starley Bros.

James Starley was one of our great inventors with many patents to his name including the Coventry lever, the open differential (still used in some tricycles and ready and waiting when the car needed the device) and tangent spokes. The Aerial Velocipede will always be associated with him. Starley died in 1881 and is buried in the London Road cemetery and has a memorial statue at Warwick Green.

William Hillman, after leaving Starley, joined forces with William Herbert (brother to Alfred) in 1875 and in 1876, together with a racing cyclist named Cooper, founded the "Hillman and Herbert Cycle Company", later renamed the 'Premier Cycle Co'. in 1891. In the 1880s the Sparkbrook Cycle Company was purchased. Hillman developed the 'Kangaroo' cycle which was safer than the Penny Farthing and was both successful and profitable. It led to the foundation of the Auto Machinery Company for which the Museum has Minute Books from 1891. In that year the census shows Hillman as the Managing Director of a Cycle Works living in Stoke Green at Abingdon House (still extant). That the business prospered is evidenced by him building Keresley Hall (now the Royal Court Hotel) in 1894.

The boom years of the 1890s continued for Hillman who indulged his love of golf by turning land behind the Hall into 'The Golf Field' and setting up his brother-in-law, Henry Brockas as a golf ball manufacturer.

Hillman moved with the times and was early into the motor industry with the formation of the Hillman-Coatalen company with the Breton, Louis Coatalen, as designer and chief engineer. The works were located in the grounds of Pinley House, owned by Harold Smith, one of the Coventry business men behind the nascent motor industry. However, after a disagreement purporting to relate to one of Hillman's five daughters, Coatalen left in 1909 to join the Sunbeam Car Company.

Hillman died in 1921 and is buried in St Thomas' Churchyard, Keresley. His gravestone marks the family's connections with other motor industry pioneers, the Wilks of Rover and the Blacks of Standard, with the burials of two grandsons, John Spencer Wilks and John Black.

The third of the trio, George Singer (1847-1909) was born in Dorset and moved to Coventry in the late 1860s. Working under Josiah Turner and James Starley at the Coventry Machinists Company, Singer gained a wealth of experience in the new cycle trade.

In 1873 he left the Coventry Machinists for a higher position at the Paragon Cycle Company, a much smaller business but one that was concerned completely with cycle production.

Singer met and married Elizabeth Stringer the following year, and in 1875 established his own cycle business - Singer & Co. Ltd. in partnership with father-in-law James Stringer making 'Ordinary' or 'Penny-Farthing' type cycles as well as tricycles of high quality under the 'Challenge' name. As an example of the close-knit cycle industry Singer held the important DHF trademark jointly with Hillman.

Singer seems to have been more involved with civic and religious matters than the others. He was a Deacon in the United Reform Church and sat on its finance committee. He donated £200 and laid the foundation stone of Brownhill Chapel. Through the 1880s he became increasingly wealthy and by 1890 he had a grand house, Coundon Court, built for him and his growing family. In 1891 he became Mayor of Coventry, a position he held for a further three years.

Singer sold the business in 1896 for £543,000 but retained the Managing Directorship at a salary of £1,500. Very considerable sums indeed. He died at Coundon Court in 1909.

Steve Bagley showed us what a wealth of information is contained in the source documents available to us all. It does, however, require dedication and perseverance to build up the picture that he presented of the pioneering days of Coventry's cycle industry.

November 2009: John Crossling

Warwickshire Breweries - Past & Present

Darling Buds, Enigmatic Variations, Hog Goblin, Autumn Bliss, Barristers and Gavel Bender, Newton's Cream and Davy's Glow, Gold and Ubu are but a few of the names created by Warwickshire's real ale brewers. Equally varied are the names of the breweries, but more of these later.

John Crossling, looking every inch the welcoming landlord, but in reality a geologist turned local government official via the museum service, gave us a whirlwind survey of Warwickshire's breweries and brewers (plus the occasional brewster). No doubt some members were more familiar than others with the product but by the time John had finished the scent of hops, malted barley and fermenting mash was almost palpable. Sadly, no samples were available but there is the prospect of a WIAS commemorative bottle - for which an appropriate name would be welcomed by the Chairman.

John's interest in the development of the brewing industry began in Derby. His research showed that a graphic picture of social development could be drawn from the records of meetings in public houses and taverns for events such as bear-baiting, cock-fighting and the like. Similar information was found in Warwick. John also has a practical interest in brewing and beer through his active role over fifteen years in the organisation of the Harbury Beer Festival, which now has a national following.

Reviewing a list of the mid-Victorian brewers that preceded the Warwick & Leamington Brewery was reminiscent of a roll-call of local solicitors as various combinations of individual names evolved over relatively few years. Such amalgamations continued and the industry eventually became what it is today, dominated by a few giants and often ultimately non-British. However, and happily, there has been a resurgence of small, local breweries around the country and Warwickshire seems to have been especially blessed in this regard.

What we are seeing is indeed a reversion to an earlier business model. In earlier times most towns had a brewery and many taverns also had their own brew-house. The Victorians created the phenomenon of the large central brewery with a network of outlets, either brewery-owned or tied-supplied. Improved distribution channels undoubtedly assisted this process. In the recent past the Campaign for Real Ale (CAMRA) has campaigned successfully for the introduction of guest beers into previously tied houses and this has greatly helped the development of small breweries, notably the trend to micro-breweries since the 1970s.

Before looking at some of the breweries in more detail it is useful to have a brief resumé of the brewing process. Malted barley is added to water in a mash tun where the enzymes are extracted. The resultant hot liquor is transferred to a copper (now stainless steel) tank and wort and hops added before boiling for 1 to 2 hours and then sieving into a fermenting vessel via a heat exchanger (cooler) ready for the addition of yeast. After 2 to 3 weeks fermentation the brew spends a further week in a conditioning tank before being racked off into barrels for distribution. In an interesting parallel with

the Highland malt whiskey industry, the characteristics of the local water is an important factor in the finished brew. For example, the gypsum-infused aquifer under Burton-on-Trent was ideal for brewing pale ales and London became the specialist area for porter.

John's well illustrated tour of Warwickshire's small breweries showed many common themes as far as equipment was concerned, although the premises varied widely - from old slaughterhouses to large garden sheds via some impressive purpose-built units and even the former laboratory of the Studley Needle Works. The equipment showed a propensity to recycle, often from other industries and especially from the dairy field where large stainless steel tanks are commonplace as are the modular plate-type coolers that seem to predominate in the micro-breweries. Tank insulation was prominent and varied from quilted lagging to elegant slatted wood finishes reminiscent of early steam engine cylinders. Proper storage for ingredients such as hops is important and cool conditions were found in chill cabinets and large refrigerators. Hops now come from many sources beyond Kent and Herefordshire, and America, Europe, New Zealand and Japan may flavour your next pint.

The breweries are classified by their output measured in barrels per day with a barrel containing thirty-six gallons or 288 pints. Warwickshire's breweries vary from one and a half barrels to thirty-eight and incidentally up to an extremely strong 17.5% ABV! Brewing recipes are closely guarded by their owners and sadly, can be lost when a brewery fails or, more likely, is absorbed into a larger business.

It would be invidious, and probably boring, to repeat John's lengthy list of breweries but a number of conclusions can be drawn. It is particularly sad to note the short life of many of the breweries reviewed. Whilst some were forced to move premises for various reasons and others survived after a change in ownership, all too often pressure from 'the big boys' and restrictions on outlets seems to have led to the failure of a fragile business model. In contrast, one of the local success stories is led by two marketing men from Bass who have emphasised innovation and quality for a limited range of beers. Funding has been secured from DEFRA for new plant and eco-friendly reed beds are used to filter effluent in a sustainable manner. A French brewer is employed and a very attractive visitor facility has been created. It must also be said that visitors are welcomed by all of Warwickshire's brewers but please telephone ahead to avoid disappointment.

What of the future? The small brewer of real ale caters for the discerning drinker through a network of specialised public houses. Thanks to earlier changes in legislation, guest beers do feature increasingly in the mainstream houses and there is a thriving programme of beer festivals across the country. Nonetheless, the enthusiast for real ale who decides to branch out into commercial brewing faces many challenges but fortunately there are enough such brave individuals to ensure that we can enjoy a tasty, local pint throughout the County.

WARWICKSHIRE WIAS

Industrial Archaeology Society

NUMBER 37 February 2010

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FROM THE CHAIRMAN

Diverse contacts, diverse sources

This Newsletter is due to be published on the occasion of a joint meeting with the Leamington Society. This is the first time that WIAS has done a joint meeting, and it caused me to reflect that this has perhaps been something of a missed opportunity. There are a number of local history societies in Warwickshire from whom we have had visiting speakers, but the actual opportunity of members of WIAS and another history group meeting on the same occasion has not been tried before.

One of the issues is, of course, that having our meetings in Warwick makes it difficult for joint meetings to take place other than for very local groups. Discussions are currently in progress about trying to get a joint meeting with the Warwick Society on the subject of the Warwick gas works.

There is, of course, an overlapping membership between WIAS and other local groups, and knowledge and expertise is shared in this way. Similarly, my own visits to various local groups to talk on the Industrial Heritage of Warwickshire always generates items of interest from the audience. Several of these groups attract those of retirement age, and many in the audience frequently have experiences that supplement our knowledge of local sites. It is a real pleasure to be able to show a set of slides of local sites, many taken in the 1970s, and to be bombarded with responses about work experiences or local knowledge of these sites – yet another reminder of the importance of local history.

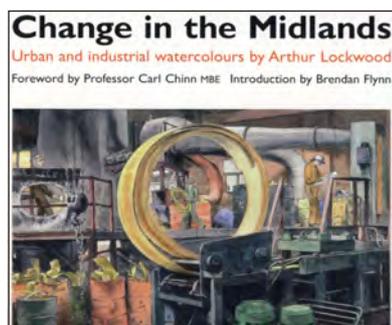
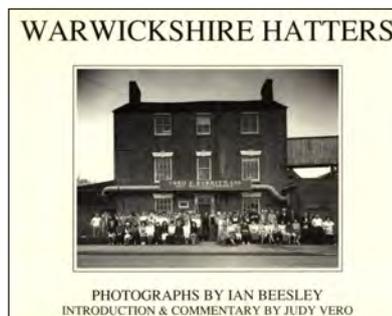
One of the most encouraging features of our Society is the very high proportion of members who attend meetings. This is unusual, and other groups admire us for this. I would like to believe that one of the reasons for this is the liberal interpretation of the industrial archaeology/history/heritage theme, and that a diverse range of subjects can be accommodated in the programme – from detailed analysis of technological change through to the social history of industrial

communities, with the content drawn from local, national or overseas examples.

This produces some blurring at the edges over what can be included but I regard this as a strength of the Society. Some of the items that creep into the last twenty minutes of some of our meetings defy classification anyway!

As I have written about before, the range of sources also seems to expand as time goes by. Earliest representations of industrial scenes relied on the skill of the artist, to be subsequently replaced by the photographer. Much archaeological recording requires photographs or drawings that present an accurate factual picture. Occasionally, collections emerge that add a great deal more to the vision of industrial experience than mere recording can achieve. Two examples are particularly appealing. One published in 1989 is *Warwickshire Hatters* (Ryburn Publishing) by Judy Vero and Ian Beesley. Judy Vero wrote the text, and Ian Beesley – who has done much photographic work on Yorkshire mills and foundries, particularly in the Bradford area – was commissioned to produce a photographic record of the last working days of Vero and Everitt, the Atherstone hat-making firm. The result is a wonderfully evocative record of the atmosphere within the works – the noise, the smell of warm damp wool, the steam of the hat-making processes – and of the lives of those who worked there. Once Vero and Everitt shut down, this left Wilson and Stafford as the only hat-making firm in Atherstone, and this, in turn, closed in 1999. A short video recording – another vital resource – of the last days of felt-making at Wilson and Stafford was made, but the (deteriorating) buildings adjacent to the Coventry Canal remain unoccupied eleven years later.

Painting has not played a significant role in the recording of industrial sites in the twentieth century, but one exception to this is the work of Arthur Lockwood. Twenty years ago Arthur Lockwood began painting scenes of the changing industrial and urban landscape of the Midlands. His paintings have been gathered



in a collection entitled *Change in the Midlands* (Sansom & Co. 2007), and – in the same way as Ian Beesley's photographs – the results are a wonderfully evocative record of times past.

Included in the collection are paintings of Coventry Colliery and the Homefire Plant – not every artist's dream location!

Both books are highly recommended, both for the skills of the artists concerned, and for their contribution to the record of our industrial heritage.

Martin Green

PROGRAMME

March 11th 2010

A joint meeting with the Leamington Society: *The works of William Louis de Normanville*

April 8th 2010

Dr Malcolm Dick: *Matthew Boulton (1728 – 1809) and the celebration of industrial technology*

May 13th 2010

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June 10th 2010

A presentation by members: *Industrial Archaeology Abroad*

NEWSLETTER

Meeting Reports

December 2009: Roger Cragg

Robert Stephenson, His Life and Works

Roger Cragg ended our year in style with his review of the life and works of Robert Stephenson, a fact-filled story of one of Britain's foremost engineers, the 150th anniversary of whose death was commemorated in 2009. Roger concentrated on Stephenson's work as a civil engineer but he also examined his substantial involvement in what would now be termed mechanical engineering.

Regarding Stephenson's early life, we learnt that he was born in October 1803, but erroneously celebrated his birthday in November. The only son of George Stephenson, he attended a private school in Newcastle, commuting by donkey. In 1819 he was apprenticed to the Viewer at Killingworth Colliery learning mine surveying and the design and operation of machinery. However, his father's career was developing and as his son's assistance was needed Robert left Killingworth and, effectively became apprenticed to his father who was rapidly developing a name in what was to become railway building.

In 1821 George Stephenson was commissioned to re-survey the route of the proposed Stockton and Darlington railway with a view to the use of locomotives on the line and he was subsequently appointed Engineer for its construction. The opening of the Hetton Colliery line in 1822 and that of the Stockton & Darlington in 1830 established him as a consulting engineer, much in demand for advice on early railway schemes.

In addition to his work on colliery wagonways, George had also been developing his skills as an engine mechanic, making improvements to winding engines and installing new engines. In all this work he was ably assisted by Robert, one of whose useful talents was that he could write clearly!

William James, an early railway entrepreneur, discussed with the Stephensons the use of locomotives on his proposed Central Junction Railway. James had undertaken the first survey for a railway from Liverpool to Manchester, a project with which the Stephensons were to become very involved and Robert accompanied James on a further survey of the route.

In 1822 Stephenson went to Edinburgh University. During his short time there he met George Bidder who became a close colleague throughout his working life. Returning to Tyneside in 1823, he commenced his professional career alongside his father. One of the first tasks which he undertook on his own was the survey and design of a branch of the Stockton & Darlington Railway and he proudly signed the drawing 'R. Stephenson, Engineer'.

In June 1823 George and Robert Stephenson, together with three others, founded the firm of Robert Stephenson & Co. with Robert as the managing partner, a huge step for one so young. The purpose of the company was to develop the mechanical engineering side of the Stephensons' business.

Roger then explored the rather mysterious period in Stephenson's life when in 1824 the Mexican Mining Company consulted the Stephensons with a view to re-opening gold and silver mines in Mexico and Colombia. Stephenson was invited to go out to supervise the work. Although his partners were reluctant, they agreed that he could go for about one year but unknown to them at the time he had contracted to go for a three year period. The discovery of this fact did not please his colleagues!

Nevertheless, Stephenson sailed in June 1824 accompanied by a party of Cornish miners who were to work the mines. He was engaged on a number of projects including the surveying of a route for a 7 mile railway which he advised was not possible owing to the mountainous terrain. From Caracas he went, by mule, to Bogota and thence to the Sanata Ana silver mine. He also undertook a 1,100 mile tour of the interior. The work was trying and there were problems with drunken miners but it did develop his managerial skills. In 1827 he travelled to Cartagena to take passage home. There he met Richard Trevithick who had fallen on hard times and Stephenson provided the funds for Trevithick's passage to England. Robert eventually returned to

England after a brief tour of the United States.

On his return he was engaged in the two tasks of managing the factory of Robert Stephenson and Co. and working alongside his father but now as an equal rather than as a subordinate. To facilitate this a new company was created, George Stephenson & Son with George and Robert appointed as Chief Engineers with 18 employees.

Stephenson first assisted with the design and construction of the Liverpool and Manchester Railway. However, his major contribution to that railway was the Rocket locomotive. George Stephenson had been active in locomotive design and his engines were already at work on the Stockton & Darlington railway. Robert's task was to develop these slow and ponderous beasts into something more useful for a major public railway. The rival merits of stationary engines against locomotive haulage were being debated. The Stephensons argued forcibly for the use of locomotives and it was decided to hold trials at Rainhill in October 1829. Several locomotives were entered for the competition but on the day only five were available and of these only three were serious competitors; Novelty, Sans Pareil and the Rocket. In the trials Novelty and Sans Pareil suffered mechanical failures and only Rocket performed the tasks set satisfactorily.

The Rocket was a major step forward in locomotive design with inclined cylinders driving directly on the crank pins of the driving wheels, enabling the driving wheels to be sprung, and its multi-tube boiler vastly increased the heating surface. The ultimate development of the Rocket type locomotive appeared shortly afterwards in the shape of the Northumbrian in which the cylinders were placed horizontally and a separate firebox was incorporated into the boiler, thus setting the pattern for all steam locomotives to the end of steam in the 1960s.

Meanwhile Stephenson had taken over responsibility from his father for the completion of the Canterbury & Whitstable Railway. Already he was making use of assistants although his absences from the works was the subject of some criticism by the Directors of the company.

From this time on Stephenson was involved in many schemes but Roger was only able to highlight some of the more outstanding projects. These included the 16 miles long Leicester & Swannington Railway, whose mile long tunnel at Glenfield near Leicester survives *in situ*, and the winding engine from the Swannington incline is preserved at the National Railway Museum at York. Another was the London & Birmingham. Several different routes had been suggested and in 1830 George and Robert Stephenson were appointed as joint Engineers to survey the line and prepare a final scheme. Robert appeared before the parliamentary committee to defend the proposals and acquitted himself well, impressing many people with his skill in dealing with many hostile questions.

At this stage his father dropped out of the project and Robert was appointed sole Chief Engineer for the railway at a salary of £1,500, later raised to £2,000. At this time he was not quite 30 years of age and solely responsible for the building of a railway with an estimated cost of £1,701,000, equivalent to many millions of pounds today and probably on the scale of the channel tunnel rail link. Some responsibility for one so young!

Roger highlighted two of the major difficulties which Stephenson had to overcome at a time when railway building had hardly started and little experience had been gained. First was the great cutting at Roade. The contractor failed and the work was taken over and finished by the Company. However the problems at Roade were dwarfed by the difficulties encountered in the driving of the tunnel at Kilsby where quicksands were encountered and the tunnel flooded. Again, the contractor was released from his obligations and Stephenson took charge. Unsurprisingly, there was a huge cost overrun, from £98,988 to £291,030! Of the workforce of about 1,300 men, 26 were killed during construction.

That these difficulties were successfully overcome, was

largely thanks to the qualities not only of Stephenson but also his subordinate staff which included many who went on to become eminent engineers in their own right, such as John Birkinshaw, Thomas Gooch, Charles Fox and George Buck. Generally, Stephenson's policy was to appoint young aspiring engineers to junior posts, trusting them with more responsibility as they proved themselves.

From this point a chronological view of Stephenson's career becomes impractical because of the sheer volume of his activities and Roger used a few of his more prominent projects to give a flavour of his career and of the man himself through his private and business life.

It was indicative of the status of the Stephensons that in 1835 they went to Brussels to meet with the King of the Belgians to discuss the creation of the Belgian State railway system, and by 1840 the Newcastle factory was sending locomotives all over Europe including France, Belgium, Austria, Germany, Italy, Russia and also to the United States.

In 1832 Stephenson agreed to act as Consulting Engineer to the Stanhope and Tyne Railway which was to build a line over the moors. It incorporated on its various sections; horse traction, locomotives and stationary engines and had three miles of inclined planes – almost every method of traction possible on one line! Economically the line was a disaster and unfortunately Stephenson had accepted five £500 shares in the company in lieu of his fee. When the company collapsed he discovered that, as the company had never been incorporated, he had an unlimited personal liability for its debts which eventually cost him £20,000.

Stephenson enjoyed a good relationship with his near contemporary Isambard Brunel who was only three years younger. Although they had different views on some aspects of railway development, the track gauge and the atmospheric system being two, they always had a high regard for one another and corresponded on friendly terms. Brunel wrote: "*despite our very bitter contests I have a great regard [for him]*".

The 1840s were perhaps the greatest years of Stephenson's career and included: Consulting Engineer to the London & Birmingham Railway, Engineer to the South Eastern Railway, Chief Engineer to the Eastern Counties Railway, Engineer in Chief to the Chester & Holyhead Railway, Chief Engineer of the Midland Railway, Joint Principal engineer to the North Staffordshire Railway, Chief Engineer to the Shrewsbury & Birmingham Railway and many others.

The Chester & Holyhead Railway included one of Stephenson's less successful structures. The coming of the railways had led to bridge building on an unprecedented scale; whereas most previous bridges had been of the stable arch type, railways needed adequate headroom and width which favoured the horizontal beam. Cast iron was the preferred material but engineers were well aware of its brittle nature, especially when subjected to tensile stresses.

The trussed compound girder became a popular solution this problem. Large numbers of these beams with spans of up to 70 ft. were built in the 1840s including a bridge carrying the Chester & Holyhead Railway over the River Dee. In early 1847 one of the spans of the bridge collapsed and five people were killed and sixteen injured when the train fell into the river. Stephenson took full responsibility for the bridge design at the inquest. The whole matter of trussed compound girders was the subject of a Royal Commission enquiry. This led to the rapid strengthening of existing girders and, by the late 1840s the abandonment of cast iron, trussed or not, for railway bridges.

The Chester & Holyhead Railway also saw the introduction of another new form of bridge design – the wrought iron tubular bridge. Thomas Telford had solved the problem of crossing the Menai Straits for road use with his suspension bridge. However, suspension bridges were not considered suitable for railways and after much experimentation the riveted, wrought iron tube was developed.

Two such bridges were built on the Chester & Holyhead. The first bridged the river Conwy with twin 400 ft. long tubes crossing the river at a low level. The 1,000-ton tubes were built on dry land and then floated out on pontoons and raised onto the supporting abutments by hydraulic jacks. The Britannia Bridge was a much greater challenge with four twin spans. Again, the tubes were floated out and jacked into place. The tubes of the spans were joined to give a continuous beam and the trains ran through the tubes instead of above them.

Other tubular bridges built by Stephenson included two over the River Nile and the Victoria Bridge over the St. Lawrence River as part of the Grand Trunk Railway which linked Toronto with Quebec. The Victoria Bridge was the world's longest bridge. It overcame the winter freezing of the river which gave rise to large quantities of ice coming down river in the spring thaw by incorporating large sloping cutwaters into the upstream side of the piers.

Two other bridges nearer to home that stand out are the High level Bridge at Newcastle and the Royal Border Bridge at Berwick upon Tweed. The former is unusual in that it is a two level bridge which carries the railway line along its upper deck and the road on the lower. There has been some controversy as to who designed the bridge but although Thomas Harrison was asked to prepare a design for the bridge he wrote that "*...the designs are not mine but my friend Mr. Robert Stephenson's.*" The latter is a bold masonry arch structure above the River Tweed and Stephenson was again assisted by Harrison.

Stephenson's professional life was widely recognised, he had joined the Institution of Civil Engineers in 1830 and was its President between 1856 and 1858. In 1857 he had received the honorary degree of Doctor of Civil Law from Oxford University. He was a founder member of the Institution of Mechanical Engineers when it was created in 1847 and became its President in 1848. In 1849 he was made a Fellow of the Royal Society. Also in 1847, rather surprisingly he became a Member of Parliament, being elected for the constituency of Whitby, a role which he continued until his death. He appears to have taken little part in Parliamentary proceedings although in 1857 he did speak in the House against the Suez Canal – one of his rare errors of judgment.

Stephenson remained in great demand as one of the leading civil engineers of the day but his health was beginning to suffer as was that of his friend and rival Isambard Brunel. The pair took a cruise to Egypt in 1858 in Stephenson's yacht *Titania* to recuperate as both were suffering from Bright's disease. Returning to London in February 1859, his health seemed improved and he returned to work but he soon relapsed and made one last voyage in *Titania* to Norway to take part in the opening of a railway which he and George Bidder had engineered. He returned to London but died on 12 October 1859 at the age of 56.

Stephenson was one of the greatest engineers of his day and arguably one of the greatest of all time. He was buried in Westminster Abbey. One of the pall bearers was his old colleague Joseph Locke who had succeeded him as President of the Institute of Civil Engineers.

What of Robert Stephenson the man? Roger fittingly closed with a quotation from Samuel Smiles' biography of 'The Chief' as he was invariably known to his associates:

"... he was eminently practical and yet always open to the influence and guidance of correct theory. ... He inherited his father's kindly spirit and benevolent disposition ... He will be judged by his achievements as an Engineer ... by the immense practical services which he rendered ... to civilisation through ... the railways constructed by him in all parts of the world."

Robert Stephenson was a truly great man and one to whom we owe a great debt of gratitude.

February 2010: Roger Hartree

The Aluminium Works at Banbury, 1929-2009

The 'Ally' was for many years the industrial heart of the old market town of Banbury and Richard Hartree gave us a very personal view of the plant and its products which resulted from his thirty-six year career with the Northern Aluminium Company and its successors. Richard joined the graduate training programme as a metallurgist in 1954 and retired in 1990 when working in Vancouver. He was based in Banbury for most of the 1960s and 70s and saw much change during this time.

The Banbury plant was located one and a half miles North of Banbury. It was always a processing plant for the aluminium ingots provided by the parent company from which rolled and extruded products were produced. However, the processes involved required a high degree of competence and attention to detail to ensure the quality demanded by customers which ranged from the burgeoning aircraft makers to hollowware spinners.

The Northern Aluminium Company (NACo) was a subsidiary of the Canadian giant Alcan which had an existing warehouse in West Bromwich, where aluminium sheets from North America were cut to size or blanked into discs and a small extrusion press produced trim sections. In 1929 Alcan decided to build a sheet rolling plant in the UK which would be the largest in the group. 40 acres of land were purchased in Banbury, a central location with good road and rail links plus a reliable electricity supply. Interestingly, the choice stemmed from a chance meeting on an Atlantic liner between an Alcan engineer and the brother-in-law of the Banbury Town Accountant. It was suggested that Alcan look at Banbury where Samuelsons, an agricultural engineer and a major employer had just closed and the Town Council was anxious to attract another major employer.

That the Council was anxious is shown in the final deal that was struck. An asking price of £12,000 was met with an offer of £10,000 from NACo who upped this by £200 after a local banker, Gillet put up £1,000 and the Councillors personally contributed £800. Banbury wanted NACo to come!

Construction was completed in 1931 and sheet shearing and blanking plant was moved from West Bromwich and local labour hired and trained. By 1932, 300 people were employed on two shifts. The extrusion press with its associated die-making facilities was moved in 1933 and a Paste and Powder Plant located away from the main buildings because of the explosion hazard.

In the mid-30s the plant was expanded substantially, not least to meet the increasing demand from the aircraft industry which was changing from wooden to metal airframes. A notable technical advance was the development of 'clad' aluminium whereby a pure outer skin was bonded onto a copper-rich core to combine strength with corrosion resistance especially for aircraft. More sophisticated heat treatment and re-rolling equipment were also installed.

Given the dangerous nature of some of the manufacturing processes it is not surprising that safety was given a high priority; even extending to the title of the work's magazine - 'Safety First'. The Safety Committee was also the name of the first regular joint management/workers forum. Nonetheless, accidents did occur with foot injuries being quite frequent. Safety shoes were available for purchase but their use was not compulsory.

Labour relations hit the national press in 1936 when a strike over pay occurred. However, the underlying cause was over union recognition and there were some unpleasant incidents at the work's gates over 'blacklegs' entering the site which

resulted in a police presence. The dispute was resolved in about a week (ed: pretty swift by later industrial relations standards) with 5% wage increase, from 10 1/2d to 11d per hour for a 50 hour week and a 'shift bonus' of 12.5%.

In 1938 a major expansion programme doubled both sheet and extrusion capacity to meet growing demand resulting from the rearmament programmes of the RAF. A new office block and Alcan's first research laboratory, both now listed, were built.

Two new extrusion presses came from Germany, and the installation engineers who were still on the site at the outbreak of hostilities were interned. At this time Banbury was the largest aluminium sheet and extrusion plant in England and as such was one of the first to be camouflaged and 'dummied' some two miles to the North.

The need for aircraft put huge demands on the aluminium industry as production rose from 2,828 units in 1938 to 15,049 in 1940 and over 26,000 by 1944. NACo built and operated a major 'recycling' plant near Adderbury to process aluminium from both British and German crashes.

On 3 October 1940 the dummy plant was bombed and the German news later claimed the destruction of a munitions factory at Banbury. The damage was quickly repaired! 'Dummy Ally' was preserved as an address in the 1964 electoral register and the dummy gateposts survived until the 1970s.

Throughout the war the plant operated continuously and a high proportion of the workforce, which exceeded 4,000 at its peak, were women. Until new plant elsewhere came on stream in 1942, Banbury supplied between 50 and 60% of the needs of the aircraft industry. NACo provided technical assistance to these new plants.

After the war came diversification to find new uses for the greater capacity now in place. Banbury concentrated on small order specialist products including all aircraft sheet. Nevertheless, the plant remained the largest employer in the town and played an important part in its social life.

The installation of new plant in the mid 1950s led to the need for labour and Roger touched on the problems at that time of recruiting from among the newly arrived Caribbean immigrants. Within a few years a new productivity-based incentive scheme increased output and avoided the need for additional labour.

However, excess capacity existed in the industry and rationalisation was needed. In 1968, Alcan bought Delta Metals' 50% stake in James Booth Aluminium with the balance owned by Kaiser Aluminium. As a result, there was a major rationalisation across four sheet and extrusion plants with consequent redundancies (some 1,200 at Banbury but generous terms meant few were compulsory).

Plant modernisation continued through the 1970s and 80s but the workforce steadily reduced to around 750 when the 50th anniversary was celebrated in 1981. In 1986 the anodising plant was closed and by 1993 employees numbered but 528.

Alcan continued to rationalise, selling surplus land and then the business in 1966 to a merchant banking group which operated it under the name of British Aluminium until selling it on to Alcoa in 2000, who in turn sold it to the French company SAPA in 2007. SAPA finally closed the plant in 2008 thus ending nearly 80 years of the 'Ally' in Banbury.

The listed 1938 Office and R&D buildings remain together with the 1931 Gates and the Memorial Garden to the forty-one employees who died on WW2 service.

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WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

The final edition of the year gives me the opportunity to thank Mike Hurn for all his efforts in putting together the quarterly Newsletter of WIAS and for providing such a valuable record of the meetings and work of the Society. It is quite a responsibility and Mike carries out the task in a quiet, good-humoured and effective manner. Mike always welcomes contributions from members, and he is very grateful for those received. Thanks are also due to our former editor, Arthur Astrop. Arthur is unable to attend meetings because of his wife's ill-health, but maintains contact with the Society via his proof-reading of each edition of the Newsletter.

This final edition also enables me to give notice of the AGM of the Warwickshire Industrial Archaeology Society to be held on September 9th, 2010 at 7.30 p.m. in the Pyne Room, Warwick School. No major changes are planned for the working of the Society, although we will have a new treasurer, with Victor Lobb kindly agreeing to take over from Richard Hartree. Formal thanks will be delivered to Richard at the AGM, but it has been very reassuring to know that the Society's finances have continued in such good health under Richard's careful stewardship.

The full programme of meetings for next year will be delivered in the annual mailing over the summer, but the mix will again be that of industrial archaeology, history and heritage, covering local sites and those further afield, with speakers drawn from within the Society as well as outside speakers. I really do believe that contributions from members are vital to the long-term success of the Society, and this has been fully reflected in the excellent talks delivered by members over the past twelve months.

The programme for the remainder of 2010 is shown below. The December meeting will be a talk by those WIAS members who attended the AIA Conference in Cornwall in September. Although we have enjoyed several fine talks on Cornwall over the years, the AIA conference gives access to some areas and sites not normally open to the public. In addition, this year is the 100th anniversary of Tom Rolt's birth, and in his memory - and in place of the traditional Rolt Memorial Lecture at the Conference - there will be a symposium on the theme *'Remembering Tom Rolt'*, and members hope to be able to report and reflect on the content of the symposium.

Martin Green

Shrewley Horse Tunnel

'Continuing the series of occasional articles on historic civil engineering works in Warwickshire by Roger Cragg.'

At Shrewley the Warwick & Birmingham Canal (later part of the Grand Union canal system) passes through a 433 yard tunnel under a ridge of high ground. The tunnel was opened in 1799 and, as was the manner at that time, there is no towpath through the tunnel. Consequently the towing horse would need to be unhitched from the boat and led over the hill to rejoin the canal at the other end of the tunnel.

Although the canal tunnel itself is not particularly remarkable, the distinctive aspect of this tunnel is that at the west end the towpath, after rising from the side of the deep cutting leading to the canal tunnel, passes through a short tunnel of its own high above the canal before emerging to reach the village of Shrewley. This feature is believed

to be unique. At the entrance to the tunnel the towpath is about 15 ft. above the level of the canal.

The towpath tunnel is about 176 ft. long and 8 ft. high. It has vertical walls and a semicircular arched roof and rises on a steepening gradient. The width of the tunnel varies from 9 ft 6 in at its lower end to 8 ft 4 in at the upper end. Most of the tunnel is paved with brick with raised courses to afford a grip to the hooves of horses but the highest 32 ft of the tunnel has recent concrete steps. The towpath tunnel can be accessed down a narrow footpath between the houses on the west side of the main street.

The horse path crosses the village street and continues down a footpath to rejoin the canal at the east end of the tunnel.

National Grid Reference: SP 214673

Roger Cragg

PROGRAMME

September 9th 2010

Annual General Meeting of the Warwickshire Industrial Archaeology Society.

Followed by *'The Last Picture Show'*: a showing of 35mm slides by members to reflect the work of WIAS over the past 21 years

October 14th 2010

Mike Glassson, curator of the Walsall Leather Museum, and author of several books on the leather trade: *The Walsall Leather Industry*

November 11th 2010

Sarah Chubb, borough archivist for Sandwell Community History and Archives Service:

Chance Brothers – glassmakers of Smethwick

December 9th 2010

WIAS members who attended the AIA Conference in Cornwall: *'Aspects of the industrial heritage of Cornwall'*

NEWSLETTER

Meeting Reports

March 2010: A Joint Meeting with The Leamington Society

Matthew Rhodes and Bernard Perkins: *Past and future renewable energy from the Leam*

William Louis de Normanville was the Borough Engineer and Surveyor of Leamington Spa for 35 years, from 1882 - 1917. During this time he engineered the river, built the Mill, York and Adelaide Bridges, renovated the Pump Rooms building, laid out Victoria Park, created York Promenade, made the Mill Gardens, was architect of the Boat House and the Pump Room Swimming Baths with its unique roof. He also sorted out the town's sewage system. Today, most of de Normanville's buildings and landscapes are listed by English Heritage and the place where he lived, 6 Clarendon Crescent, is commemorated with a Warwick District Council plaque.

Janet Storrie, who wrote this appreciation of de Normanville for The Leamington Society, has chronicled his life and works in her book: *William Louis de Normanville: Engineer, Architect and Inventor, 1843-1928, and His Role in Creating Royal Leamington Spa* (Weir Books).

It was, therefore, very appropriate that the first joint meeting of The Leamington Society and WIAS should be concerned with an engineering aspect of de Normanville's legacy and Bernard Perkins & Matthew Rhodes of the Environmental Consultancy, Encraft explained the past and examined the future prospects for extracting renewable energy from the Leam.

Before looking at de Normanville's efforts to use the Leam to power a pump, Bernard Perkins reviewed the history of the site at Mill Road. There is a reference in the Domesday Book to 'Mills on the site of a weir' but the remains at Tamworth of an 8th Century horizontal wheel mill of a similar configuration to the Dounby Click Mill on Orkney and a 10th Century Anglo Saxon Charter for a Mill near to Stratford point to earlier uses of the Leam as a power source. The Domesday record is for 2 mills at 24 shillings in Lamintone.

Over the next 1,000 years there are references to mills in 1520, 1635 and 1684 and Bernard Satchwell (1732-1809) recorded a mill in a painting. Oldhams Mill 'a heavy building with tall chimneys' was built in 1832 on the South side of the present Mill Bridge and lasted until 1889. At the turn of the 20th Century, de Normanville produced a proposal to utilise the Leam to pump water to the reservoir on Campion Hills and in summer for the swimming baths.

The benefits would include: savings in coal bills, an improvement of the Mill Property and the opening up of the grounds to the Willes Road. Technically, the proposal would locate a turbine in the storm culverts of a new weir, charged via a penstock at its outlet end, with pumps fitted in an adjoining chamber in the abutment. An output of 3½ - 18 Horse Power (2.6 to 13.5 kW) would pump 9,700 gallons/hour (44,000l/hr) at 28 rev/min.

In 1902 S Owens & Co of Whitefriars, London tendered de Normanville (referred to as 'Waterworks engineer') for a turbine and pumps to be manufactured by Gilkes of Kendal, 'the whole delivered and fixed Leamington for the sum of £335.00'. When Encraft approached Gilkes during the feasibility study process, Gilkes were able to recognise the reference and believed that original paperwork still existed in their archives. By 1903 the turbine was finished and a grand opening ceremony took place on 23 February with a full report in the Leamington Spa Courier. The next year saw some heavy rain and flooding, fortunately with no permanent damage to the installation. Its maintenance passed into the hands of the Waterworks Committee and is recorded in the Borough Engineer's Handbook (1887-1933).

Coming up to date, the story of the current Restoration Project was taken up by Matthew Rhodes. The project also includes work on the second Leamington mill site, the weir at Princes Drive, which will involve an Archimedes screw installation. Matthew concentrated on the Mill Bridge where a number of studies have been undertaken, partly in conjunction with the restoration of the Jephson Gardens, to utilise the Leam again for some useful power.

The proposal is to install new equipment inside the existing bridge abutments, but now for electricity generation not water pumping. A number of issues have had to be addressed, some

of which would be familiar to de Normanville. These include: variable water flows, fish protection, civil engineering, leisure use, environmental impact, grid synchronisation, flood defence and financing. As Matthew noted, de Normanville has already done a lot of the difficult technical work and the chambers and sluices are all in place, as is the weir.

The principle issue today is how to produce electricity economically for as much of the year as possible given the very variable seasonal flow of the river. Cost considerations mean that the proposed design will have two 13.5 kW Kaplan turbines which will operate together for 20% of the year and one only for a further 20% of the year, giving a typical generating season from October to February. The estimated annual output is 110 MWh (sufficient for 30 households) from Mill Bridge only and the combined annual output of Mill Bridge and Princes Drive is 200 MWh.

Encraft have carried out a preliminary Environmental Impact Assessment, and will commission a full report before proceeding although a scheme producing less than 500kW, such as this one, does not legally require an EIA. Amongst the criteria for consideration are: residual flow, conservation and biodiversity, pollution, water quality (turbidity), fish protection (screens and bypass over weir), townscape and visual heritage, traffic and access, public safety, noise, climate change, the community and jobs and not least, health and safety.

Another important consideration is flood defence. It is necessary to plan for possible flooding to half a metre above the Mill Bridge deck. Totally waterproof electrical rooms are needed and the scheme must allow for additional control and water paths for at least 10 cu. M/s and to add a controlled sluice to the boat bypass. However, if serious one in 125 year floods occur (as in 1998) Encraft consider that the weir structures become redundant and lost in a wider picture of flooding.

The Environmental Agency have detailed models for upstream and downstream flows which will be used to evaluate the scheme and, if necessary, to suggest extra control measures before proceeding with the scheme which will require 4 licenses from the Agency.

As with any project of this nature, the list of bodies to be consulted is lengthy and includes: The Environment Agency; Warwick District Council as the relevant planning authority and as landowners; statutory environmental bodies such as English Nature and the Countryside Commission and non-statutory bodies like Warwickshire Wild Life Trust; fisheries bodies or those with an interest in fisheries (e.g. angling clubs); Severn Trent; Central Networks; The Leamington Society and local residents.

There is also the small matter of financing the project whose total cost (including Princes Drive) is £380,000 of which the Mill Bridge is £235,000. A grant of £250,000 has been applied for from Natural England and one of £35,000 from Advantage West Midlands. The total value of the output, net of maintenance costs (£12,500 p.a.) and feed-in tariffs is £30,000 to £40,000 (indexed-linked). This would give a payback with grants of 2 to 3 years or 10 to 15 years without grants for a project with a life of 50 to 100 years. It is worth noting that the payback includes the costs of possible flood defence measures which are not normally accounted for in this way.

The present position can be summarised briefly. Await the outcome of the grant applications, after which the main stakeholder, Warwick District Council, has to decide on the preferred project structure. The balance of funding has to be raised; possibilities include loans, a community bond and public subscriptions (just like the Victorians). Agreement will be needed on the allocation of income; free electricity to Jephson Gardens, a community energy efficiency fund for free/cheap local insulation measures, general environmental projects or possibly returns to community bond holders.

All who attended thought the meeting set an excellent precedent for further joint events on subjects of mutual interest. As regards the proposal for a new micro-generation installation, the outcome will be looked at with much interest.

April 8th 2010: Dr Malcolm Dick

Matthew Boulton (1728 – 1809) and the celebration of Industrial technology

Malcolm Dick is the Director of the Centre for Birmingham and Midlands History at the University of Birmingham. His talk showed not only his grasp of the great issues at play in Britain at the onset of the Industrial Revolution but also his feel for the character of one of its leading players - Matthew Boulton. It was not by chance that Dick subtitled his collection of essays on Boulton *A Revolutionary Player* and described him as an industrialist, landowner, scientist and a contributor to transport development and the arts.

Boulton's importance was examined through his biographical details, how he was viewed by his contemporaries and colleagues and the environment and cultural milieu of his times. In particular Malcolm Dick's key theme was celebration; the celebration of Soho and manufacturing, the celebration of managing labour and the celebration of steam power.

Matthew Boulton was born in Birmingham in 1728, the son of a local manufacturer, and died in 1809. In partnership with James Watt, he developed the reciprocating and rotative engines which improved the quality of steam technology and stimulated its adoption into the British and world economies. In 1762 he opened the Soho Works, on the outskirts of Birmingham at Handsworth, which produced high-quality metal work, including buttons, ormolu and silverware, and became, reputedly, the largest factory in the world. Soho changed manufacturing by concentrating production under one roof. There were stores, drawing and design rooms and manufacturing units. Boulton moved into Soho House, a Georgian villa but no palace, close to his factory in 1766. It was one of the meeting places for the Lunar Society and the core of a landscaped estate. In 1787 Boulton established the Soho Mint and in 1795 the Soho Foundry in Smethwick, which was the first purpose-built plant to manufacture steam engines.

Boulton's educational background is unknown but he seems to have had no higher education and worked for his father from an early age. He was clearly both talented and ambitious and able to tap into the rise of Birmingham as an industrial centre with its focus on advanced technology and processes. He was also successful socially, marrying two sisters, each of whom brought a welcome dowry that he used to expand his business empire. Successful as Boulton was, his ambitions always outstripped his resources and his businesses were chronically undercapitalised. He demonstrated a desire to manage his image through the carefully chosen portraits painted at different times of his life and by exploiting Birmingham's place on the 'industrial grand tour' by potential customers.

Boulton lacks a proper biography, especially when compared to his Lunar Society contemporaries such as James Watt, Josiah Wedgwood, Erasmus Darwin and Joseph Priestley all of whom are arguably better known. There is a huge amount of archive material available on Boulton's activities which would present a daunting task for any potential author. Fortunately, James Watt and James Keir each wrote short appreciations of Boulton shortly after his death and a more detailed biography was written later by Samuel Smiles.

The Lunar Society was a centre for intellectual ideas and its members formed a network that extended from the Midlands to London, the Continent and the USA. It has been described as one of the most extraordinary and influential groups of late-eighteenth-century England. Collectively, its members comprised a clearing house for the ideas which transformed their country materially, socially, and culturally within a generation. Their major mutual interest was the sciences, pure and applied – particularly concerning the problems of industry. Exposure to such stimuli must have been exhilarating to a man of Boulton's temperament.

Dick used a selection of contemporary illustrations of the Soho Manufactory and its setting to give a vivid impression of Boulton's vision as well as the practical elements such as the complex arrangements for providing water power to the machinery which remained in use even after the installation of Watt's steam engines.

The Manufactory's classical facade echoed the nature of much of the product range. Erasmus Darwin, writing in 1768 praised a place which united landscape, production, elegance, technology, profit, chemistry, art and amusement.

Turning to the celebration of the management of labour, Dick emphasised Boulton's achievements in applying pioneering techniques in the division of labour. A button, for example, passed through the hands of ten people; each workman being responsible for only a small part of the process. A number of visitors to Soho have recorded their impressions, often remarking on the degree of mechanisation and 'the management of machinery' which led to the stimulation of production. Whilst the employment of female and child labour was observed, comment on social conditions was usually absent except that it was cheap and so reduced the need to employ scarce and expensive skilled men.

In 1767 Dorothy Richardson described Soho as a sensual and intellectual learning experience which connected beauty, elegance, spiritual enlightenment, science, commerce and education. Ten years later, an Italian, Carlo Castone made a comment that has a surprisingly modern ring. He said that the substitution of technology for skilled labour reduced industrial espionage: 'the consequence of letting the machines do the work is that the artisans do not know completely the whole process of work and cannot pass on the idea of how to design the products. The artisan is not able to pass on details of manufacturing to anyone else, because he does not understand the whole process.'

Celebrating steam power was one of Boulton's passions. Not only was it the most commercially successful of his many ventures but it justified his support over many years for the manic depressive Watt. The oft repeated, and paraphrased, comment, 'I sell here, Sir, what all the world desires - POWER', could serve as the motto for Boulton & Watt's partnership as well as one of the earliest of publicity slogans. Thanks largely to Boulton's insistence, Watt developed a rotary motion version of the engine that transformed manufacturing by freeing factories from the vagaries of water power. Interestingly, and giving the lie to any suggestion that Boulton lacked mechanical aptitude, he contributed the design of a vital link associated with the revolutionary sun and planet gearing of the rotative engine.

Erasmus Darwin celebrated Boulton's use of steam power poetically. In *The Economy of Vegetation* (1791), he transformed the engine into a giant of masculine energy which raised water and dug ores from the feminine earth, filled bellows with air to smelt metals, supplied towns with water, ground corn and released the copper from the mines of Anglesey which was then transformed into coinage at Soho.

Boulton's application of steam power to his ground-breaking coining machinery allowed the last of his great enterprises to flourish. The Soho Mint showed the way to produce coinage in high volumes (30 to 40,000 coins per hour) that was so accurate and consistent that forgery was virtually impossible. A flourishing export trade developed as a result.

Malcolm Dick concluded that Matthew Boulton was an enterprising promoter of industrial production who was communicating, literally, on an industrial scale. According to the evidence, those who visited the site absorbed positive messages about the quality of the Soho complex, the efficiency of labour management and the power of steam. Boulton established a set of markers of how to view industrialisation. These were dominant perspectives for the growing industrial *bourgeoisie* and others outside this class who welcomed industrialisation as a positive transforming force, but they were not the only ones. Industrial activity could be viewed intellectually as dimensions of the new sciences of economics, geography and geology (Adam Smith or James Keir) or it could be viewed critically – a dimension that was represented by conservative critics (Anna Seward or William Wordsworth) and radicals (like Thomas Spence or Robert Owen).

This talk was a fitting tribute to a great man.

May 2010: Peter Coulls, Alain Foote and John Willock *Willans Works*

Many members were surprised to learn the history of Willans & Robinson, a steam engine builder at the turn of the twentieth century whose products set the standards for others to try and emulate but of whom few of us had heard.

Thanks to the present management of Alstom in Rugby a significant archive of Willans & Robinson material has been deposited in the Warwickshire County Record Office, Warwick consisting of photographs, glass plate negatives, engine index books, drawings, commercial documents and much more - invaluable primary sources. Peter Coulls, Alain Foote and John Willock have been cataloguing this treasure trove and the first fruits of their labours was a fascinating and profusely illustrated review of this little known, but very important engineering company in Rugby.

Established in 1880, at Thames Ditton, Surrey, Willans & Robinson manufactured a unique series of high speed steam engines incorporating the patents of Peter Willans. Designed specifically for electrical power generation, Willans & Robinson central valve engines, at their peak, powered 68% of Britain's installed electrical capacity. In 1916, weakened by poor financial control, the company was consolidated into the Dick, Kerr Organisation which then became part of English Electric in 1919. English Electric at Rugby became GEC Turbine Generators in 1968 and in 1989 this became GEC Alsthom and later Alstom.

Peter Coulls began by outlining the lives of the two partners. Willans (1851-1892) was the engineering brain whose life was tragically cut short by an accident. He is commemorated by a plaque placed in Thames Ditton church by the workforce. An alumnus of Penn of Greenwich (a name that has occurred frequently in recent talks), Willans took out a series of patents for valveless engines for steam launches, and joined forces with Mark Robinson (1844-1923) to exploit them. Robinson seems to have been a very well connected administrator with a background in the Admiralty. He succeeded Willans as chairman but retired due to ill health in 1909. Robinson, however, was treasurer of the I Mech E for many years and also Vice President of the Institution.

Prior to the formation of Willans & Robinson, launch engines had been manufactured by sub-contractors including Tangye and Hunter & English, but never satisfactorily to Willans high standards. In 1880 the Ferry Works site in Thames Ditton was acquired and a comprehensive, vertically integrated factory created. Clearly capital was available for this and soon 400 people were employed producing engines for the launches of wealthy patrons including one Gordon Bennett, editor of the New York Herald. Patronage might have been secure but luck never was and in 1888 the works were destroyed by fire; rebuilt to higher standards including a very early example of flow-line production, they were severely damaged in devastating floods in 1894.

The archive has a wealth of photographic material covering these early years. We saw the full extent of the production process, including the use of jigs and fixtures, the staff and management and the wharf location. The works continued to be used after Willans & Robinson relocated to Rugby in 1896 for some component manufacture and subsequently it was bought by AC Cars and used until 1980 when car production ceased and then redeveloped for light industrial use. Some of the original structure survives to this day.

Rugby was chosen because of its central location, good and developing communications and particularly for an available pool of skilled labour. Further evidence of the capital available to Willans & Robinson is seen in the quality of the buildings of the Victoria works (echoing the Gothic architecture of the town and Rugby School) and the size of the workforce - some 950 at the outset. Again, the archive provided a wide range of photographs to illustrate the new works, its offices and other departments and it was particularly interesting to see the quality and ornateness of the interior fittings. Scagliola ionic columns are not common in drawing offices nor gothic stone staircases in entrance halls. The

welfare of the workforce was not neglected with a dining room and on-site bathrooms for the foundry workers.

A good example of the international nature of the business was shown in a group photograph commemorating the visit by the American Society of Mechanical Engineers in 1907.

John Willock then took us through the technicalities of the central valve steam engine. Its essential simplicity combined with scaleability allowed for a wide range of outputs from a few horsepower to 2,000 hp. This was vividly illustrated by a photograph of a workman holding a small piston and conrod alongside a large example that must be two and a half times his height. The Willans engine claimed to give great economy of steam together with durability and silent running at high rotative speeds. Durability was enhanced by having all the moving parts working in compression with no reversal of forces at any time.

The engines were designed to operate at near constant speed and steady loads and so were ideally suited for electricity generation. The development of the public electricity supply industry was good for the Company and there were many examples of engines coupled to generators in a wide variety of applications; base-load power stations and standby generation in department stores, clubs and offices. A 2,000 hp engine was shown at the Paris Exhibition of 1900 and others provided power for the first electrified London Underground train system.

Patents filed in 1890 and 1892 for forced lubrication in steam engines by the forerunner of Bellis & Morcom, a competitor of Willans & Robinson, allowed the development of the double acting steam engine which became a serious competitor to the central valve engine. Willans & Robinson were forced to consider their options and around 1900 the board decided that the steam turbine was the future.

Alain Foote then took up the story with the appointment of H F Fullager, who had worked with C A Parsons on steam turbines. He soon departed over differences of opinion on mechanical design and the board concluded a rather restrictive licence with C A Parsons in 1905. The licence authorised Willans & Robinson to build steam turbines in the UK only and not for marine propulsion. The licence fee was £1,000 with a royalty of 1/6 per kW of output if coupled to an electrical generator. Notwithstanding these conditions, a number of Willans-Parsons generating sets were produced for municipal authorities.

It was clear that any long term future depended on circumventing the Parsons restrictions and in 1906 attention was turned to the impulse turbine and experimental disc & drum and Curtis turbines were built. Eventually, the disc & drum type with a Curtis wheel at the high pressure end was adopted as a standard and many steam turbine powered generating sets were produced, often for export.

The early years of the twentieth century saw several other attempts at diversification, usually under licence despite the earlier experience with Parsons, and usually unsuccessful. These included: oil engines, condensers, various pumps, the Niclausse boiler, Vanadium alloys (which gave rise to the Izod impact testing machine, now a standard piece of materials testing equipment in laboratories around the world), high grade iron castings and even a boat disengaging gear. Perhaps the oddest venture was the Heilmann (steam-electric) locomotive which was an overweight and underpowered failure.

During WW1 the works manufactured a wide variety of items for the war effort including the Salmson aero engine. In some ways this engine typified the loss of technical direction that had followed the death of Peter Willans in 1892. A water-cooled radial engine with poppet valves it was an attempt at an advanced engine but not a 'first division' product. It is, perhaps, no surprise that Willans & Robinson failed to survive as an independent business but its legacy remains in Rugby with parts of the Victoria works now incorporated into the Alstom factory and known as Willans' Works and still involved with the manufacture of steam turbines and associated components.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

Annual General Meeting

The Annual General Meeting of the Society was held in the first part of the September meeting, and involved the election of officers for the year 2010/2011 and the receipt of both the Chairman's and Treasurer's reports.

In terms of the primary role of the society, the holding of monthly meetings to stimulate interest and research into industrial archaeology and industrial history, the Chairman reported that 2009/2010 had been a success with a variety of well attended meetings. These had involved both talks from members of the society and a range of outside speakers, and that this formula had been retained for the planning of the 2010/2011 season.

The Chairman expressed thanks for the support of the officers and committee of the Society, and of those with specific responsibilities such as membership, the newsletter, refreshments, the bookstall and the website, together with continued support from members for the monthly meetings.

After the presentation and acceptance of the treasurer's report, the formal transfer of the role of treasurer from Richard Hartree to Victor Lobb took place. Richard has done an excellent job as our treasurer, performing his duties in an effective, unobtrusive way, and, as he himself reported, hands over the finances in a very healthy condition. Victor has very much been 'treasurer-in-waiting' and we thank him for taking on this important role for the society.

No changes were made to the rates for membership subscription and meeting fees, although the outgoing treasurer did warn that a modest rise would need to be considered for next year, principally because of the rise in fees charged by visiting speakers and the slight increase in the charge for room hire. The charges have not changed for many years and it would be prudent of us to keep pace with inflation!

The meeting also heard that George and Lis Sayell had decided to end their duties as organisers of refreshments. The Chairman recorded his - and

the Society's - thanks to them both for performing this role in such an efficient way. Enthusiastic volunteers are being sought to fill this gap - perhaps in some form of rota.

Outside the formal meetings, the invaluable contribution of individual and group research on specific sites and company histories continue to take place and we look forward to the presentation of the results at a monthly meeting or as part of a members' evening at some stage in the future.

WIAS continues its links with the Association for Industrial Archaeology, and four members had attended the recent conference in West Cornwall. One important announcement at conference was the confirmation of the appointment of WIAS member Chris Barney as Affiliated Societies Officer, providing links between local societies and the national organisation. It will be interesting to hear of the issues faced by other local societies, and may provide us with useful guidelines for the future.

Future Directions

It was the AIA conference and the arrival of the notice for the AGM of the Greater London Industrial Archaeology Society (GLIAS) that prompted me to air a few thoughts about the future direction of WIAS. The GLIAS letter highlighted the fact that the Society was run by a few members of the committee, and that the committee had changed very little over many years. Where was the next generation of the committee to come from?

WIAS might be characterised as occupying a similar position, and, indeed, has fewer officers than many societies. For example, many local history/industrial archaeology societies have a meetings secretary separate from the Chairman, and someone responsible for walks and visits. This seems to be a fruitful direction for us to travel. Getting more people involved with highly specific but limited tasks could add a great deal to the society, as well, of course, as providing enjoyment and a sense of achievement for those involved.

Some aspects for potential development

There are a number of issues that

we could seek to address. Perhaps most important is the development of the recording of industrial archaeology and industrial history for Warwickshire, and I am increasingly convinced that the website and digital recording provide the way forward.

In many instances, the first contact from outsiders with the industrial archaeology of Warwickshire comes via a search of the internet for a website. The WIAS website has been developed by Peter Riley, and he gives a good deal of time and expertise to providing an attractive and informative site. He reports that much of the material on the site depends on contributions from members, and we have been discussing ways in which we might develop this into a more formal and structured coverage of the IA sites of Warwickshire. I shall be reporting back to subsequent meetings - and via e-mail - of the suggested way forward, and there will be plenty of opportunities for members to be involved.

Other aspects for future development might be the formation of a group to work on the techniques of oral history and the creation and editing of subsequent recordings, and an individual (or small group) who might take on the responsibility for organising (a small number of) visits and/or walks, mainly for the summer months. Members may have other ideas for the development of the Society and I hope to be able to return to some of these themes at our monthly meetings, once they have been discussed within committee.

Martin Green

PROGRAMME

October 14th 2010

Mike Glassson, curator of the Walsall Leather Museum, and author of several books on the leather trade: *The Walsall Leather Industry*

November 11th 2010

Sarah Chubb, borough archivist for Sandwell Community History and Archives Service:

Chance Brothers - glassmakers of Smethwick

December 9th 2010

WIAS members who attended the AIA Conference in Cornwall: *Aspects of the industrial heritage of Cornwall*

NEWSLETTER

Meeting Reports

September 2010: *The Last Picture Show - Some 35mm Slides from WIAS Members*

The interests of the membership of our Society are very wide-ranging as was evidenced by the content of 'The Last Picture Show'.

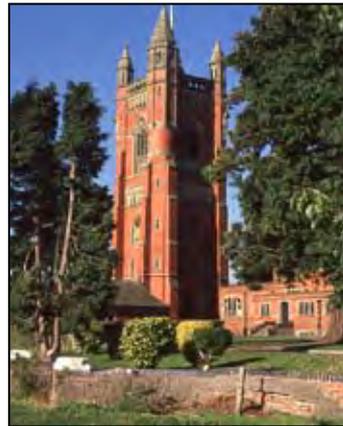
The following selection of subjects attempts to encapsulate those interests and, as with the presentations, has to suffer from space constraints. Apologies are, therefore, due to everyone whose special interest has been omitted and to those who have little or no interest in the subjects that have been chosen.

Roadside furniture is frequently used to illustrate the work of local foundries as well as different design styles. Typical examples are fingerposts and milestones or markers.

Buildings encompass many aspects of Industrial Archaeology and a wide variety of industrial processes are involved in their construction. Not only do we get a sense of period and purpose from the architecture but also of manufacturing technologies from brick-making through glazing and furniture to the production processes that took place within the building.

Princethorpe College chapel built on the site of the former St Mary's Priory in Ruabon Red Brick to designs by Pugin.

Photograph: Peter Chater



The cast iron Finger post to Myton Hamlet was made in 1938 by Richards (Leicester) Limited and is in good condition apart from a missing finial.

Photograph: Richard King

The Milemarker on Pittern Hill near Kineton was cast by the prolific local foundry of Glover & Sons in Warwick and is a good example of this ubiquitous item.

Photograph: Peter Chater



The former Nelson Dale Gelatine Works known as Emscote Mills, subsequently the home of English Rose Kitchens and now a furniture store.

Photograph: Richard King



Behind St Mary's Church in Leamington is an example of the early prefabricated buildings offered by many manufacturers and widely used as churches, village halls and clubhouses.

Photograph: Richard King



The restored bridge load warning plaque on the Lighthorne road at Kineton. originally erected by the Stratford on Avon and Midland Junction Railway

Photograph: Richard King

The town livestock market has largely disappeared in Warwickshire, together with many of the buildings, but Rugby held on longer than most. Shown here is one of the sales rings at Rugby Market.

Photograph: Martin Green



Industrial Archaeology can rub shoulders with conventional Archaeology, often to mutual benefit. Whilst engineering innovation is of great importance it is often useful to examine how earlier 'engineers' solved similar problems, especially in the realms of civil engineering.



Stare Bridge at Stoneleigh, built by 13th Century Monks is a splendid example of Medieval architectural and building practice.

Photograph: Peter Chater



Needle making has always been a relatively small-scale industry in Warwickshire. The Minerva Works in Alcester were unusually large and are now converted to multi-occupancy.

Photograph: Martin Green

One of Warwickshire's most famous land marks, Chesterton Windmill, attracts visitors from all over the world. On this occasion, the visitors were members of the Greater London Industrial Archaeology Society.



Photograph: Martin Green

Small scale industry, often with an agricultural connection, has always been an important part of Warwickshire's economic activity. Sawmills are one such example. Shown here is the (now demolished) Cubbington Sawmill.



Photograph: Martin Green

In every subject there is a place for a miscellany of examples that do not fall into any clear category. These two arbitrary selections give some idea of the wide range of potential subjects that can catch the eye.

A major part of the work of any Industrial Archaeologist is the preservation, if only as a pictorial record, of our industrial past.



The Potterton Works site in Leamington had long been associated with engineering. It has now been replaced by housing, offices and a medical centre.

Photograph: Martin Green



The evocative sculpture by Peter Hollins over the entrance to the Birmingham Gun Barrel Proof House.

Photograph: Peter Chater

Warwickshire's association with the motor industry has suffered serious decline in the past 25 years. The once-proud frontage of Automotive Products, Leamington Spa, is now just a memory.



Photograph: Martin Green

The unusual wicket gate at the entrance to a churchyard in Upper Shugborough. Combining the skills of blacksmith and carpenter or joiner it must have presented some challenges to those who used it.



Photograph: Peter Chater

June 2010: Bernie Cope

Toye Kenning and Spencer

Not a slide to see all night, but what a feast for the eye was Bernie Cope's survey of the products of Toye, Kenning and Spencer, by appointment to Her Majesty the Queen suppliers of gold and silver laces, insignia and embroidery.

The name of Toye, Kenning and Spencer has long been synonymous with quality, craftsmanship and service. For over 300 years members of the Toye family have been skilfully creating identity products for civil and military markets. The firm's founder, Guillaume Henri Toyé, arrived in London in 1685, a penniless Huguenot refugee who began weaving gold and silver laces for the military. Today, the family tradition is unbroken and although the Toye Group of Companies has grown and diversified, the original aim is unchanged - to design and manufacture the highest quality identity products.

TKS craftsmen and women are experts in weaving, gold and silversmithing, enamelling, screen printing and in hand and machine embroidery. Traditional skills and computerised technology are combined to design and create individual items or a range of products to promote an organisation's identity.

These activities are undertaken at a number of locations in the UK. The main textile factory is in Bedworth where a huge variety of ribbons are woven, now using computer-aided design, and exquisite hand embroidery is created. In Birmingham's Jewellery Quarter are found hand-painted enamelling and machine engraving whilst at Ogmere Vale in South Wales there are die-sinking and presses for high relief medals. Machine embroidery at Preston, hats and caps at Weston in Hertfordshire and ties and scarves at Bury St Edmunds complete the Toye Group's manufacturing facilities. A shop in Great Queen Street, London alongside the Masonic Rooms caters for those seeking regalia and other items.

Bernie Cope is the production director of TKS and after over 30 years with the company there seems to be little about it that is unfamiliar to him. As a result we were treated to a virtual tour of the business, illustrated by a bewildering display of its product range.

Bernie also gave us considerable insight into the difficulties faced today by a long-established British-based company with long serving employees, many with unique skills, competing against overseas suppliers from Pakistan to China. Not the least of the problem appeared to be the attitude of major customers, such as the Ministry of Defence, who issue a high specification for tender, then give the contract on price without checking the quality that comes with a low price! As a result TKS have lost out on some long established contracts. In addition, the overseas competitors are improving their quality all the time.

Fortunately, TKS themselves are winning substantial export business, notably from Commonwealth countries and especially where the very best quality is required. Bernie explained that the two shuttle looms at Bedworth are weaving the best ribbons in the world and his samples included a special watered silk Masonic ribbon and many examples using gold and

silver threads. These ribbons have many uses including: braces, watch straps and medal ribbons where quality is paramount. Colour matching is very important with repeat orders and TKS is able to refer back to original specifications and patterns, some going back to the early twentieth century. However, the UK's specialist dye houses are a disappearing breed, again through the fall off in demand.

Another problem facing manufacturers like TKS is the loss of machinery from the UK as British firms move equipment to lower labour cost countries such as Pakistan. If you can't beat them, join them! However, not all machinery skills have gone from the UK and Bernie was justly proud that TKS had restored the shuttle loom that can be seen in the Herbert Art Gallery in Coventry and, moreover, the accompanying video is of a similar loom working at Bedworth.

Examples of hand embroidery, especially a large coat of arms, impressed greatly but served to provide another salutary tale. Thirty years ago TKS regularly employed 30 to 40 women at this work but today most of their requirements are bought in from Pakistan! The fate of the company's traditional outworkers is the same, declining from 80 to less than ten today. It is difficult to train up new skilled people when the available pay rates are close to the minimum wage. However, all was not gloom and TKS continues to be a Royal Warrant holder and the samples included a medal cushion produced annually for Prince Charles, horse cloths and trumpet banners.

Another product line with plenty of interesting examples came from Western Cap; sporting headgear jostled with military and police caps but this business is also suffering from reduced demand and serious overseas competition.

Machine embroidery uses sewing machines having up to 15 needles and an automatic colour change mechanism to produce school badges on shirts, badges on hatbands and similar applications. Ties have been manufactured in the past but now only a few are made in the UK because of overseas competition. For example, a silk tie costing £8 made in the UK is only £3 when sourced in China. Screen printing is used on mugs and other substrates.

Bernie closed his talk with examples of hand painted enamelling including the insignia of various Orders of the British Empire which also featured ribbons woven at Bedworth. Other examples of the very best of workmanship were elaborate pole tops where there is a good export market in developing countries.

An extended question and answer session gave Bernie plenty of opportunity to expand on his earlier comments and we were left with few illusions about the difficulties, the trials and the tribulations of being a specialist manufacturer in the UK today. Fierce, low cost competition from overseas, customers who issue high specifications for tender but place the order with the lowest price. There are plenty of examples of contracts won by overseas suppliers at prices below TKS's cost!

Nonetheless, Toye, Kenning and Spencer had a turnover last year of some £8.5 million and are quietly confident about the future. There is certainly a long and proud history to be continued by future generations of the Toye family.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

With the onset of New Year, thoughts inevitably turn to the prospects for meetings, conferences, and visits that may lie ahead in 2011, and I thought it would be appropriate for me to mention the City Safaris run by Heritage of Industry. This is a small, friendly company which has been organising specialist industrial history tours to many parts of the world including the UK, Europe and further afield for more than 21 years. I give the tours a special mention in this Newsletter because one of the City Safaris for 2011 is to the Heart of England, based in Coventry, from 24 to 27 March. Full details are on the website www.heritageofindustry.co.uk.

Heritage of Industry is also the exclusive overseas tour provider for the Association for Industrial Archaeology, and they have organised some magnificent overseas trips. They plan to go to South Australia and Tasmania in November 2011 to coincide with the 16th Engineering Heritage Australia Conference in Hobart, Tasmania.

There are members of WIAS who have been on these domestic and overseas trips, and I am sure they would be happy to pass on their experiences to any interested parties.

WIAS has more modest targets, but plans to try and increase the number of visits it makes to industrial sites and premises, some of these directly linked to our monthly meetings.

All that remains is for me to send best wishes for the New Year to all members and supporters of WIAS. I do hope that the Society can contribute to your enjoyment of industrial archaeology and industrial history during 2011.

Martin Green

Umberslade Hall Drive Bridge

Continuing the series of occasional articles on historic civil engineering works in Warwickshire.



A detail of the main arch of the bridge, note the fine quality of the stonework

Just to the east of Tamworth in Arden the route of the Birmingham & North Warwickshire Railway from Tyseley to Stratford upon Avon crosses over the driveway leading to Umberslade Hall. The bridge which was built here is a superb example of late skew masonry arch bridge construction. The bridge has three spans on an acute skew angle, the arches being semi-elliptical in form and built in finely dressed ashlar sandstone. A small stream flows through the easternmost arch. The first three courses of masonry in the arches are horizontal, above these is a single course of blocks cut twice the normal size and notched to receive the skew blocks which comprise the remainder of the arch. The centre span is 39 ft and the side spans 31 ft on the skew. The bridge dates from about 1908, the railway having opened on 1st July of that year. The Engineer was H. D. Smith, the Resident Engineer for the GWR and the contractor was C. J. Wills & Son. The bridge is built to a much higher standard than most of the other bridges on the line, presumably for the owners of Umberslade Hall.

The Birmingham & North Warwickshire Railway was authorised in 1894. This line was projected privately as a direct route from Birmingham to Stratford upon Avon but did not make any progress until 1900 when the GWR took over the project and built the line in its present form from a junction with the GWR main line at Tyseley direct to a junction with the Great Western Hatton to Stratford line at Bearley. This route, together with a line between Honeybourne and Cheltenham, opened in 1906, gave the Great Western a new direct route to Bristol largely independent of the Midland Railway.

National Grid Reference:

SP 119709

Roger Cragg

PROGRAMME

January 13th 2011

Sarah Chubb, Sandwell Borough Archivist:

Chance Brothers: glassmakers of Smethwick

February 10th 2011

Peter Cross-Rudkin:

The life and works of John Rennie (1761-1821)

March 10th 2011

Anthony Leahy and Martin Green:

Nelsons of Warwick – gelatine and a great deal more

April 14th 2011

Tim Booth:

Warwickshire Mills, news of research and updates on the state of various mills in the county

May 12th 2011

Members Evening:

a chance for several short contributions from members

June 9th 2011

Damien Kimberley, of Coventry Transport Museum:

The Coventry motor-cycle industry

NEWSLETTER

Meeting Reports

October 2010: David Mills

The Walsall Leather Industry

Unfortunately, Mike Glasson the Curator of the Walsall Leather Museum was unable to speak to us but he was represented by the Assistant Curator, David Mills. David has spent 21 years with the Museum and authored many publications about Walsall, its people and its industries.

He began by setting Walsall's industrial history into context. The Walsall Arboretum Lake is the remains of an old limestone mining site and served to illustrate the extent of the local mining industry. A view of the High Street in the 1840s showed what recent rebuilding had destroyed – and the rebuilding leaves much to be desired. However, at that time, Walsall's leather industry was about to take off from an interesting base.

Whilst there is no reference in the Domesday Book to the town, it can trace its history for over 1,000 years and evidence of metal working in Walsall exists from as far back as 13th century. This is not surprising in view of the fact that all the necessary raw materials were available locally: iron ore, limestone, charcoal and later, of course, coal. By the 15th century the lighter metal trades, in particular the making of small items in iron and brass were well established. Some of these manufacturers were already specialising in horse furniture. Three Walsall loriners occur in 1435 and thereafter the trade is often mentioned. A century later, in 1540, the antiquary Leland noted that "Ther be many Smithes and Bytte Makers yn the Town".

A Loriner makes and sells bits, bridles, spurs, stirrups, saddle trees and the minor metal items of a horse's harness. The word Loriner is derived from the Latin *lorum*, a thong, bridle or reins, and seems to have entered the English language, from the French, as *Lorimer*. The craft has long since disappeared from the City of London but the Worshipful Company of Loriners is one of the oldest of the City Livery Companies and national centre of the craft today is mainly in and around Walsall.

Before the Industrial Revolution, bits, spurs, stirrups and buckles would have been hand forged and produced in small family workshops, mainly in the back yards of the loriners' dwellings. Walsall products were reaching a wide market by the mid 16th century. By the late 17th century, the saddlers' ironmongery trade was becoming highly specialised and articles could include parts made by several different craftsmen. A variety of patterns were produced, as evidenced by Robert Plot in the 1680s when he noted several designs of spur, five types of snaffle with six varieties of end, six types of bit, four sorts of stirrup, and other ironwork including curbs, chains, bolts, rings, swivels, saddle-bars and plates.

The industry continued to prosper in the eighteenth century as life in Britain became more affluent and improvements in the roads led to an increase in horse-drawn transport. A list of trades in 1770 includes nineteen spur and spur rowel-makers, eleven stirrup-makers, five bit-makers, eighteen snaffle-makers and ten saddlers' ironmongers.

Against this background, together with the railway boom which saw many hundreds of trains daily passing through the town, one Thomas Newton (1810-1889), an established Loriner, saw the opportunity to develop a saddlery business which offered better returns than lorinery. Newton is considered the father of the commercial saddle trade and recruited many skilled leatherworkers to his burgeoning business.

Any survey of Georgian/Victorian England will show that horses were an essential part of Victorian economic and social life. The working horse was still the chief means of power on most farms, the military were in constant action abroad and the local transport of people and goods depended on horsepower. In total there were something like 3.3 million horses in late Victorian Britain. All needed saddlery, collars, harnesses and other equipment, and Walsall could supply everything.

In the last decades of the 19th century the Walsall leather trades entered upon a 'Golden Age' of unprecedented prosperity. Exports boomed and Walsall firms sent their products to most parts of the British Empire. Foreign wars provided a particularly lucrative source of trade.

The Walsall manufacturers were swift to adopt new methods and the first sewing machines were in use by the 1860s. However, suspicions about the quality of machine stitched saddlery persists to this day but anecdotally, the difference between the so-called top and the better quality products is said to be none but only dependant on the purchaser's wallet.

The coming of the internal combustion engine began the inevitable decline for Walsall's leather and lorinery industries which had employed some 7,000 people. Albeit in a mass of tiny and often primitive backyard workshops, intermingled with a handful of factories each employing perhaps two or three hundred people. At the turn of the 20th century Walsall was home to nearly a third of Britain's saddlers and harness makers. Some diversification was attempted into such products as dog coats, bags, gloves and belts but the glory days were over by the 1930s.

Turning to the Leather Museum itself, this is housed in the 1891 building of J Withers & Sons, Manufacturers of Horse and Carriage Mountings, Spurs, Bits & Stirrups. Rebuilt, restored and extended, today visitors can discover why Walsall became the British leather goods capital in a working museum which seeks to celebrate that great tradition and to reflect the achievements of the leather craftsmen and women of Walsall.

In atmospheric, recreated workshops skilled leather workers demonstrate the process of hand-crafting leather goods such as wallets and purses. The displays around the museum tell the stories of the Walsall leather trade and feature splendid examples of local craftsmanship past and present, including saddles made for the Royal Family and exciting contemporary designs.

Walsall is still home to over ninety leather companies between them making an astonishing variety of items which are exported to most parts of the world.

November 2010: David Bright & John Brace

Water in Warwick

David Bright opened this members evening with the second instalment of his work on the Mill and Engine House at Warwick Castle. He preceded the detail with an account of how he became an archaeologist; thanks to accompanying an American visitor to the Castle and noticing the water wheel. A subsequent discussion with the then Manager led to David assisting in the development of the story of a neglected aspect of the Castle's history – domestic electricity generation.

A preliminary investigation of the mill area found that whilst the building had already been practically stripped out fortunately the relevant Castle papers were already in the possession of the County Archives.

David's datum for his presentation was the floor of the Engine House and he dealt with those elements that lay beneath it. Maps by Speed (1610) and Fish & Buckman (1711) showed possible water sources or leats for a wheel but the tunnels under the engine house had been bricked up at some time in the past. There was evidence of a turbine pit but no machinery.

A most useful piece of evidence was Lady Louisa Greville's painting of 1763 showing the Castle from across the river with the Mill House and wheel in the foreground. This view is at 90 deg to that of the Canaletto painting of the Castle.

From the archives came evidence of the original turbine. This was supplied by Gilkes of Kendal whose invoice dated 21 November 1894 showed that a Thompson Vortex Turbine was delivered and erected for the sum of £482.18.0. From this and the other residual evidence it had been possible to deduce all the elements of the 13 HP (10Kw) machine arousing the possibility of new power generation as part of the project.

More detailed investigation of the original layout drawings showed the inclusion of an eel trap alongside the water wheel. This aroused the interest of the Castle's present owners, The Tussauds Group, and the involvement of one Bernie Hall, an eel catcher. Any redevelopment would need to include some form of eel rack.

Returning to the technology of the generating plant, the turbine was supplemented by gas engines as the load increased together with a bank of storage batteries. A particular point of interest, and one of the weaknesses of the installation, was the 'chevron' or 'herring-bone' gear wheels incorporated into the drive mechanism from the water wheel. David had found similar mortise and tenon gear wheels at an old mill in Totnes as well as a technical article on moulded helical gears which showed the extraordinarily high foundry standards that were available at the turn of the 19th Century.

In 1983, consulting engineers Mander Raikes & Marshall were commissioned to report on the water flows of the River Avon. Water driven turbines need a steady flow and cannot cope with low summer levels nor winter floods. Furthermore, an inconsistent demand pattern makes planning very difficult. Various alternatives are being examined including the AUR Water Engine, an ingenious

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device that converts water flow into a reciprocating movement, the Kaplan Turbine and 'pod' turbines.

David left us with the promise of Part Three: 'Gas Engines, Dynamos and a Hole in the Roof' to come.

John Brace then entertained us with 'The Taste of Water' a wry look at the Warwick Syphon, not some receptacle for carbonated water but an integral part of the town's new (1876) water supply system. After reviewing the use of siphons by the Romans to carry water supplies over a hill John offered some contemporary views on the state of Warwick's water.

"So bad has been the state of the town water this week that no one, unless driven by sheer necessity, would use it for domestic purposes."

Warwick Advertiser 17 February 1866

After a tumbler of town water has stood for 30 hours. "It is yellow, muddy and so opaque that I cannot see one object in the room through it, nor can I define the outline of a strong gas light."

Warwick Advertiser 17 February 1866

"Its present condition [That is of the town water] is scandalously filthy - throughout the town it is regarded only suitable for water closets and watering gardens." "Being softer than any other water it is also used for washing but is so often muddy that white things cannot be washed in it." "Wherever possible it is not used for drinking - where so used let it stand till it gets clear or tie a piece of muslin over the tap to catch the creeping things that are sometimes 3/4 inch long." "While water from some pumps was perfectly transparent; that from others contained fibres and floccule; whilst from a few it was so thick and foul that even the town's water was drunk by preference."

E. Pritchard 1876

Pritchard was a consulting engineer with a need to promote his business which, at that time, was to improve the water supply to Warwick. He had even published a book on the subject before completing the project. His difficulty was to connect the source, between Hatton and Haseley, with the town but a hill lay in between. Unfortunately, the hill consisted of sand and gravel and could not be tunnelled or cut. Pritchard, consequently, proposed a siphon and vacuum pump solution and a drawing exists of waterwheel driven air pumps.

A search for precedents of such siphons had found none until a description of a flood control system on the Ouse near to Lynn in Norfolk was unearthed. Contemporary illustrations showed work on a coffer dam behind which was the dam proper. Other pictures of the dam showed details of pipes that were siphons. Could this have been the precedent for Pritchard?

John's pamphlet, *The Warwick Improvement Works* is a fuller account of the efforts to improve Warwick's water supply.

December 2010: Simon Topman MBE

Acme Whistles

A slightly nerve-jangling start (for the Chairman) was resolved around 7.45 when the speaker emerged from the kitchen behind a large box muttering about mis-directions from the car park. Thereafter, Mr Whistle, Simon Topman MBE did not disappoint and gave us a most memorable evening; instructive, informative, hilarious, noisy and above all imbued with the confidence that comes from being in total command of his subject.

Birmingham is many things to industrial archaeologists, but to few can it be 'the whistling capital of the world'. Simon's company, The Acme Whistle Company, is 140 years old and the sole survivor of the seven companies that made, over the years, some 1,000 million whistles between them. Acme's contribution being around half of the total. Interestingly, at the company's premises in Birmingham's Jewellery Quarter, can be found complete records and much of the production tooling for all products made since 1900, a treasure trove for historians and most useful for repeat orders.

In 1870, Joseph Hudson, a farm worker from Matlock moved with 17 members of his extended family into four back-to-backs in Ladywood. Hudson was a resourceful toolmaker and together with his mechanically-minded brothers rented a small workshop for 3/- a week. Amongst other things he made were whistles. This turned out to be the right product at the right time.

The Metropolitan Police force needed to replace the policeman's rattle with something less clumsy but which demanded attention. Tradition has it that Hudson was inspired by the sound made when he accidentally dropped his violin. The breaking strings 'let forth a dying breath' with a jarring discordant note which he set about replicating. The resultant whistle was tested by the police on Clapham Common and found to be audible at a range of over a mile.

The police liked the sound and promised Hudson a large order. He returned to Birmingham a happy man but became worried at hearing nothing for several months. He went back to London to find that the police had mislaid his address and had given an order to another manufacturer to produce whistles to Hudson's pattern. Happily for Hudson he prevailed on both parties to cancel the arrangement and he secured an order for 21,000 whistles. He even obtained an advance of £20 as working capital! Incidentally, the London Bobbies expressed a preference for the old rattle as it was a more effective weapon than the small whistle. However, the rest, as they say, is history.

The new policeman's whistle generated a lot of publicity with questions in Parliament and letters to the Times usually asking whether others could use the new whistle. As the use spread in the UK so there opened up the possibilities of 'Empire Trade'. Within a year Hudson was employing some 50 people in the jewellery quarter. All this was good, but how can a sound be advertised?

A brilliant solution was provided by the Pall Mall Gazette, a newspaper always looking to break new ground opened a special telephone line on 22 March 1884 to allow

the public to hear the new police whistle being blown. The 'official whistler' was exhausted after six busy days! Today, prospective purchasers can hear all the different Acme whistles on the company web-site.

Hudson was a prolific inventor and a good business man with a restless spirit that was forever seeking new users for his whistles and new ways to produce a different sound. Sports referees needed something authoritative and the introduction of the pea (never the dried pea of legend but a cork pellet) gave birth to the legendary Acme Thunderer.

Hudson's success allowed him to move to the more salubrious surroundings of the village of Handsworth where he became involved in the development of the Heathfield Estate surrounding Heathfield House, the former home of James Watt.

As the owner of the 53rd motor car registered in Birmingham, Hudson was more aware than most of the many cyclists for whom he devised 'the cyclist's road clearer' which is still made today as a sound effect as is the Acme Song Whistle, fondly remembered by fans of the Clangers.

Simon Topman is a brilliant raconteur with a huge sense of humour. His recollection of an early radio phone-in when he was asked where the peas for the whistles came from – answer – grown by ourselves on 16 acres of pea fields around the factory was typical. When challenged by a listener from Hockley who could not recollect any such fields he responded that thanks to genetic modifications all their requirements could now be grown in a few window boxes.

Other examples included the saga of the Titanic whistles and the missed opportunities to exploit the success of the film wherein a genuine surviving example from the ship was used. Kate Winslett demanded \$5 million to use a gold replica at the Oscars ceremony. An order for 7 million whistles for the Iraq army that took 18 months to complete. Incidents at international trade fairs that challenged diplomatic relations – a French competitor took exception to a rendition of the Marseillaise on a duck caller and many more. The Loch Ness Monster caller and the wartime lion roarer to scare Japanese defenders of Pacific Islands were but two others.

Hudson's technical expertise lived on through his sons and subsequent generations of management. Today, Acme has more than 40 active patents in place and exploits a range of modern manufacturing technologies. The company has a policy of introducing two new products a year which, together with a strong brand image, keeps them ahead of the competition.

As well as running Acme, Topman devotes much time to a special school charity which receives all the proceeds from his talks. Members purchases on the night added some £400 to his fee.

Finally, who could ever forget the tale of the vote of thanks at the WI meeting? As the voice at the back of the hall was heard to say: 'whatever shall we put in the minutes?'

Your reporter knows the feeling well!

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WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

A recent WIAS meeting looked at the history of brewing in Warwickshire, including the rise (and in some cases, fall) of a variety of micro-breweries in more recent times. These were themes explored in a national context at two recent events at the National Brewery Centre in Burton on Trent.

Saturday March 12th marked the launch of a report on England's brewing heritage prepared by Dr. Lynn Pearson and the Brewery History Society as part of English Heritage's SHIER (Strategy for the Historic Industrial Environment Reports) programme, and on the following Thursday a conference was organised to look at some of the issues raised by the potential regeneration of old brewery buildings.

I could not attend the Saturday conference but managed to squeeze myself into the regeneration seminar, and greatly enjoyed the experience of listening to professionals talking about some of the issues raised by potential regeneration. The AIA was well represented with Tony Crosby (Chairman, AIA) and Amber Patrick (Endangered Sites Officer, AIA), who had already done much pioneering work on the recording of maltings), with Keith Falconer (Head of Industrial Archaeology at English Heritage) delivering a keynote address on the brewing industry's SHIER.

There was much talk of funding, and one of the workshop groups sought to explore ways of raising money in a period of economic austerity. Other groups looked at the specific problems associated with the fabric of brewery buildings that made adaptive re-use more or less difficult. Issues such as 'the need for compromise', 'the new economy', 'localism', 'co-operative ventures', the 'Big Society' all received an airing, as well as much discussion of the role and future of the micro-brewing sector.

Also of great interest was a presentation by Cordelia Mellor-Whiting, curator of the National Brewery Centre, and the efforts involved in trying to make the Centre a going concern after a two-year period of closure. The land, buildings and many of the artefacts are all owned by the parent US brewing company – Molson Coors – and they lease the Centre to the current operators – Plant Solutions Ltd (a company specialising in visitor attractions). With the site in private hands, this presents interesting issues over funding – Heritage Lottery funds, for example, would be difficult to secure because those funds need to be directly linked to public (rather than private) benefit. As with so many museums of this type the skill of the curator not only lies in making the museum itself an attractive option to a range of potential visi-

tors (from dedicated industrial archaeologist to casual passers-by), but also in utilising the facilities of the site for a variety of other activities in order to boost revenue. The original museum was very much related to the Bass company, and one of the issues discussed was the possibility of bringing historical material from other breweries onto this site in order to develop the concept of a national brewing centre.

The Centre deserves our support as visitors, and I would heartily recommend it to you. At lunch, I also met a volunteer from the (nearby) Claymills Victorian Pumping station – and she argued strongly for a dual site visit to make the most of a day trip to Burton on Trent! www.nationalbrewerycentre.co.uk. 01283 532880 and www.claymills.org.uk. + 01283 509929

Martin Green

PROGRAMME

April 14th 2011

Tim Booth:

Warwickshire Mills, news of research and updates on the state of various mills in the county

May 12th 2011

Members Evening:

a chance for several short contributions from members

June 9th 2011

Damien Kimberley, of Coventry Transport Museum:

The Coventry motor-cycle industry

NEWSLETTER

Meeting Reports

January 2011: Sarah Chubb, Sandwell Borough Archivist
Chance Brothers: glassmakers of Smethwick

Sarah Chubb, of the Sandwell Community History & Archives Service, gave us a new perspective on Industrial Archaeology, that of a professional archivist. Whilst amongst members there is a considerable amount of knowledge concerning the activities of Chance Brothers of Smethwick and their expertise in many fields of glass manufacture, few have had experience of the behind the scenes work needed to preserve company records for posterity. And the Chance Brothers archive is undoubtedly an important record.

Sandwell is one of the four Black Country Authorities and includes the towns of Oldbury, Rowley Regis, Smethwick, Tipton, Wednesbury and West Bromwich. Consequently, there is a rich industrial past that needs to be conserved. Engineering, chemicals, brewing and steel as well as glass-making have all taken advantage of the area's natural resources and skilled workers.

The Chances were a yeoman family whose members included both farmers and craftsmen. In 1824 Robert Lucas Chance, bought the glassworks of the British Crown Glass Company in Spon Lane, which specialised in making blown window glass.

Prior to this, Chance had worked at the Nailsea glassworks near Bristol, owned by his father William Chance where he was affectionally known as a twelve year old as *the little master in the jacket*. John Hartley, a crown glass expert, became a partner of the company in 1828 after being brought from the Nailsea glassworks. Robert's brother, William became a partner three years later. In 1832, Chance introduced the blown glass cylinder method for the production of sheet glass and opened a chemical works at Oldbury in 1835 to supply the chemicals required for glass manufacture. Following the death of John Hartley in 1833, the company was renamed 'Chance Brothers'.

The early Victorian era saw an explosive growth amongst the aristocracy and wealthy for ostentatious glazed buildings to house exotic plant collections and to provide year-round fruit for the table. Joseph Paxton's great glasshouse at Chatsworth was the forerunner of the Crystal Palace built in 1851 to house the Great Exhibition. Chance Brothers secured the glazing contracts for both buildings from which flowed other prestigious work, including glazing for the new Houses of Parliament (the opal glass for the four faces of the Westminster Clock was unique to Chance) and the ornamental windows for the White House in Washington. Other products included stained glass windows, ornamental lamp shades, microscope glass slides, painted glassware, glass tubing and other specialist types of glass.

Chance Brothers exhibited at the Great Exhibition and the archive includes copies of the catalogue. The exhibits showed their expertise extending from ultra-thin glass for microscope slides to complex lenses for lighthouses. This expertise owed much to Frenchman Georges Bontemps and his fellow countrymen who had come to work in Smethwick. Their skills were closely protected and only passed down from father to son.

However, James Timmins Chance, who had joined the firm in 1840 at the age of 26 was a prolific inventor and engineer who was responsible for many advances. He took a particular interest in optics and the Lighthouse Works was created in 1851 to meet the demand from around the world – especially from the maritime traders of the British Empire – for better aids to navigation and safety. Chance capitalised on the work of Fresnel in France to develop better and larger lighthouse lenses and eventually supplied

some 2,400 lenses to over 80 countries.

Chance created a coloured and ornamental glass department in 1848 under Bontemps although this lasted only until 1866. A licence was taken out in 1852 for the use of the Mason and Conqueror machine to produce rolled glass. Chance developed the process into a double rolling machine for the lamination of glass between rollers and using a second pair of rollers to imprint a pattern on the glass. This double rolling process was used to create a range of white and tinted figured/cathedral glasses.

As with many of their contemporaries, the Chances became involved in civic affairs and in 1900 a baronetcy was created for James Timmins Chance.

Advanced technology was never neglected; using the pioneering work of Sir William Crookes, Chance perfected optical glass that blocked harmful UV rays and indeed used the Crookes name as a trade mark into the 1960s. Chance also developed, in the 1930s, the manufacturing technology needed for cathode ray tubes – just in time for their widespread use in radar during the war. A 22" tube was exhibited at the 1938 Berlin Radio Show.

Chance played an important role during WW2 supplying optical glass for telescope and binocular lenses, Aldis lamps, Crookes UV lenses and special dark-lensed goggles for night fighter crews. Many of these items were produced in a shadow factory jointly owned with Pilkington.

In 1945 Pilkington acquired a 50% shareholding in the company but the Chance operation continued to be largely separately managed and a factory was established in Malvern, Worcestershire in 1947 to specialise in laboratory glass. The operation was incorporated as an arms-length subsidiary under the old name Chance Brothers Ltd. In 1948 the Malvern plant produced the world's first interchangeable syringe. When plastic disposable syringes displaced glass in the late 1960s, the range of its precision bore product was diversified.

By the end of 1952 Pilkington had assumed full financial control of Chance Brothers, but did not become actively involved in its management until later. Subsequently, the lighthouse works was sold in 1954, the optical division relocated to St Asaph in 1957, the Glasgow works closed in 1964, the rolled-plate division in 1976 and finally in 1981 the Spon Lane site was closed. The seven-storey listed building still stands alongside the M5 motorway but it is in a poor state of repair.

Sarah closed her talk with a review of the work undertaken by her department and shared some of the interesting finds that had been made. The extensive family papers, lodged in the Sandwell Borough Archive in 1990, confirmed the family's involvement in civic affairs. The bulk of the business archive had gone to Pilkington who eventually released the material to Sandwell where it now occupies some 30 cubic metres in 60 bays of shelving.

There are immediate issues to be addressed; original leather bindings have deteriorated badly plus cataloguing is being hindered by the random order in which the material has been stored. Of particular interest has been examples of pre-war glassware from the Orlic range, patents and trade mark applications, personnel records (including the notice of a drowning in Liverpool Docks and a knuckleduster made in the works). Not all available material is in the archive; at least two large photographic collections are known to be in private hands.

Finally, we in Leamington can see examples of Chance's ecclesiastical glass in three windows in the Parish Church.

February 2011: Peter Cross-Rudkin

The life and works of John Rennie (1761-1821)

Given the scale and quality of his work, it is surprising that John Rennie is relatively unknown; at least, in comparison with Telford, the Stephensons and Brunel, to name but a few of his peers in the pantheon of British Civil Engineers. Peter Cross-Rudkin, himself a distinguished engineer, lecturer and author provided a necessary correction and opened many eyes to the range of Rennie's works. The forthcoming London exhibition in July to celebrate the 250th anniversary of Rennie's birth is awaited with interest. Evidently there is a wealth of material available, not least thanks to a bequest in the 1930s to the National Library of Scotland by a descendant of Rennie and also within the Boulton & Watt papers.

Rennie's was not a rags to riches story. He was born the ninth child of a reasonably prosperous tenant farmer at Phantassie, East Lothian. The family house still exists. His older brothers found success in other fields but John Rennie showed an early interest in things mechanical spending much time in the workshops of a local millwright, Andrew Meikle, for whom he subsequently worked

Rennie set up in business on his own account in 1779. His first job was to rebuild Knowe Mill whose ruins still stand. Practising mainly as a millwright, he showed an early interest in fire engines. However, he also saw the need for more formal qualifications and enrolled at Edinburgh University for three years in 1780 to study natural philosophy, becoming the first civil engineer at the university.

In 1784 Rennie made a study tour to Birmingham and was offered a 7 year contract by Boulton & Watt who needed a millwright to supervise the construction of the Albion Mills in London. The mills became operational in 1768/9 but Rennie was allowed to undertake private work and set up his own manufactory in Southwark. A surviving testimonial letter recommends him as '*a country man of great integrity & of equal genius in the science of mechanics – he has not much fortune, but great knowledge as an Engineer*'

After meeting John Smeaton, one of the leading engineers of the day, Rennie was introduced into the business of canal surveying and building and over the next twenty years worked on many projects all over England and Scotland. His notable, and lasting contribution has been a number of elegant bridges. His first major work was on the Lancaster canal, crossing the River Lune with the only bridge to bear his name. Another river crossing used a siphon to duct the river under the canal. In Scotland the Crinan canal is still used by 'Puffers'.

Rennie foreshadowed Brunel in his use of a post chaise as a travelling office. An extract from his diary gives some idea of his hectic schedule; '*Left London for Scotland on Friday Oct 17th. 94. Got to Fantasy Tuesday 21st. Was on the London Canal business till Friday 24th. Arrived Inverary on Monday 27th. Left Crinan on Saturday Nov 15th. Stayed in Glasgow on ditto business till Wednesday the 19th. Got to Busbie (?) Saturday Nov 22nd. Was at Dunbar & Edinburgh on London Canal from 19th to 22nd.*'

Aqueducts on the Kennet & Avon showed his inventive architecture and the Calne Hill flight of 27 locks his determination. At the summit Rennie wanted a long tunnel but at Jessop's suggestion built the Crofton pumping station and a shorter tunnel with a watermill-powered pump at the Bath end in which Rennie pioneered the use of cast iron gearing.

Another example of Rennie's skills as a draughtsman was shown in the great detail included in the plans for the

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Rennie's first major work: carrying the Lancaster canal over the River Lune



Stoneleigh Abbey Bridge



John Rennie (1761-1821)

Act of Parliament drawing for the proposed Croydon & Rotherhithe Canal.

Other canal work throughout the British Isles has left us many examples of Rennie's bridges and their routes show his feeling for the countryside. His Boston Town footbridge was notable for its use of cast iron box-sections as if they were pieces of traditional masonry.

The bridge at Chepstow is not by Rennie, as is often said, but the confusion may be caused because he did submit a design. Two major bridges in London were his innovative Southwark bridge which nearly bankrupted the contractor and the impressive Waterloo bridge, similar to the earlier one at Kelso, which was opened by the Prince Regent in 1871. Rennie subsequently declined to accept a proffered knighthood.

In Warwickshire Rennie built the attractive balustraded bridge at Stoneleigh Abbey. However, his work was by no means confined to canals and bridges. He was extensively engaged in docks and harbour works, Grimsby, Sheerness with its innovative cellular walls and coffer dams, London Docks and harbours from Ramsgate to Peterhead and across the Irish Sea to Louth and Dun Laoghaire. Perhaps the most famous work at the time of his death was the massive breakwater outside Plymouth.

Rennie's involvement in the Bell Rock lighthouse remains disputed, Stephenson was the resident engineer but was not responsible for the design. Elsewhere, Rennie was involved in several East Anglian fen drainage schemes and water supply schemes for Manchester and London. A quarry at Stow on the Wold provided stone pipes, some relics of which can still be seen incorporated into a wall, but the joints proved unsuitable and cast iron was used instead.

Other works such as the sea walls at Reculver and the elegant cast iron pillars and trusses of the Dublin Customs House and steam ship schematics showed Rennie's mastery of different engineering techniques.

With such a body of work behind him, why is Rennie relatively unknown, especially compared with his contemporary Thomas Telford? Peter Cross-Rudkin suggested that Rennie was, in his time, regarded as pre-eminent but Telford survived him by 13 years and significantly became the first President of the Institution of Civil Engineers and, furthermore, had a body of work that has survived better than those of Rennie. Undoubtedly, the two men were serious rivals with very different attitudes to their profession. Rennie with his formal qualifications and consequent exposure to French engineering practices contrasted with Telford's attitude that a degree was unnecessary for an engineer.

Happily, enough of Rennie's work has survived for us to judge that he made a most significant contribution to our industrial and architectural heritage.

March 2011: Anthony Leahy and Sam Nelson:

Nelsons of Warwick – gelatine and a great deal more

An attendance of members and visitors totalling 134 stretched the Pyne Room facilities to the utmost whilst local historian Anthony Leahy and fifth generation family member Sam Nelson gave a fascinating presentation of the history of one of Warwick's most important family businesses.

The Nelson story involved much more than gelatine, ranging over food products, advanced manufacturing processes, cement works, the development of New Zealand's frozen meat trade, marketing methods used in Victorian times that are still used today, company housing and civic duty, photographic materials and finally a poignant explanation for the decline of a great family business.

Anthony Leahy led us through the Nelson history with a sure touch. George Nelson was born in Nottingham in 1800. After studying chemistry, he moved to Leamington and produced the first Leamington Salts by evaporation from the celebrated saline. He took out his first patent for the manufacture of gelatine in 1837.

George Nelson prepared his gelatine from buffalo hides. His vision was to create a product that was colourless, odourless and consistent. The sales of his gelatine product, increased rapidly, and the firm moved to Emscote Mills in 1841. George Nelson died in 1850, leaving five sons.

Thomas Bellamy Dale was the cousin and partner of George Nelson. He too had studied as a chemist and was involved in the business from its beginnings. He took an active part in local affairs, and was elected Mayor of Warwick on three occasions.

Gelatine softens and swells in cold water, but does not dissolve until it is heated; when the solution cools it solidifies to a firm jelly. Sources of gelatine are hides, calves' feet, and various animal tissues. Hides were used at Emscote. Gelatine was largely consumed as a food; blanc-mange, creams, table jellies, in extracts of meat, soups, and in many preparations of confectionary.

Emscote Mills are situated in Wharf Street on the Grand union Canal. The site was probably three times larger than today. The mills were largely self-sufficient, with all support trades on site. In 1899 there were thirty-eight steam engines on the premises pumping the wells, feeding the steam boilers, the filter presses, supplying power to the lifts and driving the endless belts and machinery.

Charles Nelson was the eldest of the five brothers, he started at the family's lime and cement works at Stockton. Thomas Dale ran the gelatine factory. Later Charles took a more active role in the gelatine business in partnership with his younger brothers, Edward Montague and George Henry. As in Warwick, Nelson constructed houses at Stockton, for their workers. The Village Hall and later the Nelson Club provided recreational and educational facilities. The Nelson Village in Warwick was a model development, containing work-men's cottages and two villas for the works managers. The village forms part of Charles Street and now, is all but lost in the expanse of the Percy Estate. In Charles Street stands the "Nelson Workmen's Club," opened in 1883 and is still in use.

George Henry Nelson devoted his life exclusively to the gelatine business. Despite his 40 years' service, very little is known about him as yet. For the most part he lived at the Lawn at Emscote which was home to the Nelson family from the 1840's up until the early 1920's.

The Nelson involvement in photography was established by 1880. Gelatine was one of the substances used to mount prints. It promised to replace collodion as the medium for forming the sensitive layer on glass plates. In 1896 the Warwick Dry Plate Company was formed to develop gelatine for improved photographic processing.

Nelson's advertised their products in many ways. One of the most popular being '*Nelson's Home Comforts*' a hard back cookery book, that was available for the cost of a stamp. Over

a million were distributed between 1880 and 1910.

The value of a celebrity chef's endorsement was also recognised and in 1882 Mary Hooper was commissioned to revise *Nelson's Home Comforts*. It is more than likely that Miss Hooper was sponsored prior to this engagement as all but one of her cookery books promoted Nelson's Gelatine exclusively. Mary began her literary career as a sub editor on the "Household Words" a weekly magazine edited by Charles Dickens

Edward Montague Nelson had a head for business. He was a deal maker who became head of the Colonial Consignment and Distributing Company and of Nelson Brothers, New Zealand. He was the Charter Mayor of Ealing, a Sheriff of Middlesex, as well as a mayor of Warwick. He was knighted for services to the Australasian Colonies, and in recognition of his public services.

William Nelson, the youngest of the five brothers has left us a valuable document in his diaries. These describe his time in Warwick and New Zealand whither, in 1863 he and his brother Frederick went. After abortive attempts at sheep farming William returned to England and married before returning to New Zealand but returning again to England in 1872 with his family before making a final move back to New Zealand in 1879. He established a tallow and canned-meat factory at Hawkes Bay with his brother Frederick. William Nelson is known in New Zealand as The Father of Hawke's Bay and is commemorated with Parks in both Napier and Hastings.

Nelsons played a significant part in the history of the frozen meat trade. William Nelson managed the New Zealand operation where works and a village for workers were established on the same principles as in Warwick and Stockton. The first cargo of frozen meat was successfully shipped to London in 1882. The Nelson brothers had established a new industry and over the next decade dominated the frozen-meat trade.

We learnt little about the next generation, save that Walter Nelson was killed in action during WW1. Of the fourth generation, the important figure was Guy Nelson who became Managing director in 1924. Much involved in civic affairs and charities, he was an Honorary Freeman of the Borough of Warwick, Deputy Lieutenant of the County, twice Mayor and an Alderman. He served on the Warwickshire Police Authority, the County Council and as a JP. He was a long-serving Chairman of Governors of Warwick School and the Guy Nelson Hall is named after him.

Finally, representing the fifth generation, his son Edward Montague (Sam) joined the firm in 1953 after spending time in East Africa serving in the Kenyan police force. However, the business was not in the best of health, the workforce of some 600 in 1900 had declined to only 90 in 1950 and competition was intense from some 60 other gelatine manufacturers. In 1957 Davis Gelatine, brought in as a knowledgeable and natural partner, took a 51% controlling share in George Nelson Dale & Co.

In a lively discussion following the presentation Sam Nelson's response to the question; 'what happened to the business', was a very clear rationale for the decline of many Victorian family businesses. Bluntly, their families were too large. Several of the five brothers in the second generation had ten children, whilst the older brothers ran the business and their siblings found success overseas, the ownership of the relatively small business became fragmented over the generations. Couple this with family feuding, ending in an expensive court action, plus growing technical competition and the seeds of eventual decline were sown.

Many former employees and residents of the company village contributed reminiscences of the works and their homes ranging from health hazards, clogs and smells to the problems of painting the front door white (not the company colour) and the pugilistic achievements of the Turpin family. By common consent, members and visitors had greatly enjoyed the story of an important Warwick family.

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WARWICKSHIRE

WIAS

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FROM THE CHAIRMAN

Thanks

I would like to thank members of the committee (particularly Peter Coulls, Victor Lobb and Dennis Crips) for running the Society so efficiently whilst I was away cycling from Land's End to Lowestoft, and also to thank all those who kindly contributed to the charities we were supporting.

Land's End to Lowestoft

The lasting impression of the route from Land's End to Lowestoft was the wonderful diversity of the English landscape and the pivotal role that transport and industrial heritage plays in it. We rarely had time to pause and spend time exploring the various sites, but it acted as a timely reminder of the need to return to these locations in the future, perhaps, next time, by motorized transport!

Sustrans have established a series of National Cycle Routes, and we were struck by the degree to which these employed former track-beds of railways and mineral tramways and (variously surfaced) canal towpaths. National Cycle Route 3 runs from Land's End to Bristol and Route 4 from Bristol to London's Putney Bridge. The gentle gradients of these train and canal routes were a welcome respite from some of the more challenging sections!!

In the early stages of route 3, the 'Camel Trail' from Padstow to the flanks of Bodmin Moor and The 'Tarka Trail' from Meeth via Torrington and Bideford to Barnstaple reminded one of the halcyon days of the Atlantic Coast Express when it was possible to leave Waterloo and reach these destinations on the northern coast of Devon and Cornwall by train. Both these former railway paths were enjoying intensive recreational use, with some sites portraying past glories of the line such as the converted station at Fremington

Quay. Access into towns and cities was also facilitated by the use of former railway lines e.g. the route from Whitchurch to Temple Meads, Bristol and the subsequent route out of Bristol and on to Bath.

Canals also featured heavily – even in the south-west - where two sections were incorporated in the route from Tiverton to Bridgwater – the Great Western Canal from Tiverton to Taunton, and the Taunton and Bridgwater Canal. How different an atmosphere – and history – these canals had compared with the industrial canals of the Midlands and the north. Most significant of all was, of course, the Kennet and Avon Canal from Bath to Reading, combining magnificent architecture and engineering to produce what must be England's most attractive canal route. Enjoying the intimacy of the canal as it passes through Bath, crossing the Dundas and Avoncliff aqueducts, viewing the pumping stations at Claverton and Crofton, and climbing the Caen Hill flights of locks into Devizes on a beautiful summer's evening surely stirs the spirit in anyone!

We followed the Thames Path into London and exited via the Isle of Dogs, on to the Regent's Canal and Hertford Union Canal, and then headed up the Lea Valley, a very fertile area for the industrial history of east London. Sadly, thunder, lightning and torrential rain kept us focussed on getting to our destination rather than stopping to explore the sites!!

We then entered (largely unfamiliar) Essex with unanticipated delights such as the Tiptree jam museum and the port of Maldon (complete with pie and eel shop) and then on to final sections in Suffolk including Woodbridge tide mill, Snape maltings and the Adnams brewery of Southwold.

Not all locations and industrial sites could be described as worthy of celebration, and there were many

instances where industrial decline and decay had taken a firm grip, with no obvious exit strategy. Current economic conditions were clearly not buoyant in our final destination – Lowestoft – and at the end of the trip it caused much reflection on the economic and social inequalities that are still so prevalent in our country.

Even so, what this trip demonstrated was that at every stage of the route, there seemed to be so much of interest – and so often the transport and industrial features were an integral part of that landscape, contributing to the unique character of our country. The over-riding feeling at the end was a desire to revisit, to explore and to learn more of England's industrial heritage and to press the case for care and preservation.

Martin Green

PROGRAMME

September 8th 2011

AGM and 'Industrial Shorts'. A programme of short presentations from members, each lasting no more than fifteen minutes.

Co-ordinated by Martin Green

October 13th 2011

Sally Hoban:

The history of The Birmingham Assay Office.

Sally Hoban is the newly appointed curator of the Birmingham Assay Office.

November 10th 2011

Roger Bailey:

Coventry Transport.

Roger Bailey is an expert on the history of Coventry's bus transport, and has published two books on the subject.

December 8th 2011

Peter Lee:

Nuneaton and Bedworth: coal, stone, clay and iron.

Peter Lee's expertise on the history of the Nuneaton and Bedworth areas is well known, and his talk will draw on his latest publication on the collieries and quarries of the area.

NEWSLETTER

Meeting Reports

April 2011: Tim Booth

Warwickshire Mills, news of research and updates on the state of various mills in the county

Tim Booth's encyclopaedic knowledge of Warwickshire's wind and water mills provided a most interesting evening. Behind the descriptions of many diverse mills we learnt much of the often conflicting requirements of restoration and conservation. Is it better to leave alone or to compromise originality in order to have a working example?

Whilst these criteria certainly apply to the machinery of any mill, there is also the issue of the buildings. Conversion into an 'interesting' and no doubt expensive house may preserve some features but to 'prettify' machinery is surely a step too far. Better to keep the old machinery if only as wall-hung decoration.

Sadly, Warwickshire has lost more mills through demolition than almost any other county. Will it be possible to halt this trend? Unfortunately, as with many other parts of our industrial heritage, the answer is uncertain. What are the prospects for replacing a miller when the incumbent retires? There has to be some hope from the increase in the numbers of trained millwrights now emerging, but the future remains unclear.

As a former chairman of the Midland Wind & Watermills Group, Tim Booth has experienced most aspects of all these issues since he started to record Warwickshire's mills in 1969. He has now moved west into Shropshire where he has leased a mill.

Tim set the tone for the evening with two evocative illustrations; the now lost watermill at Weston under Weatherly and the Baxterley windmill which is sadly in decline. Retracing his early survey work revealed that in many instances little had been done in the intervening years, but it did allow Tim to explain some of the technology behind the mills and their development.

For example, the Blackford mill on the river Alne in Henley in Arden has a unique iron support frame for the machinery and millstones supplied by R Summers of Tamworth in Arden, a name unfamiliar to many members but which was to recur on a number of occasions during the evening.

Robert Summers started a millwrighting business in Tamworth in the 1830s. The buildings are now used as a garage but have also housed a foundry and a blacksmith. A trove of papers were found some years ago in an old desk; letters, time sheets and other material that would merit closer study and ideally, publishing. By the same token, other local businesses including Lampitts in Banbury, Glovers in Warwick and Bull & Horton in Stratford upon Avon all need work to be done on their records.

Another facet of water mills is the usefulness of their associated weirs and sluices as part of the river management system. If allowed to deteriorate or be demolished then the flood risks increase, surely a good reason for keeping them in a good state of repair.

Tim's catalogue of lost heritage and broken promises included Rock Mill, Milverton, where an agreement to leave the wheel extant on conversion was not honoured. The flour and provender mill at Broom Hills, which was a good example of mill growth through the 18th and 19th centuries, has been demolished. Maxstoke Mill was

complete but is now demolished, as is Murcott Mill which had a Summers wheel. Arbury Mill is still standing but is of no interest to the George Eliot Society and so may well not be recorded as it should be. Henwood Mill in Solihull has had a genteel makeover with the ironwork painted a baby blue! But the wheel has been repaired.

Tim gave us some more interesting details about Chesterton Windmill. He shares the opinion of many that it is a most important site. He believes that the Edward Peyto building has always been a mill from its 17th century beginnings, although there has been debate over its possible use as an observatory. The machinery was replaced during the 19th century. During the last survey by the Mill Group some graffiti was found of a windmill that could have been the forerunner of the present mill.

Chesterton Mill is a good example of the dangers of over-restoration and the need for proper maintenance – the serious accident in 2006 exemplified the perils of using incorrect materials. Tim would like to see dendrochronology used to date the Hurst frame to confirm, or otherwise, the believed construction date of 1632. Members might care to refer to Newsletter 35 for an earlier presentation on the mill.

Another windmill under threat is the one at Berkswell which contains some rare 18th/19th century timber gearing. The cap has been removed for some time and there is fear that this work may not be completed. Interestingly, there is evidence from the carpenter's joints in some reused timbers that they were originally supports for a post mill.

Wellesbourne mill was thought secure although in need of repair, but the millwright has moved on after a dispute leaving the future in doubt. Norton Lindsey has a mill with important features such as a very rare governor system that must be preserved, preferably by being left unrestored but protected.

Not all Tim's news was bad, The New Hall Mill in Sutton Coldfield, which was restored by Alfred Owen in the 1970s, remains a good example of a working mill. Similarly, Charlecote mill which was restored for the TV production of *Mill on the Floss* remains working but the miller is retiring and its longer term future may not be secure.

Some mills have been relocated: the Dansey mill from Tamworth has been rebuilt at the Avoncroft Museum but the mill from Temple Balsall also moved to Avoncroft has yet to be rebuilt. It is currently being assessed by the Midlands Mill Group but some parts are missing. However, the Museum Director would like to get a wheel rotating if funding can be found for the project.

Tim ended with an anecdote that summed up the perils of cold calling in the interests of surveying an interesting mill. The saga of Burton Hastings, which went something like: 'Me mother isn't in', 'I'll have to ask Jack', 'Jack says to research off', eventually led to the discovery of an 17th century mill inside a 19th century shell which, despite the terrible state of the machinery and a dreadful clutter of other equipment was still producing animal feed.

Tim made it clear that there was no sense in trying to replicate today the original Mill Group survey that had been done in the 1970s. So much has changed and it would be disheartening to try and rewrite the Warwickshire survey.

May 2011: Members' Evening

Dennis Crips opened this members' evening with the topological mystery of Bridge 126 on the Oxford Canal at Wormleighton. Before getting to the mystery, Dennis reminisced over 25 years spent walking the local canals and the IA paradise that they offered. The Napton to Banbury section of the Oxford Canal being a particular favourite and one which included Bridge 126.

The Canal reached Napton in 1774 and Dennis graphically outlined the problems facing the surveyors and builders in overcoming the watershed at Priors Hardwick, given the disinclination of James Brindley and his successors to undertake cuttings or embankments. By following the contour line between Napton and Fenny Compton the canal wanders through the countryside. Dennis highlighted the accuracy required in its construction – 1:700,000 plus an allowance for the earth's curvature in order to maintain a nearly level course.

It was thus a great surprise, and cause for mystification, to pause at Bridge 127 and to look back across the fields to Bridge 126 and apparently be looking down on it. The camera cannot lie but his slide clearly showed the track immediately beyond the crown of the bridge. The subsequent discussion failed to provide any clear explanation and the mystery persists.

New member John Berkeley introduced us to the 150 year old Brandauer company, founded by his wife's many times great grandfather who had fled from persecution in France and set up a 'Toy' business at 7 High Street, Deritend in 1782. Within two generations the business, now trading as Ash & Petit, was specialising in pens (nibs to the uninitiated) and prospering. In 1862 an arrangement was reached with Charles Brandauer of Vienna for additional finance, a condition of which was the adoption of the Brandauer name for the business.

A new factory was built in New John Street and expanded in the 1880s, by which time Brandauer had become one of the leading pen manufacturers in the UK with an output of over 1 million pieces a day and a thriving export business. The manufacturing processes were labour intensive (largely female and on piecework) but required tooling of great precision which then as now was produced in-house.

Brandauer was an early proponent of celebrity endorsement for its products. John showed examples of early advertising posters with splendid engravings featuring popular authors including Dickens, Collins and Thackeray.

The company operated from the same factory until 2000 and little had changed in 140 years, except that pens had been replaced by other high precision metal pressings made to tolerances of 2 to 3 microns. The old factory has been sold for redevelopment but a new factory in Bridge Street West, still in Birmingham's Jewellery Quarter, continues to serve a wide range of customers from push-fit plumbing parts and micro-switches to the Large Hadron Collider; indeed from pens to particle physics.

Roger Cragg talked about two innovative structures in Leamington by William de Normanville, the Mill Road Bridge and the Pump Room Swimming Bath Roof.

The 100 ft span of the Mill Road Bridge was unusual for its time. Not a conventional suspension bridge but a forerunner for today's cable stayed bridges with three rods on each side terminating on handrail uprights and forming trusses to support the roadway. The New Bridge at Ironbridge was cited as an example of a modern cable stayed structure.

The Swimming Bath, now Library, roof was completed

in 1890. It is 120 ft long and 60 ft wide, hipped at one end and with a five-sided apsidal structure at the other. The latter leads to complicated trusses elegantly resolved in timber and wrought iron. Two 2 inch diameter rods running the full length of the building relieve the outward thrust forces.

A move to dismantle the roof as part of the redevelopment process was resisted and, with Roger's involvement, it was registered as an historic engineering structure and remains in place today.

John Brace took a wry look at the improvements to the Stratford upon Avon Water and Sewage System between 1848 and 1906, if the term system can be applied to what passed for a service at that time. As with most mid-Victorian towns, Stratford had no water supply nor drainage; cesspits contaminated wells and cholera was never far away in the time of the 'Great Stinks'.

The 1848 Public Health Act precipitated many conflicts of interests between Parish, Town and Borough Authorities, any one of which could outvote the Local Board of Health. Public enquiries were held to try and establish needs, practicability and, not least, affordability for the proposals.

A source of soft water was needed for domestic and laundry purposes but the landowner of a potential spring source in Wilmcote refused to sell. Authority was granted to build a new sewer but not to put anything into it, and when this was resolved an attempt to tap the canal for water to flush the sewer was unsuccessful. The brewery also discharged waste into the sewer system clogging it up with 'cake'.

John traced the routes for various water supplies to Stratford and reminded us that wasted resources are nothing new; in 1890 the Trinity Church organ had an hydraulic motor fed by a 3 inch supply pipe. In its first year it used 900,000 gallons. Stratford's needs were only properly met when artesian wells were sunk and purification plant installed in 1923.

After the break, Richard King presented another Warwickshire Miscellany. He opened with the construction of the Meer End Mission Church, The Coventry Ordnance Works in Red Lane with its 1,000 ft bay used for the manufacture of naval guns but sold to English Electric in 1919, and the construction of the Leamington railway bridge in 1906/7.

A collection of lapel badges made during WWI by local companies for their workers in reserved occupations hopefully prevented the receipt of white feathers. A similar set from WWII reminded us of long lost local companies, including Warwickshire Aviation and Helliwells Aviation together with ARP and First Aid identification.

Other WWII reminders included derelict sluice gates in Coventry for a fire fighting pound, patched holes in a canal bridge where gun ports had been knocked through, bar and rod mesh roadway reused as fencing and concrete drums, some still with wooden runners, ready to be rolled into place as anti-tank defences.

Richard had found a series of painted signs on buildings including the Willes Road Corn Stores, the George Inn at Barford and the 1884 sign of W F Gossage on a Clemens Street pub for Chops & Steaks and Carriages.

To conclude the evening Martin Woolston reviewed a recent Newcomen Society conference in Manchester on 'The Piston Engine Revolution'. Some 22 papers were presented ranging from early attempts, unsuccessful, to use gunpowder as a fuel to a description of the first free piston engine. This last paper was presented in Italian but sadly the interpreter's attempts to explain the workings of the engine were a dismal failure.

The conference provided the opportunity to visit the Anson Engine Museum and a dinner was held in the Power Hall of the Museum of Science & Technology with running engines – a memorable experience.

June 2011: Damien Kimberley, Coventry Transport Museum *The Coventry Motor-cycle Industry*

Damien Kimberley gave us a wide ranging survey of the 114 known businesses that produced motorcycles in Coventry over the 87 years from 1895 to 1982. Damien joined the Coventry Transport Museum staff in 2005 following a placement at the Museum whilst completing an MSc at Ironbridge and writing a thesis on the redevelopment of Coventry after WWII. His presentation complemented that given by his colleague, Steve Bagley, in October 2009 on the cycling pioneers Starley, Hillman and Singer whose names are inextricably linked with Coventry and its heritage.

The presentation was based on the collection of motor cycles at the Museum and on the research that Damien had undertaken to produce a book on 'Coventry's Motorcycle Heritage', sponsored by the Museum and the British Motorcycle Charitable Trust.

The archive material used to illustrate the talk together with the restored machinery on display will have made members aware of the wealth of material fortunately preserved for present and future generations. Industrial archaeology is about much more than the corner of a wall of some forgotten factory, although Coventry has a significant quantity of such material. Many of the illustrations were of buildings remembered by some but unknown to many and are now only an illustration in an old catalogue or advertisement. Probably very few could remember but a handful of the makers or the machines that were shown, but how evocative they were of the early days of powered personal transport.

The evolution of the cycle trade followed an interesting path. The early pioneers exploited a demand that seemed to cross barriers of sex and class for personal transport that allowed greater freedom of movement. As Damien notes in the introduction of his book; Coventry was the birthplace of bicycle production in England and at its peak in the early 1890s was producing some 300,000 units a year and employing around 40,000 people or around two thirds of the working population.

As soon as small, light petrol engines became available (Gottlieb Daimler fitted a vertical single cylinder petrol engine into a reinforced boneshaker frame in 1885) the smaller bicycle manufacturers began to disappear to be replaced by others producing motorised cycles. It was interesting to see that many of the early examples shown in the presentation incorporated both pedal and motor power.

Inevitably, commercial success depended upon the funding available. Those fortunate to secure substantial backing, for whatever reason (and one supposes that then as now the right contacts were important), prospered. The names Humber, Singer, Triumph, Swift, Rudge and Francis-Barnett are all associated with large, purpose-built factories and their names survive, whilst the opportunistic firms such as Aurora, Kingsway, Lancer and Wigan-Barlow flourished briefly and then failed after a few years.

We learnt about some more of the early personalities, not least Henry (Harry) John Lawson who, not satisfied with some pioneering bicycle designs, went on to try and dominate the nascent car industry by acquiring controlling patents. However, after a success with forming the Daimler company in England he was eventually found guilty of fraud and went to prison.

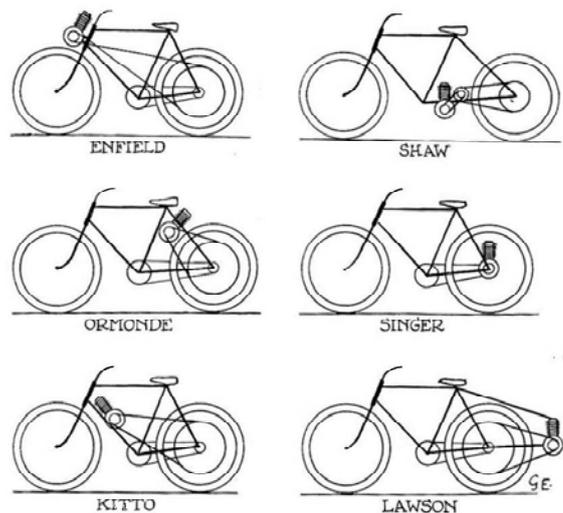
An eccentric American, E J Pennington 'talked the talk' and had some wild ideas for fire engines and armoured vehicles. He also advertised a powered bicycle that had 'jumped 65 feet over a river' startling onlookers.

Much more down to earth was Agnes Muriel Hind, reputedly the first woman in Britain to own and ride a motorcycle. She competed in national trials and races with great success, often overshadowing her male competitors. She also became a noted journalist. This led to contacts with the Rex Motor Manufacturing Company which wanted to break into the motorcycle market catering for ladies. Collaboration led to the 'Blue Devil' machine and marriage to Richard Lord, a senior manager of the company who was also active in motorcycle competitions. They lived for many years at Wall Hill Hall in Corley, a house that still stands today.

In 1928, a Rudge sales agent, Stanley Glanfield, embarked on a world tour on a 499cc Rudge motorcycle combination with sleeping facilities incorporated into the sidecar! Eight months and 18,000 miles through sixteen countries in four continents was some tour for the time, and excellent publicity for the reliability of the Rudge machine which is now a prized exhibit in the collection.

The archives of the Transport Museum provided a varied range of illustrations which charted the development of the cycle industry in its many manifestations. Of equal interest were some rarely seen views of early factory and office interiors. It was sad to see how little of these manufacturing sites remains today. Damien had searched diligently but found little. Coventry's cemeteries contain the remains of many of the industry's pioneers but the flamboyant Harry Lawson rests in a modest North London grave in Hendon.

Looking at the many photographs of motor cycles it was notable how similar were the designs of frames and fuel tanks although engine locations showed more individuality, as is seen below. Illustration courtesy CTM.



The associated component industry was only briefly touched upon but it clearly flourished as a result of the demand from many quarters.

The list of 114 Coventry manufacturers so far traced ranges from Accles to York with many familiar names in between. It is a tribute to the invention, industry and commercial acumen of many individuals, few of whose names are recognised today.

Warwickshire Industrial Archaeology Society Newsletter: Number 42

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

Two plaques: two causes for celebration of Warwickshire's industrial heritage

It was quite a coincidence that two plaques celebrating different aspects of Warwickshire's industrial heritage should be unveiled within 48 hours of each other. On Wednesday November 16th., the mayor of Leamington, Councillor Alan Wilkinson, unveiled a blue plaque commemorating the residence of Sidney Flavel (1819-1892) at his former home in Newbold Terrace, Leamington Spa. Sidney Flavel was the driving force behind the development of the firm of Flavels, specialist designers and producers of kitchen ranges.

The unveiling was attended by many local dignitaries, local history enthusiasts, representatives of Rangemaster (the modern successor to Flavels), Sidney Flavel's great grandson, Mike Wilmot, as well as a liberal sprinkling of members of the Warwickshire Industrial Archaeology Society. As the crowd gathered there was some debate about exactly which Sidney Flavel we would be commemorating, for father and son were both called Sidney and both had a significant impact on the company and the town!

Local historian, Dr. Christine Hodgetts, who had completed the research on the Flavel connection to the house, gave a short presentation before the plaque was unveiled, and subsequently in the Town Hall gave a fuller description of the Flavel company's history, raising some issues that she felt could merit further research. William McGrath, chief executive of Rangemaster, also spoke on the role of Sidney Flavel in bringing the name of Leamington to the rest of the UK and other parts of the world via his 'Leamington Kitchener'. Several items of Flavel memorabilia had been brought from the company's headquarters to add to the occasion. We hope to be able to arrange a talk to WIAS on Flavels next year, possibly by an outside speaker, or by a group

of members who have had a long interest in the company.

Two days later at Alstom in Rugby, John Willock and myself were fortunate enough to be invited to the ceremony marking the presentation of the Institute of Mechanical Engineers Heritage Award to the pioneering work of Peter Willans, and in particular, to the Willans Central Valve Steam Engine. This was the 68th occasion that the award had been made, and the booklet containing the details of the other 67 recipients revealed what a prestigious award it was.

Alain Foote – Manager of Steam Turbine Service Engineering at Alstom, Institution of Mechanical Engineers' Industrial Liaison Officer, and a member of WIAS – organised the event, and began the day with a presentation on the importance of the Willans Central Valve Steam Engine in the history of steam technology. The development of the Willans engine was fundamental to the growth of electricity usage in Britain in the second half of the nineteenth century - in homes, factories and even ships - and was a crucial step in the country's ongoing industrialisation.

We then moved to the Training Centre where the presentation of the Award was made by John Wood, former President of the Institute of Mechanical Engineers, to Roger Beaumont, Managing Director of the Steam Turbine Product Centre at Alstom. John Wood spoke about the engine's significance and reminded us that so much of the work of these engines remained out of public view, working incessantly to maintain electricity supplies in a manner seen only by a few engineers. A beam engine or a water wheel are viewable items with the simplest of technologies which can be easily understood by the interested observer. The Willans engine was a far more complex, far less accessible item, but no less important in the history of technology.

The particular engine (recently refurbished by Alstom employees) was built in 1901 in Rugby, and

the 140 horse-power, three crank compound engine was in service for 57 years. In 1892 generators of this type accounted for 68% of all electricity generated in Britain.

These two examples reinforced the fact that Warwickshire does indeed have a varied industrial history, and the time spent in Rugby reminded me that the town has much to offer the industrial history/industrial archaeology enthusiast. We have hardly any members from the Rugby area and this is a matter we need to address, initially perhaps by trying to attract more speakers with expertise of Rugby's industrial history to make presentations at our monthly meetings. The next stage might be to take our message into Rugby – and indeed other parts of the county – to build up support for the importance of researching, recording and maintaining Warwickshire's industrial heritage.

PROGRAMME

December 8th 2011

Peter Lee:
Nuneaton and Bedworth: coal, stone, clay and iron.

January 12th 2012

Christina Evans, Archaeological Project Manager, WCC:
Warwickshire Environment Record and the 'Imaging Past & Present' project.

February 9th 2012

John Bedington:
Charlecote Mill

March 8th 2012

Graham Fisher MBE:
Jewels on the Cut (Stourbridge Glass Industry & the Stourbridge Canal).

April 12th 2012

Sam Collenette, Archive Service Manager, Warwickshire County Record Office:
From Bolton to Warwick.

May 10th 2012

Derek Hurst:
Droitwich Salt Production: the technology.

June 14th 2012

Jeromy Hassell:
Coventry Machinists & Coventry Victor.

NEWSLETTER

Meeting Reports

September 2011: Members' Evening

A programme of short presentations from members.

Chris Barney opened the evening with a review of the recent AIA Conference held in Cork, Eire. Some 80 delegates, including others from WIAS, attended the event held on the campus of the University of Cork, an interesting mixture of old and new architecture.

The visits programme opened at the now defunct Jameson whiskey distillery, once home to the largest still in the world and empty since production was moved in the mid-80s. Today it seems to be in an unchanging time warp with the huge corn store that once received annually the 5,000 tons of barley grown on 15,000 acres lying empty but fully maintained. A visit to a gunpowder works, in itself a pretty dull site, was enlivened by the guide's entertaining blend of social and historical comment. The copper mines at Bantry, visited via a quaint selection of the local house painting shades, showed a landscape familiar to Industrial Archaeologists. Copper had been mined from 2,000 BC, with production peaking in Victorian times and ending in the 1920s. A tour of Cork included the waterworks with its ornate brickwork chimney stack, the old lunatic asylum, the largest building in Ireland and the Shannon Hydro-electric works where an old insulator was being used as a flower vase. The works with their 100 ft penstocks were built by Siemens in the 1920s at a cost of £5 million as a statement of the Republic's independence. Finally, the huge natural harbour at Cobh, home to the old transatlantic liner terminal, the last port of call for the Titanic and the site of the sinking of the Lusitania.

John Berkeley then introduced us to 'The Flying Standards', reviewing the long history of aircraft building by the Standard Motor Company after setting the scene with the replica Bleriot monoplane at Birmingham Airport – a Spitfire was wanted but rejected as 'it might upset some passengers'!

Standards' Canley works were built specifically for aircraft construction during WWI when all significant motor car and furniture manufacturers were required to produce aircraft. Standard had other sites for sub-assemblies including one in Dormer Place, Leamington and one in Cash's Lane. Aircraft built included the BE12, not a pretty machine according to Lord Trenchard, and the exquisite little Sopwith Pup, regarded by many as the greatest aircraft of the period. Standard built some 850 Pups or half of all those made. After the war some went to Australia to found the RAAF. Standard also built 500 'Harry Tates', the RE8 2-seat reconnaissance aircraft designed at Farnborough, and just under 100 Bristol Fighters at the end of the war. In all 1,474 aircraft were produced by Standard.

The Company returned to aircraft manufacture in WWII. 750 Airspeed Oxfords were built at Canley and shipped by road to Anstey for final assembly and flight test. The road transporter for the fuselage complete with wing centre section and engines must have been a familiar sight to Coventrians, and something of a moving road block for the few motorists then around. The Oxford was followed by the wooden wonder, the De Havilland Mosquito, one of the great and very versatile aircraft from that stable of which 1,066 examples were built.

There are few survivors of the 'Flying Standards'. None complete, but a few remnants of a Standard-built Mosquito are in Australia's Camden Air Museum and some restoration is under way.

Martin Wolston continued the story from the March

meeting of the free-piston engine from the Newcomen Society conference in Manchester. In an era of technology a 'chalk and talk' presentation was nostalgic. The gas-powered engine under discussion was an interesting if fruitless diversion from the mainstream of prime mover development. As presented, the engine is upside down. A cast iron cylinder, which is bolted to the floor has a fuelling valve and ignition system at its base. A free piston, which has a long rack extending from it, runs inside the cylinder and meshes with a pinion that includes a freewheel mechanism and is attached to the driven shaft which carries dual flywheels either side of the cylinder. The expansion of the gas charge forces the piston up the cylinder. A partial vacuum is created below the piston which sucks the piston down on its power stroke, turning the driven shaft which can continue to turn between strokes thanks to the freewheel mechanism. Another ingenious but ultimately flawed concept to add to the list of engineering might-have-beens.

Rosalind Bolton next entertained with a self-confessed 'holiday snaps' tour of Sheffield's industrial past. Today, there is little to remind the visitor of industrial smoke and grime since the clean air acts of the 1950s led to the restoration of many buildings. Nonetheless, there is plenty to see around the City of old and new factories with some remarkable survivors, including some individual workshops as well as their successors.

Peter Bolton then led us towards Manchester Airport via Eccles where the remains of an arch of the Bridgewater Canal Aqueduct is built into a wall, and the swing aqueduct over the Manchester Ship Canal continues to operate. In fact we went to the first Manchester Airport at Peel Green, not the present one sited at Ringway. Peel Green, in 1922, was the site of the first flying club in the UK and soon Manchester Corporation acquired the land for the second municipal airport after Croyden. Today, only private aircraft operate at Peel Green but the control tower designed by Manchester City Architect, Mr Hill, remains standing as do a run of buildings that formed the earliest passenger terminal in the UK together with early hangars of various designs.

Peter also showed a pair of large hangar-like structures in Pucklechurch, Gloucester which purported to be WWII barrage balloon sheds, unless anyone knows differently.

Peter Coulls concluded the evening with a selection of photographs from the County Records Office of the products of Eagle Engineering of Saltisford taken between 1920 and the 1950s. Not only were the products interesting in themselves, but the backgrounds showed many local scenes of nostalgic interest to members. The Warwick Gas Works featured in a number of the pictures.

Eagle Engineering specialised in trailers and commercial vehicle coachwork with an emphasis towards municipal waste machinery, dust carts, street cleaning and gulley emptiers being typical. The trailers ranged from a 2-wheeler for Shipways Timber Merchants through a variety of pole trailers to a 100 ton, two-bogie monster for Norman Box Heavy Haulage Contractors. More specialised were a brush sweeper for RAF runways and tower wagons, the forerunners to today's hydraulic platforms. A unique, small-wheeled waste collection vehicle could negotiate narrow alleys and a row of side-loading Austin dust carts were remembered by many.

All in all, a very full evening that well demonstrated members' wide ranging interests and expertise.

October 2011: Sally Hoban

The history of The Birmingham Assay Office.

A very well attended meeting, including 10 visitors, learned much about the history and present activities of the Birmingham Assay Office from its newly appointed Heritage & Training Officer. Sally Hoban has brought a wealth of experience, both academical and practical, to her part-time role where she is responsible for bringing together the history and heritage of the Assay Office with its future development as a provider of high quality education and training for the professional jewellery trade and members of the public. Sally specialises in the history of design, especially the Arts & Crafts movement, and is currently conducting a research project at the University of Birmingham on 19th and early 20th century women jewellers and silversmiths in the City. She has also found time to author *Millers Collecting Modern Designs* and to Chair the Heritage Committee of the Birmingham Civic Society.

The Assay Office today is an integral part of the still flourishing Jewellery Quarter where in the 1880s, with no Guild restrictions, all that a budding jeweller needed was a leather apron, a bench, some modest capital and talent. The newly reopened J W Evans factory, left exactly as it was on its last day of trading, illustrates the will to preserve the heritage of the Quarter.

And what a heritage it is. Against the background of the history of hallmarking from its inception with the London Assay Office in 1327 and the development of the various marks for office, maker or sponsor, date and quality, we learned that the protection of both consumer and trader and law enforcement is ensured by hallmarking all items of gold, silver, platinum and palladium offered for sale. All such pieces are made of an alloy with, usually, copper added to the precious metal to give strength. The proportion of the precious metal cannot be determined without laboratory analysis and this can only be undertaken at an Assay Office. Interestingly, whilst this analysis used to take some three hours, the introduction of spectroscopy has reduced the time to a few minutes.

Sally was at one with many members in her enthusiasm for Matthew Boulton and his pioneering achievements in so many fields. Following the growth of his silverware business in the affluent years of the mid-18th century Boulton became increasingly unhappy with the need to send his pieces 70 miles to Chester, the nearest Assay Office. The risk of damage and robbery during the slow journey together with the opportunities for his designs to be pirated and the 'feckless carelessness' of the Chester Office all led Boulton to lobby for a Birmingham Assay office. In London Boulton lodged at the Crown & Anchor Inn in the Strand in the company of representatives from Sheffield on a similar quest. Both were successful and the story goes that a coin was tossed to decide which city should use the crown or the anchor as its mark. Birmingham took the anchor.

Whilst talking about Boulton, Sally interjected a fascinating possibility that his activities included pioneering work in photography. She is jointly researching with Jon Wood of Aston University for evidence. One suggestive clue is a picture of Soho House in Birmingham, owned by Boulton, which seems to show the building as it was before alterations in the late 18th century. Further information may be hidden in the massive archive of the Lunar Society papers in Birmingham Library.

The Birmingham Assay Office opened in 1773 on 31st August in a room over a tavern. It moved to its present location in Newhall Street in 1877. Today, it is the largest

assay office in the world marking a peak of some 13 million items in 2003/4. This figure has subsequently halved due to the recession and the rise in the gold price.

The Assay Office holds a remarkable collection of 'Birmingham Toys': snuff boxes of high quality, vinaigrettes often carrying topical local scenes, card cases, caddy spoons, toothpick and patch boxes from all the major Birmingham silversmiths. The second half of the talk reviewed these personalities and their wares as represented by some of the 3,000 items in the Assay Office collection.

Samuel Pemberton, who was also the Guardian of the Office from 1793 until his death in 1803, was renowned for his use of filigree, especially in spoons. Nathaniel Mills, first registered in 1803, specialised in card cases with stamped topographical scenes. His business was very successful and his son left a fortune of £30,000.

The Victorian grand style was exemplified by Elkington & Co, founded in the 1830s by Josiah and George Richards with their nephew G R Elkington and specialists in electroplating. A large factory opposite the Assay Office was complemented by a stylish showroom dedicated to marketing excellence. Leading designers used by Elkington included Schlick (Danish) and Christopher Dresser.

The Arts & Crafts movement, spearheaded by Ruskin, Morris and Burne-Jones, has deep Birmingham roots. The Birmingham Municipal School of Art was fundamental to its development and is now part of the City University. Edward Taylor introduced the concept of including practical skills as part of the course and his ideas were taken up and developed by the Glasgow School of Art whose alumni include Charles Rennie Macintosh. Training for girls was actively encouraged at Birmingham, so much so that in 1900 there were more girls enrolled than boys. Prominent amongst them was Florence Stern who was noted for her spoons. A major force in merchandising Arts & Crafts products was Arthur Liberty with his iconic Regent Street store, Liberty & Co which still trades today.

Elsewhere, Arthur Stansfield Dixon, who was a friend of William Morris and Philip Webb and an accomplished silversmith and copper worker, was prominent in the Birmingham Guild of Handicrafts and designed its building in Great Charles Street. The Guild provided workshop space on a co-operative basis similar to and rivalling Charles Ashbee's efforts in Chipping Camden. Another stalwart was Albert E Jones, the 'Metal Craftsman' of St Dunstan's Works.

The twentieth century saw the craftsman-based industry that had grown up over the previous 150 years begin to coalesce into larger units, typified by Adie Bros who produced the largest piece ever assayed in Birmingham with an 18ct tea set for King Farouk of Egypt. However, there is now a reversion to the traditional craftsmen such as Martyn Pugh who was commissioned to make a pair of 18ct water jugs to mark the Queen's Golden Jubilee. With such commissions the Assay Office is investing its profits to support Birmingham manufacturers and encourage young artists.

The Assay Office has also diversified and now comprises three main divisions: Safeguard, the largest jewellery valuation service in the UK, AnchorCert, for independent diamond and gem valuations and certification and the Laboratory at the Birmingham Assay Office—experts in precious metal analysis, but able to undertake a wide variety of test procedures from the fire-resistance of a teddy bear to textile colour fastness. Matthew Boulton would surely feel that his efforts to establish the Assay Office have been well rewarded.

November 2011: Roger Bailey
Coventry Transport.

Report by Arthur Astrop

Many UK cities began to establish their own public transport systems in the late 19th century, and Coventry was no exception. This was the era of 'Corporation' transport bearing distinctive 'liveries', and while the designs of trams and buses changed radically over the years many of the 'colours' they proudly displayed survived well into the second half of the 20th century.

All aspects of the history of public transport in Coventry have been a life-long interest for Roger Bailey, our speaker at the November meeting. Indeed, 'interest' is perhaps too bland a word to describe Roger's involvement with the trams, buses and coaches owned by Coventry, for his devotion to the subject ranks little short of a passion, as was immediately evident in his talk to our November meeting.

Roger's parents dedicated their working lives to Coventry's public transport system and Roger was thus involved with the subject from a very early age. So began an interest which today lies as much with the social history of the development of Coventry's transport system as it does with its technical aspects. The story starts in 1894 with the appearance of small steam-driven 'tugs' each pulling a passenger-carrying trailer, capable of speeds up to 5 mph and providing a public service between Bedworth and the City centre.

A few years later, the Corporation's first electric trams made their appearance on the City streets, open-topped, and taking current from overhead conductors by means of a swivelling arm. Soon, however, a very important modification to tram design proved to be absolutely necessary. In the interests of public decency screens were swiftly fitted all round the upper deck so that the ankles of lady passengers were no longer visible to voyeurs at pavement level!

As the tram services expanded, a network of tracks grew throughout the City and its environs, and while most roads had twin tracks the spaciousness of the Broadgate area allowed a 3-track layout to be installed. The outbreak of the first world war, and transfer of so many men to the fighting Services, saw the introduction of women to Coventry's trams. Working as 'clippies', they brought about a social change which was to be repeated in WW2. Tram design was also advancing, with more weather protection for drivers as well as for passengers, but as the network grew the narrowness of many of the City's streets increasingly presented problems. Many of the slides shown by Roger revealed just how close some of the trams were when passing each other.

The tram system remained dominant after WW1, and continued developing in scope and design well into the 1930s. But the shape of things to come appeared when, as a service for outlying districts, six feeder buses (by Maudslay), were provided to bring passengers within reach of the nearest tram routes. But an end to dominance of the electric tram as Coventry's principle means of public transport was in sight. The devastating air raids which the City suffered in the early years of WW2 did so much damage to the tracks and the conductor systems that, when the war ended, it was in fact impractical financially to restore them.

During WW2, buses of all types and makes, some drafted-in from other parts of the country, were used

to maintain a service for the City, and especially for the factory workers who were so essential to the war effort. Thus the once all-powerful and proud tram service was largely replaced by a somewhat motley collection of buses, all suitably modified to comply with blackout requirements. Headlights were fitted with beam-constricting grills, and white bands were painted on body work to improve visibility for pedestrians in the blackout. At one time, even the proud logo 'Coventry Transport' on the sides of the City's buses had the word 'Coventry' painted-out, lest any descending Nazi paratrooper should have no difficulty in discovering where he had landed!

But once the war ended, the re-development of the City on a massive scale was planned, and the era of the omnibus had truly dawned. It was at this point that Roger really hit his stride. His knowledge of the evolution of the bus services in Coventry must be unparalleled, as also must be his personal collection of photographs (extending to very many thousands), together with other public transport memorabilia, from tickets to ticket punches, from transport posters to route maps. He inherited the passion and loyalty to public transport of his parents and has preserved for posterity much of his knowledge and understanding through the publication of books on the subject.

His photographic collection alone, of which we saw only a brief selection, is a one-man archive of inestimable value, and not just to the City of Coventry. And it is not simply a dry record of trams and buses of different designs and liveries, with subtle differences in design which are of interest only to the single-minded expert.

Most, if not all, of his photographs contain 'backgrounds' which show not only areas and buildings once prominent in Coventry but now long gone, but also crowds of people, with dress and demeanour that are today only a memory. It is those aspects which Roger values as much as the numerous different trams or buses which take centre stage in each of the shots. The operating staff of the Coventry public transport system, especially from 1945 onwards, was close-knit and contained many different nationalities and cultures, sometimes including even erstwhile wartime enemies. All were very successfully integrated into what became a 'family', with loyalty to each other as strong as their loyalty to 'public service'.

Post-war, it was Daimler who gradually began to supply the majority of Coventry's bus fleet, and initially some problems were encountered. An early design had, in the driver's cab, what appeared to be somewhere for him to hang his coat. In fact, it was actually the starter control and when a coat was hung on it the engine fired up!

In another instance, one bus was inadvertently delivered with an 'ungoverned' engine, with the result that it was much sought after by drivers as the fastest in the fleet! The arrival of the first buses with the engine located at the rear also caused problems. Drivers familiar with the traditional 'engine at the front' had to get used to not hearing it running, and were thus unable to judge its revs.

The City also at one time ran coaches for longer trips, including those offering a 30-mile sight-seeing circular tour of Coventry and its surrounding areas aimed at providing 'afternoon outings for all the family'!

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

Dealing with twentieth century sites is not an easy task for the industrial archaeologist, and it is perhaps apt that the seminar preceding this year's AIA Conference in Essex will be upon *'The Archaeological Approach to Twentieth Century Sites'*. Indeed, the recent experiences of two of Leamington's most familiar landmarks illustrate both the importance and difficulty of dealing with the industrial archaeology of the twentieth century. The Ford foundry and Leamington Spa railway station stood at opposite ends of a large site once occupied largely by manufacturing and rail-related activities, adjacent to the old Great Western route from Birmingham Snow Hill to London Paddington. The original station was re-built in the 1930s, and has now become one of Chiltern's landmark stations, with the efforts of many contributing to the renovation, re-equipping and landscaping of the station. The Railway Heritage Trust, The Friends of Leamington Station, Network Rail, Department for Transport and Chiltern Railways have all helped in the restoration, and a recent cleaning of the external stonework has revealed the station in much of its former glory. The renovations have added much to the pleasure of travelling from Leamington Spa – and not just for the industrial archaeologist.



By contrast, further down the Old Warwick Road, the historic Ford foundry – after years of gentle decay since closure in 2008 – has finally been demolished. This was one of the few remaining links with the motor industry in the town. The demolition has revealed the large extent of the site, (best viewed from

the footbridge on Princes Drive). The tangled mass of ironwork and piles of concrete and brick rubble provide a sad end to this era of manufacturing on the site, but the closure had an inevitability about it, given the pace and pattern of change in car manufacturing in the UK and beyond. The difficulty for the industrial archaeologist is to identify the best way of recording sites of this type, where processes are involved and there is no possibility of converting to other uses.



Clearly, recording rather than any thoughts of preservation has been the priority. In this digital age, the (often illegal) activities of photographers keen to explore any derelict site mean that photographs of the site after closure - but before demolition - are readily viewable on the internet. Indeed, there seems to be quite a passion amongst intrepid trespassers for exploring derelict sites with camera in hand, and many such sites seem to be of an industrial nature.

Fortunately there is also the official version. A detailed photographic record of the Ford foundry buildings has been undertaken by the Worcestershire County Council Historic Environment and Archaeology Service under the direction of the Waterman Energy, Environment & Design. A copy of the final report will be submitted to, and made publicly available through, the Warwickshire Historic Environment Record (WHER). To view the report once it has been submitted, please contact the WHER on 01926 412734 or e-mail historicenvironmentrecord@warwickshire.gov.uk. An on-line version of the WHER can be found at: <http://timetrail.warwickshire.gov.uk/>

In addition, the artistic eye of the professional photographers has also been applied to the Ford Foundry site. Ray Spence is a local photographer and lecturer in photography at the Birmingham Institute of Art and Design, Birmingham City University. His atmospheric studies of the Ford foundry site can be viewed on www.rayspence.co.uk

Both official and unofficial photographic recording at the time of closure is a starting point, but the nature of the processes utilised at the foundry and changes in those techniques over time merit careful recording. Oral history from workers with (hopefully long) memories of the site would be a starting point. There may be recollections and photographs from within the membership of WIAS that would add to this pool of information. The Society has had two site visits to my knowledge since 1989, and others may have visited on an individual basis. We hope in the course of the next series of meetings to have a presentation on the history of the site.

Finally, it is to be hoped that some permanent record of manufacturing on the site – something more imaginative, perhaps, than the familiar naming of a road or shopping mall - can be included in the public spaces of the new site.

PROGRAMME

March 8th 2012

Graham Fisher MBE:

Jewels on the Cut: Stourbridge Glass Industry & the Stourbridge Canal.

April 12th 2012

Sam Collenette, Archive Service Manager, Warwickshire County Record Office:

From Bolton to Warwick.

May 10th 2012

Derek Hurst:

Droitwich Salt Production: the technology.

June 14th 2012

Jeromy Hassell:

Coventry Machinists & Coventry Victor.

NEWSLETTER

Meeting Reports

December 2011: Peter Lee

Nuneaton & Bedworth: coal, stone, clay and iron

Peter Lee's review of the now lost extractive and processing activities that once provided full employment for the men and women of Nuneaton and Bedworth was both depressing and heartening. As industrial archaeologists we have to recognise the inevitability of product lifecycles: the history of Coventry, for example, has been one of industrial reinvention over many centuries and it has provided us with much material for examination. We may mourn the passing of once great names but others do rise up to replace them. And is the demise of hard, dangerous and life-destroying manual labour not to be applauded? Providing, of course, that there is an adequate substitute put in place. If pit cottages and brickworks are replaced with new commuter housing estates and country parks is that necessarily a bad thing?

Nonetheless, the statistics with which Peter opened his talk were startling. The one-time boom town has lost some 40% of its jobs in the last ten years. For example, Sterling Metals employed 2,700 and is no more, there is only one working coal mine left in the district, the many mills that employed a high proportion of women have closed, and no bricks or tiles are being produced. Today, the largest employer is Dairy Crest with only 350 on the payroll. On the other hand, a dormitory town has emerged with landscaped parks and other amenities available to the community.

Nuneaton and Bedworth knew four principal industries based upon coal, stone, clay and iron. Of these, coal mining was the most important followed by brick and tile manufacturing and quarrying. All benefitted from being close to the canal network that was followed by the railways.

The liberally illustrated talk included many glimpses of these industries. Whilst the preponderance of illustrations being of steam locomotives was explained by the efforts of enthusiasts seeking out survivors for the record and that few photographs had been taken of the earlier activities, there was often much of interest and of valuable evidence in the backgrounds. Picture postcards from the turn of the 19th century provided another aspect of the district's main features.

Coal had been mined in the area since the 1500s. Coal seams were close to the surface and one inn even had its cellar carved out of the coal. Distribution was by canal barge and some estates such as Newdigate had their own canal system linking into the national network. Similar local networks were used subsequently for railways. Loading railway wagons needed expertise to ensure that the coal was not reduced to slack by undue movement during its journey and adopting dry stone walling techniques was one answer to the problem. The last shipment of coal to power stations took place in the 1960s.

Peter's research has revealed something of the personalities behind the local industries. E F Melly JP (a cousin of jazz musician George) was a philanthropist and mining engineer who was killed in the 1941 blitz. Alexander Donald, a Glasgow merchant and slave trader owned the Haunchwood colliery in the 1730s. Victoria colliery employed the future Labour Party Secretary, Thomas Mann, who was born in a cottage on Victoria Farm in 1856 and aged ten was a trapper at the colliery and worked there until its closure in 1870. W H Boon JP owned a granite quarry and was Chairman of the Rural District Council.

We saw too few illustrations of actual colliery workings except for some hair-raising examples of miners being lowered down the shaft in buckets and of the atrocious conditions that prevailed underground. Perhaps the best

record found so far are the photographs commissioned by the owners of the Haunchwood colliery as evidence 'just in case' prior to nationalisation. Ironically, it seems that they made more money after nationalisation than before!

The roll-call of now forgotten collieries seemed endless; Bedworth, Charity, Collycroft, Coventry, Craven, Exhall, Griff, Grove, Haunchwood, Hawkesbury, Newdigate, Nuneaton, Oldbury, Stockingford, Swan Lane, Victoria and Wyken. Peter held the history of them all at his fingertips and most were the subject of an affectionate anecdote to go with a photograph of a now pensioned off or scrapped locomotive. Notable was his description of the white-knuckle ride down a 40° slope into a drift mine and the not infrequent accidents on the rail network included a group of laden coal wagons that had run away down an incline to the canal wharf and overshot into the canal, discharging their loads of coal into the cut trapping several full barges for some time.

Closely associated with the collieries was brick-making. From the beginning of the seventeenth century, the area now known as the Borough of Nuneaton and Bedworth was riddled with coal workings and brick kilns. Wherever coal was found, good brick clay was found alongside. As the clay was dug through to reach the coal-seams, it made sense to construct kilns to produce bricks for the pithead buildings, and to sell the surplus to the local building trade. Throughout the area are the remains of old buildings long since demolished and in the frogs of the bricks scattered about are the words Durex, Hardy, Haunchwood, Moorwood and Stanley Brothers among others. Frequently, the brickworks and colliery bear the same name.

The district's brick and tile industry enjoyed a world-wide reputation for excellence. Stanley Bros had seven separate brickyards and specialised in glazed bricks for which there was a good export demand. The business lasted until 1988 when it closed and its records were acquired by the Nuneaton Civic Society, rescued by Peter Lee from the company's new owner who was about to scrap them. They are now on permanent loan to Warwickshire County Records Office.

Happily, examples of Stanley products survive in Nuneaton town centre; the former Gate Temperance Hotel was built by Reginald Stanley in 1895 and incorporates many of the yards' best products as does the Nuneaton Liberal Club and the Theatre and Gate Hotel.

Haunchwood Brick & Tile enjoyed the reputation of being the best in the country with its blue bricks being especially praised. James Knox, one of the directors also built a house to showcase the company's products; the Chase off Higham Lane in Nuneaton still stands today as the Chase Hotel.

The company's old no.1 brickyard is today the site of Whittleford Country Park, a local wildlife sanctuary. One illustration, without a loco in sight, showed three Haunchwood ladies in the 1960s operating a brick press line where operator safety seemed to be of little concern!

Much high quality granite was quarried in the district, W H Boon has been mentioned above and other quarries included Mancetter and Judkins who took over the old Boon quarry in 1955.

Some illustrations of the National Coal Board laboratories housed in the old Tansey needle works in Nuneaton showed another aspect of local industry.

Bedworth did possess some iron works but today nothing remains, and even machine tool manufacturers Clarksons has gone the way of earlier industries.

All in all, a most interesting evening that gave much food for thought.

January 2012: Christina Evans

Warwickshire Historic Environment Record and the 'Imaging Past & Present' project

Christina Evans opened many eyes to the work being done by a small team based in Warwick and part of the County Council's Museum Service. The Warwickshire Historic Environment Record (HER) could play an increasingly important role in the future under proposed changes to the planning framework and potentially be of great interest and benefit to industrial archaeologists.

The HER is a record of all the known historic and archaeological sites and finds within the county. Its function is to maintain and enhance the record, to operate a public information service, to provide information to planning archaeologists, consultants and other interested parties and to promote local archaeology to the community. The HER team provides specialist archaeological advice and consists of the County archaeologist, who will be retiring at the end of March 2012 - and will not be replaced in the present climate - three people responsible for the historic environment record and a planning archaeologist.

Amongst the masses of information to be found at the HER are over 12,000 aerial photographs, historic and modern maps (including first and second edition OS), published and unpublished material (including local antiquarian and research groups and parish surveys), over 1,000 fieldwork reports often arising from development requirements, statutory designations, national and local journals and personal correspondence. Much of these data can be accessed through the Warwickshire Museum's 'Timetrail' website (www.warwickshire.gov.uk/timetrail).

This website has been designed to accept contributions from users and these are welcomed, especially photographs and descriptions of sites that are of historic and general interest. Visits, by appointment, are welcomed at the HER which is presently located with the Museum Field Services in The Butts, but the department is moving in the spring to Barrack Street in Warwick.

It was clear from Christina's presentation, and from subsequent questions and answers, that much of the future success of the HER as a force for the protection and preservation of the County's archaeological environment will depend upon input from outsiders. The present and likely levels of staffing are simply too small to do more than monitor the most prominent locations. An obvious example that could well overwhelm the existing resources is the impact of HS2 on Warwickshire. Whilst some sites of archaeological importance on the proposed route are known, there could be many minor, and especially industrial, ones, that need to be flagged up as early as possible. Clearly, WIAS could play an important role as an information provider, possibly co-ordinating input from members.

A number of publications is produced by the HER team, ranging from archaeological comics aimed at 7-11 year olds to the Local Studies Toolkit which was developed to provide guidance about how to undertake research into the history and heritage of the local area. It is specifically aimed at those who have little or no experience of undertaking personal research and who feel they need some support and advice. The toolkit was created with the help of a number of experts from the County including HER staff, Local Studies Librarians, and County Record Office archivists. Within the toolkit there is information on key primary and secondary sources, including a description of each, their main uses and where each is likely to be found. The toolkit also includes information sheets on the use of maps and care for historic documents and objects, as well as information on who to contact for further help and advice. The Local Studies Toolkit can be viewed at local libraries or via 'Timetrail'.

Another current project, led by the landscape archaeology society, is charting the development of Warwickshire's historic towns from the Roman period onwards. Externally funded, the project is due for completion in 2013. It seeks to show the development patterns, both social and industrial, in each town. In the case of Atherstone we saw how hat factories had been located on now covered streams and how the development of the Vero slipper works progressed over 100 plus years. It is likely that future similar projects will be of considerable interest to members of WIAS.

In the second half of her presentation Christina concentrated on the various ways that information could be provided by members of the public to the HER.

'Timetrail' has already been mentioned. It is complemented by the HER blog at <http://warwickshireher.wordpress.com>, where up to date information can be found on many issues. Currently, opinions are being sought on a new local history website for Warwickshire. Warwickshire County Council's Heritage and Cultural Services are compiling a bid for Heritage Lottery funding that includes a brand new local history website. Working in partnership with Warwickshire Local History Society, the website aims to be an online gateway that would enable organisations, groups and individuals to share their research and collections and to promote events. For more information visit <http://www.warwickshire.gov.uk/localhistorygateway>. Local archaeological societies are also being encouraged to join the partnership.

Local lists are being compiled as a way for a local community and local authority to jointly decide what it is in their area that they would like recognised as a 'local heritage asset' and therefore worthy of some degree of protection in the planning process. These could include buildings, monuments, sites, places or landscapes which currently have no protection in the planning process (i.e. that are not Listed or Scheduled). Typically, structures, landscapes, sites and spaces associated with a significant period in an area's history - for example the remains of industrial or agricultural activities, key public buildings such as schools, pubs, railway stations (and their associated structures) or bridges. Also, buildings or sites associated with a major event in the area or a group of buildings and/or open spaces which are typical of a local area and help create the area's character - such as a cluster of buildings with a particularly interesting design, street plans or the relationship between a group of buildings and an area of open space, buildings linked to figures of local importance (which can include those identified by commemorative plaque schemes).

Another method of inputting information that could be of particular use to members is the Warwickshire HER Flickr Project. Using the well-established social media site this offers a swift and simple way of capitalising on the wealth of illustrative material and knowledge within the membership of WIAS. Some reservations were expressed at the 'user friendliness', or rather the lack of same with Flickr, but nevertheless there seemed to be a clear need for industrial archaeological sites to be better represented in the HER. Members can join through either a Google or Yahoo account at www.flickr.com/groups/warwickshireher.

A lively question and answer session indicated considerable interest in and enthusiasm for the project. The ramifications of HS2 have already been mentioned and other areas of concern included the need for a visual record of old buildings, and of those no longer existing, for better industrial archaeological records generally and for ensuring that planners and developers were fully informed as to what the community considered important.

A thought provoking evening admirably concluded by the Chairman's slightly irreverent review of the London Olympic site's outer fringes.

February 2012: John Bedington

Charlecote Mill

John Bedington, the tenant and miller at Charlecote Mill, gave us a rare insight into the joys and tribulations of real life industrial archaeology with his review of his tenure of this Warwickshire survivor.

The present mill is located on the river Avon between Charlecote and Hampton Lucy. Mills have been known here, or hereabouts, since the Domesday Book but differences over the exact parish boundary line mean that the early mill was in either or perhaps both parishes! It seems likely that the present mill is in a different location, albeit close by its earlier incarnations.

The earliest map in the County Record Office to show a mill on the present site at Charlecote is one by Fish of Warwick dated to 1736. Another record shows that in 1731, one John Osborne rented 74 acres adjacent to the mill from the widow of Stephen Lewis and there is another reference to repairs to a mill in 1732. It is thus possible that the mill is older. The 1791 map by Clarke of Evesham also shows a mill in the same location. John Bedington contends that both maps have the mill in the wrong orientation, it should be turned by 90°.

Sadly, the Lucy family archive at Charlecote House suffered considerable destruction in the 1890s but fortunately two deeds relating to the mill have survived. The first from 1772 shows that a lease of 21 years was granted in 1753 to a John Osborne (seemingly a relative of the Osborne referred to above). The date of 1753 was found engraved under the head race by John Bedington during some maintenance work. The deed included a provision that the landlord 'keep the mill in tenantable repair'. It also refers to the 'fletchers'. Not arrow-making but an old Warwickshire word for a weir.

The second deed covered a lease to two other Osbornes, possibly sons, and allowed them to remove certain equipment which they had installed, including dressing machines and sack tackle, at the end of their tenure.

Turning to the present mill, it is possible to date it to at least 1806 from a carved inscription recording the installation of the bed stone (the lower mill stone) at that date. The general style of the buildings also confirms such an age. A further pointer is that all the timber used is elm when oak would have been more usual; we know that the great ship-building programmes for the Napoleonic wars demanded huge volumes of oak.

John Bedington considered that a possible reference connecting the mill to one of the great civil engineers (Rennie?) is unlikely to be true, not least because the structure is so old-fashioned in many of its characteristics.

Today, the mill is very much 'as built' except for the rear roof elevation which has been changed to accommodate raised walls. A possible explanation is the provision of additional storage space for flour or grain at a time of rapidly rising prices at the beginning of the 19th century. Extra supports for the floor are a further indication of increased floor loading. War profiteering is nothing new.

Turning to the flat-paddled undershot waterwheels, there is clear evidence of modifications made in the late 19th or early 20th century. Cast iron hubs by Bell & Horton of Stratford upon Avon mate the original hexagonal shaft to a radial-spoked waterwheel which retains the original rims and paddles but replaces the former cross-over spokes.

The inefficiency of the undershot wheel concept was commented upon.

A review of some of the former millers at Charlecote produced some interesting anecdotes and nostalgic photographs. W Witherington left his name stencilled onto a wall and a beam whilst Samuel Gough's rent arrears are detailed in a surviving rent book which also showed his rent being halved to £44 per half year. The reason remains obscure but possibly linked to hard times following the introduction of reduction roller milling on an increasing scale. Traditional country mills did survive by milling animal feed but this work fell away when electricity came to farms and allowed small feed mills to be installed.

Harold Palmer ran several mills including Charlecote and from 1914 to 1929 brothers Oliver and Roland Baker who were remembered by a Mrs Gilbert (born in 1814) who lived in Avonford Cottage near to the mill. She had reminisced about milk and extra staff as well as collecting bran from the mill to feed her rabbits. In 1929 Newberry & Son took over the mill alongside their existing agricultural contracting business.

Amongst the old photographs were eel catchers on one of the weirs, a miller and his workers outside the mill, and a number of evocative views of the mill across the river.

Returning to the mill's history, in 1939 it seems that the estate refused to repair the waterwheels and there is evidence that the hammer mills were driven from a tractor power take-off. When John took over the mill in 1978 the internal shaft was still in place. The sack hoist was originally powered by the waterwheel and the tale was told of a miller who demanded that his labourer tied two sacks to the hoist and followed them upstairs with a third sack over his shoulder. There's productivity in a bygone age!

From 1959 the mill was unused until 1978 when John Bedington was approached by Sir Edmund Fairfax-Lucy with a view to putting it into working order again. John took on the lease and the repairs to such good effect that the mill was chosen by the BBC for a production of *The Mill on the Floss* which paid for much of the restoration work.

By 1989 there was the possibility of returning the mill to full time working. This needed negotiations with the various Public Health and Industrial Safety bodies; the early inspectors sucked their teeth and warned that 'the Boss' was unlikely to look favourably upon the project but in the event he proved to be very enthusiastic and supportive.

The mill is still grinding flour and just pays its way. Ten tons of grain is enough for five weeks production which now goes mainly to private individuals and a few specialist bakeries. An interesting development in recent times has been the milling of maize for some Asian supermarkets. It is very popular with the Punjabi community who rate it more highly than the imported flour.

In conclusion, John expressed his thanks to the many people who had helped him over the years, not least his own family. He hopes that there will be some young man who will be willing to take over the mill – perhaps another solicitor from Birmingham who hates offices and loves mills is waiting in the wings. There are other dangers, the proposal to canalise the Avon would destroy the mill's viability by raising the water level by nearly a metre. The outcome of the feasibility study is awaited with some trepidation.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

The end of the current season of meetings finds the Warwickshire Industrial Archaeology Society in good health, with high attendances at meetings, involvement with local industrial heritage projects, and increasing contact with other industrial history groups and local history societies. In terms of involvement in projects, the society has pledged £250 in support of the Warwickshire County Record Office's application for funds from the Grants Scheme to catalogue a large collection (80 linear metres) of the Willans and Robinson collection. The project is known as 'Willans Works Archive: Boaters and Bright Sparks' and is a partnership project between Alstom (the depositor), Warwickshire County Record Office, Warwickshire Industrial Archaeology Society and The Friends of Warwickshire County Record Office. As part of that application, I wrote in support of the project and that letter included the following:

The place of the Willans firm in the development of the technology of electricity generation is highly significant and yet surprisingly undervalued, and the possibility of cataloguing this archive presents a unique opportunity to rectify this imbalance and to give the Willans Works an appropriate place in the history of the industry.

Future students and researchers will undoubtedly find this archive an invaluable resource in understanding the pace and pattern of technological change, and the importance of the firm locally, nationally and internationally. The fact that over 60% of electricity generation in this country was supplied by Willans equipment in the latter part of the 19th. century gives some indication of the importance of this technology and the need to place it in context.

There is a wider significance as well with the role played by Willans in the history of Rugby, and the continuing presence of the firm's

successors in the town. Rugby developed a strong railway and manufacturing sector during the nineteenth century and the causes and consequences of this growth remain a fascinating topic for study. There is much to be gained from improving our knowledge of the firm, its workers and the impact on the wider community.

In our view, there is a strong case for access to the archive, but this is not possible at the moment. Some of the photographic collection has been recorded, but there is so much more that could become available. Several members of the Warwickshire Industrial Archaeology Society have expressed interest, with two actively involved in the process, and I feel sure more volunteers would be forthcoming if the cataloguing project went ahead.

One of the earliest recording projects with which the Society became involved was the Fenny Compton brick kiln, and I am pleased to report that the renovation project mentioned in a previous newsletter continues to make headway. To that effect, I received an e-mail from James Clifton, Enterprise Manager, British Waterways, which included the following: *I am planning for the kiln to be at the heart of a wider project, potentially including archaeological surveys, circular walks, interpretation, work with the Butterfly Trust, volunteering and possibly heritage skill training for apprentice bricklayers – plus an element of education and, I hope tourism.*

We are linked with the Guild of Bricklayers, as you know, and hope to engage with a good range of local organisations, including WIAS. The kiln last fired bricks in 1917. It is our aspiration to restore it, ready to fire one load of bricks to celebrate the centenary.

John Selby (the author of an AIA Review article on the kiln and Fenny Compton tunnel) and I have been invited to attend a meeting in Fenny Compton in late June and we will keep members informed of

progress. This wider involvement of industrial heritage as part of local community projects seems to be an important ingredient of the task of preserving our industrial past.

The presence of WIAS at local history and archaeology events is an excellent way of both spreading the word and of building contacts and the society has invested in a set of display boards to help in this process. The boards had their first outing at the recent Leamington Local History Day, where the focus was the need to encourage recording of memories of local firms Ford, AP and Potterton. We hope to have these display boards available at our monthly meetings and members will be able to display notices and any projects with which they have been involved.

Notice of the AGM

This is formal notice of the AGM to be held in the Pyne Room, Warwick School on Thursday September 13th. 2012. I repeat the usual appeal that if you feel you would like to take on a responsibility within the society (e.g. oral history; summer visits programme) do not be afraid to come forward for a preliminary discussion, with the possibility of joining the committee.

PROGRAMME

September 13th 2012

AGM followed by 'The Industrial Archaeology of Essex'. Co-ordinated by Martin Green. This year's AIA Conference will be held in Essex, and the chairman will present a report on the Conference and some detail of the sites visited.

October 11th. 2012

Dennis Crips: *A Living Dinosaur: From crystal sets to quantum computing in one lifetime.*

November 8 2012

Ian Mackintosh (of the Stroudwater Textile Trust): *400 years of Stroudwater Textiles.*

December 13th 2012

John Berkeley OBE: *From Pens to Particle Physics: the story of a Birmingham family business.*

NEWSLETTER

Meeting Reports

March 2011: Graham Fisher MBE

Jewels on the Cut: The Stourbridge Glass Industry & the Stourbridge Canal.

Graham Fisher spoke for and from the heart of the Black Country with his evocation of the now lost Stourbridge Glass Industry and its place alongside both the River Stour and the Stourbridge Canal. 'Jewels on the Cut' is an inspired title, combining a sense of the exotic and romantic with the down to earth location of many an 'Enoch and Eli' escapade. Graham himself is uniquely equipped to tell the story. A devoted son of the Black country (his own words), a lifelong devotee of our inland waterways since he 'legged' through the Dudley Tunnel in the 1960s (and receiving the MBE in 2001 for services to inland waterways), a scientist, a journalist and a rock musician, a qualified skipper of the largest hotel-boat operating on the UK's inland waterways and now an ambassador for the Broadfield House Glass Museum and the fast vanishing industrial heritage it is seeking to preserve. He is also a most entertaining speaker with a ready anecdote or telling aside.

Our journey began with a lesson in geology which showed how all the essential elements of sand, limestone and coal were readily available in the Stourbridge area. Indeed, glass manufacturing there is recorded in the early 17th century, the baptismal record of one John Tyzack in 1612 shows his father as a glassmaker, and must have been in place long before. Then, at the outset of the industrial revolution local entrepreneurial aristocrats such as the Earl of Bridgewater and especially John, 2nd Viscount Dudley & Ward together with the ubiquitous James Brindley and his colleagues, created the canal superhighway which included the Stourbridge canal.

The Stourbridge glass industry encompassed two main processes, hot and cold. The hot is common to all glass manufacture where the molten glass is blown, pressed or moulded to the desired shape. The cold is where the glass blank is crafted into the exquisite bowls, glasses, jugs and decanters generically known as 'cut glass or crystal' and for which Stourbridge is justly renowned.

For the hot end, the Stourbridge district also possessed good reserves of easily accessed fireclay for the pots used to melt the raw materials, and an illustration of pot setting at the Red House Cone in 1984 showed a cavalier attitude to 'Elf 'n Safety'. A cone-shaped chimney has been synonymous with glass manufacture since the late 17th century. Beneath the cone is a circular multi-pot furnace each pot of which was used by a single team or 'chair', often a family group. When shaping a blob of molten glass on the end of a blowpipe one of the craftsman's favourite tools is a wad of wet newspaper but there seems to be no preference between red-top and broadsheet for the best results. Pressed glass may be derided as 'cheap as chips' but underlying the process is considerable technology and precision die sinking.

Turning to the cold processes, there were principally two, grinding and acid etching. Grinding could use over or undershot wheels of stone or copper and was largely a masculine craft whilst women usually undertook the unhealthy task of etching using hydrofluoric acid, although female engravers were not uncommon. The illustrations of engravers, both early and current, showed vividly how little technology has changed over time. There are just very few practising engravers today.

The glass houses that arose in the Stourbridge area to exploit the local natural resources were initially located alongside the river Stour with the earliest recorded (Colemans) in 1612. Subsequent development closely followed the line of the Stourbridge canal when it opened in 1779. The arrival of the canal, with its significantly higher carrying capacity, shorter travelling times and minimal

breakage compared to the earlier pack-horse transport must have been of incalculable benefit to the fledgling industry. Furthermore, the canal slashed the price of raw materials, especially coal, which were needed in ever increasing quantities.

No review of the Stourbridge glass industry can ignore the story of the Portland Vase. This exquisite example of Roman cameo glasswork has a fascinating history. Probably, but not certainly, unearthed near Rome it was first seen in 1601 on its acquisition by the Barberini family on the death of Cardinal Del Monte. Sir William Hamilton reputedly paid £1,000 in 1778 when it was sold to pay gambling debts. In 1784 it was bought by the Duchess of Portland, hence its modern name. Its beauty and craftsmanship were much admired and copied, after much experimenting, by Josiah Wedgwood in his Jasperware. Deposited in the British Museum in 1810 it was smashed to pieces in 1845 but subsequently repaired and in 1945 was purchased by the Museum where it can still be admired.

Not only did the vase inspire Wedgwood, it also triggered a resurgence of interest in cameo glass that continues to this day. Benjamin Richardson, whose family owned the Wordsley Flint Glassworks, produced a transfer print version and is said to have offered £1,000 to anyone who could replicate the original, or possibly only said that that would be the value of the replica to its creator. In any event, some thirty years later suitable blanks were produced at the Red House Glassworks and John Northwood successfully carved a replica. He went on to create further masterpieces of cameo glass.

The visual history of the Stourbridge Glass Industry is rather sparse today but we were treated to a walk along the 'Cut' with the best of guides. Starting at the restored Bonded Warehouse in Stourbridge we passed the derelict site of Dovey's Glassworks, established in 1790, where one of the first steam engines was installed 'for the manufacture of cutting and grinding of glass'. Holloway End Glassworks is now a retirement home, and so on.

Bridges and the entries to barge tunnels have some interesting ironwork. Notably two bridges carrying the embossed name of James Bradley & Co, Stourbridge, AD 1838 and an earlier example by him cast at Coalbrookdale in 1873. Other abandoned and ruined works line the river and canal and present a depressing picture of how large swathes of our industrial heritage is disappearing under our eyes.

There is more to the district than glass, ironworks and canals. Foster & Rastrick were pioneers of steam locomotives and 'Agenoria', built in 1829 for the Round Oak Steel Works, can still be seen at the National Railway Museum in York.

Continuing along the canal we found reminders of other once great names; Webb, Corbett, Coalbournhill, Platts, together with a refreshing example of detailing by a modern architect who incorporated representations of glass cones into the brickwork of a modern supermarket built on the site of the Old Dial Glassworks.

There are now only four glass cones left intact in the UK, only one of which, the Red House Cone, is in Wordsley in the Stourbridge area. There is a truncated cone at the New Dial Glassworks which is still in regular use by Plowden & Thompson and Tudor Crystal, and is most likely the closest to a working example still extant in the UK.

The evening was a reminder, if any was needed, that our industrial heritage needs more Graham Fishers with his ability to articulate the need for appropriate preservation before all is lost, often on a whim. Another most interesting and thought provoking account of the practical issues facing Industrial Archaeologists.

April 2012: Sam Collette, Archive Service Manager, Warwickshire County Record Office
From Bolton to Warwick.

Sam Collette, Manager of Archives and Historic Environment at Warwickshire County Council added to a number of earlier presentations and gave us an illuminating overview of the issues facing those charged with safeguarding our heritage, which is not exclusively industrial.

Through the archives of two once substantial companies, Hick Hargreaves & Co in Bolton and Willans & Robinson in Rugby we were able to explore the rise and fall of several industries. More especially, there was a clear message that much of our remaining industrial heritage needs friends if it is to avoid the fate of many of its peers – records and artefacts unwanted and unloved tipped into a skip and thence to landfill.

We also learnt a lot about the work undertaken at the Records Centre, not least how much is done by Friends and Volunteers as several members can attest.

That archives can have a commercial value today was shown by the recent use made by Prudential of its association with the Titanic in a recent Asian advertising campaign that was very successful. It stemmed from an archivist stumbling upon a copy of an old newspaper carrying an earlier advertisement.

Another factor when dealing with industrial archives is technical expertise. Many professional archivists will have great competence in dealing with matters of commercial history but an understandable lack of technical expertise is clearly a handicap when examining engineering material. We already have members giving their time to help with the Willans & Robinson material and it may be that additional volunteers would be welcomed to help with other material.

Before dealing with her work in Bolton on the Hick Hargreaves material, Sam introduced us to the Bolton Museum, Library and Art Gallery site which also houses an Aquarium, the early work of Mass Observation in the person of Bill Naughton (author of *Alfie and Spring and Port Wine*) and memories of Fred Dibnah who was involved in the final days of Hick Hargreaves. Sam herself was responsible for removing the company's archive and many artefacts to the Bolton Museum in 2002.

B. Hick and Sons, later known as Hick, Hargreaves & Co, was based at the Soho Ironworks in Bolton. Benjamin Hick had originally been a partner in Rothwell, Hick and Rothwell and set up his company in partnership with his sons in 1832. After the death of the elder in 1842, the firm continued under the management of his son who in 1845 took into partnership William Hargreaves.

The Soho works were extensive and the site large. The first steam locomotive was built in 1833, followed by several more over the remainder of the decade, including an unconventional gear driven steam rail carriage. A number were built for export to America. Between 1837 and 1840 the company supplied engines to many of the new Railway companies as well as the Paris and Versailles Railway.

In 1841 the Birmingham and Gloucester Railway had found some American Norris locomotives very successful, especially on the notorious Lickey Incline, and Hick built three similar ones for the line. Locomotive building continued until 1855, and in all some ninety to a hundred locomotives were produced; but they were a sideline for the company, which concentrated on marine and stationary engines, of which they made a large number. Incidentally, as a result of the company's strong exports, especially to Egypt, Bolton Museum has the best collection of Egyptian cotton products outside of the British Museum.

At the end of the 19th century HH began to manufacture steam engines for electricity generating purposes, and from 1911 diesel engines. In World War I the firm did much war work, and began making high vacuum condensing plant, again used in power generation. This was greatly expanded in later years as centralised power generation was adopted in Great Britain.

In 1933 the records, drawings and patterns of three defunct steam engine manufacturers were acquired and a lucrative business developed in repairs and spare parts. Large stationary steam engines were still used by many textile manufacturers in the Bolton area until the collapse of that industry after World War II.

After World War II the firm expanded its work in electricity generation, and branched out into food processing, oil refining, petrochemicals and offshore oil equipment production.

The photographs from the HH archive gave a flavour of the business over the years and included the final removal of the factory gates in 2003, and Fred Dibnah's statue in front of the restored 1886 HH Corliss engine in Oxford Street, Bolton.

Turning to Warwickshire since her arrival in 2004, Sam expanded on the work of the Record Office and the January 2012 presentation to the Society by her colleague Christina Evans. In particular she expressed her thanks for the work done by friends and volunteers without which much needed research would remain untouched.

The Records Office provides a wide variety of services to the public including free access to various subscription websites. Interestingly, if any member is contemplating taking out a subscription to Ancestry UK with a view to a bit of family research it is financially advantageous to the Record Office if application is made via the link on the Warwickshire gov website.

Future developments are dependent on the financial situation for which the outlook is gloomy in the short term. However, an application for Heritage Lottery funding for cataloguing projects is pending with a decision due in June.

Returning to the archive material, we revisited Willans & Robinson. Three of our members are currently working on this material and gave us a most detailed presentation in May 2010 (see Newsletter 38) and so a lot of the information was familiar and does not need to be repeated.

However, the concluding part of the evening covering the products of both companies allowed the use of much new material from the archives.

Early drawings of HH locomotives and pioneering railcar engines needed more time for study, as did the Corliss valve mechanism. The variety of industrial applications for W&R engines spoke for their exporting abilities and there were tantalising glimpses of ledgers and commercial documents written in immaculate copperplate.

A fragile blueprint relating to cattle pens on the SS Sorrento, an early Australian Refrigerated ship from the HH archive, indicated a connection with cold storage that might have links to the Nelson family's development of the frozen meat trade from Australia and New Zealand (see Newsletter 41). HH were even involved in the car industry in the 1920s, producing a range of small petrol engines. One was shown fitted to a now long-forgotten Vulcan car.

Sam Collette made a powerful case for assistance, especially in dealing with technical or engineering subjects. Indeed, as she said 'I have chosen pictures for their aesthetic qualities. I do not understand the engineering'. There seems to be a gap that needs to be filled.

May 2012: Derek Hurst*Droitwich Salt Production: A Pickled Past.*

Whilst we all use salt on a daily basis, the techniques behind its production are less well known. Pictures of salt pans on coastlines, especially in warm climates, may be familiar from travel documentaries but Iron Age brine pits in Droitwich get few mentions.

Derek Hurst, Archaeological Projects Manager at Worcestershire County Council, knows more than most about them having been involved in much of the recent work around the Droitwich salt industry. Surprisingly, it has only been during the last thirty years that any serious archaeology has been undertaken in the area. As an archaeologist specialising in exploring the economic drivers behind his projects, one of which was the story of Cotswold sheep, Derek has found much of interest in Droitwich.

Inland salt production anywhere in the world stems from either mining solid deposits, as in Cheshire, or utilising brine from saline springs. Droitwich is rich in saline springs (unusually as a totally saturated solution with one gallon of brine yielding 3 ½ pounds of salt) and the town was long a producer of salt on a commercial scale.

The rights to making salt, given its importance and universal use as a preservative and as a condiment, were vested in persons of authority and power, often the Crown. However, in 1215 King John sold the rights to the citizens of Droitwich for an annual payment of £100 and until 1695 the industry was run as a monopoly of the townspeople. This period is well documented but needs a full investigation. When the borough monopoly was broken as the result of a court ruling, individual producers proliferated. With the simultaneous removal of price and output controls production soared and prices plummeted, ruining the speculators. One astute survivor, John Corbett, bought up the remains and in the 19th century his private monopoly brought great wealth to him and his descendants.

The early production process, known from at least the second century BC, was simple. Brine from the spring is first contained in large pits lined with wood and clay to form a watertight storage tank. Some evaporation may also take place at this point but settling out is considered the principal objective, with evaporation taking place in large shallow pans heated from below. Wet salt crystals deposited from the solution are removed and placed in another container which allows the salt to drain and form a solid block. Archaeology has found remains of both tanks and evaporating pans close by the saline springs in Droitwich.

The conical porous salt containers were made from 'briquetage' and some recent work has recreated examples based on fragments from excavation. Large quantities have been found in dense layers in the salt-making areas of Droitwich as well as in many Iron Age settlements in Hereford and Worcester and beyond. A network of salt trade and exchange across a large area can, therefore, be mapped in detail and shows the importance of Droitwich salt at this early period.

Roman times have left little evidence of salt production but the other nearby Roman remains of Doddenhill Fort and the luxurious Bays Meadow Villa (an example uncommon in the Midlands) dating from the 2nd century AD, together with the use of the name 'Salinae' for the town, indicate significant Roman interest in the area.

One piece of Roman archaeology is the major engineering works around the brine springs also dating from the 2nd century. A large plank-lined tank or channel, probably for brine collection was constructed from older timbers dendrochronologically dated to AD 61-5 and situated adjacent to two massive crossbeam braces, possibly part

of a later crane or winch mechanism. The villa was burned down in the late 3rd Century and the last dateable evidence of Roman occupation is coins dating to the 370s. There is evidence that the villa's aisled hall was reoccupied in the 4th century but extensive robbing has taken place and the site was ploughed up in medieval times.

Salt production continued in Anglo-Saxon times. Stone-lined hearths with lead pans have been found dating to the 5th to 7th centuries. There is also evidence of post holes that indicates an out-of-doors location protected by wind-breaks needed to ensure a steady temperature in the evaporating pans. Excavations have also found that during this period there was a great flood which inundated the site in mud and buried the evidence for salt making. The Saxons named the River Salwarpe after its propensity for 'throwing up brown stuff'.

Further evidence for the importance of Droitwich as a centre for salt production is that of the medieval 'salt-ways' that can be traced from Saxon and medieval place names radiating from Droitwich to the South and South East. Interestingly, there seems to be little evidence of such connections between Worcestershire and Warwickshire which begs the question; where did the latter's salt come from?

Perhaps the most interesting archaeological find from these times has been the 'Great Well' found in Upwich in the excavations of 1983/4. This large, ten metre deep brine pit has been dated to 1264/5. It is lined with oak beams and is located alongside the Roman crossbeam braces referred to above. Between the two lie the remains of a later medieval pump base. Other examples of medieval equipment found are the remains of barrels and wooden tools, rakes, paddles and shovels for handling the salt. Very similar equipment is illustrated in a 16th century German industrial treatise which suggests a strong European tradition of salt manufacture and the interchange of technology.

By around 1400, annual salt production had been raised to at least 1,500 tons using about 11.35 million litres (2.5 million gallons) of brine. The pump alongside the brine pit further increased production when it replaced the bucket method of brine extraction. Hollowed-out elm was used for piping. Interestingly, production of salt was limited to six months in a year equating to some 10 tons a day.

A visitor to the town in the 1530s reckoned that 6,000 cart loads of wood were being consumed each year by the brine boiling hearths. Terrible pollution resulted and a local cleric is recorded as petitioning the Bishop of Worcester for a transfer to a cleaner place!

By the end of the 17th century larger pans (some iron but many still lead lined) and brick built coal-fired hearths helped to increase production to nearly 3,000 tons a year. This led to the need for cheaper transportation and attempts were made to improve the navigability of the River Salwarpe between Droitwich and the River Severn.

In the 19th century, large factories were built alongside the Droitwich barge canal enabling boatloads of 60 to 70 tons of salt at the peak of production of 120,000 tons in 1872. After John Corbett amalgamated all the salt production he relocated much of it to Stoke Prior some 3 ½ miles to the North East, and Droitwich was developed as a spa. He also built Chateau Impney as his home.

Salt production finally ended in 1922 when ICI, by then owning all the salt resources in both Droitwich and Cheshire, moved production North. Apart from the archaeological remains, the main evidence remaining of Droitwich's great salt industry is the subsidence and leaning buildings, especially in the High Street. Had brine extraction continued the town might have disappeared!

Warwickshire Industrial Archaeology Society Newsletter: Number 45

WARWICKSHIRE

WIAS

Industrial Archaeology Society

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FROM THE CHAIRMAN

Maintaining momentum

During this year's AIA Conference in Chelmsford it was interesting to hear of the way in which many industrial history and industrial archaeology societies were struggling to maintain membership and attendance at meetings. The ageing demographic structure of membership, the diminished interest of current generations in past industrial eras, plus the proliferation of other societies that often touch on industrial subjects (e.g. local history and family history societies), were identified as possible factors, with the first of these seen as the main explanation.

The increasing membership of WIAS and the buoyant attendance at meetings seemed to buck the trend, and the committee is determined to maintain this momentum.

Principal amongst these is the goal of providing a range of monthly meetings that can prove attractive to a cross-section of our members and visitors - from the talks on the technologies of the past to interpretations of urban and social history; from the local to the national and even international context; from the lecture that occupies a whole evening to the shorter presentations, often given by members. These shorter 'add-ons' that usually occur in the latter part of the meeting have contributed greatly to the diversity of material that seems to interest the industrial archaeologist!

We hope that this year's programme fulfils this goal, and that no-one should feel reluctant about offering input to a meeting, either via comment, question or additional talk.

Planning the year's programme is probably the principal work of the committee, all of whom apart from

Richard Hartree - retiring after several years of loyal service - are willing to serve another year. Alain Foote will be joining the committee for 2012-2013. These and others (e.g. Jan Coulls and Barbara du Bois providing the refreshments at meetings; the website run by Peter Riley who also works with Richard Storey on the bookstall; the Newsletter largely written and edited by Mike Hurn) all combine to produce a highly effective team.

As you will notice, this Newsletter - in response to member requests - has an additional four pages containing photographs and text provided by members. We hope that this will become a regular feature and the editor Mike Hurn is very happy to receive contributions, either handed over at a meeting or sent via e-mail mikedhurn@btinternet.com.

This project obviously relies on the volume of contributions from members, so please send in material - particularly relating to Warwickshire - that you feel would be of interest to the industrial archaeologist.

The display boards purchased by the Society are also available at meetings should anyone wish to mount a display of material. Please contact the Chairman on wiaschairman@aol.com.

Other goals for the committee include making the AIA Journal more readily available to members; seeking the spread of the IA message into other parts of the county where we are not well represented (e.g. Rugby, Nuneaton); gathering knowledge and photographs of local firms with a view to mounting a presentation at one of our meetings, with the first of these concentrating

on the Ford Foundry of Leamington, co-ordinated by Peter Grenfell (rpgrenfell@ntlworld.com), with a presentation at our June 2013 meeting.

The Fenny Compton Kiln Preservation Trust

Many will be aware of WIAS's close involvement with the project to restore the Fenny Compton Brick Kiln. The Guild of Bricklayers and The River and Canal Trust (formerly British Waterways) are prime movers in this project, and members might know of the Fenny Compton Kiln Preservation Trust. The Trust was formed in 2010, and is committed to restoring the kiln and the surrounding area, thereby enabling the public to have a greater understanding of brick making, the canal network and local history. The trust is extremely keen to attract volunteers. For further information, please contact Steve Barlow, Secretary of the Trust stevebarlow@live.co.uk. Tel: 07932 310710. Membership is £5 per annum, with a joining fee of £5.

PROGRAMME

November 8th 2012

Ian Mackintosh (of the Stroudwater TextileTrust):
400 years of Stroudwater Textiles.

December 13th 2012

John Berkeley OBE:
From Pens to Particle Physics: the story of a Birmingham family business.

January 10th 2013

Alain Foote:
The English Electric Company 1918-1968.

February 14th 2013

Members' Evening

March 14th 2013

John Yates (Inspector of Historic Buildings, English Heritage)
The First Iron-framed Building in the World: Ditherington Flax Mill -History and Restoration.

NEWSLETTER

Meeting Reports

June 2012: Jeromy Hassell

Coventry Machinists and Coventry Victor

Jeromy Hassell has talked to the Society on two previous occasions; in March 2007 (Newsletter 27) on his ancestor Joseph Wright – a Coventry Watchmaker and in June 2006 (Newsletter 23) on engine makers White & Poppe. On this occasion he gave us his understated but penetrating observations on two other famous Coventry names: The Coventry Machinist's Company and Coventry Victor.

The history of these two companies was traced through a pageant of product illustrations and memorable pictures of factory conditions giving a vivid recreation of the bygone age of late Victorian and Edwardian England before WWI. This was the time of luxury toys for the well-to-do and horrendous working conditions under which the toys were produced.

Whilst some of the history of each company was familiar to many members, Jeromy's wry approach brought new insights into their activities and uncovered new material.

The story of the Coventry Machinist's Company starts with James Starley. His natural flair for invention led to an improved sewing machine, said to have been the first capable of stitching around the hems of cuffs and trouser legs.

Starley moved to Coventry in 1861 and started the Coventry Sewing Machine Company backed by a group of financiers wishing to provide employment for skilled workers laid-off through the decline in the watchmaking industry. The sewing machine went into production but with increasing American competition other products were needed.

Michaux in France had introduced pedal power with the Velocipede. Starley obtained an order to make 400 machines for sale in France, but the Franco-Prussian war resulted in their being sold in the UK. The Velocipede had a cast iron frame and weighed 160lb! It sold for about £12, at a time when the average wage was around £1 a week.

Starley started to make improvements, modifying the brake, fitting a mounting step and reducing weight. He introduced larger front and smaller rear wheels plus leg-rests over the front wheel. Starley's developments led to him becoming known as 'the father of the British bicycle'.

Jeromy explored the development of the 'penny-farthing', which was introduced to provide higher gearing and a better ride on uneven surfaces, through a series of illustrations highlighting brakes, chain drives, tricycle derivatives, free-wheels and rocking lever pedals. We even saw single and double coolie cycles for Colonial use and a tricycle which could be changed from single to double configuration, although perhaps not as smoothly as in the powerpoint transformation!

A Royal Warrant was granted in 1883 and bicycles began to take on a more modern appearance with the rider seated between two equal-sized wheels. Passenger carrying tricycle tandems allowed 'a lady to mount or dismount with perfect ease without soiling her dress'.

The review of Coventry Machinists concluded with nostalgic pictures of the Cheylesmore factory both inside and out and some of the eccentric machines it produced including four and five-seaters. Commercially the company languished. It was sold in 1896 and the name changed to The Swift Cycle Company. The purchaser was the flamboyant Ernest Terah Hooley whose practice was to buy well-run private companies and float them with a great fanfare. As with all his flotations, that of Swift was heavily oversubscribed. The future went well for the Company, but not so well for Hooley, who two years later when, after acquiring a series of companies for £9m, and then selling them for £14m, declared himself bankrupt on refusing to settle a small debt which he considered unjustified. During his career, over £100m passed through

his hands, and the companies he launched included Boots, Schweppes, Dunlop, Singer Sewing Machines and Raleigh Bicycles. Swift expanded its site at Cheylesmore and went on to manufacture motor vehicles but eventually folded in 1931.

Jeromy then turned his attention to the inventive William Weaver and his Company, Coventry Victor. Born in Peterborough in 1885, Weaver served an engineering apprenticeship in Manchester and moved to Coventry in 1904. He has been described as an individualist working on his own account, paying scant attention to anyone else and having the pioneer's obsession with his own ideas which he produced 'as a catherine wheel produces sparks'.

In Coventry, Weaver established Moreton & Weaver, in Hillfields to carry out experimental work and make machine tools and components for the motor and aircraft industries.

Weaver was attracted to the new field of aeronautics and built some pioneering ornithopters (aeroplanes with flapping wings) of which little is known save that the original machine was tested on the Hampton in Arden golf course and subsequently destroyed in a gale. However, Flight magazine in May 1910 did record the successful trial of an ornithoptone designed and built by a Mr Weaver of Coventry with a flight of a quarter of a mile.

In 1911 Weaver founded The Coventry Victor Motor Company Limited to manufacture engines and motorcycles under his own patents. The first engine was a horizontally opposed twin-cylinder, four-stroke which in due course established Weaver as Britain's major producer of such engines. At this time Weaver also produced parts for man-lifting kites and the Cody biplane. During WWI he made some of the first bombing devices for aircraft and by the end of the war Coventry Victor was producing motorcycles powered by their own engine.

A series of illustrations, culled from the Coventry City archives, of Coventry Victor promotional material showed many machines of originality and included a bullet shaped sidecar of polished aluminium with air cushion upholstery 'of superior quality'. Of even greater interest were photographs of the works, some of which included Weaver himself, that gave another glimpse into the manufacturing processes in early twentieth century Coventry.

The three-wheeled cyclecar, originated by Morgan in 1910, flourished in the post-war years being cheaper to buy, tax and run than cars and more comfortable than a motorcycle. Weaver launched the first Coventry Victor cyclecar at the 1925 Olympia Cycle Show. Unlike Morgan, Coventry Victor made both the chassis and the engine – a water-cooled version of the old twin.

A wide variety of models followed over the next decade but as tax concessions for small four-wheelers eroded the cyclecar's advantages and, despite good press comment and a loyal customer base, production ceased in 1937. Thereafter the company concentrated on manufacturing and supplying engines, always flat twins, both petrol and diesel, for vehicle, marine and stationary applications. There was even an air-cooled aircraft engine in 1955.

In 1965 production was moved to a new site in Willenhall Lane. William Weaver died in 1968 and in 1969 the company went into voluntary liquidation. Weaver's son then purchased the sole rights to manufacture Coventry Victor engines and trades today as A N Weaver (Coventry Victor) Ltd.

A most interesting meeting concluded with one of the Chairman's finds – a silent film from 1929 extolling the variety of activity to be found in the Port of London. A considerable contrast indeed to Coventry's manufacturing heritage.

Members' Contributions

Martin Green:

Two Modern Structures: Two new views of London's Industrial Heritage

One of the unexpected inclusions in the AIA Conference at Chelmsford was a talk on the structures of the Olympic Park, sites with which we had all become increasingly familiar via the extensive TV coverage of the Olympic and Paralympic Games. Love it or hate it, Anish Kapoor's and Cecil Balmond's ArcelorMittal Orbit certainly became one of the lasting images of those games, and will have a permanent place in the re-modelled Olympic Park in the future. It is Britain's tallest art sculpture at 115 metres high, and, as its appearance suggests, it presented a considerable challenge in terms of structural engineering, with Arup providing the necessary expertise. Sadly, the Orbit will remain closed to visitors for the time being and will not re-open until late 2013 or early 2014.

In addition, The Emirates Airline – the cable car across the Thames from the O2 arena on the Greenwich peninsula to the ExCel Centre at Royal Victoria Dock - had been built with impressive speed to be open in time for the Olympics. The cable car - capable of carrying 2,500 passengers an hour - stretches over three spiralling towers, designed by architects Wilkinson Eyre, and manufactured in Bolton. The towers are mounted by specialist cable car equipment supplied by Austrian-Swiss company Doppelmayr.

These two structures have generated an unexpected bonus for the industrial historian, by giving access to new views of some of the industrial sites of the area. During the Olympics it was possible to ride to the top of the Orbit and to enjoy the magnificent 360 degree views of the Olympic park and this part of east London. One building that was probably not on many people's radar was the (former) Bryant & May match factory in Bow. This has now been converted for residential use and is known as 'Bow Quarter', but remains one of East London's most important industrial sites.

Industries such as match-making were typical of the area, and the industrial activity on the north bank of the Thames continues this theme. 'Noxious trades' tended to be pushed eastwards of the City of London, partly because regulations on industrial use were far more lax east of the river Lea.

The sequence of wharves along this riverbank towards Silvertown illustrate the diversity of this past industrial activity. As we look downriver we see Clyde wharf (location of former sugar refinery), Pinchin's wharf (former Pinchin and Johnson paints and varnishes now Nuplex Resins), Peruvian wharf (location of former Anglo-Continental guano works with land now awaiting development), Plaistow wharf (Lyle's Golden Syrup still in active production), Knight's Royal Primrose soap works (now J.Knight : Animal by Products). – and many more beyond, including Tate and Lyle's sugar refinery. Each wharf has a story to tell, but seeing these either by land or riverboat was always difficult or inaccessible. The cable car has changed all that. A trip is strongly recommended, not only for the views of the Greenwich peninsula, Canary Wharf and the Royal Victoria Dock, but for a glimpse of the area's past and present industrial activity. Much of it is changing, with new residential developments built or in the planning process.

The only criticism is that the cable car travels too quickly, and the opportunity to really study the area quickly disappears. This makes a return trip almost imperative!



The Orbit close to completion, with just the viewing gallery still boarded up, and the Aquatics Centre in the background.



The former Bryant & May factory in Bow as viewed from the Orbit, with the tops of the Olympic Stadium floodlights in the foreground.



The view of the industrial riverside of the north bank of the Thames as viewed from the cable car across the river. The main wharf in the picture is the site of Pinchin and Johnson's paint works which passed through various owners before being sold recently by AkzoNobel to Nuplex Resins, a NZ-based multinational company. Beyond that lies the vacant ground of Peruvian wharf, and then Lyle's Golden Syrup works.

Members' Contributions

Roger Cragg:

Early Reinforced Concrete Bridges in the West Midlands Region

The technique of building bridges and other structures using reinforced concrete was developed by a French engineer – François Hennebique (1842-1921). He appreciated that the weakness in tension of plain concrete could be overcome by placing steel bars within the concrete in regions where tensile stresses occurred, most notable in the bottom face of concrete beams. In France this technique was known at that time as *Béton Armé* and in Britain as 'Ferro-Concrete', a term which has now gone out of use but may still be encountered in older publications.

The construction of reinforced concrete bridges using the Hennebique technique started in the UK with Chewton Glen Bridge in Hampshire in 1902, the British agents for the patented process being L.G. Mouchel and Partners.

The oldest reinforced concrete bridge in the West Midlands Region is the 96 ft. span arch bridge at Stanford upon Teme in Worcestershire, built in 1905.



Stanford Bridge

Another early bridge is Dogpole Lane bridge in Birmingham (SP061822) of 1908 with a skew span of 45 ft. This bridge has a very flat arch and is currently propped and awaiting replacement due to its inadequate strength.



Dogpole Lane Bridge

Early Mouchel-Hennebique bridges which also still survive in the Region are in Birmingham – Cranford Street Bridge (1906) SP035883 and Bond Street Bridge (SP052814) and Umberslade Road Bridge (SP053814) in Stirchley, both 1908. More locally there is Binley Road Bridge, Coventry (1911) at SP369786.



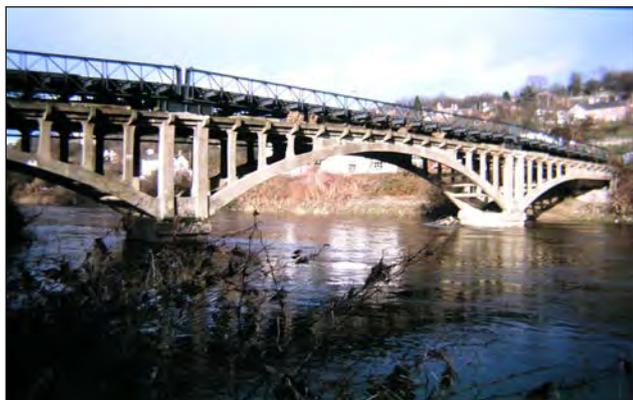
Bond Street Bridge

Princes Drive Bridge in Leamington Spa dates from 1923 but is of interest as it was built by the Trussed Concrete Steel Co.



Princes Drive Bridge

In 1909 a new reinforced concrete bridge was designed by Mouchel and Partners and built by the Liverpool Hennebique Company over the River Severn at Jackfield, downstream from the Iron Bridge (SJ681033). This bridge, named the Free Bridge as it was the only toll free crossing of the Severn in the area, had three open spandrel reinforced concrete arches of 66, 87 and 66 ft. span. Unfortunately, despite frequent repairs the concrete deteriorated and, due to its narrow width, the concrete parapets were subject to frequent damage by vehicles.



Old Free Bridge (1909)

In 1991, after lengthy discussion in which the author took part, it was decided to demolish the bridge and replace it with the present structure, a single span cable stayed bridge with a single tower on the south bank. The new bridge was opened in August 1994.

Also in Shropshire is Cressage Bridge (SJ594045), dating from 1913, with three spans of 40, 80 and 40 ft. It carries the B4380 road over the River Severn. A conventional reinforced concrete arch bridge, it is a good example of the transition from masonry to reinforced concrete, the external design, by Mouchel and Partners in conjunction with Shropshire County Council, being strongly based on masonry practice.



Cressage Bridge

Similarly dating from 1913 is Wergins Bridge over the River Lugg north-east of Hereford. (SO529447). It has a single span of 50 ft., was designed by the Considere Construction Company and built by Andrew Scott, Contractor, of Port Talbot. The bridge is rare in that it utilises the Kahn system of reinforcement. In this system the main horizontal steel reinforcing bars have 'wings' which are bent up at 45° to provide shear reinforcement.



New Free Bridge (1994)



Wergins Bridge

Another early reinforced concrete bridge over the River Severn is situated at Atcham, Shropshire (SJ541093). This large bridge has five arches of 60, 100, 120, 100 and 60 ft. span. Until recently it carried the A5 Holyhead Road. It was built in 1927, parallel to John Gwynne's 1779 masonry arch bridge a few yards away, the original bridge being preserved for pedestrian use. Another Mouchel & Partners design together with Shropshire County Council Engineer Mr. W.H. Butler, the bridge used coloured cement and a bush hammered finished to match the Grinshill stone of the old bridge.

There is a fine bowstring arch bridge of 110 ft. span over the River Avon at Evesham dating from 1928 (SP034431) but this bridge is under threat.

Although reinforced concrete bridges continued to be built until the 1950s the technique has now largely been superseded by the use of prestressed concrete.

Members' Contributions

Martin Green, Peter Coulls, Peter Chater and George Sayell

End-Piece: The Archaeology of the Inevitable

It was the submission of photographs by Peter Chater that prompted thoughts about a (potentially) untapped source of material for the industrial historian. The archaeology of death sounds a distinctly unattractive topic, but the cemeteries, churchyards and funerals that record the inevitable do contain much material of interest. This ranges from the content of inscriptions as a source of information, through the materials and techniques used for gravestones and memorials, to the manufacturing of all the components for funerals, burials and cremations. No doubt members will have knowledge of local churches, churchyards and cemeteries that contain material of an industrial connection, and we would be delighted to hear of them. An obvious and well-known source would be London Road Cemetery in Coventry - designed by Joseph Paxton in the middle of the nineteenth century - where several of Coventry's most eminent industrialists are laid to rest including James Starley.

This is a serious component of archaeological study and I am reminded of a conference I attended at Ironbridge where a lecture on this theme was given by Dr. Harold Mytum, of the University of Liverpool, and an old boy of Warwick School. He is author of a book *'Recording and Analysing Graveyards'*, a CBA Practical Handbook in Archaeology. This theme also fits in well with one of our monthly meetings where Elizabeth Perkins (Director, Birmingham Conservation Trust) will talk on Newman Brothers Coffin Works in Birmingham. This is a fascinating insight into the wide variety of materials (including 'soft goods') that were produced in Birmingham and elsewhere to supply the industry. This tradition lives on with John Wilde and Co Ltd of Devon Street, Birmingham, Europe's largest manufacturer of funeral furnishings with factories in both Birmingham and Glasgow, although competition from China - where else? - has become a serious challenge.

A few examples of local interest are included here. Peter Coulls, writing below, answers the questions over the identity of John Whitehead Greaves and the reason he is buried at St Mary Magdalene's Church, Lillington, Leamington Spa; George Sayell reveals a significant memorial in Old Milverton churchyard to Philip Kench of Emscote Mill fame; and Peter Chater asks whether anybody has more information on buildings which might be described as 'mortuary chapels'

Who was John Whitehead Greaves (Born 21 June 1807; Died 12 February 1880) and why is he buried in this Churchyard? He was born in St Albans, Hertfordshire to John Greaves, a Quaker from Radford Semele and Mary (née Whitehead) in 1807 the third of four sons. His elder brothers were taken into the family banking business and he was advised to look elsewhere for employment such as Canada. In 1830 he travelled to Caernarfon, from whence transatlantic tickets were readily available. He appears to have been deterred from leaving after seeing the conditions which he would have to endure in order to reach the other side of the Atlantic.

Whilst in Wales he met Edwin Shelton and formed a partnership to take over a slate quarry in Llanberis. The partnership acquired new quarries in the Blaenau Ffestiniog area. The nearby Ffestiniog Railway, then in its infancy, enabled slate shipments to be taken to 'Port Madoc' which was being developed. In 1843 Greaves became Treasurer and ultimately the Chairman of the Railway Company that survives to this day as J.W.Greaves & Sons. At the age of 63 he announced his intention to retire to a house he had built at Bericote (Bericote House) in 1870. He handed

over the business to his son J.E.Greaves.

J.W.Greaves died in Brighton in 1880 as the result of injuries sustained in a riding accident. His body was returned to Leamington Spa for burial in St. Mary Magdalene. The Company he founded survives today producing slates and slate products in conjunction with operating a very popular tourist attraction, Llechwedd Slate Caverns, in Blaenau Ffestiniog.

(acknowledgements to <http://warkcom.net/live/cme810.htm> and *Victorian Slate Mining* by Ivor Wynne Jones, Landmark Publishing)



The Memorial to John Whitehead Greaves in Lillington.



George Sayell with the memorial to Philip Kench of Emscote Mill which is to be found in the churchyard of St James in Old Milverton.



The 'Mortuary Chapel' found by Peter Chater adjacent to Farnborough Churchyard. It is thought that the original use was to hold a body overnight awaiting burial. This was before there was a road network and bodies were carried sometimes a distance over rough tracks by hand to the church the day before burial.

September 2012: Martin Green

The Industrial Heritage of Essex - A Personal selection

The annual conference of the Association for Industrial archaeology was held in Essex this year, and the Chairman chose the industrial heritage of that county as the theme of the opening lecture of the season. He began by explaining that he was no expert on Essex, but hoped that the (perhaps unanticipated) delights of the industrial sites in the county might stimulate interest, and might even tempt some to make the intrepid journey eastwards.

Industrial activity pays no heed to county boundaries, but an additional complication in Essex's case is that the current county was previously a much larger area. The major difference is that a large strip of land bordering the river Thames on the eastern edge of the county is now part of Greater London. This strip had become extremely industrialised (including sites such as the Tate and Lyle sugar refinery at Silvertown and the Ford motor plant at Dagenham), and there was a case for treating estuary-side Essex as a specific area. Such an area would include Tilbury docks, passenger terminal and power station, as well as the oil terminals at Thames Haven. The estuary location has dictated the nature of industrial activity at these locations.

For much of the rest of Essex, the nature of the land, its underlying geological make-up, and the pattern of rivers (Stour, Colne, Chelmer and Blackwater, Crouch, Roach, Thames) draining eastwards into the North Sea have been powerful determinants of the pattern of industry. The land is generally flat, with no coal or metal ores, nor significant quantities of building stone. Agriculture has dominated - and continues to dominate - the landscape. Timber and brick have been the favoured building materials. Some parts of Essex (particularly the extensive areas of marshland) have been unproductive and remain relatively isolated. Isolation is not necessarily a handicap to the growth of industry - isolated areas make good locations for the explosives industry, for nuclear power stations and offer the potential for opportunist entrepreneurs to take advantage of a low-cost location.

In simplest terms, the geology of Essex is a bowl of chalk (outcropping in the north and south of the county) overlain with clay. The chalk deposits have been exploited in the past, but no activity remains. The chalk quarries in the south have been converted into housing estates, nature reserves and the huge Lakeland shopping centre. Given the geology, it is no surprise that brickmaking has thrived in Essex with large numbers of small-scale producers. One such works still in operation is the Bulmer Brick and Tile Company. The AIA visit to these works, led by owner Peter Minter, gave a fascinating insight into the world of producing bricks for restoration projects, including Compton Wynyates, St. Pancras Station and Hampton Court.

The rivers of Essex have long been utilised as a source of power and a means of trade and transport. River ports (such as Maldon with its salt works, broad estuary and Thames barges) and riverside and river-dependent industries have always featured strongly in any of audit of industrial activity. The improved natural waterway has been a stronger ingredient than the man-made canal. Essex has a very long coastline (particularly at high tide!) and coastal trade has been vital in overcoming the limited resource base of the county, with imports of coal from the north-east instrumental in achieving this.

The coal trade was the driving force behind the construction of the Chelmer and Blackwater Navigation which sought to supply coal to Chelmsford via Heybridge, and its story reflects many of the characteristic features of canal construction in England - local canal mania,

commercial rivalries, eminent engineers (in this case, John Rennie senior), and construction controversy and crisis all had their part to play.

Riverside and canalside locations became prime sites for local industry, and Bentalls of Heybridge developed as one of the largest agricultural engineers in the country, let alone the county. A plaque on the wall of one of the few remaining buildings of the company in Heybridge gives some indication of this. It reads 'Bentall's Warehouse erected in 1883 by Edward Hammond Bentall, ironfounder and agricultural implement manufacturer, to hold up to 15,000 machines awaiting export.'

Power supply for these various activities reflected the development of technology throughout the land - wind, tide, water and steam power all made telling contributions, perhaps best exhibited at Beeleigh Mill and Langford Museum of Power. At Beeleigh, a long history of water mills and a later addition of steam power was curtailed by a disastrous fire of 1875 which left the water mill destroyed, but the (subsequently abandoned) boiler house, beam engine, and milling equipment of 1845 intact. The nearby Museum of Power houses one of the three Lilleshall Company vertical triple expansion rotative engines installed 1929-1931 that helped supply Southend with its water following the emergence of the town as a premier seaside location, much encouraged by the building of the London, Tilbury and Southend Railway. Both these fascinating sites are within easy walking distance of one another.

Processing the products of agriculture is inevitably one of the most prominent features of Essex's industrial landscape. The sugar beet industry of Felsted disappeared in the 1970s and many of the mill premises for other crops have followed a similar fate, or have been converted to other uses. East Mill in Colchester (now apartments after a brief spell as a hotel) and Moulsham Mill in Chelmsford (now a craft and business centre) are two such examples. The Marriage's Mill in Chelmsford remains as a working mill, although it now stands as part of a large modern milling complex comprising huge production buildings and flour silos, and modern steel-clad processing plants. It has long been a family firm, and still produces some stone-ground wholemeal flour as part of its product range.

Essex was described in one of the lectures as a collection of market towns, and Chelmsford possessed many of the criteria identified by Barrie Trinder in his analysis of the characteristics of the market town. For example, until the 1950s, every week Marriages's and other mill owners would visit Chelmsford Corn Exchange to buy wheat from local farmers and merchants, only for the Exchange to be demolished in 1969 as part of a 'redevelopment programme'.

Other food processing activities in Essex have prospered, and perhaps most notable of these is A.C. Wilkin and Co and their famous Tiptree brand of jams, preserves and chutneys. Originally arable farmers, the Wilkin family moved into fruit farming in 1865, taking stocks by horse and cart to the local railway station for sale in London's market, and then, in 1885 turning to fruit preserving. The firm has prospered in recent years, and within a modern farm complex, a small museum exists at the Tiptree site, including exhibits on the Kelevedon, Tiptree and Tollesbury Light Railway, and opportunities, of course, to take the obligatory cream tea.

It was at this point that our Chairman had to end his talk because of time pressure, although he clearly had more to tell us, and perhaps there will be an occasion to hear the second instalment.

October 2012: Dennis Crips

A Living Dinosaur: From crystal sets to quantum computing in one lifetime

Dennis Crips' account of his engineering career was a journey through the technologies of the twentieth century. It was also a powerful endorsement of the dictum that it is the engineers who change the world – without them there would be no progress, little evolution of society and certainly much less of domestic comfort or convenience.

As Dennis said, his time as an engineer was a boy's dream. Every day was Christmas Day with new components, new techniques and new products; all of a smaller size, improved performance and lower cost a daily occurrence. Yesterday's hopes became today's realities – and, inevitably, were obsolete by tomorrow. And the process is continuing to this day.

The presentation, in four parts, covered some of the technological advances made over the past 100 years. First, the key technologies involved in creating the world in which we live. Second, the effects these had on a digital electronics designer. Third, the changing face of project management and finally, a look at some of the social and engineering problems which have arisen and which will affect us as in an uncertain future.

Looking at the technologies in more detail, silicon technology has allowed us to progress from the germanium crystal and cat's whisker radio of the 1920s to today's microchip containing tens of thousands of individual transistors. These chips, already quality controlled, are mounted onto multi-layered printed circuit boards using automated processes that minimise cost and increase reliability.

Digitisation is a highly efficient way of capturing an analogue world and using the resultant information. It has its origins in cinematography but in the digital transmission of both sound and vision, samples of the analogue signal are taken, digitised, transmitted and then reconstituted at the receiver. A single fibre optic cable can transmit up to 160,000 separate voice channels. It is also possible to mix voice, data and tv signals on the same cable.

The development of fibre optics has virtually eliminated data corruption and increased speeds, thus revolutionising communications of all kinds. It is a somewhat reassuring link with our industrial archaeological roots to know that much of the UK's fibre network, 'Fibreway', has been laid along canal towpaths. Access for the installation is relatively easy and the canals connect all major towns and cities. What would James Brindley make of it?

With all this digitised material, data storage was the last major technology considered. It has been a growing requirement driven principally by the needs for faster access, smaller size and ever decreasing cost. Over the past half century we have moved from relays, valves and transistors through integrated circuits to memory sticks. From paper to magnetic tape to floppy discs to CDs and DVDs. Size and cost have reduced by unbelievable factors as has power consumption whilst physical robustness is beyond compare.

Turning to design techniques, Dennis used the example of a bedside tea making machine to explore different methods. All begin from the need for a clear specification and the need to consider testability in commissioning and maintenance, how the device will be used, what can go wrong and what would be the consequences. We looked at designs based on electromagnetic relays, the practical approach, and ones using mathematical equations which led to computer programming to achieve the design objectives.

Following techniques came project management. Advances in technology give rise to increasingly complex systems and many schemes have failed through poor management. About 100 years ago Henri Gantt developed his eponymous chart, basically a bar chart with a bar for each critical element of the project plotted against time. It is still widely used today and enables an entire project plan to be captured on a single A3 sheet and be understandable by all parties.

In the late 1950s the US Navy introduced Programme Evaluation and Review Technique or PERT to manage the Polaris submarine project following several costly programme failures. PERT is sometimes known as critical path analysis and has become an internationally adopted process with an associated industry ranging from software to a professional body, the Institute of Project Managers.

Gantt or PERT or CPA all break down the work into well-defined work packages which can each be analysed for content, start and finish dates, dependencies on other packages, criticality to the project as a whole and resource requirements. Hopefully the project manager will get appropriate, timely feedback from whatever system he employs and complete his project, on time, to budget and satisfy his client. Lord Coe must have had an excellent project manager for the Olympics.

Dennis concluded with some cautionary tales relating to design responsibility and safety, security, artificial intelligence and finally quantum computing.

Responsibility for design and safety highlights the difficulties at the interface between the design engineer and the computer or software developer. Often some aspects of design and safety responsibility have been transferred to people who, although highly qualified in their field, may have little or no engineering background. Few if any design engineers want to learn high level programming languages or to be responsible for debugging the inevitable problems. Equally, the software specialist may not have an instinctive feel for things mechanical. Again, a crystal clear, fully detailed functional specification at the outset of a project is vital if problems are to be avoided.

The bedside tea maker involves pumping a kilowatt of power into a device sitting a few feet away from the head of a sleeping person. What if the siphon is blocked? The kettle becomes a potential bomb! Like quality, safety has to be assessed and built in at every stage of the design process, not bolted on afterwards in a so-called 'safety audit'. It was suggested that only a competent engineer was qualified to undertake such an assessment.

Today, many real-time systems such as motorway signals use two computers validating each other but only one is in control at any one time. Aircraft flight control systems will use three computers and a two out of three voting system. Such automation has led to catastrophes such as an aircraft ground test when the computer released the brakes with engines on full throttle and no pilot at the controls and an airliner plunging into the Atlantic in a deep stall with the loss of all on board.

Data security is not just preventing identity theft from computer systems. With the development of highly portable flash drives, DVDs and laptops the theft of data from the workplace is a new problem for society.

The problem of 'artificial intelligence' is not so much mankind's subservience to some master computer complex but the myriad occasions when a transaction cannot be completed because 'the computer is down', the effects of social networking on real person to person interaction and the often dangerous times when searching for that elusive mobile.

Finally, quantum computing might give unbreakable ciphers or driverless cars but will it also bring with it the surrender of human control to a machine? And who or what would be responsible for any catastrophic system failure?

Dennis twice quoted the examples of the Mars rover vehicles to demonstrate the achievements of engineering and science. They will probably continue to rove for many years yet and garner unknown information for our benefit.

Many of us echo Dennis's wish to be 50 years younger and to share the engineering design challenges that lie in the exploration of the universe in which we live.

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FROM THE CHAIRMAN

Recessionary times

No-one needs to be reminded of the parlous state of the British economy and of government finances, but it is interesting to reflect on the impact that this might have on the recording and preservation of our industrial heritage.

In simplest terms, recession might have a number of impacts. The likelihood of closure of firms is heightened, and although this is most frequently brought to our attention via the retail sector, there must be a considerable effect on the manufacturing firms supplying these outlets, some of which may be housed in older premises. The desire to make most effective use of available funds has produced a boom in internet sales, once more adding to the potential loss of retail outlets. Slump conditions also mean existing vacant buildings remain empty for longer (with attendant problems of deterioration), and the prospects of the conversion and revitalisation of old industrial premises becomes less likely. These problems are often compounded by a potentially lethal combination of concentrations of large unoccupied industrial premises in areas of low incomes, high unemployment and social deprivation. The view of a former industrial building (with potential for renovation were it located elsewhere in the country) suffering the inexorable impact of neglect and vandalism is indeed a sorry sight.

Nor is this a problem that exists elsewhere in the country but not in Coventry and Warwickshire. There are several examples that come to mind of premises that deserve renovation but it is, indeed, difficult to see how funding might become available.

In terms of financing, there are many features that put pressure on funding. The quest to reduce (at least in real terms) the volume of government spending (both central

and local) could see budgets for industrial heritage as suitable candidates for pruning. Libraries, museums, record offices, archaeological services could find staffing levels reduced and funding re-allocated elsewhere.

At the individual level, subscriptions to societies may be one of the items scrapped from household budgets, and the cost of visits to museums carefully considered.

National leaders of the industrial heritage movement are well aware of these problems, and English Heritage's *'Industrial Heritage at Risk'* programme highlighted many of these issues. One significant feature of Shane Gould's impassioned presentations on this issue has been the *'public attitudes survey'* and the confirmation of the importance that the general public do indeed place on our industrial heritage. A good source of information is Issue 67 of English Heritage's Conservation Bulletin *'Saving the Age of Industry'* (available online – or to borrow from WIAS).

As part of this process is the role of voluntary effort and support. There is a heightened need to monitor what is happening locally, and to lend support for national organisations such as the Association for Industrial Archaeology. We hope that our WIAS meetings can make a small contribution to this process, combined the efforts of individuals on particular projects.

One building that certainly is under our watchful eye (as well as being our society logo) is the Warwick gas works in the Saltisford, Warwick, which – after many years of being empty – is now planned for conversion. We shall monitor this carefully, particularly in terms of not losing the balanced, manageable scale of the streetscape fronting the Saltisford.

Willans Works Archive

In view of the pressures on funding outlined above, it is with enormous pleasure that I am able to pass

on the news that the application for funds to help the cataloguing of the Willans Works Archive has been successful. With professional input and the voluntary contributions of John Willock, Peter Coulls, Arthur Astrop and Alain Foote the future of the Archive looks safe.

Sad news

It is with much regret that I announce the death of two of our members – Tony Poole and Peter Mason. Our sincere condolences go out to their families and friends.

Next issue

The editor – Mike Hurn – is very willing to receive input for the next issue, due to be published in June. Text and/or photographs for the middle pages insert should reach him by 31st May. Please send to mikedhurn@btinternet.com, or hand to him at a WIAS meeting.

Change of meeting

In the programme shown below, there are two changes from the previously issued list. In May, the speaker will be Simon Buteux who has replaced Elizabeth Perkins as Director of the Birmingham Conservation Trust, and the June meeting will now be Anthony Coulls speaking on The Railways and National Railways Museum of Sierra Leone.

PROGRAMME

February 14th 2013

Members' Evening

March 14th 2013

John Yates (Inspector of Historic Buildings, English Heritage)
The First Iron-framed Building in the World: Ditherington Flax Mill - History and Restoration.

April 11th 2013

Richard Thomasson:

Ariel motorcycles from Selly Oak.

May 9th 2013

Simon Buteux (Director, Birmingham Conservation Trust):
Newman Coffin Works, Birmingham.

June 13th 2013

Anthony Coulls:

Railways and the National Railways Museum of Sierra Leone.

NEWSLETTER

Meeting Reports

November 2012: Ian Mackintosh

400 Years of Stroudwater Textiles

Ian Macintosh, resplendent in a 'Stroud Scarlet' waistcoat, gave us an illuminating tour of the Stroudwater valley – The Land of the Clothiers. As a trustee of the Stroudwater Textile Trust, he has an authoritative command over the subject which combines many aspects of industrial archaeology as well as English social history. In particular, he showed how the textile industry demonstrated adaptability and flexibility over several centuries and was always international in its outlook.

Woollen cloth manufacture has been important in the Stroud valleys since medieval times. The local streams are dotted with mill sites and their courses have been straightened and interrupted with weirs and millponds over the ages. Towns like Stroud and Nailsworth developed because of the industry while more ancient foundations like Cirencester, Dursley, Painswick, Tetbury and Wotton under Edge prospered.

Besides British markets the cloth was sold to Europe, the Native Americans and Asia in such large quantities that at one time there were over 170 mills working. The Royal families of Great Britain and Russia, the Queen's guards, The East India and Africa Companies as well as the Papal Court were all customers, and in the 1880s 21 ships a year are recorded leaving for Canton with the bulk of their cargo being West of England cloth from Stroud. A special double sided cloth, dark on one side and reflective light on the other woven simultaneously, was used for tents in the Crimean War and in India

Evidence of the wealth of some merchants is that one Samuel Capel left on his death £3,000 worth of cloth in his London factor's house and a further £2,000 worth elsewhere.

The Stroudwater Textile Trust seeks to preserve this rich textile heritage, which extends to over 400 years, to promote awareness of the past importance of the woollen industry in the Stroud Valleys and to bring together past and contemporary textile art. The Trust was established in 1999, consolidating ten years of volunteer activity in the preservation and restoration of historic textile machinery, the provision of educational materials and the organisation of tours of the surviving mills.

The Trust's activities are centred on the Dunkirk Mill, with its impressive waterwheel and regular demonstrations of 'West of England' cloth being finished using historic textile machinery, and at Gigg Mill where there is a weaving workshop with demonstrations and classes. At two other historic mills, St Mary's has a large waterwheel and a Tangye steam engine, whilst at Stanley visitors can watch demonstrations of carding machinery and spinning mules in a Grade I listed building.

The historical part of Ian's presentation utilised many contemporary paintings that not only showed the beauty of the valleys but also contained many illustrations of the mills themselves together with the extensive outdoor activities involved in producing the cloth. These notably showed the variety of colours produced in the district: apart from the scarlet were green, beige, yellow and navy blue.

A number of well-known sayings come from the cloth industry. Dyed in the wool and dyed in the piece originally signified differences in quality whilst being on tenterhooks derives from the tenting frames on which the dyed cloth was hung out to dry stretched onto the tenterhooks.

Water has always been important, whether as a source of power to drive machinery or for the washing and dying

processes or for transportation of raw materials and finished goods. As early as the 1790s the Stroudwater canal provided a link to the River Thames. Mills were usually named after their owners and these place names sometimes survive even though the buildings are long gone. Four medieval mills within the course of a single mile of the river would seem to indicate plenty of demand for West of England cloth.

Turning to the technology, there was an early need for mechanical assistance to drive the fulling stocks where wet broadcloth, produced by a network of cottage hand-loom weavers, was pounded to consolidate the material. The fulling stock preserved by the Trust last worked in 1964 and takes six men to lift it. The process creates much heat and noise and a mill runs continuously, 24 hours a day for six days – Sundays off. In Nailsmith, 38 fulling mills ran full time and it was said that ladies of a nervous disposition should not live near to a fulling mill!

After fulling the cloth nap was raised using three grades of natural 'teazels' prior to 'shearing'. The shearmen were the elite tradesmen amongst the cloth makers and the description given by the Textile Trust is an evocation of times past. "The gentlemen shearmen considered themselves the "dons" of all the branches of cloth making, cutting the nap to give the cloth an even and dressy appearance.

They worked in pairs in shirt-sleeves, generally held above the elbow by a strip of scarlet cloth - their badge - on a shear board about 18 inches wide and 8 feet long packed with coarse pillowing cloth made for the purpose. The shears weighed 40 to 50 pounds and a block of lead was placed on them to press them down steadily on the cloth which was strained out tight by hooks over the pillowing. One brought his shear to the list or selvedge; the other began in the middle so they finished at the same time. The shears and weight had to be carried off the cloth every time a 'board' was cut. Some allowed a 'colt', a strong lad, to pay them to learn the trade.

Dyeing became an important element as the Stroud industry became more vertically integrated and dye houses were added to spinning, weaving and finishing operations. Indigo was an important material providing blue for naval uniforms and black for Victorian gentlemen's formal attire. The famous Stroud scarlet had its origins in Montezuma's cloak. The Spaniards imported prickly pears on which to raise the cochineal beetles that were crushed to make the dye. Later the secret came to Stroud.

The industrial revolution came late to the Stroud district but it brought pollution, notably in the winter when smoke was trapped in the steep valleys where the mills were concentrated for lack of room to expand. A complainant was told to fit better windows! At the same time, increased demand for water from unreliable Cotswold streams caused friction amongst the mill owners that was only resolved with the increasing adoption of steam power which brought with it more pollution and accidents. The dye houses were particularly notorious for fumes that caused illnesses.

Nonetheless, technology from the cotton industry was gradually adopted. Water-powered carding and slubbing mills produced yarn material for the spinning jennies. The shearman was replaced by a mechanised 'cross cutter' that boys could operate. Incidentally, this cross cutter gave birth to the cylinder grass mower.

Today, two mills are working producing cloth for billiards tables and tennis balls. A far cry perhaps from the Royal orders of past times but proof that the adaptability of the Stroud textile industry remains in place.

Members' Contributions

John Willock

The 3.7" Anti-Aircraft Battery at Goodrest Farm, Leek Wootton.

On Sunday, November 18, 2012, members of the public had a rare opportunity to view a surviving second world war anti-aircraft gun battery situated at Goodrest Farm, Rouncil Lane, near Leek Wootton. The site, comprising a command and control bunker, observation post and four emplaced 3.7" anti-aircraft-gun installations, has been surveyed and carefully conserved, over a number of years, by the Friends of the Anti-Aircraft Battery at Goodrest Farm.

Designated H25, Bannerhill Camp, this battery was brought into operation in 1941 as part of a ring of defences protecting Birmingham and Coventry. At its operational peak nearly 200 service personnel, many of them young women of the ATS, served at the camp to enable 24 hour operation of the guns. Members of the ATS operated the observation posts, the predictors (an electro-mechanical device that computed the time of flight of the shell) and assisted in the command room. All this information was fed to the guns, which were manned by men of the RA. Before each shell was fired the fuse had to be manually set, in accordance with the information supplied by the predictor. Much later in the war, with the advent of the British designed and American made proximity shell, the need to fuse set was obviated.

The site, which is on private land, has been restored to something of its former state and shows a typical installation of the early war period; the concrete command and control bunker being a particularly early example of its type - possibly a prototype. Surrounding each of the four gun emplacements are a number of small concrete receptacles for ammunition storage. Each shell weighed 28lb (12.7kg) and up to twenty could be fired per minute, depending on the actual variant of 3.7" gun being used, and could be fired to an effective height of 39,000 ft (12,000 m) with later marques of the gun. The battery worked in conjunction with a mobile searchlight unit that was situated a little distance away along Rouncil Lane.

Accommodation on the site was provided by a number of Nissen Huts and living conditions were particularly spartan for all the service personnel. In 1943 the guns were removed and transferred to the south coast. The camp then took on a new role as a small prisoner of war camp for about 80 Italian and German prisoners of war. It is thought that some of the prisoners from Bannerhill Camp may have been employed at the Cherry Orchard Brickworks at Kenilworth.

It is not known if the battery recorded any definite enemy aircraft "kills" during its operational life at Goodrest Farm. It is probably unlikely: during the early stages of the war, without the benefits of radar-assisted prediction and proximity shells, the chances of actually hitting a high flying enemy aircraft were extremely small. What battery H25 did, along with other similar AA units, was to give attacking aircraft a hard time, forcing them ever higher and thus making target acquisition more difficult. In addition, there was also the not inconsiderable propaganda effect derived from the sound of retaliatory gunfire!

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Command and Observation Bunkers.

The Command Bunker is of a particularly early type - possibly a prototype.



3.7" Emplacement. The receptacles surrounding the concrete plinth were for ammunition storage. At Goodrest Farm there were at least four emplacements, with just possibly a fifth.



Members' Contributions

John Copping and Arthur Astrop

Flotsam or Jetsam? Or perhaps a thingummybob.



Amongst a group of friends, John Copping is perceived to be knowledgeable about old tools etc. One has, over recent months, developed the habit of putting this to the test. He was politely surprised when the use of a small folding magnifying glass was identified as for counting the number of threads per inch in a piece of fabric. He was not to know John's grandfather was a haberdasher.

The next challenge he posed was to interpret the mechanism illustrated here. The owner was only able to say that it was found on a beach.

Its effect is to change the direction of a rotating drive through 90 degrees. There is no change of gearing, but an unavoidable reversal of the direction of rotation. It seems pretty certain to come from a ship, maybe only a boat. The possibility of its use in a lighthouse prompts consideration also of a light-ship. The bronze parts provide resistance to corrosion. However, a study of this photograph shows that each rotating sub-assembly needs to rotate on its fixed spigot, which is clearly steel. That obliges the use of bronze for the sleeve, even if not for the gear wheels. If the mechanism needed to transmit significant torque, the gears themselves would realistically have been hobbled onto iron castings. The logical conclusion is that the load to be transmitted is relatively light. Equally, the informal style of the whole, including the provision for transmission to shaft by some form of 'dog' to fit in the slots in the bronze lugs, strongly suggests intermittent rather than permanent operation.

It seems likely that the unit served as part of a control mechanism providing, for instance, the ability for a helmsman to operate a piece of kit further up the deck without need to leave the wheel. According to a member well placed to advise about such things, such an application could easily be envisaged on a canal boat.

Arthur Astrop adds: I agree with the conclusions drawn about the possible usage of the device. As for a possible application, one suggestion I can offer is as follows. Some years ago, while on holiday, I had the opportunity to use a boat with a small inboard engine and originally designed for steering by a tiller-operated rudder at the stern. The owner, however, had converted it to steering from the bow-seat by a small-diameter steering wheel which, through a set of bevels like those in the photo, turned a vertical shaft carrying an aluminium drum.

Around this drum was wound a length of Bowden cable which ran internally towards the stern, along both sides of the boat, close up beneath the gunwhales. The cable then wrapped around another aluminium drum, of identical diameter to the first, but attached to the rudder post. Small movements of the steering wheel to left or right thus turned the rudder by the same amount.

In short, the bevel drive was subject only to light-load usage, applied intermittently. Members may be interested in this 'holiday remembrance'!

Peter Chater

Memories of the Burton Dassett windmill.



These pictures were taken on consecutive days, 25th and 26th July 1946 by a person unknown. Peter and his two sisters are shown beside the picture of the fallen mill. It was obviously a Post Mill and is thought to have been built around 1664 and ceased working about 1912.



Martin Green:

Salt of the earth; salt of the sea.

The AIA's visit to Maldon, Derek Hurst's talk on the Droitwich salt industry, and the sheer volume of salt required to treat the roads in the current (January 2013) snow-covered landscape reminds one of the essential role that salt has played - and continues to play - in our society. Freezing temperatures also turns one's mind to sunnier climes and the production of salt in entirely different conditions to those pertaining in the UK.

In the northwestern corner of Sicily, along the coastline between Trapani and Marsala, lies a large area of salt pans that have an extremely long history and remain in production to this day. They also retain features that attract the attention of the industrial archaeologist.

With evidence of salt extraction in this region traced back to the Phoenicians, the current landscape has a timeless quality, particular with parts of the area given protection via the creation of a nature reserve. Salt production along this coast probably reached its peak in the mid-nineteenth century (after the Unification of Italy in 1860), when 31 salt pans produced over 100,000 tonnes per year, much of which was exported throughout Europe, including Norway and Russia.

The combination of high summer temperatures, the dry North African winds and the high salt content of the Mediterranean (3.5^o to 4.5^o Baumé) provide the ideal combination of conditions for the successful extraction of salt via evaporation. Apart from the mosaic of salt pans and the piles of evaporated salt lying under the protection of terracotta tiles, the dominant feature of the landscape is the collection of windmills that remain a testimony to the techniques used to extract and treat the salt. The windmills were used both to drive the Archimedean screws that lifted water from one level to another, and also to grind the salt once it had been extracted.

The typical windmill has a conical tower, capped with a conical roof, and six trapezoidal vanes made up of cloth sails attached to wooden frames. The roof (and, hence, the sails) can be turned to exploit the wind to best advantage. The sails can rotate at a speed of 20km per hour and generate a power equivalent to 120 horsepower.

There is also a single example of a much later so-called American Mill ('Mulino Americano') with metal blades. This mill was used solely for the transfer of water from one pan to another.

The water moves from those ponds closest to the seawater ('fridda') through a number of ponds each with increasing salinity, until the final evaporation ponds are reached ('cassedri') and the salt is ready for harvesting. My visit was in April well before the harvesting of the salt. This occurs in July and August when extreme summer temperatures would frazzle most Warwickshire industrial archaeologists, whatever their level of interest! Even so, I was fortunate enough to see the modern removal and transportation of the salt from the protected piles - not photographs that would gain an entry in the travel brochures, but perhaps deserving of a place in the WIAS Newsletter. Three thousand tons are produced each year, with the 100% natural salt occupying a niche market, possessing a higher concentration of potassium and magnesium than common salt.

There is a small museum - the 'museo delle saline' - housed in 300 year-old buildings - telling the story of the salt pans over time, with relics of the industry on display. Further information about the windmills and saltworks is probably best secured online, although those fluent in Italian could consult '*Saline e Silinai*' (Salt and Saltworks) by Maria Manguerra!



Windmills near Trapani



The American Mill

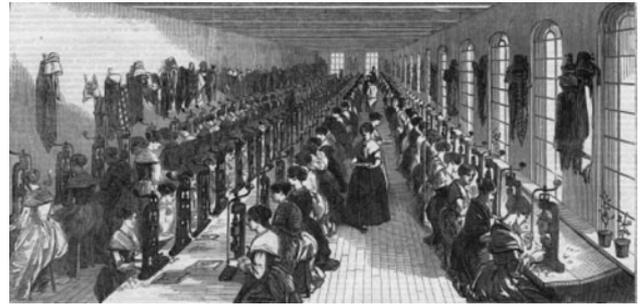
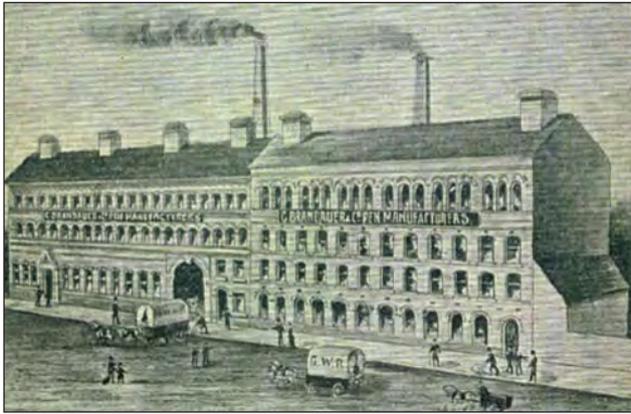


The Saltworks Museum - with obliging flamingos!



Moving the salt from the protected piles

From Pens to Particle Physics: the story of a Birmingham family business



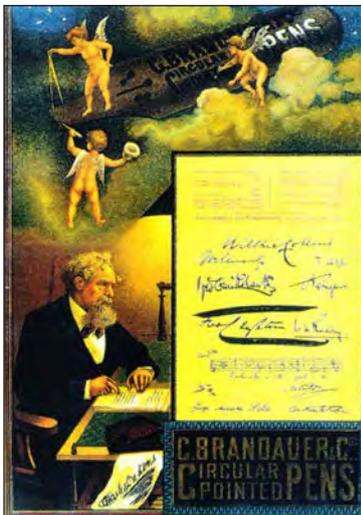
Left: The Brandauer factory in the 1890s.
Right: Steel pen production was highly labour intensive. This is a Slitting Room where the all-important slit was added to the pen by ladies using fly presses.



Mrs Fanny Phillips 1877 - 1972. The Company's longest serving employee with 71 years service!



A point-of-sale advertisement for one of Brandauer's most popular pens



Left: Charles Dickens featured in this typical example of early Brandauer advertising. Centre: BSR Record Changer. Right: Parts for use in Push-fit Plumbing fittings, typical of today's mass production. Below Left: Airspeed Oxford leaving Canley. Below Right: Large Hadron Collider pressure relief spring.



December 2012: John Berkeley OBE*From Pens to Particle Physics: the story of a Birmingham family business*

Report by Arthur Astrop

By the mid-19th century, Birmingham was firmly established as the world's centre for the manufacture of steel pens. In fact the City was at one time home to more companies involved in that trade than in the whole of the rest of the world put together. Most of the companies were small to medium-sized, and the majority were to be found in the City's Jewellery Quarter, but 1862 saw the arrival of a newcomer. The frontage of its premises, a substantial 3-storey building at 403/407 New John Street West formerly owned by Thomas Derrington, a rifle and pistol maker, bore the name C Brandauer – Steel Pen Manufacturer. The new company was destined to become a significant force in the pen trade, and later to hold a similar position in the high-precision small-parts presswork industry, an activity in which it prospers to this day. The year 2012, therefore, saw it celebrating its 150th Anniversary.

It would be difficult to find anyone better qualified to trace the history of the Brandauer Company than WIAS member John Berkeley who, as that Company's Chairman, led the celebration of its 150th anniversary. John has lately retired as chairman but remains a director, and under the title *From Pens to Particle Physics* he delivered a memorable presentation to the Society's final meeting of 2012.

The demand for steel pens (nibs) and pen holders throughout the world, pouring in from schools to offices, from draughtsmen to map makers, from calligraphers to artists was, until approximately the mid-20th century, apparently limitless. Hence the number of companies offering and producing them in huge quantities and in an enormous range of different styles, colours, qualities and shapes.

At first sight, the steel pen is a deceptively simple item, but in practice its manufacture required a large number of successive operations, from preparing the raw strip steel in strictly-controlled gauges, through to the finished product. In between, each pen was subjected to a series of blanking, stamping, forming and slitting operations, often performed by tools in manually-operated fly presses, with annealing processes in between, and culminating in de-burring, heat-treating and chemical colouring. The 'colouring' of pens was generally regarded as a trade secret and in a Brandauer Board minute as late as May 1946 it was recorded that three of the Directors 'had been initiated into the processes of the No 4 Department', the area of the factory dedicated to the arcane art of pen colouring.

Traditionally, the industry employed large numbers of female operatives, not least because of their innate manual dexterity, and it was customary for each to perform one operation only. Thus, long rows of benches with fly-presses arranged side-by-side were a common sight, and each operator, once trained and having become skilful, would handle very large numbers of pens per shift.

For some operations, drop presses were also required, driven by overhead pulleys and shafting. Each press was tripped by a foot pedal, so that the operator could use both hands to position a pen accurately in its die. When a battery of such machines was in 'full song' striking simultaneously (but not necessarily in synchronism!), the noise must have been deafening. No ear-defenders in those days, nor safety guards and there are records of boys as young as 9 ½ in the raw material departments.

Finished pens were packed in small highly-decorated cardboard boxes, many of which bore outstanding examples of artistic design and colour printing, and to this day are regarded as highly collectible. Each box would contain a gross (144) of nibs, the quantity determined by weighing rather than by counting.

By today's standards, working hours were long (often as much as 57 or more hours a week), and conditions were rigorous. Workshops were heated by coal fires, but employees were required to provide their own fuel, and were also required to clean the windows of workshops regularly. Failure to meet these conditions, also to maintain quality standards of manufacture, was dealt with by a complex system of fines. It was those rules that undoubtedly contributed to the formation of a Penworkers Union in 1897.

In November 1901, the Company became C Brandauer & Co Ltd, the name under which it trades to this day, and in its first full financial year it recorded a payout to directors and shareholders of £13,200, equivalent to over £1m today. Business was booming, but all too soon WW1 came and the factory turned to producing war material such as pressed steel rifle cartridge clips.

The end of WW1 saw a return to established product ranges which, in the mid-1930s, also included a variety of nibs for the fountain pens that were becoming increasingly popular. Soon, however, minutes of Board meetings show that the Company was investigating the possibilities of diversifying into other types of light press work. WW2 saw Brandauer once again involved with war work, receiving contracts from, among others, Lockheed in Leamington, for components including 'undercarriage parts' for Airspeed Oxford aircraft, then being made by Standard in Coventry. The pre-war decision to widen its range beyond pens and into 'steel pressings in general' had proved to be a wise policy.

In the 1950s, Birmingham Sound Reproducers (BSR) introduced a range of manual and automatic record players, and by the 1970s was turning out no fewer than 250,000 per week. Brandauer was a major contributor of the many small pressed-metal components incorporated in those fantastically popular units.

But by then, time was fast running out for the manufacture of steel pens. The ball-point pen was increasingly dominant and in 1961, with the manufacture of steel pens down to only two days per week, it was decided to bring their production to a close.

And Birmingham itself was now changing rapidly. Old parts of the City were being redeveloped and one-time landmarks demolished. Brandauer had already adapted itself in the new needs of industry for light pressings, in many exotic materials besides steel, and demand equalled, indeed sometimes even exceeded, that for its steel pens. Components were now being made for Singer sewing machines, for the Harrier jump-jet aircraft, and not least for the Anglo-French Concorde.

Described by John Berkeley as 'probably its proudest and most significant achievement' is Brandauer's contribution to the Large Hadron Collider in CERN, Switzerland. Along both sides of the 27-kilometre long twin high-vacuum beam tubes of the LHC are pumping slot strips produced by Brandauer, their function being to maintain the operating temperature in the tubes at a constant -217 deg C.

In January 2001, Brandauer moved from its historic factory to more modern premises, albeit only a mere 200 metres away in Bridge Street West. Brandauer's original factory, now a Grade 2 listed building, stood empty for some years and time inevitably began to take its toll.

Fortunately, before its decline became irreversible, plans to redevelop it as a multi-occupation business centre have been drawn up and the intention is for the building to continue to bear the Brandauer name on its frontage.

January 2013: Alain Foote*The English Electric Company 1918 - 1968*

Member Alain Foote opened the New Year with our second highest attendance of 78 people who enjoyed a comprehensive review of the English Electric Company's 50 year history. This covered its formation, growth and demise and reviewed the products and plants involved.

EE was formed as a public company in 1918, merging a number of participants in the electrical industry, primarily, Dick, Kerr & Co and The Coventry Ordnance Works, to meet the expected demand for electrical machinery following the end of WW1. The founding directors all had backgrounds in shipbuilding and railway equipment.

Dick, Kerr dated from 1863 and incorporated a number of diverse engineering companies including Britannia Engineering in Kilmarnock, English Electric Manufacturing in Preston and notably, Willans & Robinson in Rugby. AEG Electric was acquired from the Controller of Enemy Property followed by The United Electric Car Company in Preston and The Phoenix Dynamo Manufacturing Company in Bradford. The Coventry Ordnance Works was a joint venture by shipbuilders John Brown, Cammell Laird and Fairfield to manufacture heavy guns in competition to Vickers and Armstrong Whitworth.

Post war growth continued in 1920 with the purchase of the Siemens Dynamo works at Stafford which had been compulsorily acquired by the government during the war. Another Siemens company jointly owned was Siemens & Electric Lamps Co.

At the British Empire Exhibition at Wembley in 1924 an engine plaque showed English Electric headquartered at Queen's House, Kingsway in London with five principal subsidiaries: Ordnance Coventry, Dick-Kerr Preston, Siemens Stafford, Willans Rugby and Phoenix Bradford.

However, this sprawling conglomerate did not find commercial success in the 1920s and in 1927 sold its half share in Siemens & Electric Lamps to raise cash. The next year the Coventry Ordnance Works, practically dormant since 1922, was closed and later sold in 1930. In 1929 a loss of £47,000 was declared and Lazards stepped in with new capital. In 1930, Westinghouse of the USA and other American backers took control appointing George Nelson from Metropolitan-Vickers as managing director.

Nelson set about a badly needed reorganisation and the company slowly recovered, much helped by the rearmament programmes of the late 1930s. EE made a great contribution to the war effort and in 1942 took control of Napier, the aero engine maker. The company expanded greatly to employ some 30,000 and double its assets to £16.5 million by the end of the war. From inheriting a near bankrupt business in 1930, Nelson now headed one of the largest engineering companies in the UK.

Post-war EE developed its interests in aviation, electronics, computers (in collaboration with NPL) and heavy engineering. In 1960 EE sought a merger with GEC but its approach was rejected. In the same year, under government pressure, EE Aviation was merged with Vickers-Armstrong, Bristol Aeroplane and Hunting Aircraft to form the British Aircraft Corporation. The loss-making Napier business was sold to Rolls Royce and diesel engine manufacturer W H Dorman was acquired in 1961.

In 1963 the computer interests expanded with a joint venture with LEO Computers (Lyons Electronic Office) as English Electric LEO, to which EE's Marconi computer operations were later added. The guided weapons division went to BAC. Ruston & Hornsby and Elliott Automation were the last major acquisitions by EE and in 1968 the Wilson government created International Computers (ICL) by merging EE's interests with those of International

Computers & Tabulators (ICT). In the autumn of the same year Plessey made an unwanted £260 million bid for EE but a white knight in the person of Arnold Weinstock's GEC gained government approval and the General Electric and English Electric Company came into being. Within a couple of years English Electric was quietly dropped and so ended 50 years of mixed fortunes in engineering.

A review of EE's products in the 1960s shows that it had spread itself too thinly for its resources and sowed the seeds of its own demise as a result. The main products included: generating plant for steam, water, gas, oil or atomic power; electric traction and transport; marine equipment; aircraft, equipment and guided missiles; transmission systems, switchgear and controls; meters, instruments and relays; substations and converting plant; electrical equipment; computers and domestic appliances.

All these activities were liberally illustrated with some evocative slides. Steam turbines and generators impressed by their scale as did water turbines. Gas turbines reminded us of the adaption to peak lopping generators of aircraft engines, notably the RR Avon. The diesel engine interests ranged from stand-by generators to rail traction, including the interesting but troubled 1750 hp Napier Deltic engine also used in minesweepers and fast attack craft. Trams, trolleybuses and locomotives included an early (1934) diesel-electric unit and later mainline locomotives, even a gas turbine version.

EE was more successful with its aircraft. A number of the founding companies had been involved in aircraft manufacture during WW1. The first EE aircraft, the Wren, flew in 1923 but after building a few flying boats the aircraft department was closed in 1926. However, under the rearmament programme begun in 1936 EE was chosen to build the Handley Page Hampden medium EE bomber. By the end of the war EE had built 2,500 Halifax and 770 Hampden bombers. In 1944 contracts were awarded to build de Havilland Vampire jet fighters of which over 500 were produced.

Two outstanding aircraft from EE were the Canberra and the Lightning. The Canberra, inherited from Westland, was the first jet-propelled bomber produced in Britain. It first flew in 1948 and was the most advanced aircraft of its kind in the world at that time. 1,400 examples were built over a service life approaching half a century. Production of the Lightning was held back by the belief in the late 1950s that manned fighters would become obsolete, but eventually 337 examples of the Mach 2 capable machine were built over some 30 years.

A specification for a Canberra replacement was drawn up in 1957. The design was extremely ambitious and the government decided that it would be built by Vickers-Armstrong and EE. This aircraft became the BAC TSR-2, and we all know what happened to that project!

EE's contribution to guided weapons, Thunderbird and Bluewater was limited in extent but its domestic appliances included cookers, refrigerators and televisions. Of greater importance was its contribution to the early development of computers in the UK. The Luton Analogue Computing Engine (LACE) resulted from war-time work on thermionic valve technology, whilst the Digital Electronic Universal Computing Engine (DEUCE) came from collaboration with NPL to develop the ACE (Automatic Computing Engine) inspired by Alan Turing and built by NPL in 1946.

The well-illustrated review of EE's many sites served again to demonstrate how widely the company's assets had been spread and the potential for rationalisation and cost saving that existed. All in all, a salutary reminder of an interesting period in Britain's industrial history.

WARWICKSHIRE

WIAS

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FROM THE CHAIRMAN

These notes were prompted by a decision to try and re-visit some of the industrial museums and collections that exist locally and further afield in order to see how they had changed over the period since I first became interested in the subject of industrial archaeology. This was an excellent decision and reminded me principally of the wealth of industrial heritage that exists in this country and the sterling efforts of amateur and professional enthusiasts in seeking to record and preserve this heritage and to make it accessible to a wide audience.

It also reminded me that making the enjoyment of industrial heritage a viable financial proposition was no easy task, and attracting visitors on a regular basis demanded enthusiasm, initiative and dedication, often acting in the face of difficult economic circumstances.

Museums can gain income from a variety of sources and visitor income is only one amongst many. Public authority funding (both national and local), charity funding, sponsorship and private philanthropy all combine with earned income to provide funds for the museum. Earned income includes not only visitor income, but also the use of the museum's facilities by other groups e.g. for courses and conferences.

Some shifts are inevitable – making the museum somewhere that will attract families, perhaps with additional entertainment and a more diverse selection of items on sale in the museum shop. This 'secondary spend' income with visitors adding to revenue via refreshment and shop sales has become a very important ingredient in many cases. The leisure market is extremely crowded and competition intense, and this, combined with the increasing costs of travel, exerts great pressure on visitor income. Repeat visits also need to be encouraged, in part by flexible ticketing arrangements, with a changing programme of events and exhibitions, itself often an expensive process.

This has produced changes that might not always rest happily with the more specialist interests of the industrial archaeologist. As one member commented to me recently after a visit to the shop at an industrial museum 'you are more likely to get a packet of vanilla fudge than a technical guide to the exhibits!'

However, the reality is that these changes represent the only way forward, and we have two prime examples in the midlands with the Blists Hill Victorian town at Ironbridge and the Black Country Living Museum. These museums obviously offer a great deal more than these 'visitor experiences' but such experiences have become the main attraction for many families.

The Black Country Living Museum has recently lost its regular funding from Dudley Council as part of the cuts programme initiated by many local authorities, and the pressure to be self-financing has intensified. One initiative has been the 'Heritage Skills Courses and Talks', now in its second year. These seek to introduce a new audience to the heritage and traditional skills of the Black Country, with courses, for example, on canal crafts, ceramics and glass engraving, as well as some with an industrial archaeology theme. I attended a day course recently on iron making in the Black Country led by Paul Belford, which surveyed the various processes involved, related these to the exhibits on site, and spent some time on a case study of the archaeological excavations at Wednesbury Forge.

During our tour of the site, it was good to see the museum busy, and gratifying to witness visitors enjoying the nail and chain-making demonstrations as well as the fun fair and fish and chip shop!

Index to WIAS Proceedings

It is a truth (universally acknowledged!), that there is no such thing as a perfect index. It follows, therefore, that the index

recently published on our website for the proceedings of this Society must inevitably have its own share of errors and omissions. These are best spotted by its users and it is hoped that all such discoveries will be swiftly passed on either by e-mail to: artastrop@ntlworld.com or by 'phone to (01926) 857898. Or at one of our monthly meetings, of course.

Complementary to the index, it has also been suggested that our website could include a list of the titles of all the papers, booklets etc. which have been published by members since the Society's inception. Some were published under the *aegis* of WIAS, some privately and some just made available on request.

Such publications of course received coverage in the Society when they first appeared, but usually none thereafter. It follows therefore that there exist collections of valuable IA research of which some members (especially those newly-joined), will be completely unaware. If our website were to list the titles with brief abstracts of their contents, plus the authors' names and contact information, anyone interested in acquiring a copy of a particular paper can then approach the author direct.

Initially, therefore, all members are invited to contact Arthur Astrop (at the above e-mail address or 'phone number), to offer their published papers for inclusion in the list. Depending on the response to that invitation further details of the scheme will be worked out.

PROGRAMME

May 9th 2013

Simon Buteux (Director, Birmingham Conservation Trust):
Newman Coffin Works, Birmingham.

June 13th 2013

Anthony Coulls:
Railways and the National Railways Museum of Sierra Leone.

The programme for 2013-2014 will be published at the June meeting, with inclusion on the website, and as part of the annual mailing over the summer.

NEWSLETTER

Meeting Reports

February 2013: Members' Evening

Another excellent turnout of members and visitors were entertained by a varied programme which ranged from the saga of 'The Stone Pipe Company' through a 16th century mining text book, the vicissitudes of aircraft collecting and a few days in Liverpool to a clamp brick kiln in South Africa. Who ever said Industrial Archaeology was dull.

The Stone Pipe Company

The interest of Peter Chater, Peter Coulls and John Willock had been sparked during a presentation on John Rennie by a picture of a stone pipe embedded in a Cotswold wall near Guiting Powers. It was a good excuse for a Spring day out and once the right wall had been found (at the entrance to the village on the Cheltenham road) resulted in the unearthing of a fascinating example of industrial archaeology.

The existence of the Stone Pipe Company was no secret. The Gloucestershire Society for Industrial Archaeology had excavated one of the sites in 1984/5 without uncovering much of interest and it had been the subject of a public lecture at Durham University in 2009. However, much remained to be revealed. Searches of contemporary newspapers produced advertisements for 'stone masons, labourers and scablers' and the need to improve local roads to accommodate the transportation of some 30 tons a day of stone pipes by horse and cart. The bill to create a tram-road or railway was refused despite the damage being caused to the turnpike.

John Willock's reconstructions of the production machinery and manufacturing processes were exemplary and demonstrated the extraordinary activity taking place in the remote and rural Cotswolds at the time of the Napoleonic wars. Furthermore, the project was fundamentally flawed by the choice of grossly unsuitable raw material for its intended purpose, which led to complete commercial failure if not fraud on a grand scale. Over 60 miles of stone pipe (some 53,000 individual pipes) was laid in Manchester only to leak due to porosity and faulty joints as soon as the system was pressurised. The involvement of men like Rennie and Murdoch as well as the firm of Boulton & Watt raises the question of how did it all go wrong? Why was there, apparently, no testing to establish fitness for purpose?

The full story of The Stone Pipe Company of Guiting Power is told in an Occasional Paper published by the Society to coincide with the presentation.

Blame it on Demons

Professor Chris Voss, first a metallurgist and latterly an academic, 'blamed it on demons' and showed that there is nothing new today with a look at the pre-history of operations and engineering management. *De Re Metallica* by Georgius Agricola was published in 1556 and is seen as the first major textbook on the subject focussing on the mining and metallurgy industries.

Agricola says that "There are many arts and sciences of which a miner should not be ignorant". These include: Philosophy - to discern the origin, cause and nature and obtain more abundant results from his mining. Medicine - that he may be able to look after his diggers and other workmen. Astronomy - that he may judge the direction of

the veins. The science of surveying - that he may estimate and determine the limits and boundaries in these workings. Arithmetical Science - that he may calculate the cost to be incurred in the machinery and the working of the mine. Architecture - that he may himself construct the various machines and be able to explain the method of construction to others. Drawing - that he can draw plans of machinery. Law - that he may claim his own rights and that he may fulfil his obligations to others under the law. A pretty comprehensive curriculum even by today's standards.

Illustrations from the publication gave many examples of medieval production processes that had clear successors today; flow production, automation and green technology to name but three. Descriptions of organisation and management were equally modern, with a clear chain of command from owners through managers and foremen to tradesmen and included quality control or assaying to minimise losses. Also covered are the criteria for site location: the situation, the conditions, the water, the roads, the climate, the right ownership and the neighbours, financing, costs and technology.

The scope of engineering and operations management in medieval times seems very familiar and has not changed much in 450 years. The paramount considerations remain: people, process, technology, quality and cost. Technology has obviously advanced but other factors show little change in modern textbooks. Agricola even deals with environmental (mining was recognised as a serious source of pollution) and ethical (links to armaments and finance) issues.

And when it all goes wrong: 'In some of our mines, however are other pernicious pests. These are Demons of a ferocious aspect. Demons of this kind are expelled and put to flight by prayer and fasting'. Sentiments that may well be familiar to today's engineers and managers!

The Midland Air Museum

If collecting stamps is your passion then all you need are a few albums, and a small shelf on which to put them. But what if your obsession is collecting and preserving historic aircraft? Then you have a problem, because even the whole of your spare bedroom won't be much use for that!

The solution of that problem for the Midland Aircraft Museum on the periphery of Coventry airport was outlined by John Berkeley in his account of the difficulties involved in first acquiring iconic aircraft and then providing the substantial amount of open and covered space in which to house and to maintain them.

MAM was founded in 1967 by a small band of volunteers who, in its early days, began to attend 'air shows' and fêtes with just a few small exhibits, and a tent in case it rained! Bit by bit, sometimes with odd slices of luck, but always with countless hours of voluntary effort, the members built up their collection to the point where today MAM is recognised as one of the country's leading self-funded independent aviation museums.

An important breakthrough came in 1975 when the lease on a small piece of land on the north side of Coventry airport was obtained, which meant that the organisation had its first permanent home. Three years later, the museum opened to the public, proudly displaying five aircraft and attracting its first public visitors.

The 1980s was an important decade since it saw the acquisition of two very large aircraft, namely a Vulcan V-bomber and an Argosy freighter; together with the establishment of the Sir Frank Whittle Jet Heritage Centre; and a move to its larger present site. In due course, a Second World War Robin hangar was erected and the Museum at last had a substantial covered area where selected aircraft and associated items could be displayed, and proper facilities for maintenance and restoration could be provided.

Among its collection the Museum is proud to include a MIG-21 fighter, a Sea Hawk and Sea Harrier jump-jet, a Saab J29 and a CMC Leopard, an all-composite construction aircraft.

Liverpool Explored

Roger Cragg took us on a whirlwind tour of Liverpool as experienced during a three day visit by the Historic Engineering Works Panel. The appropriately named Hope Street is book-ended by two great Cathedrals. The Anglican, designed by a young (and Roman Catholic) Giles Gilbert Scott, was begun in 1910 but not completed until 1978. It is the largest in the UK and the fourth largest in the world. The Roman Catholic is unashamedly modern. The fourth design but the first completed on the site, it was designed by the Protestant Frederick Gibberd. The previous designs had been by Pugin, Lutyens and Adrian Gilbert Scott. Begun in 1962 and completed in 1967 the conical building is topped with a striking cylindrical lantern tower crowned with pinnacles.

We then went underground into the curious 'Williamson Tunnels'. The purpose of this warren is unknown but could have been a philanthropic make-work scheme by Joseph Williamson who had come to Liverpool in 1780, married the boss's daughter (Tate Tobacco) and sought to develop housing on the site of the tunnels. Building ceased on his death in 1840 and the tunnels remained derelict, filled with rubble and refuse, until archaeological investigations were carried out in 1995. Since then some excavation has taken place and part of the labyrinth of tunnels has been opened to the public as a heritage centre.

Much has been written about the World Heritage Site that is Liverpool's Albert Dock. Built in 1842/9 its buildings have been converted to other interesting uses and include a restored pumping station. Adjacent to the pier head and waterfront is a new canal linking the Leeds Liverpool Canal to the Albert Docks. The striking Cunard and Liver Buildings are tributes to reinforced concrete construction, the latter being the largest such structure when built.

The ventilation building for the Queensway Tunnel and its control room showed how complex are the needs of a two mile long tunnel carrying a high volume of cars and commercial vehicles. 2.5 million cubic feet of air need to be changed every minute by a two fan system, one inlet, one exhaust and duplicated for instant replacement in the case of failure.

In the newly restored St George's Hall, which houses a concert hall and civil courts, a wooden floor now protects the original and highly decorative Minton tiles of the concert hall. Finally, two stations. Edgehill the terminus for the Liverpool and Manchester Railway is the oldest station in continuous use and Lime Street, whose iron roof built in 1849 was the largest in this material in the world at the time.

South African Bricks

Martin Green's bicycle odyssey in South Africa was in striking contrast but started closer to home as his title 'Coventry to the Cape' indicated. A quick review of some now derelict Warwickshire brick works awaiting redevelopment led to consideration of other local sites and especially the concept of the clamp kiln, a temporary structure taking its name from the age-old method of preserving root vegetables by piling them under an earth mound. The process is no longer in use in the UK, needing both space and plenty of cheap labour.

Participation in a charity cycle ride took Martin to the beautiful scenery of South Africa's Cape Coast and the diversions of huge sand dunes and whale watching. The 'Whale Crier' of Hermanus seemed to enjoy plenty of job satisfaction. Some miles further on the riders were surprised to find a road sign warning of 'Smog – No Visibility' on a crystal clear day.

The reason became evident around a corner with a large open brick works using clamp kilns. This necessitated a pause from pedalling to investigate. The management and workforce were happy to receive visitors and Martin's ever ready camera.

Green, hand-moulded bricks were stacked to dry and covered if rain was coming – a useful local weather forecast for the neighbours. The huge kilns were seen in various states of construction, firing and dismantling. Typically a kiln would need three weeks to build, ten days firing and four days cooling.

Considerable skill was evident in the construction of the basic kiln with its labyrinth of passages to conduct the heat throughout the structure. Sealing or 'scoring' the outer surface with mud and without any signs of 'elf 'n safety' seemed slightly hazardous and emphasised the size of the finished kiln.

The works produces six to seven million bricks a year but the process is very wasteful of energy and only viable thanks to a plentiful supply of cheap, but on the evidence of the camera, very cheerful labour. The return to clamp kiln brickworks in Warwickshire seems most unlikely!

Endpiece: The flotsam or jetsam puzzle

The 'what's it for?' puzzle set on p 4 of our Newsletter No 47 caught the eye of Brian Wells of Middleton Cheney, near Banbury. Brian writes:

'I have seen an identical mechanism on one of the church clocks I look after. The yoke (associated with each bevel gear) is part of a crude universal joint. The shafts enter on the same alignment as the shafts in the photo, a small round bar is fixed at right-angles to the said shaft, and this allows for a degree of misalignment.

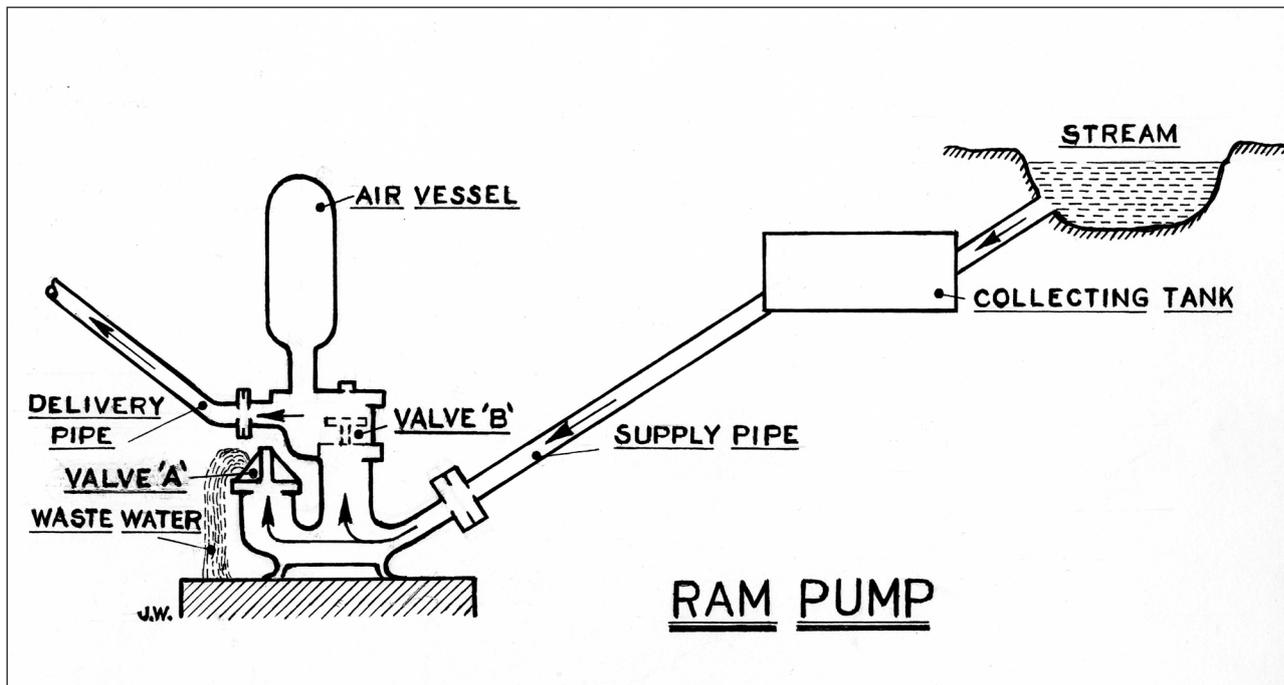
The whole mechanism rotates once every hour, and therefore drives only the clock's minute hand. Adjacent to the clock face there is a 12-to-1 reduction gear which drives the clock's hour hand, the latter being attached to a tube which is concentric to the minute-hand shaft.

This type of bevel-gear system is used where, for structural reasons, the clock is remote from the clock face., and one such can be seen in the church tower at Middleton Cheney'.

Well spotted, Brian! Now we only have to discover how the mechanism in our photo came to be washed-up on a beach!

Members' Contributions

Peter Chater:
A Ram Pump



Almost hidden away in an unnamed stream which feeds into the River Alne, close by the Heart of England Way at Wootton Wawen, is a small ram pump (BLAKES HYDRAM 5X).

This pump is similar to the one shown opposite.

Those with good hearing when walking the Heart of England Way may hear it pulsating away, day or night, pumping water to farm buildings several hundred yards away.

It pumps about 10,000 gallons per week at very low cost as it relies on the water in the stream to provide power.

Ram pumps were fairly common until the advent of the electric pump and this is the only one in use that I am aware of locally.

The name Ram Pump with its knocking sound is said to have reminded the inventor of two rams (sheep) butting their heads together.

This simple pump operates with only two clack type valves. See diagram above.

Water leaves the stream and feeds into a collecting tank. The water then enters into the descending supply pipe to the pump. Water initially passes valve A until the flow has sufficiently built up to force this valve to suddenly close. This sudden closure trapping the water creates pressure, pushes valve B open and a small amount of water enters the delivery pipe. When water pressure in the pump equalizes, valve B closes retaining the water above it and valve A falls open to start the whole process again.

The Air Vessel holds a cushion of air which compresses at each action/stroke to give a more equal flow in the delivery pipe.

It is said that these pumps can perform this pumping action between 40 and 200 times per minute. This would depend on the head of water.



Diagram drawn by John Willock.
 Some information given by Farmer David Steele.

John Brace:*A Sheepwash and Stone Culvert at Sutton-Under-Brailes*

The Sheepwash is located about 300m SE of the Manor House, Sutton – under – Brailes, and immediately upstream of the bridge over Sutton Brook (or Washbrook) at:

GR SP30213722. (Landranger Sheet 151).

It dates, probably, from the 19th Century but has had at least two major reconstructions.

Access is easy from the Sutton – Traitorsford Road.

Traditionally sheep were washed to clean the fleece before shearing. Often this was done in purpose-built permanent sheepwashes. As sheepwashing declined, after the great war of 1914-1918, the old washes were abandoned. Many are now lost whilst others are in ruins. A few have been restored.

This site has two features that may or may not be associated. The principal one is a typical 19th century Cotswold sheepwash. The second is a stone culvert.

The ditch is an extension of the roadside drain and reaches the brook a little upstream of the sheepwash. The stone culvert, which may or may not be contemporary with the sheepwash, runs for about 5m about halfway between the brook and the Sutton – Traitorsford Road. It must have been the crossing point for a roadway or track – perhaps an earlier alignment of the present road.

In about 2000 it was decided to restore the Sutton-under-Brailes sheepwash. The work, greatly assisted by a grant from the Heritage Lottery Fund, was substantially complete by September 2006.



Restoring the exit ramp



The sheepwash in the 1920s



An early photograph

Colin J Brookes:*The Last Picture Show*

During the 1960's cinema-going in the Birmingham and Midland area was in decline, as indeed was the general trend throughout the country. In the Birmingham area over 40 cinemas advertised, just ten years later there only remained a handful. Therefore, my career as a projectionist lasted less than three years and involved two Cinemas - the News Theatre in High Street Birmingham, and the Sheldon Cinema on Coventry Road, Birmingham. Both buildings have since been demolished and new buildings erected on their sites.

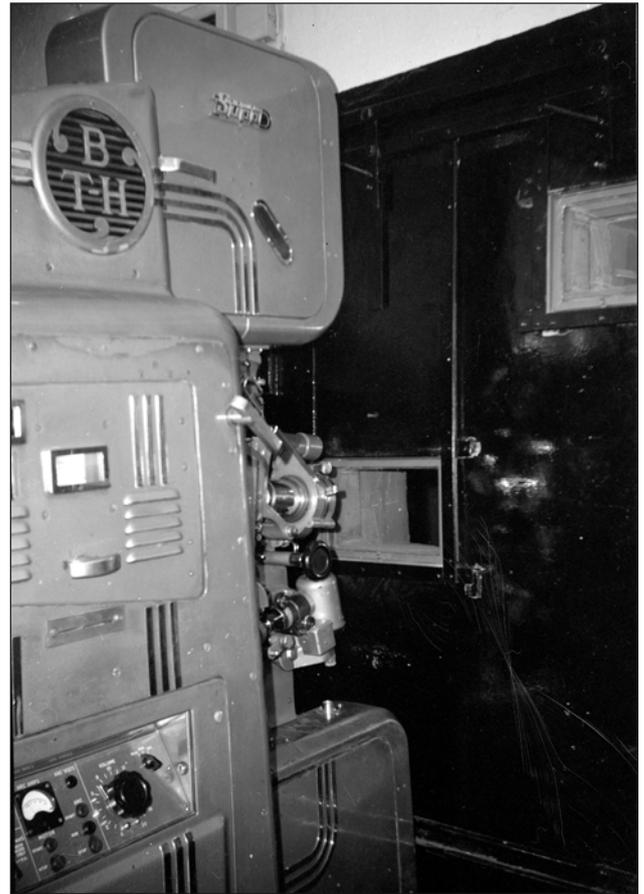
I joined the News Theatre in 1957 as a trainee, and a very green one at that. The hierarchy of the cinema world was headed by the Head Projectionist, universally referred as Chief, seniority of the "Box" was Second, Third and rarely Fourth, and Trainee, often as in my box, the fourth and Trainee were the same. Things were slightly different at the Sheldon; the main reason being that the operation of a feature house was different from the News Theatre as in the latter the programme lasted an hour and ran Monday to Saturday from 10.15 to 22.15- that is twelve showings a day, with Sunday from 14.00 to 21.15.

However my day started at 09.00 and my first job was to check the gas lighting mantels on the secondary (safety) lighting, as well as all the other bulbs in the theatre, of which there were many. Those gas lights were converted to battery electric and the entire cinema refurbished in 1959, just a year before it was closed. The whole stage was included in the refurbishment including a new screen and curtains (tabs) and masking for Cinemascope, all just for a few months use.

All cinemas had a room referred as a box to house the projection equipment. The News had two modern projectors, six foot tall BTH SUPAs. Sheldon had two ancient projectors with Kalee arcs plus a slide lantern, again with arc lighting. Arc lighting went out with the Ark and I know not of any cinema that uses this source of light in modern times. All cinemas had at least two projectors and some even had three. Essential for showing feature films which were on 35mm film with optical sound at 24 fps.

Film was spooled on to separate reels, typically 6 or 7 for a feature. The News Theatre spliced cartoons and features (not forgetting the adverts!) over four reels, and a reel would last about twenty minutes. In a feature house, projector one would begin the film, and projector two would be prepared and "laced up" with the second reel. The second projector would be fired up a few minutes before the end of reel one and the operator levelled the gate with the leader number (a known equation worked out in each box depending on the uptake of the projector and other factors). On the screen were two "signals" in the top right hand corner, the first the operator started the projector and opened the "dowser", and upon the second signal, the relay or whatever was activated usually by the cry "over!" and the film would continue, hopefully with the audience being completely unaware.

However all boxes had a device for opening one side and closing the other. The News was sophisticated, as you would expect from BTH, with a relay which was pressed at exactly the right moment, whilst the Sheldon had a somewhat primitive cable arrangement. The sound was transferred by a simple pole switch whereas the News was entirely automatic. Mind you, the changeover was used



One of the two BTH SUPA projectors at the News Theatre



*The last Chief Projectionist at the News Theatre, Charles Golder; watching the aperture above the gate for his cue to show *The Queen* for the very last time at 22.25 on 16th April 1960.*

rarely at the News Theatre, and the photograph above not only illustrates the changeover in practice, but is a unique shot of the very last ever running of *The Queen* at the end of the closing night of the News Theatre in 1960.

Today, for those that are left the scene is very different, one projector suffices, no arc's, and the film is supplied on what are called Todd-AO (albeit the latter is really 70mm film with optical and magnetic sound) but those 35mm reels have the whole film in one go, and the merry go round system enables it to self rewind- believe me they have got it easy today!

March 2013: John Yates (Inspector of Historic Buildings, English Heritage)

The First Iron-framed Building in the World: Ditherington Flax Mill. Its History and Restoration.

John Yates presented the most cogent argument we have yet had for the appropriate preservation of important industrial buildings. Arguably, few are more important than the world's first multi-storey, cast iron framed building built in Shrewsbury in 1797 not far from the iconic Iron Bridge in Coalbrookdale

As Inspector of Historic Buildings for English Heritage, John was able to give us the insider's line on the multitude of issues facing those charged with the preservation and/or conservation of the fabric of our industrial heritage. It is a task bedevilled by conflicting interests, often underfunded and dependent upon public donations in some form or another.

Happily, the future for the Ditherington buildings (the site includes several other important iron-framed structures contemporaneous with the Flax Mill) is looking tolerably secure. English Heritage acquired the derelict buildings in 2005, and has since been working with a steering group made up of Shropshire Council, the Homes and Communities Agency, the Friends of the Flax Mill Maltings and architects of the scheme Feilden Clegg Bradley Studios, to find a new use for the site.

The goal is to create a long-term future for the historic buildings and for the community of which they have so long been a part. The buildings have supported 90 years of flax production and 90 years of barley malting. Today the whole site is in need of a new sense of purpose and identity to ensure its survival and productive use for the next 100 years and beyond.

The site is large and complex and in need of serious repair and reinvention. The mill buildings have been a huge feature on the local landscape for over 200 years but, more recently, have been empty, abandoned and decaying.

Four buildings have been selected for the first phase of the development and a substantial Heritage Lottery Fund application has recently been submitted to secure part of the funding needed to bring them into a third century of productive use.

This first phase will carefully conserve and reuse some of the key historic buildings which include the Main Mill from 1797, the Kiln from the maltings phase in 1898, the Dye and Stove House and the Office and Stables along with works to ensure visual and physical access. This restoration will provide an 'exemplar' in how modern technology and innovation can be applied to ensure a sustainable future for these important historic buildings.

Once the Main Mill and associated buildings are repaired and brought back into use the remainder of the historic buildings on site will be more attractive to potential users and investors. The complete restoration of the historic site will then stimulate the final phase of development of the full site which will include commercial and residential buildings. This in turn will significantly boost the local and regional economies and will make a real difference to the lives of local people, particularly on the northern side of Shrewsbury.

But what is it that is to be preserved? Beneath the creation of these innovative structures in a somewhat unlikely market town in Shropshire lie the roots of the Industrial Revolution. 1797 was a significant year for Shrewsbury. For 500 years the town had been on the trade route for wool from Wales to Europe, this trade was in

severe decline because of European conflicts. Secondly, two canals reached the town, one from the East and one from the South. Thirdly, the Midlands Enlightenment was flowering across the region.

The processing of flax was one possible diversification from the wool trade and a suitable mill was needed. One recognised danger was that of fire and this would be minimised by a structure combining cast iron columns and beams, a system which later developed into the modern steel frame which made skyscrapers possible. The Flax Mill's architect was Charles Bage, it was built for John Marshall of Leeds and the brothers Thomas and Benjamin Benyon. Bage, was also a partner in the venture which was dissolved in 1804, the mill being retained by John Marshall. Another Mill was built by the other partners nearby. These two flax mills provided the 'chief manufacture' of Shrewsbury (according to an 1851 directory).

Illustrations of the ironwork showed how slender were the cruciform tapered columns and beams. Calculations indicate a safety factor of only 2 when today 5 would be the norm. Brick vaulted ceilings fill the 10 foot span between the beams. The centre row of columns on some floors are shorter with an open capital or frame to the beam to allow shafting to run the length of the building. This shafting and other equipment was powered by a Boulton & Watt beam engine at one end of the building and a Leeds manufactured engine at the other.

Overall the Mill measures 200 feet x 40 feet and rises to 5 storeys. An excellent piece of computer-generated action made the skeleton of the structure come to life and allowed us to enjoy the quality of its design and execution. Further illustrations of the investigations into the details of the structure confirmed the original thinking of its designers.

Amongst the other listed buildings on the site are The Cross Mill (an iron framed building replaced a wooden one burnt down in 1812), The Apprentice House also from 1812, The Warehouse (1805) and the Stable and Offices of 1804. The Dye and Stovehouse was added in 1850 and the Malt Kiln in 1898.

The 1882 OS map shows a 'Thread Manufactory' on the site which is alongside the Shrewsbury branch of the Shropshire Union Canal and with a siding off the Crewe & Shrewsbury Branch of the L & N W R. Well located indeed, and Shrewsbury thread was regarded as a premium product. So much so that the incumbent member of the Marshall family sold the Mill in 1887 – entrepreneur to country gentry in three generations.

The Mill remained empty for a decade until it was bought by William Jones, an established maltster in the town and it entered its second existence in a new industry. On the 1927 OS map it is shown as 'Shropshire Maltings' alongside the canal. One continuity from the early days also shown are the groups of 'cluster' dwellings – groups of four back-to-backs across the canal from the Mill.

Sadly, to date no illustrations of the Mill or its ancillary buildings in its days as a flax mill have been found. Perhaps something will turn up. In the meantime it is to be hoped that the proposed development will gain funding and progress smoothly so as to preserve a truly important example of our industrial heritage. An iron-framed, gas-lit, steam-powered Mill in an oil-lit, timber-framed county town.

April 2013: Richard Thomasson

Ariel Motorcycles from Selly Oak

Given its relatively short life as an independent company and the low volume production of a somewhat limited product range, Ariel Motorcycles enjoyed, and still enjoys an enthusiastic following amongst its devotees.

Richard Thomasson is one of them and his review of the machines from Selly Oak drew a large audience, which included a number of visiting motorcyclists, to hear the history of the House of the Horse.

The story was liberally illustrated with archive photographs, contemporary restorations and a range of advertising material that latterly seemed more appropriate to sports cars than powerful motorcycles. Scarcely a hard hat in sight, but plenty of glamour.

The original company was established in 1870 by James Starley and William Hillman to make bicycles. After a few false starts Ariel Motorcycles began to build machines in the early 1890s at Bournbrook, Selly Oak, as part of the Dunlop Group. Perhaps Dunlop wanted to concentrate on its other businesses and in 1897 Ariel was sold to Cycle Components. At the 1898 National Cycle Show the company exhibited a tricycle powered by a 1 ¾ hp de Dion engine and made under license from the British Motor Co Ltd, according to a contemporary advertisement.

A remarkable number of early examples of Ariel machines survive, including one from 1901 powered by a Minerva engine and a restored 1914 TT Replica. This interesting machine has a rear hub containing a clutch and three gears made by Sturmeo Archer. The hub was stripped down by the restorer who, after taking a month to reassemble the 30 individual plates and other parts, vowed not to repeat the feat!

Once WW1 was over Ariel machines began to look more like a motorcycle with a proper gearbox, a twin cylinder engine but still with a belt drive to help damp out the engine pulses. By 1926 a substantial works had been built alongside the canal, simplifying amongst other things, coal deliveries.

Perhaps the most significant event in the company's history was the arrival in 1925 of Val Page from engine maker JAP (J A Prestwich). Page immediately stamped his mark on the company and started to bring the Ariel machines up to date, beginning with decent 7" brakes.

Various weird and wonderful exploits took place during the 1920s, one especially whacky one mounted a motorcycle onto two pontoons and proceeded to motor across the Channel. Having arrived in France, the two riders turned round and crossed back to England!

The Wall Street crash in 1929 had a dramatic effect on business and the Cycle Components Group of Companies was put into receivership. Jack Sangster was able to buy the tooling from the receiver and Ariel JS came into being. Sangster strengthened the engineering team by recruiting Edward Turner. One of Turner's first bikes was the Ariel Square Four in 1930.

This machine became the most famous of the Ariel range. Originally a 500cc, overhead camshaft engine it was successively developed to 600cc and finally 1,000cc. It was quite complicated for its modest power output (around 40 bhp), but it did produce lots of torque. Square Fours were famously capable of 10 to 100 mph in top gear and some 15,000 of all variants were built.

Ariel produced a number of innovations, prominent amongst which was a centrifugal filter built into a crankshaft

web. This was so efficient that clearing the debris during an overhaul required it to be drilled out, so compacted did it become.

The 1930s were busy times and one photograph of the crowded works showed the variety of machines produced, and how close the assembly area was to the finished stock. The 500cc OHV single was a popular model and even featured in a dirt track pre-event entertainment chariot race.

The model range expanded during the last years of peace as was shown in a series of contemporary advertisements. A number of models featured high level exhausts which looked certain to cause burnt knees and singed luggage. To say nothing of the discomfort to any pillion passenger! A number of engines utilised side valve configurations in the interests of reliability and reduced damage in the event of valve failure, which was not uncommon until materials technology improved.

During WW2 production was largely turned over to military machines. A 350cc OHV machine with high ground clearance and good brakes was initially ordered by the French Government but due to unfortunate circumstances they were unable to take delivery and the machines were diverted to the British forces. In total, Ariel produced 47,599 bikes for the War Department.

In 1944 Sangster sold the business to BSA but the Ariel brand continued to have its own identity and this was presented in a series of advertisements that cast some doubt on the suitability of the clothing being worn for meeting the rigours of motorcycling. Flat caps and plus fours are one thing but short sleeved summer dresses and lounge suits are quite another.

Nonetheless, Ariel steadily developed a loyal band of owners and in 1951 The Ariel Owners Motor Cycle Club was formed at the famous (or infamous) Ace Café on London's North Circular Road. The contemporary advertising strap line 'Leaders of Design' was equally at home at the Festival of Britain and the Ace.

Technical innovation continued with rear suspension and telescopic front forks, better saddles and a welcome spring absorber on the end of the crankshaft to damp down engine pulses. Ariel machines with their excellent torque characteristics had always been popular with sidecar enthusiasts but the advent of the BMC Mini at about the same price as a combination outfit spelt the end for the sidecar.

Ariel sought to break new ground with the Leader in 1958. Combining the weather protection of a scooter with the performance of a proper motor cycle it was popular with the Police and boasted trailing-arm front suspension, luggage capacity and, a world first, indicators.

Despite variants on the Leader theme such as the Arrow and the Pixie, Ariel eventually could not compete against Japanese imports and the company closed in 1966.

Richard closed with a review of Ariel activities and some interesting 'might-have-beens'. Never an out and out racer, there were no TT victories but the marque always performed well in trials and scrambles.

The Owners Club is very active with branches throughout the world offering events, advice and spares. The bikes are reliable, but they do wear out! There is even talk of the name being revived; in the meantime machines and parts are available for any enthusiast prepared to take on a restoration project. It can be most rewarding.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

The 25th season of WIAS meetings began in September 2013, with a revised constitution, a healthy financial position and a thriving membership, all discussed fully at the Society's Annual General Meeting. Much has happened in those 25 years, and yet in some senses it 'seems only yesterday' that a group of 'younger men' gathered at St John's Museum, Warwick to launch the Society, with Toby Cave as Chairman and myself as Secretary, and an inaugural lecture from Barrie Trinder.

I thought it would be of interest to write down some of the industrial sites in Warwickshire and Coventry that had been lost in that time, and it will probably come as no surprise that the list was worryingly long. A presentation on these sites might be an appropriate inclusion on a Members' Evening. Fortunately, in some cases recording had taken place; in others the loss has been more serious. Many of us have photographs of these sites, and the increasing use of social media (e.g. blogs, facebook) has prompted the proliferation of oral memories of many of these buildings and their workings, but it did re-emphasise the continued need for recording by whatever means available.

Attendance at the AIA Conference in Dundee (recorded elsewhere in this Newsletter) added power to the argument. The gazetteers for these Conferences focus on what actually remains at the time of publication, and whilst those sites now built over by housing or retail developments are of interest to the industrial historian, the physical remains have been lost.

At the Conference, one delegate made the thought-provoking suggestion that industrial archaeology is about what happened inside industrial buildings, and the buildings themselves were of less importance. The retort to this is, of course, that we would dearly like the working parts of the site to

remain for us to study, but it is often only the framework of the building that remains, and the ability of the industrial archaeologist to interpret the physical remains of these buildings is a fundamental component of his/her role.

This recording of industrial activity can be achieved using a variety of techniques, but the advent of digital photography and HD video on phones and cameras (at an acceptable cost) means that accurate recording has become accessible to the amateur enthusiast. Postings on Flickr and clips on YouTube (and elsewhere) have given new life to the recording of industrial activity.

We are all photographers now, but the skill of the professional photographer still adds much to the recording of industrial processes and their associated atmospheres. For our county, Ian Beesley's wonderfully evocative record of the Atherstone works of Vero & Everitt 'Warwickshire Hatters' is an outstanding example.

Water colours are, of course, another medium, and there are many examples of very fine water colour depictions of industrial scenes. Many of these – perhaps by the very nature of the medium used – tend to concentrate on industrial landscapes rather than the detail of buildings and technology. One modern exception is the wonderful work of Falcon D. Hildred, with a range of drawings from urban and industrial settings, including Coventry, recently on exhibition at Ironbridge. Equally impressive in their intimacy and detail in recording the processes of industrial activity, often prior to their disappearance, has been the work of Arthur Lockwood. The fact that his work has been in Birmingham and the Black Country has been, of course, an added bonus for us. What is perhaps unusual about his work is the way in which he seeks to record the processes of

industrial activity, working inside factories and foundries and having the patience and skill to record these processes so effectively, from Acme Whistles to Webster and Horsfall's wire works. One example of his work - readily available on the internet – is the recording of the last days of the Crown Nail Company, Wolverhampton.

<http://www.historywebsite.co.uk/museum/engineering/crownrailco>.

He has also produced a wonderful new book, reviewed elsewhere in this Newsletter.

PROGRAMME

October 10 2013

Roger Cragg:
Managing the Civil Engineering Heritage.

November 14 2013

Barrie Trinder:
Pontcysyllte: its place in history.

December 12 2013

Alain Foote:
The History of British Thomson-Houston, Rugby.

January 9 2014

David Fry:
Industrial Coventry in old postcards.

February 13 2014

John Brace:
The Channel Tunnel Fires.

March 13 2014

John Frearson:
Jonathan Dumbleton Pinfold and the Brickmakers of Rugby.

April 10 2014

Malcolm Nixon:
A New Light on an Old Industry: the Industrial Archaeology of the Worcestershire Potter.

May 8 2014

Peter Perkins:
The rise and fall of the Northamptonshire boot and shoe industry.

June 12 2014

Members' Evening:
25 Years of WIAS: 1989 - 2014.

NEWSLETTER

Meeting Reports

May 2013: Simon Buteux (Director: Birmingham Conservation Trust)
Newman Coffin Works, Birmingham.

Simon Buteux is the Director of The Birmingham Conservation Trust and a Research Fellow of Birmingham University but is also very much a hands-on field archaeologist who was involved with the excavations before the Bull Ring redevelopment and the restoration of the Reader's House in Ludlow. More recently, he spent a year with a charity school project in Borneo before returning to take up his present position with the Conservation Trust.

The Newman Brothers' Coffin Works in the Jewellery Quarter is but one of his responsibilities although, perhaps, one of the more interesting. Located in Fleet Street on the edge of the Quarter it is not only the last factory left on the street, it is a time capsule unchanged from when the doors closed for the last time in 1999 after 105 years of business leaving most of the machinery, furniture, stock, records and everything else in suspended animation. A Mercantile 'Marie Celeste' gathering dust in its Grade II* listed mausoleum.

Victorian funerals were lavish affairs of conspicuous expenditure. Coffin fittings were an important element to a stylish and opulent departure and Newman Brothers operated at the top end of the trade. Some notable 'clients' reputedly included Joseph Chamberlain, Winston Churchill, Cardinal Basil Hume, Princess Diana and HM The Queen Mother.

Until the end of the 19th century the coffin trade was centred on London but then moved to Birmingham where the small metal parts that formed the bulk of the coffin furniture were readily available. Newman Bros never manufactured coffins but supplied all the fittings, furnishings and textile elements needed by the local coffin maker.

In 1892 Roger Harley produced plans for 'A New Manufactory' in Fleet Street for Newman Brothers, Brassfounders, of 102 Irving Street. The Newmans had seen a business opportunity. The Fleet Street site was formerly a set of back-to-backs which were demolished. The façade of the building onto Fleet Street today is unchanged from the original drawings although photographs of the inner courtyard show the shoddy 1960s rebuilding of the casting shop wing.

Simon's presentation cleverly combined the original elevation drawings with schematics to show the locations of the various sections of the manufactory in its final days. To these he added pictures of the interior 'as left' when the doors were closed for the last time.

Amongst these illustrations were some evocative drawings by a Dr Allen, the son of a former sales director, recording his memories of the factory when he was a teenager in the 1930s. Dr Allen had fond memories of the polishing shop where large diameter linen mops were driven by individual electric motors. Apparently one majestic lady, known as Diamond Lil, was wont to support the part to be polished in her cleavage! The imagination boggles.

At one end of the courtyard, underneath the toilets, was located a gas engine which drove the line shafting for the barrelling shop and other machinery. The cramped working conditions in the workshops were clearly evident from the illustrations. If the conditions for stamping and pressing were bad enough those in the electro-plating shop would terrify today's officialdom.

Conditions were somewhat better for the seamstresses on the top floor. The shroud room was a 'jolly place to work' producing the clothes you would be seen dead in. This section contained huge amounts of stock, robes and fancy trimmings, including shrouds in Birmingham City and Aston Villa colours. An attempt at diversification that

failed, leaving plenty of surplus stock for any fans in need.

A hoist runs the full height of the building from the shroud room down through the warehouse to the post room on the ground floor. The warehouse remains stuffed with stock and is a treasure trove of Newman's products. The range was breath-taking and a 'one stop shop' that included embalming fluid.

Another most interesting archive is formed by the ledgers and catalogues found in the offices which, as with the factory, remain, as left, even to tins of soup and bottles of Gordon's orange gin and champagne in a cupboard.

Unsurprisingly, there were two entrances on Fleet Street to the manufactory, one double door for the workers which also gave access for transport into the courtyard, and one panelled door for office staff and clients. At its peak the business employed about 100 people.

Turning to the personalities in the company, one Alfred Newman, a brass founder, was the father of two sons, Horace (1885-1952) and George (1889-1944) the Newman Brothers. They were succeeded by John Kellett who rebuilt the product range and eventually sold the business to Joyce Green in 1976. Miss Green then ran the company until closing the doors in 1999.

What of the future? At present a team of volunteer guides, often in costume, entertain school parties and conduct 'twilight tours'; when candle-lit the Coffin Works can be very atmospheric. The works also provides a setting for art events such as the Tin Box Theatre Company's production of 'Stop the Clocks'.

The Coffin Works Restoration Project has a lengthy history. In 1998-9 an English Heritage survey of the Jewellery Quarter identified the importance of Newman Brothers' factory and in 2000 the Factory was listed Grade II*. In 2001 the Birmingham Conservation Trust (BCT) undertook a feasibility study commissioned by Birmingham City Council and The National Trust, and in 2003 Advantage West Midlands (AWM) bought the factory from Miss Green. Between 2006 and 2008 with funding from AWM and others BCT developed an ambitious scheme for the factory.

Then in 2008 recession struck. AWM withdrew funding when regional development agencies were wound up and BCT developed a revised, more modest scheme and applied for Heritage Lottery funding. In 2010, BCT bought the Coffin Works from AWM with funding from Birmingham City Council and English Heritage approved a grant for repairs. In 2011 the application for Heritage Lottery Funding of just under £1million was successful and the development of a scheme was put in hand together with grant applications for match funding. This was achieved in 2013 and Heritage Lottery Funding gave permission to start.

The BCT plans for the Coffin Works are comprehensive with multiple uses envisaged for the buildings. The front area and stamp room will become a heritage attraction. The South (1960s) rear ground floor is to be used for a collections store, a conservation workshop and meeting room. Top floor units will be available for commercial letting. The North (1894) rear buildings will house commercial units and BCT will move its office to the Coffin Works. Rent from the commercial units and ticket receipts from the heritage attraction will enable the Coffin Works to become financially self-sustaining in the long term. The approximate cost of the scheme (including activities) will be some £2 million. Construction work will last until April 2014 and the Heritage Attraction should open in July 2014 leading to a self-sustaining operation by 2017.

All in all an ambitious project that we wish well.

Members' Contributions

Peter Chater:

The Burton Dassett Quarries and Aerial Ropeway



The original owner of the Burton Dassett Quarries was Lord Willoughby de Broke of Compton Verney.

From 1895 the quarries were known as the Burton Dassett Iron Stone Company and from 1918-1921 as T&I Bradley and Sons Ltd.

The Quarries were opened intermittently from probably 1868. It is thought that the stone was conveyed at first by cart to Fenny Compton station.

The East and West Junction Railway was opened from Fenny Compton to Kineton in 1871, and to Stratford on Avon in 1873.

A ropeway was constructed in 1871 from the quarries to the Burton Dassett Sidings on the East & West Junction Railway. In 1895, under new ownership, the ropeway was rebuilt and much strengthened. Each bucket was capable of carrying a little over 3 cwt. The ropeway, powered by a steam engine, was a little over one mile long.

The railways in the quarries were of two foot gauge and the wagons were of the V-shaped tipping variety. Ponies were used to draw these wagons.

The head of the ropeway was at the western side of the quarries; the V-shaped wagons were brought to this point and their contents tipped onto a platform and then through a chute into the buckets.

The quarries were finally closed in 1921 and, when it became apparent that they would not be reopened, in 1929 the ropeway was dismantled as was the bridge which crossed the road between Little Dassett and Northend.

Much of the above information has been taken from Eric S. Tonks' *The Ironstone Railways and Tramways of the Midlands*.

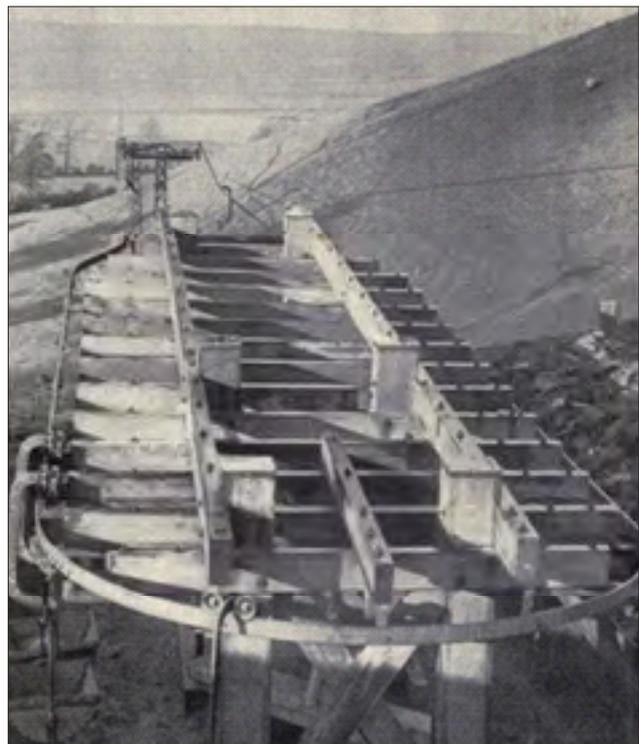
The illustrations are from:

http://www.copsewood.org/aropeway/uk/rw_ukgaz.htm.

Top: Ropeway on the hillside west of the 'Beacon'.

Right upper: Bridge crossing the road between Little Dassett and Northend.

Right lower: The head of the Ropeway.



Members' Contributions

Richard Green:

Arthur Lockwood: Urban and Industrial Watercolours of Birmingham and the Black Country.

After his 'Change in the Midlands' publication in 2007, Arthur Lockwood has now produced a second, larger volume entitled 'Urban and Industrial Watercolours of Birmingham and the Black Country', and our Chairman asked his brother Richard Green (Honorary Secretary of the Birmingham Watercolour Society) to present a review of the book, published by Sansom & Co. £25.00, and to offer a broader perspective on Arthur Lockwood's work.

Arthur Lockwood's book "Urban and Industrial Watercolours of Birmingham and the Black Country" is a celebration of the talent and work of three generations of the Lockwood family, with paintings and sketches by Arthur's father Frank T, providing a context for Arthur's watercolours, and a few works by son Paul showing that the family traditions continue. We therefore can enjoy Frank's work in the 1920s and 30s, Arthur's early work at his father's side and in the 1940s and 1950s at College and as a graphic designer. Fortunately, Arthur's timely return to the Midlands in the 1980s enabled him to produce a unique series of watercolours that now serve as a precious record of the decline and loss of the manufacturing activity that had been the lifeblood of Birmingham and the Black Country for more than a century, in a manner that gives real shape to our memory of those distant days. In complete contrast to Arthur's super-detailed and accurate representations of all he sees before him, Paul's work is fired by his creative imagination, and is more abstract than observed.

This is a beautifully produced, accessible book with the layout and print quality at the sort of high standard one would expect from an artist who studied graphic design and worked for much of his life as a designer, bringing to bear all his understanding of book layout and typographical structure. However, it is the technical skill shown in his use of pen and brush and the breadth of subject matter that make the book notable, working on many levels and enjoyable at every level. It is an attractive book to all, whether expert or novice, because it is simply so good to look at. It is a special historical record of industrial transformation and change that will help researchers understand the pace and process of change, and contains accomplished works of art which demand close study.

The book charts change, sometimes capturing an industrial scene that will soon disappear, or a set of buildings awaiting the hammer or in the middle of demolition. Many have a haunting quality, the structures being an echo of what was once there, an old friend about to be lost forever and suspended in time forever as an abandoned relic by the artist. Birmingham has seen many buildings disappear, some attractive, some an eyesore, but it is impossible to live in Birmingham or its Black Country neighbours and not witness the predicament of decision-makers as the old was swept away and the new was brought in. For good or ill,

it has been an irrevocable transition as, for example, some of Birmingham's well-loved bedrock industries collapsed overnight, never to reappear, and the road-building so beloved in the 1960s dominated the change agenda. We therefore hold a debt of gratitude to Arthur and his father for appreciating what should be recorded and why.

Arthur is not judgemental, nor is he a romanticist, at least not in his paintings as he seems more captivated by illustrating the real contribution played by a skilled workforce (e.g. *Smith Edge Tools of Oldbury: plates 302-304*), but equally does not ignore the grit and grime of the factory floor. He tells us how it is – or was. Nothing that Arthur portrays will ever return but there is no melancholy about his work. He simply - and with ease – captures the atmosphere of factories full of understated but industrious people hard at work, or buildings left exactly as they were when they were padlocked, or often just the empty shells that were left behind.

Arthur's paintings show a draughtsman's eye for perspective and he achieves compositions that draw the viewer right into the picture. Whether he is painting right up against the subject matter (e.g. *Canalside factories, Small Heath, Birmingham: plate 286*), or working inside buildings (e.g. *In the Henley Foundry, Smethwick: plates 243-246*), or capturing street scenes (e.g. *New Bond Street, Digbeth, Birmingham: plate 107*), he seems completely at one with the subject. Watercolour is an ideal medium for a 'light touch' and Arthur shows this skill when painting scenes that have a transitory nature or will soon be all that remains - as if they are just echoes of the past (e.g. *the Inn Place, Midland Street, Birmingham: plate 206*). By contrast many of his 'live' subjects – working foundries and forges etc – display the dark, muscular grittiness that working with metal and steel demands. What stands out in all his work – and his father's – is the attention to detail: the patina on the side of a drop forge, the discolouration on a skip. Not that Arthur slavishly paints every brick or corrugated iron sheet – he merely paints what is important to create an attractive picture and an appropriate record.

Little seems to have escaped Arthur's keen and reflective eye, whether it is comprehensive housing clearance, removal of modern structures or demolition in advance of the building of new industrial or commercial activity. He records some of the biggest schemes, such as that huge hole at the Bull Ring during redevelopment, but has rather greater empathy with more modest street scenes when seemingly overnight, buildings that had turned the corner of a street are no longer there.

For Arthur is a story-teller, a visual diarist of an ever-changing picture of urban change. Few of us can confidently predict where the next change will occur. But it surely will happen and hopefully others will follow Arthur's consummate skills of being there when it matters and being willing and able to record it.



The Inn Place, Midland Street, Birmingham: closed and boarded up, it was set on fire and demolished in 2001.



Coventry Colliery, Keresley: Number 1 head frame derelict and ready for demolition, June 1997.



Webster & Horsfall Ltd., Hay Mills, Birmingham: hot dip galvanising for the application of a zinc coat to wire to prevent rust.



Acme Whistles, Birmingham: assembling the whistles prior to soldering the parts together.



Right: Sidney Smith Castings, Stourbridge: the electric furnace, where molten metal is poured into the ladle or pot.

September 2013: Martin Green

Association for Industrial Archaeology Conference 2013: Tayside (Dundee, Angus, The Mearns and North Fife)

For its fortieth Conference, the AIA ventured north of the border to Tayside, based at the University of Dundee. Four members of WIAS attended for most of the week-long Conference and our Chairman Martin Green produced this report for the September meeting.

The AIA Conference has become a focal point for AIA activities over the past four decades. It performs a range of functions, some associated with the AIA itself and its activities over the past year, whilst the majority of the time is spent learning about (via a series of lectures and shorter presentations) and exploring the industrial heritage of the surrounding area. The AGM, the Conference Dinner, the AIA Awards for various IA projects, and the Rolt Memorial Lecture – ‘*The Public Benefit of Industrial Heritage: Taking a Positive View*’ by Miles Oglethorpe – were the main formal elements, but there were also opportunities to share time with fellow enthusiasts and to establish and renew friendships.

The Friday prior to the main conference is reserved for a seminar, and the theme for this year’s presentations was ‘Iron Structures’. The seminar was chaired by Professor John Hulme, a pivotal figure in the recording of Scotland’s industrial archaeology, with an unrivalled collection of photographs taken in the 1960s and 1970s. A range of speakers (including Dr. David Mitchell, Director of Conservation, Historic Scotland) explored the history of particular structures in Scotland and beyond. This was followed by a fascinating presentation on the Tay Bridge Disaster from Professor Ian MacLeod, together with a description of the current restoration project for the bridge by Duncan Sooman of Network Rail. It was singularly appropriate that the afternoon trip was a walk beneath the current Tay Bridge, with the remnants of the piers of the doomed earlier bridge visible in the turbulent Forth of Tay beneath.

The conference gathered in the evening for a Tayside barbecue at Discovery Point, a visitor centre housing the Scott and Antarctica exhibition, with Scott’s ship RRS Discovery (1901) moored at an adjacent quay. Scott had decided to have the Discovery built in Dundee because of the experience of the city with Arctic whaling and the qualities of the ships required for such expeditions. This emphasised to me the importance of landmark exhibits in attracting visitors to the industrial heritage of an area. Two other craft moored in Victoria Dock – HMS Unicorn (venue for the Conference dinner) and Lightship North Carr – were further attractions to bring people into the ‘re-generated’ port of Dundee.

Another landmark attraction in the city is the Verdant Works which houses the jute museum of a city once dominated by production of goods derived from this brittle, imported fibre. Elsewhere the sheer scale of the mills devoted to production left a lasting impression, with the Camperdown Mills of the Cox Brothers in Lochee and the Tay Mills of Gilroy and Sons in the heart of Dundee representing two outstanding examples. Production was, of course, not confined to Dundee and the enormous Broadford works in Aberdeen represent a mammoth task

for regeneration as an ‘urban village’. Given the dominance of the jute industry, it is no surprise that many ancillary trades developed in the region, for example Pullars of Perth dyeworks; and Urquhart, Lindsay & Co., Blackness Foundry, Dundee, manufacturers of a huge range of specialist textile machinery.

Spending the week exploring the buildings of the jute industry, both in Dundee and beyond, reminded one that industrial archaeology is only one piece – albeit a very important piece – of the jigsaw of industrial history and heritage. The story of jute fascinated me, with so many aspects deserving further study, including the severity and social impact of the decline in the industry as a result of the (often Dundee-sponsored) rise of the Indian jute industry. Indeed, some of the most telling images at the Conference were pictures taken earlier this year by one of the AIA delegates Chris Emery of a jute mill in Kolkata (Calcutta). The atmosphere and conditions of the crowded factory – noise, heat, dust – were effectively conveyed through the visual image. Even more telling, perhaps, was the fact they were working with machines manufactured in Dundee.

Given the location on the north eastern coast of Scotland, maritime heritage would inevitably be an important element in Conference tours. Most dramatic of these was the visit to Aberdeen and the transformation of a once vibrant fishing port into one dedicated to serving the needs of the North Sea oil and gas industry. This was brought vividly home to us as we toured the harbour in our (Dinky toy) ferry beneath the bulk and sophistication of the vessels moored above. Other maritime elements were on a much smaller scale – for example the tide mill at Fife Ness and the salt pans at St. Morans. These two were excellent demonstrations of the benefits that dedicated, careful research (of both documentary evidence and physical remains) could produce in our knowledge, understanding and interpretation of an industrial site.

Jute, of course, was not the only textile produced in this part of Scotland, and there were many references to other textile sites. The Arkwright-influenced Stanley Mill – a range of water-powered cotton mills restored by Historic Scotland and the Prince’s Regeneration Trust – reminded one of the image of the isolated textile mill, with mill village attached, reminiscent of New Lanark. Deanston Mill was another example, now converted to a whiskey distillery.

It would have been, of course, a crime to have departed Dundee without tasting malt whiskey, haggis and Dundee cake and marmalade. The first two were very evident – the latter less easy to find. Fundamental to the success of the Conference is always the energy and efficiency of the organisers, and it was a goal of this year’s ebullient organiser Mark Watson that all should visit at least one distillery. Some delegates, I believe, managed three!

There are many reasons to return – the east coast rail route over the Tyne, Tweed, Forth and Tay bridges might be justification enough – particularly as Dundee seeks to raise its profile with the £45m project to build a V and A Museum adjacent to Discovery Point, and to bid for UK City of Culture 2017.



The second (1887) rail bridge over the river Tay seen from a vantage point above the city of Dundee.



Part of the Baxter Brothers jute mills in the Dens area of Dundee, now converted to housing.



The challenge of restoration to the enormous Broadford works in Aberdeen.



Cox's stack and the High Mill (1858-1868) of the Camperdown jute works of the Cox Brothers, Lochee.

*Right:
The stills at Deanston Whiskey Distillery, a converted textile mill.*



June 2013: Anthony Coulls:

Railways and the National Railways Museum of Sierra Leone

Anthony Coulls has given us several interesting talks in recent years but the history of the railway and the story of how a National Railway Museum was created and is being developed in one of the most deprived of sub-Saharan countries was both stimulating and heartening. However, whilst there was much to admire about the museum project the contrast that emerged between the early British colonial development of the railway system with its echoes of English gentility and the present ruthless exploitation of the country's mineral resources by the new colonial power, China, was revelatory and worrying.

Sierra Leone is rich in possibilities. Its capital, Freetown, lies on the largest deep water harbour in Africa, and there are rich deposits of iron ore, rutile (titanium), gold and especially diamonds. Despite this, two-thirds of the country's 4 million inhabitants survive as subsistence farmers and many of the 1 ½ million in Freetown are unemployed shanty dwellers. The country is still recovering from a vicious civil war that lasted from 1991 to 2002.

A soldier with a passionate interest in railways and museums is a little unusual. Colonel Steve Davies MBE is such a man. In 2004 he was Deputy Commander of the International Military Advisory Training Team (IMATT) in Sierra Leone. In his spare time, and with the help of a small band of unemployed but enthusiastic volunteers, he transformed a warehouse of decaying railway artefacts, including locomotives and carriages abandoned since the abolition of the State railway in 1974, into a new museum. He even paid wages from his own pocket. The Museum was officially opened in 2005 by the President of Sierra Leone.

Anthony's talk included many anecdotes relating to the trials and tribulations surrounding life in Sierra Leone generally and especially the acquisition of material for the museum. Getting around by road, by air or afloat required patience, initiative and hope for a successful outcome. Davies' military experience stood him in good stead on more than one occasion!

But to return to the history of the railway in Sierra Leone. In 1896 a 2' 6" gauge line was begun running from Freetown 270 miles up country to Pendemu. At Bauya Junction some 50 miles from Freetown, a branch line went to Makeni. A separate 3' 6" gauge line to serve the development of minerals, especially coal and iron ore extraction, went from Freetown to Marampa.

A contrasting series of pictures showed the original railway infrastructure and the few remnants that survive today. Notable were the spidery iron viaducts and their later concrete pillars, the English style buildings and a sense of order with later ruin. Today, only those parts fashioned from stone and concrete remain. Station signs being good examples. Anything of use for building has been liberated and reused.

The rail system began to contract in the 1960s, shortly after diesel locomotives had succeeded steam. First the section from Pendemu back to Bo (tinned with Leamington Spa) was closed and a decade later the line retreated to Bauya Junction and in 1974 back to Freetown. Much of the permanent way has now disappeared via the scrap merchants.

Short lengths of track have survived in and around the old railway workshops in the Cline Town area of Freetown where the museum is presently located. The workshops had remained open until the civil war when, it is said, at one time 30,000 people were living in and around them.

When Steve Davies first saw the workshops and surrounding area he was surprised to see what had survived. Not only a number of locomotives, both steam and diesel but important rolling stock including the original Governor's coach and one specially built for the visit of The Queen in 1961. Sadly, it seems that she did not in fact travel in it but it is being restored to its original condition. Also there were a number of passenger carriages remaining from the 30 sent out from England in 1961 to improve the railway. One problem with many of these items is the 'heritage insulation' they contain.

In February 2009 Anthony left a snowy England for his first visit to Sierra Leone, in fact his first flight and overseas journey, to review the material with Steve Davies and to begin the creation of the Sierra Leone National Railway Museum. It was indeed a leap into the deep end!

Fortunately, Steve had excellent contacts at the highest levels and Anthony found that he and the Anglophile President were both alumni of Aberystwyth University. Another plus was the work ethic of the Sierra Leoneans at the nascent museum; often unpaid but still prepared to come in and help.

Fortunately, funding has been found to allow the creation of an archive (there is much important and endangered material), a curator's office and other facilities. Repairs, especially to the decrepit tin roof, and the buildings is a priority issue.

A potentially useful source of future income is from the increasing number of cruise ships visiting Freetown who are being encouraged to show generosity.

The pictures of the restorations carried out so far demonstrated that the museum has plenty of potential attractions. This will be further enhanced if some track can be restored outside the museum buildings to allow proper steaming. There are also a number of diesel locos that can probably be restored to running condition.

Outside of the museum there is now little remaining of track or bridges. The ever present scrap dealer has taken advantage of booming metal prices and thus the chances of restoring the railway have been greatly reduced. Given the dreadful state of the road system this is unfortunate since a working railway could be of great benefit.

The museum is well received by a growing number of visitors and has featured on the local TV network. Its displays will be augmented with material no longer needed by the NRM at York and an oral history project has been started with so far half a dozen old employees recording their memories. It is hoped that there will be a growing number of international links to other railway museums.

Outside of the museum, the description of a trip up country to examine the refurbished 75 mile long section of line to the iron ore fields was notable. This work has been sponsored by China with Chinese labour, locos and rolling stock and is another example of a new colonial power seeking raw materials. The quality of the new track seemed marginal for its 3,000 ton ore trains and there is a clear need for education of the local population about the dangers of open crossings.

The presentation closed with a few examples of other industrial archaeology including a flat pack house sent from Harrods in 1912, the government wharf used by slavers and filmed in 'The Heart of the Matter', an ex-Isle of White hovercraft ferry from the 1970s and a bus emblazoned with 'Banbury United F.C. on its rear.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

WIAS DATABASE: STAGE 1

The Warwickshire Industrial Archaeology Society has always maintained a broad perspective by exploring both the industrial archaeology and the wider industrial, economic and social history of the county. In fact industrial archaeology (IA) looks specifically at the physical remains of past industrial activity, and this has been the focus of our attempt to establish a database of IA sites for Warwickshire, Coventry and Solihull (henceforward abbreviated to 'Warwickshire').

Our approach has been (deliberately) practical and our goal (initially) modest. We have sought to establish what a visitor to Warwickshire - or to the WIAS website - might want to know about the IA sites of the county. A small team was charged with the task of identifying the principles and process of establishing such a database for Warwickshire. This comprised Roger Cragg, Peter Riley, Dennis Crips and myself. I would like to place on record my particular thanks to Roger Cragg for taking on the responsibility for entering each site on the database, and to Peter Riley for masterminding the inclusion of the database on the WIAS website.

The focus throughout has been on what actually remains. This, of course, in no way diminishes our interest in other sites in the county that have disappeared, but we needed a specific framework within which to work. This is the approach adopted by the Association for Industrial Archaeology (AIA) and the publication of its regional

guides (often as part of the Annual Conference). The team identified the essential ingredients to be: Site Name; Site Location (including OS Grid Reference); (brief) Site Details; Photograph; Industry concerned; Availability of Access to the site.

Once these details had been gathered, the site would be entered on the database, and any visitor to that database would discover both a listing of sites by location and a listing of sites by industry, together with a collection of photographs linked to the sites.

We began by entering some 'tried and tested' sites, based on the work of Roger Cragg for the Civil Engineering Heritage of Warwickshire. Many of these sites (e.g. bridges, aqueducts) are readily identifiable, are still in (original) use, and have up-to-date information and photographs attached to them. Thus they provided an ideal launchpad for the project.

Other sites may be less easy to record e.g. a building that has undergone much physical alteration and changes of use over time; the landscape of an industry such as sand and gravel.

So there remains a great deal of work to be done, and one of the guiding principles of the project has been to encourage the involvement of members of WIAS wherever possible. We have now reached the stage where we need to expand our list of entries, for there remain considerable gaps in the geographical and industrial coverage of the database. We hope that members will feel encouraged to participate. The first stage is to ask individual members for a

statement of intent - that you would be willing to assist - and this can be done by completing a form available at WIAS meetings or by contacting me on wiaschairman@aol.com. You may know a specific industry well, or a particular location, or you may simply wish to be directed to sites that need to be recorded. The method of recording will be via the WIAS Database Information Sheet, which will be available both in hard copy and on the WIAS website.

When we know the likely level of involvement of members, hopefully we will be able to make considerable progress with the project. The goal is to reach a situation in June 2014 when we will be able to go 'live' on the internet. This is a real opportunity to contribute to recording the industrial archaeology of Warwickshire and we very much look forward to sharing the experience of creating the database with members of WIAS.

PROGRAMME

February 13 2014

John Brace:
The Channel Tunnel Fires.

March 13 2014

John Frearson:
Jonathan Dumbleton Pinfold and the Brickmakers of Rugby.

April 10 2014

Malcolm Nixon:
A New Light on an Old Industry: the Industrial Archaeology of the Worcestershire Potter.

May 8 2014

Peter Perkins:
The rise and fall of the Northamptonshire boot and shoe industry.

June 12 2014

Members' Evening:
25 Years of WIAS: 1989 - 2014.

NEWSLETTER

Meeting Reports

October 2013: Roger Cragg

Managing the Civil Engineering Heritage.

Members with good memories may recall Roger's presentation at the 2005 AGM when he introduced a *Scheme for Industrial Monument Assessment and Grading*. At that time it was envisioned that, whilst the system had been devised for use on a national scale, it could, with little if any modification, equally be applied on a local scale. In particular, it could be of assistance in selecting those IA sites suitable for inclusion in the Society's Gazetteer.

We have had several recent speakers talking about our engineering heritage; from Ditherington Flax Mill to the Railways of Sierra Leone. In this talk Roger spoke with the authority of a practitioner and as a long-standing member of the Institute of Civil Engineers' Panel for Historical Engineering Works (PHEW).

Many would agree with the proposition that our engineering heritage requires managing; all aspects of conservation and preservation involve managerial decisions in addition to the purely technical. Assessments need to be made of quality and historical significance and balanced with financial and other criteria, all reflect management processes.

Three fundamental questions are raised when considering any potential subject under the scheme:

Does the structure have sufficient historical value?

Is it feasible to take any action to preserve or conserve?

What method of preservation or conservation treatment is appropriate?

In a presentation replete with illustrations predominantly of Warwickshire examples Roger explored these issues.

The assessment of historical value, its quality or its merit is contentious and gives rise to much debate. Description, let alone quantification is problematic, value judgments are needed and all too often the 'I know one when I see one' prevails over a more structured approach.

After many years of discussion, and attempts at devising a rational system for assessing historical value, the PHEW set up a Working Party under Roger's chairmanship which devised the method used today. The basis of the system is that a number of separate categories are each independently assessed. The results are then combined to give an overall assessment in four categories. The assessment categories are:

Landmark, does it represent a significant stage in the development of structural form or does it utilise new materials or construction techniques. A typical 'landmark' might be Bage's Mill at Shrewsbury.

Rarity, (not to be confused with Landmark), is it the sole surviving example or one of only a small number remaining. A typical structure might be Meldon Viaduct, although not the oldest wrought iron lattice viaduct ever built it is one of only two surviving similar structures.

Age, must be assessed, not as the absolute age of the structure but in relation to the age of the oldest known structure of the type under consideration. Stanford Bridge may only have a chronological age of 107 but it is one of the earliest surviving concrete bridges.

Size, all other things being equal a large structure would be more highly regarded than a smaller one.

Engineer/Contractor, there is a tendency to favour works by those eminent in the profession to have a better claim to fame than those designed and built by 'unknowns'.

Aesthetics, some types of structure might be appropriate for an

assessment to be made of the aesthetic quality of the design.

Condition, assesses the present physical condition of the structure, the degree to which the original design has been altered by later work and takes into account the current state of the structure. It is not possible to devise a single, unique, assessment formula that would be applicable to all types of civil engineering structure. Consequently for each type of structure, cast iron bridge, seaside pier, windmill or whatever, a set of factors is extracted from the above list which is felt to properly represent that particular type with the proviso that at least five factors must be chosen

Once the list has been decided then each one is graded from A (best) to D (least). Lastly, a final overall Grade is determined on a scale from 1 (best) to 4 (least). The method by which this combining is done is flexible but the recommended method is to take the best three factors. From these the final grade is determined as:

AAA or AAB	Grade 1	Nationally important
ABB or AAC	Grade 2	Regionally important
AAD or ABC or BBB	Grade 3	Locally important
All other combinations	Grade 4	Probably worth recording

Following assessment comes feasibility, and here it became necessary to modify the Panel's organisation from regional to national by type of structure. Each panel has to compile a data base of structures and then has to devise a suitable assessment procedure which will consider, *inter alia*:

Is it feasible to preserve or conserve?

Does a valid use exist for the structure?

Is any finance available?

Are there issues of maintenance or other long-term expense?

In cases where the structure has retained its original use, or has acquired a new use, then a useful source of revenue may be income from future users of the system. An obvious case would be the preservation of a railway line where fares would contribute towards the upkeep of the line once the running costs have been met. However, it is salutary to note that even with the very high levels of "free" labour which such projects usually attract, financial difficulties may arise. Charges for admission to sites may also be a factor but in some cases, especially where a structure is preserved in situ this may not be a feasible proposition since the costs of collecting and administering such charges may not be economic. Preservation on an established "museum" site may be one way round this problem.

Finally, there are the methods of conservation. The best solution is for the structure to remain in full use for its original purpose and this will sometimes be possible, especially where the original owner is co-operative or where the structure can be taken over and run as a going concern, such as with many of the preserved railway lines of which the Welshpool and Llanfair Light Railway is a shining example.

Given the scale of many structures, preservation on the existing site is optimal but there are clearly safety issues with derelict structures that need to be covered for public safety. If demolition becomes necessary, full prior recording must be undertaken.

Clearly, preserving our Civil Engineering Heritage is a complex business involving a wide range of management decisions. It is fortunate that it is being managed in such a professional way.

November 2013: Barrie Trinder

Pontcysyllte: its place in history.

Whilst our founder members may have felt a glow of nostalgia twenty five years on, other later comers may only have heard Barrie Trinder speak once or maybe twice on his more recent visits to the Society. All, however, must have found his presentation on Pontcysyllte: its place in history a great pleasure. A *tour d'horizon*, centred on Telford and Jessop's soaring aqueduct, and the extraordinary developments in British industrial development at the height of the Napoleonic Wars, was all too short.

Those who acquire a copy of Barrie's latest book; *Britain's Industrial Revolution* (Lancaster, Carnegie, 2013. www.carnegiepublishing.com) will be able to enjoy the full story at their leisure.

The Pontcysyllte aqueduct is today the centre of a UNESCO World Heritage Site. A part of the Ellesmere Canal it is a landmark in the development of the constructional use of iron and a symbol of Britain's Industrial Revolution.

The aqueduct was a child of its time; its promoters gained their Act of Parliament in 1793 and completed the structure in 1805, just after Nelson's victory at Trafalgar. The immediate canal system had its hub at Ellesmere where a substantial headquarters overlooked the canal near to the town wharf and the depot for the Shropshire Union Railways & Canal Company, some of which buildings still survive.

The structure came after the successes of the Iron Bridges at Coalbrookdale and Sunderland and the disastrous failures of others at Staines and Yarm. The latter did constrain the optimism about iron structures which had been expressed in 1801 with the claim that the Coalbrookdale works could produce 'iron bridges of any span or height'. Pontcysyllte embodied such optimism, carrying the Ellesmere Canal 126 feet above the River Dee in a cast-iron trough supported by 19 cast-iron arches erected between slender, hollow masonry piers.

It is useful to see Pontcysyllte in its context; the canal mania that had followed the Bridgewater Canal's opening and the national network of 'navigations' that was beginning to be created. The Ellesmere Canal, authorised in 1793, was intended to link the river Dee at Chester with the Severn at Shrewsbury through the North Wales coalfield. The company engineer was William Jessop and Telford was appointed its 'general agent'. Both men had experience of iron structures and in 1795 it was decided to follow Jessop's recommendation to carry the canal on high aqueducts at Pontcysyllte and Chirk.

The original route, due South from Chester via Wrexham to near Pontcysyllte, was abandoned in favour of a longer but easier Eastern loop using some existing canals via Whitchurch and Ellesmere to Welsh Frankton, where it joined the branch originating at Horseshoe Falls beyond Llangollen and passing over the two aqueducts.

Barrie traced the route of the canal with some early illustrations that evoked a more leisured era, not that canal work was ever easy but the countryside seemed more tranquil. The 'Mosses', the junctions, the locks, the bridges and the wharves all contributed to the overall effect. However, many of the buildings are now in a sad state of disrepair. A situation that did not help the campaign for World Heritage Site status!

One place of considerable importance was Plas Kynaston, a notable centre of iron-founding and the source of parts for other iron bridges including Telford's over the Scottish

Dee at Craigellachie with its commemorative plaque from 1814, over the Caledonian Canal at Moy and the Waterloo Bridge at Bettws-y-Coed.

The commercial justification for the Pontcysyllte and Chirk aqueducts was to facilitate industrial development to the North by delivering the high quality iron and limestone from Llangollen to the Shropshire coalfield and the Black Country. Important industries from dyestuffs to explosives were also developed as a result together with general cargo traffic.

As the commercial relevance of the canals declined in the latter half of the 19th C, pleasure boating gained in importance but by the 1920s this had reduced considerably and deterioration set in. So much so that in 1939 Tom Rolt was unable to complete his proposed journey from Banbury. By the mid-1930s closure was threatened but fortunately in 1954 British Waterways agreed to keep the canal open – it was important for the distribution of water!

Pontcysyllte was a landmark in the development of the constructional use of iron. Barrie entertainingly traced the early history of the material from Coalbrookdale in 1709 with its revolutionary use of coke for smelting via the Iron Bridge to structures at Sunderland, Buildwas, the Longdon Aqueduct on the Shrewsbury Canal, Pont-y-Cafnau (the Bridge of Troughs) and Stalybridge, before ending back at Pontcysyllte rising 126 feet above the Dee and its cast iron trough. Truly, a magnificent and amazing vision and a feat of engineering skill.

However, as noted above, confidence in large iron structures was shaken by several major failures and no significant iron structures were built in the early 1800s apart from some canal aqueducts, including those on the Stratford on Avon Canal at Bearley and Edston.

As a symbol of Britain's Industrial Revolution, the Pontcysyllte Aqueduct enjoyed a splendid opening ceremony on 26 November 1805 orchestrated by Thomas Telford. Rowland Hunt of Boreatton gave an oration which included such phrases as 'Antiquity has produced no structure, as an Aqueduct, which can compare with Pontcysyllte or with many other of the works we are now assembled to celebrate.' And 'the complete sense of security in which we floated 126 feet above the River Dee, and a just acknowledgement to Mr Telford, to whom it was deservedly a proud day, and who had most happily arranged the whole of our accommodation as well as constructing the wonderful edifice that supported us'. And 'A beautiful picture of the harmony with which all ranks may unite in promoting the prosperity of the British Empire and in diffusing general happiness'.

Praise was also heaped upon other pioneers including: the 3rd Duke of Bridgewater, our first National Patron of Inland Navigation; Mr Darby, who erected the first Iron Bridge; Mr Wilkinson, a late member of this company and an improver and leader of the iron trade in this kingdom; Rowland Burdon, builder of the Sunderland bridge; and the manufactory of Messrs Benyon & Bage in Shrewsbury.

But the final words of a fascinating evening that had reflected social as much as engineering history are from the *Chester Chronicle's* report of the events: 'The Canal Works between the north bank of the River Dee and the south bank of the Ceiriog, consisting of two large Aqueducts, two tunnels and a great extent of deep cutting, will gratify those who enjoy the effects of works of art, when executed on a large scale.'

December 2013: Alain Foote

The History of British Thomson-Houston, Rugby

A near record attendance of 62 members plus 10 visitors heard Alain Foote further develop the history of Rugby's engineering with a review of British Thomson-Houston or BT-H as the company is often known.

This talk well complemented Alain's presentation in January 2013 on BT-H rival English Electric (Newsletter 47), the other great electrical engineering company in Rugby.

Whereas English Electric was an assembly of companies with a common theme of electrical engineering, BT-H arose from the efforts of two American Professors. Elihu Thomson was born in Manchester but when he was 5 the family moved to Philadelphia and at the age of 23, he became Professor of Chemistry and Physics in the Central High School. Edwin J Houston was born in Virginia and after teaching at Girard College, he was elected Professor of Civil Engineering at the Central High School where he later became a Professor of Natural Philosophy.

The subject of electricity attracted both Thomson and Houston and they worked together on developing a dynamo, arc lamps and transformers. An American, named Churchill invited the Professors to join him in forming the American Electric Company in 1880.

The venture failed, but in 1883, a group of shoe manufacturers acquired the company and changed the name to the Thomson-Houston Company which merged with the Edison General Electric Company to become the General Electric Company. The Edison General Electric Company still exists today as GE.

The Compagnie Française Thomson-Houston (CFTH) was set up in 1893, in Paris, as a European sister company to General Electric. Much later, in 1928, CFTH joined with Societe Alsacienne de Construction Mecanique (S.A.C.M.) to form a common subsidiary, which took its name ALS THOM from the two companies.

Meanwhile, in 1886, the firm of Laing, Wharton & Down was formed in London to sell apparatus made by the Thomson-Houston Company. These included the Thomson-Houston system of arc lighting and high tension AC incandescent lighting. The first contract was for electric lighting in the Eastern district of the City of London.

The new company no longer acted merely as agent, as it had purchased the existing patents of the American company with the exclusive rights to manufacture and sell in Great Britain and Ireland. The British Thomson-Houston Company Ltd. was formed from the old company in May 1896. During the first year or so it had no manufacturing facilities, only a small works and store at Bankside in London. One of the orders, received in 1896, was for some alternators, coupled to Willans engines, for the City of London Electric Light Co. They were built for BT-H by Armstrongs, Mitchell & Co. of Newcastle.

After an interesting speculation surrounding the similar 'logos' of BT-H and GE (which included a tale of a twisted paper clip), Alain moved to the construction of the Rugby works of BT-H. The need for manufacturing facilities had become evident by 1899 and after careful consideration, a site in Rugby was chosen on account of it being central and having good railway connections. About 25 acres of land were purchased for £10,000. Levelling began on 11 January 1900 and manufacturing commenced on March 14 1902. The works were planned for 800 staff and consisted of 14 substantial steel and brick buildings with a total floor space of about 206,000 sq. ft. A number of archive photographs showed the scale of some shops, notably the turbine factory, foundry and machine shop.

The majority of staff moved to Rugby in October 1901. The chief difficulty with the move was the lack of housing for the workers and their families. In 1901, the town was

still lit by gas, the only electrical plant being a small one at Rugby School. At the end of 1902, BT-H supplied electricity for lighting and power in the town with two Willans engines driving BT-H generators.

The works grew substantially during WW1 (with an interesting early example of precast concrete framing) when turbines and generators for naval vessels were made and the manufacture of thermionic valves commenced. Illustrations showed the extent of the works in 1914 and 1924.

The importance BT-H attached to civic responsibility was shown in the War Memorial, designed by Lutyens and now Grade II listed, erected within the grounds to commemorate the 243 employees killed. Later the 175 who died in WW2 were added.

In 1928, some of the country's leading electrical manufacturing companies pooled their resources to create Associated Electrical Industries Ltd. Initially the American company International General Electric (IGE) had a significant shareholding through its holdings in BT-H and Metropolitan Vickers. IGE steadily reduced their holdings and by 1953, AEI was a fully British-owned company. Despite the formation of AEI, BT-H continued to operate independently, although there was some rationalisation of manufacture between the various AEI locations.

Other important developments of the inter-war years were the establishment of the Research Laboratory which grouped a number of the existing electrical development and metallurgical facilities, a new office block and a new lamp works.

At the start of WW2 a factory was built to manufacture complex electro-mechanical predictors for aiming anti-aircraft guns, but production ceased with the introduction of proximity fuses. BT-H magnetos were fitted to all the UK-built Rolls-Royce Merlin engines that powered so many fighters and bombers. By the end of WW2 BT-H was manufacturing a wide product range in Rugby: Steam and Gas Turbines, Turbo-generators and Compressors, Motor-Generators, Converters and Transformers, Electrical Control Gear, Filament and Discharge Lamps, Thyatron and Magnetron Valves and Tungsten and Molybdenum Wires. Other plants around the country added to this imposing catalogue. By 1960 AEI employed some 110,000 people in the UK, but perhaps a portent of the future was the opening of the largest turbine works in Europe at Lame, NI in 1957. Funded by the government (£8 million) it was another industrial white elephant.

The later history of AEI is well known. During the early 1960s the CEGB ordered the construction of new power stations to meet the anticipated need for electrical power. In the event, the forecasts were wildly optimistic, the plans were cut back drastically, leaving power station equipment suppliers with excess capacity. In 1967 came the amalgamation of AEI, EE and GEC. Later, GEC formed a joint venture with Alstom of France to form GEC Alstom which then joined with ABB in 1999. In 2005 Alstom sold most of the business to a management team.

Plentifully illustrated with many nostalgic photographs Alain closed with a review of BT-H products over the years. Many have been mentioned above but others of particular note include: radio and radar sets, torpedoes, the Whittle jet engine, marine propulsion gas turbines, domestic appliances, cinema projection equipment and not least a hand in developing transistors and holography.

Sadly, today many of the old buildings have gone and an aerial view of the site showed much open space planned for redevelopment. But to close on a positive note, there remains in Rugby the world's leading developer of marine electric propulsion equipment.

WARWICKSHIRE Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

Looking forward

The June 2014 meeting marks the completion of twenty five years of existence for the Warwickshire Industrial Archaeology Society. This is a cause for celebration and reflection but also one where we need to consider the directions that the society needs to travel – in, dare I say it – the next twenty five years.

This will, of course, not just be an issue for WIAS but for the subject as a whole, and the availability of enthusiastic, committed people to carry on the work, and to take the subject and the society in new directions may become quite a challenge. What will be the focus of the post-steam train generation? Has most of the important work already been completed? Will more recent industrial change be part of the subject or will there be an accepted chronological period to which our studies should be applied?

For the immediate future there is much that the Society can do. As previously announced, from the summer, the WIAS database will be available online and we shall have a real focus of trying to ensure that the information on that database is as comprehensive, up-to-date and accurate as possible. The process has already thrown up some interesting questions surrounding the definition and classification of particular sites, a reflection in part of the difficulties of defining the limits of 'industrial' archaeology. We plan to involve members of the Society in this process and a list of sites for investigation and recording will be available at the June meeting. For my own part, I have found it fascinating to return to sites in various parts of Warwickshire to check details for the database, and to witness the changes that have taken place both to sites and the surrounding environment. It has

also taken me away from some of the responsibilities of being Chairman and given me the opportunity to return to what I like doing most of all. There is nothing better than a bit of exploring, opening a few doors, climbing over the odd fence, perhaps even an occasional trespass, with camera and notebook at the ready!

Increasing the material available on our website is a second, complementary goal to the development of the database. Peter Riley works extremely hard to keep material as up-to-date as possible and he is very willing to receive information, photographs and comments that he might be able to publish. The website may be the best destination for those unique photographs that remain stored in a drawer somewhere at home, or for that unpublished article that lies in everyone's head. Far better that these items are available for others to see, read and further explore than to risk losing them. This can also be achieved via publication in the Quarterly Newsletter, so ably edited by Mike Hurn.

We shall continue with our monthly meetings as the main thrust of the work of the Society, and we will seek to provide as varied a programme as possible to serve the diverse interests of our membership. Over the past 25 years we have provided approximately 250 meetings and the responsibility for arranging these meetings has been shared by our first Chairman Toby Cave and myself. Do I hear someone say that they would like to take on the role?

Indeed, the committee is very aware of the need to engage in some 'succession planning' and there may be younger members out there who would wish to gain a taste of the inner workings of WIAS via membership of the committee. Do not be shy in stepping forward.

These are important items for the future, but I hope we may be

permitted the chance to reflect on the achievements and enjoyment of twenty five years of WIAS and this will be the focus of the June meeting.

IMPORTANT NOTICE: Change of venue and start time for June meeting

The next meeting on 12th June 'Twenty five years of WIAS' will be held in the Bridge House Theatre, Warwick School, at 7.15pm. There is parking available near to the theatre at the Western end of the Warwick School site.

As part of that evening we would like to offer the opportunity to members to recall an event, a particular site, a certain individual, a memorable meeting that epitomises WIAS for them. These need to be very short items so that several get the chance to speak, and I need to know in advance. Please contact me by e-mail on wiaschairman@aol.com or speak to me at the May meeting.

PROGRAMME

May 8 2014

Peter Perkins:

The rise and fall of the Northamptonshire boot and shoe industry.

June 12 2014

Members' Evening:

25 Years of WIAS. 1989 - 2014.

September 11 2014

AGM, AIA Cheshire Conference Report and Members' Evening.

October 9 2014

Peter Grenfell:

The Ford Foundry, Leamington Spa.

November 13 2014

Bob Booth (Chairman of the Bournville Society):

'Cadburys and Bournville'.

December 11 2014

Martin Green (Chairman WIAS):
Chairman's Lecture.

NEWSLETTER

Meeting Reports

January 2014: David Fry

Industrial Coventry in Old Postcards.

A record attendance of 80, including 8 visitors, was treated to views of Coventry that were new to most. David Fry, a sociology and psychology teacher used the medium of old postcards to review the history of the city and to trace the demise of its craft industries. Indeed, there is really no medium that allows us better to explore the changes that occurred at the end of the 19th and especially at the beginning of the 20th centuries.

How did such a range and variety of subjects become preserved as postcards? It seems that the Victorian penchant for recording the family stimulated the evolution of the local photographer, usually with a studio for portraiture but then with a growing desire to explore and record the changing world beyond.

Whilst half-plate cameras were considerably bulkier and more unwieldy than today's equipment, they enabled contact prints to be made directly onto postcards for which there was a ready market. The local photographer thus needed to find ever more niche subjects in his neighbourhood. Happily for social historians and industrial archaeologists a hundred years later there resulted a treasure trove of visual material for exploration.

Every one of David's illustrations was worthy of close examination. An unexceptional view of a street with a few figures might confirm a run of artisan's houses with top-shops above, whilst the 'end of the working day' exodus from a factory showed where Lowry may have found his inspiration to record similar scenes.

Apart from recording the world outside, the early postcard was also used for advertising. For example, Geo. Herbert Holt was the only tobacco pipe manufacturer in Warwickshire with premises in Stoke, Coventry and a postcard records his waxed moustache and bowler hat for us.

Similarly, we have the record of the working model of a silk ribbon weaving loom made by one Harry Laxon of Coventry. This image has added importance since no illustrations of domestic weaving have yet been found and so details of the machinery used are otherwise unknown.

Moving to the recording of the Coventry cityscape, David traced the collapse of the silk weaving industry in the 1860s following the removal of tariffs by the Cobden Treaty which allowed in continental imports together with the activities of the Coventry Freeholders Land Society a few years earlier. These events spelled the end of the building of 'top shops' and also limited development in Coventry.

A fascinating set of postcards, mostly dated to the early years of the 20th century, showed both the scale of the photographic activity, it seemed that no street was unworthy of being recorded, and the fortuitous capture of so much visual information of use to us today.

Not only do we have details of streets and houses long lost but there are some isolated survivors that we can recognise. Especially, we have the corner shops and pubs often with a number of people bringing the scene to life.

Of particular note is the wide variety of houses present in any given street. Detached properties are rare but built side by side are two and three storied houses, some with obvious top shops, some substantial villas, some more lowly. References to the large scale contemporary maps confirmed the haphazard development of some Coventry streets.

Evidence of a ribbon weaving factory in Cromwell

Street, Earlsdon shows that more than watch making took place in that district. Also recorded are storm-damaged houses, highlighting the poor standards of building. A view of the Foleshill Road included a building with some fancy brickwork above the top shop windows giving extra height to the workspace, presumably for larger machinery.

Pictures of the larger scale activities of the philanthropic, non-conformists J & J Cash showed how investment and organisation could create employment opportunities out of specialisation.

However, as so often over the years, Coventry's fortunes shifted and watch making came to the rescue as artisan textiles waned. This new activity was centred on Spon End where suitable building land in the triangle bounded by the Old Birmingham Turnpike Road, Craven Street and Mount Street had been made available by an Act of Parliament in 1847.

Again, the postcard records of Allesley Old Road and Craven Street give a vivid picture of the area. There were pubs a plenty and social activities as exemplified by the Lord Street FC, winners of the MDT Cup in 1900, 1902, 1906 and 1907.

The postcards also record more personal and domestic scenes such as a family group in a garden or the substantial house built by a watch master in Moor Street.

As with the consolidation of ribbon weaving by Cash so Rotheram and others developed a watch industry. Illustrations of the factory were now possible and those of production lines (all female labour) at Williamsons, and an end of the shift exodus at Rotherams, were typical.

The pace of industrialisation quickened as Coventry caught up with the factory system and David's final examples showed the great increase in scale brought by the likes of Swift Cycle, Humber and Triumph Cycle. One picture of the new Rudge Whitworth factory showed an early steel framed building.

The Daimler works proved difficult to photograph but advertising pictures of a typical week's output of Daimler motor cars and assembly shops more than compensated.

The aftermath of a fire in 1906 at the Humber Motor Works contrasted neatly with the work's fire brigade. It seems that fire and Humber were no strangers.

One illustration of the pattern making department at Coventry Engineering and Pattern in Godiva Street harked back to earlier craft days, but a succession of pictures of the Courtauld operations showed where the City was heading. Not least with the tallest chimney in England (365 feet high).

No review of Coventry would be complete without a reference to Alfred Herbert, Wickman, Coventry Gauge & Tool and the other precision engineering companies on whom so much other industry depended.

Perhaps the most impressive of Coventry's lost industries was its short-lived heavy ordnance. 15" naval gun barrels straddling a level crossing stay in the memory.

Similarly memorable were the groups of trades unionists, whether posed or parading in support of their aims such as a 1914 Railway strike or the Stoke Heath Rent Strike.

It is, therefore, thanks to a relatively small group of photographers interested in their surroundings, the buildings, the industries and the people that worked in them we can get a greater understanding of Coventry and its inhabitants a 100 years ago.

February 2014: John Brace

The Channel Tunnel Fires.

John Brace entertained another large audience with a wry but insightful review of operating procedures in the Channel Tunnel and examined the events surrounding the three major fires that have occurred in the tunnels since commercial services began in 1994.

Thankfully, there was no examination of the origins of the Anglo-French project with its huge cost overruns for construction and heroic over-estimates for traffic volumes that spelt commercial disaster for the initial investors. However, hubris can be seen in the subsequent events.

There are three parallel tunnels – two outer rail tunnels with a smaller service tunnel running between them. The service tunnel is pressurised to exclude smoke and is entered via air locks. It is narrow and has special double ended wire-guided vehicles. The service and running tunnels are connected by frequent cross passages sealed by heavy fire doors. The service tunnel is a safe haven in the event of a tunnel fire.

The freight shuttles differ from the car services in that the drivers do not remain with their vehicles but use a Club Car, usually placed immediately behind the loco. The original design for the freight wagons was enclosed, so as to contain any fire and had a self-extinguishing sump for liquids. Unfortunately, such wagons proved to be too heavy and the revised design was open-sided, un-roofed and without the sump.

Conventional rail signalling is not used in the tunnel. The driver has both a cab display and two radio links. This duplication can, and has, lead to conflicts. There are fire and smoke detectors throughout the tunnels and on board the locomotives and wagons.

There are permanently crewed and fully equipped first response teams on both sides of the channel. A pressurised fire main runs through the service tunnel to hydrants in the running tunnels. The primary role of the first response teams is to ensure a safe evacuation and appropriate first aid.

There would seem to be plentiful opportunities for Murphy's Law to apply – as the details of the three fires would show to be the case.

In the evening of 18 November 1996 a freight shuttle left France. All was normal save that both crossover doors had been left open – and they could not be closed without an engineer being in attendance. As the train moved off it was seen that one wagon was clearly on fire but the train was into the tunnel before an alarm reached the control room. However, no tunnel detectors were activated until the train was 2 Km into the tunnel followed by 3 further alarms over the next 3 minutes. It was not until 11 minutes after departure and 10 Km into the tunnel that the control centre got a full alarm.

Then followed a catalogue of failures: the rear loco power tripped, control circuits failed progressively, other services continued to run, smoke filled the tunnel preventing the driver from knowing his position to alert the control centre to open the appropriate cross passage door, the telephone circuits failed and the radio circuits deteriorated.

Fortunately, the French first response team found the right cross passage door by working backwards from in front of the stopped train and discovered that when the door was opened it produced a bubble of clear air which enabled the passengers and crew to escape into the service tunnel and to be evacuated. It was 1 ½ hours before fire fighting started

and it took a further 5 hours to extinguish the fire.

The second fire on 21 August 2006 was small and quickly dealt with but much had been learnt from the first event. Most significantly, the phenomenon of the bubble of clear air about an open cross passage door in an otherwise smoke-filled tunnel. This could be used to assist an evacuation provided that the driver could stop with the primary exit immediately opposite a cross passage door and appropriate marker boards were installed. But there are clear difficulties involved, precise positioning of the train, different configurations of locos and club cars and reading the marker in a smoke-filled tunnel to name but a few.

Other changes were made to improve the response to alarms. Notably, looking for signs of fire on departing services, loading restrictions to minimise fire risk adjacent to the club car and the provision of fire hoods for all passengers and crew.

The third fire on 11 September 2008 was potentially the nearest to a major disaster- and repeated all the previous errors. Blighted from the outset by an electrical fault on one of the vans being carried which the driver tried to rectify – he thought successfully - before having to board the club car whose primary emergency exit was 'locked'.

18 minutes into the journey simultaneous fire alarms from both train and tunnel detectors initiated a first response from the controller. On board, those in the club car could see the fire but the train did not stop, the driver's radio contact with the controller had failed. Eventually, the train manager convinced the driver to stop without the controller's permission.

Radio communication with the driver was re-established but smoke prevented him from identifying the number of the cross passage door where the train had stopped. But he could say that he was at PK49 thus allowing, after reference to track layout diagrams, the correct doors to be opened.

At the same time ventilation fans and fire pumps became unserviceable due to power failures and duplicates took hours to configure. The controller was overburdened but fortunately an off-duty controller was in the terminal and he played a vital role in managing the incident.

On board there was confusion in evacuating the club car due to the smoke and the locked door but eventually all passengers (some resourceful persons having broken a window to expedite their exit) and crew reach the safety of the service tunnel.

The power and water failures caused delays for the firefighters which were exacerbated by demarcation issues and it took 16 hours to bring the fire under control by which time all the wagons were burnt out and extensive damage had been caused. Over 700 fire and emergency personnel had been involved.

Subsequent to this near disaster a number of significant measures have been put in place to improve safety. Four 'safe stations', each 870m long and equipped with a sprinkler system, have been built under the channel where a train will stop and any fire can be extinguished. Firemen can now earth the catenary in the tunnel and they have equipment for setting up a fire curtain if necessary. Ventilation fans will be brought into use earlier and a permanent standby controller will always be on hand.

All in all, a sobering reminder that 'the best laid plans of mice and men...etc'.

March 2014: John Frearson

Jonathan Dumbleton Pinfold and the Brickmakers of Rugby.

John Frearson is not an industrial archaeologist, or so he says, but he is a most diligent researcher and historian who brings a working lifetime in the concrete and cement industries to bear on his chosen subjects. These are many, and his examination of Jonathan Dumbleton Pinfold and the Brickmakers of Rugby demonstrated his methods to the full.

Detailed examinations of census data, OS maps of all vintages, trade directories, newspapers, County records, probates and wills and contemporary photographs were all used to show the development of Rugby's brick making activities during the late 18th and 19th centuries and the role played latterly by Pinfold.

The story stemmed from a photograph by E H Speight, a Rugby photographer, of a portable (wheeled) steam engine. Just decipherable cast into the wheel hubs was the legend 'J D Pinfold – Rugby'.

Investigations into that name revealed the extent of early brickmaking in Rugby. The earliest record is 1793 and linked to the building of the Union Canal. Brickmaking was a local on-site craft for the canal and many other building projects including industrial premises, churches and domestic housing as the town developed. The earliest local directory, Pigott's *Rugby Directory* of 1828, makes no mention of brick makers, although there were builders included who were later also listed as brick makers. The 1841 Census named 15 'brick makers'.

Plotting the early brick works on a modern map unsurprisingly showed them clustered near to the canal in the area of the Dunchurch, Barby and Hillmorton Roads. Convenient for incoming fuel and outgoing finished products. Reference to the large scale 1850 OS map reveals the details of many 'Brick Yards' and Brick Kilns'. The bricks were fired in clamps and some clays were self-fuelling by virtue of the inclusions of coal and other ignitable materials.

A common theme running through these early operations was the vertical integration of contractor, builder and brickmaker. It is probably no coincidence that the Rugby, St Cross Hospital was built next to the old Barby Road brick yards.

The individual brickmakers, as shown by the census returns, moved homes as the brick works moved to the new construction sites as the town expanded.

Along the Dunchurch Road were a number of such works and by 1851 a part at least was known as Haswell's Brickfield where one Francis Dring, who was at 'Parnell's Brickyard' in 1841 was now shown at Haswell's Brick Kiln Cottage, Dunchurch Road. When the 1887 OS map was published, the brickfields in Dunchurch Road were gone and the area had become allotments.

Looking at the Hillmorton area, the Satchell family was prominent. The earliest reference is the probate inventory of Henry Satchell, Innholder of Hillmorton for materials 'in the kiln'. A descendant, William Satchell was a brickmaker in Hillmorton 'for many years before 1864' and was well known for Hillmorton Red Bricks plus many other products.

By 1894 his son, John Satchell had retired and moved to 2 Bilton Road but still had the brickworks at Hillmorton 'in his own hands'. He had served on the Rugby Urban District Council and also as a County Councillor. Satchell built himself a handsome retirement home, Bayfield, in Clifton Road using what looks to have been Satchell's Red Bricks. An interesting record was recently unearthed during renovations at Bayfield, a plank of wood inscribed '...this house was built by Mr W G Satchell, for himself, on the occasion of his retiring from business. The following is a list of the names of the men employed on the job from the

start...'. Today, the Hillmorton brick works site is an Aldi supermarket.

Similar histories can be traced for other families including Rathbone, Lucas and Banks. The last having a colourful career. A Cheshire journalist who married a Hillmorton woman possessing some family land where '...there was clay and sand beneath...'. However, poor management and an expensive lifestyle resulted in bankruptcy. In the Bilton area, the Wakefield family followed the same pattern of success and failure.

Technical developments also occurred, notably through the efforts of J Heritage on the Lawford Road with a patented process for perforated bricks that were lighter, stronger and cheaper. Mechanisation was coming into play. This led to an expansion of the trade and a confusing pattern of conveyancing of land and works for bricks and lime.

One Henry Haddon, seems to have sold up a large Lawford Road works to satisfy creditors and relocated to Malvern to prosper as an architect. His son was a successful engineer in the Indian Civil Service whose wife had a purported affair with Albert, Duke of Clarence, eldest son of the future Edward VII. After Albert's death Mrs Haddon, now divorced, claimed him as the father of her son, Clarence. The claim was dismissed but in the 1920s Clarence published a book *'My Uncle George V'* and was charged with demanding money and extortion after writing to the King. At his trial it was proved that he had been born two years before his mother's affair. Bound over for three years he breached his conditions and was jailed for a year.

Another Bilton dynasty, John Parnell & Sons, provides the link to Jonathan Dumbleton Pinfold, engineer, by selling him a parcel of land near to the Rugby and Leamington Railway, '...part whereof was lately used as a brickyard...'.
Pinfold was born in 1825 in Middleton Cheney, Oxfordshire, the son of a travelling journeyman miller. After his apprenticeship he went to London to gain experience, married and returned to Rugby as a '...Millwright and Engineer Master employing 1 man and 1 boy...'. Sadly, no photograph or portrait of Pinfold has yet been found.

However, there is no shortage of material recording his commercial success since he used agricultural shows and trade exhibitions extensively to promote his products, principally machinery. We find him first in 1862 at the Warwickshire Agricultural Show: '...Mr J D Pinfold, Rugby, exhibited Wright's patent Brick and Pipe making machine, worked by steam power. ...'. Then follows a succession of handbills, patent applications for brickmaking machinery and grist mills, company and exhibition catalogues and even a writ for patent infringement.

With much of the equipment needing independent power, self-contained steam engines were an important part of Pinfold's product range and an illustration from 1876 shows a portable steam engine identical to that used to introduce the talk.

Which brought us nearly full circle. In 1880 Pinfold floated his business as The Rugby Brick and Tile Manufacturing Company Ltd. Sadly, in 1888 a bankruptcy notice was served on him by a brickmaker in Kilburn. The creditors were paid off in full. Pinfold remarried after his first wife's death, his second wife being a daughter of the millwright to whom he had been apprenticed in Oxfordshire. He died in 1910.

Finally, a review of the development by Bromwich, Foster and Dicksee of the businesses that became The Rugby Brick Company showed the usefulness of the wealth of detail contained in the old Aerofilms Collection to examine industrial sites from earlier years.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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Lyndon Fraser Cave-Browne-Cave
Toby Cave 1923 - 2014

Toby Cave was a remarkable man – architect, teacher, author, conservationist, historian, enthusiast for the industrial heritage, as well as being a very committed family man and an inspiration to so many with whom he came into contact.

It is not my role to cover all aspects of Toby's contribution to our lives, but to concentrate on his role within the Warwickshire Industrial Archaeology Society. However, I do feel I need to mention that before he came to Warwickshire in the 1950s, he was a fire-fighter on the Liver Building in the Second World War in the face of German attacks on the Liverpool Docks, became actively involved in the post-war reconstruction of Prague, and was a founder member of a modern art gallery in Nottingham. There was always much to learn about Toby.

I cannot quite remember when I first met him, but I suspect it was in an educational context, with me as student and Toby as teacher. Our shared interest in the industrial heritage soon became apparent and from this developed the idea of forming the Warwickshire Industrial Archaeology Society.

Toby played a pivotal role in the formation of WIAS, being its first Chairman, and subsequently its first President. In the early years, he gave talks to the group, and also organised speakers for meetings, a role that he subsequently passed on to me. Even after he had relinquished the responsibility, I would still receive the occasional handwritten letter which contained details of a potential speaker, drawn from his multitude of contacts.

What was immediately apparent was that Toby's knowledge was both

wide and deep, with certainty about where everything could be checked if doubt arose. What amazed me was his capacity to find the relevant newspaper cutting, journal or book from the mass of literature that was contained – just about – within the four walls of 24 Portland Street.

I would often pick him up to take him to meetings, and the car journey was always packed with interest as Toby led the conversation on any number of issues. A casual chat en route to a WIAS meeting often produced another of those hand-written letters with details of chapter and verse where I might follow up the topic concerned.

What surprised many was that a man so dedicated to conservation, and so knowledgeable about traditional buildings, should also be so interested in those more mundane building materials of cement and concrete. His membership of a number of organisations dedicated to conservation, and his determination to save the Warwickshire that he knew and loved, (together with his published works on Warwickshire Villages, Smaller Country Houses and two volumes on Leamington Spa), must also be placed alongside his work, for example, on the Model Village associated with Southam Cement Works, and his continuing research into the brickmakers of Warwickshire.

When he moved to Sherborne because of ill-health the flow of information – and newspaper cuttings – did not cease and it is remarkable that he was still working so effectively beyond his 90th birthday. We have lost a remarkable man, and the Committee are actively considering how best to create a lasting memorial to honour his contribution to the Warwickshire Industrial Archaeology Society.

WIAS Secretary: Dennis Crips

Our long-serving secretary Dennis Crips has decided to relinquish this post after many years of dedicated service. Dennis has executed this role with great efficiency, and the carefully prepared minutes of all our committee meetings are testimony to this. He has also been much involved in projects such as creating a constitution for the society and in the development of the database project. In addition, he contributed much to debates within committee

and would remind us all of the need to look at the role of the Society within a broader context.

On behalf of the committee and the Society as a whole, I would like to pass on sincere thanks to Dennis for all his hard work as Secretary of WIAS, and we all look forward to seeing him and his wife Maureen at future meetings, together with some lively contributions from the floor at question time.

We do not have a new secretary in place as yet, and if anyone would be interested in taking on this role, please contact myself or Dennis. The one aspect of the post that we really need to cover is the notification and recording of minutes of committee meetings (four per annum), and if you feel this could be for you, do not be shy in stepping forward!

Martin Green

PROGRAMME

September 11 2014

AGM, AIA Cheshire Conference Report and Members' Evening.

October 9 2014

Peter Grenfell:

The Ford Foundry, Leamington Spa.

November 13 2014

Bob Booth (Chairman of the Bournville Society):

'Cadburys and Bournville'.

December 11 2014

Martin Green:

Nooks & Crannies of Warwickshire's Industrial Heritage.

January 8 2015

Richard Thomasson:

The BAE 146: the last UK-designed civil aircraft.

February 12 2015

Christiaan van Schaardenburgh:

Coventry Shadow Factories.

March 12 2015

Jeff Burgess:

Leamington's Water Supply.

April 9 2015

Jim Andrew:

Housing the Great Exhibition - The Crystal Palace of 1851.

May 14 2015

Sue Tungate:

Matthew Boulton and the Soho Mint:

Copper to Customer.

June 11 2015

Members' Evening:

Industrial Archaeology and Agriculture - Strange Bedfellows?

NEWSLETTER

Meeting Reports

April 2014: Malcolm Nixon

A New Light on an Old Industry: The Industrial Archaeology of the Worcestershire Potter.

Dr Malcolm Nixon recently retired from a long career in Conservation Architecture specialising in buildings preservation. He has had a lifelong interest in the pottery industry, surveying his first bottle kiln in 1966. Since his retirement he has been working with the Royal Worcester Museum. He has his roots in Warwickshire, which did have a pottery industry centred on Nuneaton, but this was his first talk in the County. His presentation used many old maps and photographs plus narrative detail from archives and old minute books to create a vivid impression of life in former times.

According to Malcolm, historians' views of the pottery industry as a whole are changing and perhaps some of this attitude can be read over into other industries with whose origins we are more familiar.

The Napoleonic Wars and general state of flux in Europe during the late 18th and early 19th centuries had made the traditional 'Grand Tour' impossible. Consequently, attention was turned to the delights and wonders to be found nearer to home as the 'New Pandemonium' ushered in the industrial revolution.

Wealthy patrons scrambled around the Blue John caverns in the Derbyshire Peaks and explored the wild countryside but of greater importance to the burgeoning manufacturing class was their interest in furnaces and factories. This interest was well exploited, and notably so, by Matthew Boulton and his friend Josiah Wedgwood both of whom lavishly entertained potential customers at Etruria and Soho whilst fearing possible industrial espionage. Other potteries were popular destinations, especially those in Worcester with its links to Staffordshire. Michael Faraday of electricity fame was one celebrity visitor to Worcester.

An especially useful find for historians has been a 'Guide Book' *The Process of Making China* with twelve plates illustrating much of the production methods used. Visitors were above all interested in how things were made and examples of new technology were greatly sought after. No wonder Wedgwood had concerns for his intellectual property. Another prime source of information has been rediscovered minute books and other paperwork. These have much extended knowledge of the early operations in factories that no longer exist. For example, we know that one James Hadleigh broke away and founded the Shrub Hill China Works but there is nothing else known about the business.

Similarly, Bellevue Potteries on Mucklow Hill is unknown apart from the name and location. Clearly there is evidence of a vibrant pottery industry in and around Worcester of which nothing is now known. And not only in Worcester. In the 1770s a cream ware factory to rival Wedgwood's Etruria was built in Kidderminster but it failed and is now shrouded in mystery.

Turning to techniques, what can be deduced from the available evidence? An underlying fact is the antipathy to progress shown by many pottery owners; for example, the failure to introduce machinery for plate making. An invaluable source of information is a report from 1850 in *The Penny Magazine* following a visit to Worcester. There are excellent illustrated descriptions that show little change in techniques in over a century; child labour still powered the potter's wheel in a deeply conservative industry.

Working conditions continued to be terrible and those employed had a built-in ability to die early. An examination of the now available minute books shows much evidence of illness but also that little or no action was taken to ameliorate conditions. All categories of workers were affected by pneumoconiosis, paint poisoning and other

preventable incidents. Josiah Wedgwood might be regarded as our greatest potter but his reputed remark 'I want to make machines of men' shows some lack of humanity, or perhaps, simply reflects the attitudes of the age.

Another example of the management style was that of Chamberlain & Sons who also owned a pub and exerted a measure of wage control by paying the men's wages in the bar, thus ensuring some immediate recirculation! It may be possible to do some excavation work on this site in the next few years.

Chamberlain's archive also provides an example of the draconian 'rules & regulations' imposed on workers with fines for the most minor offences such as whistling. Sometimes this fund was put to good use; Royal Worcester used it to take apprentices to the Great Exhibition and for excursions to Llandudno. However, the myth of the caring, compassionate employer seems to be just that.

Looking at the surviving examples of architecture in Worcester it seems that the City followed the prevailing fashion. There are problems with excavating in many places and this, coupled with the changing uses of land and buildings over time, causes some confusion. However, the employment of the same architects in both Stafford and Worcester makes for similar buildings. An old 'Aerofilm' photograph of the Royal Worcester works during a 'potters fortnight' holiday gives an unusually pollution-free picture of the site.

An examination of the people working in the potteries provided many insights into contemporary life. Squalor was commonplace and one pithy comment was 'you could guarantee a beetle race as soon as it got dark'.

As today, many women were employed as 'paintresses'. Arnold Bennett's description of those in Stoke as 'loud-tongued and aggressive' may be equally true in Worcester as there was frequent migration of workers between the two cities. However, whilst painters often suffered from lead, arsenic and cadmium poisoning, they also benefitted from training at the Worcester or Stoke Art Colleges that then led to employment.

Worcester was also a centre for glove-making and plotting 'glovers' and 'potters' from census data onto old town maps produces clear enclaves for each trade. An interesting case history was that of one woman shown in the minute books of Royal Worcester as having been employed for 65 years and receiving support as a widow but in a census she was shown as a glover! Was she moonlighting at two jobs or was there a census error?

Finally, archaeology has produced evidence for technological advances. Discoveries of over-fired wasters and shoddy buildings as well as pioneering attempts at underglaze transfer printing and encaustic tiles are but a few examples. Also unearthed has been a 'seven-fire-mouth' biscuit oven, one of the few so far excavated. The use of a cheese-cutter wire and a large lorry to bring down a bottle oven was an interesting aside.

The clean air acts have greatly affected both Stoke and Worcester and today it is difficult to imagine what life in those communities was really like. Or for the rest of Worcester because the works were predominantly located to the South West of the city whence come the prevailing winds!

The social history of the two pottery communities 70 miles apart needs much more research, and could be a very rewarding subject. There is a common denominator in the people, but what did they really do to exploit their resources of coal, clay and bloody-mindedness? Not forgetting the funding that came up the Severn from Bristol.

May 2014: Peter Perkins

The Rise and Fall of the Northamptonshire Boot and Shoe Industry.

For forty years Peter Perkins worked for SATRA, The Shoe and Allied Trades Research Association and has been both Secretary and Chairman of the Northamptonshire Industrial Archaeology Group. Who better then to tell the story of 'The Land of the Shoemakers' as the 1878 *Murray's Handbook for Travellers* describes Northampton with its streets haunted by leather aprons and grimy faces.

Before the 16th century, the woollen industry was the source of wealth in Northamptonshire, but as weaving declined, the boot & shoe and leather trades emerged and it is with these that the prosperity of the county would forever after be linked.

As in many other parts of Britain, shoemaking was a cottage industry; but there were factors that increased its importance in Northamptonshire. The pastoral economy provided hides or skins and the oak woodlands provided the bark for tanning them. There was also a good supply of water for washing the hides. Additionally, its central location was important.

By the time of the Civil War the boot & shoe industry in the county was sufficiently organised that groups of makers could compete for orders from the army. An order was obtained in 1642 by Thomas Pendleton of Northampton (fulfilled by 13 shoemakers) for 4,000 pairs of shoes & 600 pairs of boots for the army bound for Ireland.

Large orders could only be met by good organisation and in this respect, the wholesale manufacturer was pivotal. He would have had a small warehouse, where uppers, soles and other components were cut and sent to outworkers for making into shoes and return to the warehouse for payment. Until around 1850 all boot and shoemaking was entirely manual, but within a decade, machinery started to influence the industry.

The principles of shoemaking were explained with a wealth of illustrations and the progression from the early 'turnshoe' system (a leather upper stitched in the form of a bag, turned inside out and attached to a sole) to the lasted, hand welted process became clear. In the latter, the upper is stretched over a wood or metal former (the last) and attached to an innersole. The outsole is then attached to the upper with the aid of a leather welt. This method forms the basis of modern welted footwear.

We learnt a new vocabulary of 'clicking', cutting the upper leather or sole around a brass bound pattern; 'closing', stitching together the upper leather pieces; 'lasting', stretching the upper leather over the former or last and fixing it to the insole and finally stitching a leather welt to the lasted upper and the insole before attaching the sole by stitching it to the welt. The welt simply allows the sole to be stitched on without stitching inside the shoe which would be quite difficult. Finishing covers a range of operations including scouring and inking the sole edge, buffing, lacing and cleaning. Some shoemakers used a cheaper riveted construction. The shoe is lasted as before but the sole is attached using rivets - simply nails or tacks - being hammered in and clenched over on the metal last. Later as machinery began to be introduced, simpler machine-stitched methods of attaching the sole were introduced.

Turning to machinery, shoemaking in Britain had the reputation as a trade to which machinery could never apply. Due to variability in leather it was thought impossible to perfect suitable machines. Nevertheless, there had been

some attempts at development of machinery during the Napoleonic wars, when Marc Brunel filed a patent for a machine to fasten soles to uppers by means of driving nails. The machine was apparently used for mass production of army boots; but after the wars it was forgotten.

In the 1850s shoe machinery developments, especially sewing machines, started to appear in America. However there was resistance to its introduction in England and a series of strikes caused resentment and some highly skilled workers moved to other parts of country.

How did these machinery developments influence the shoe industry in Northamptonshire? Whilst some outworking continued, large factories were built to house the new mechanised production, typically three storeys and a basement. In the basement was leather storage and heavy presses for cutting soles; on the ground floor was lasting, making (sole and heel attaching) and riveting; on the first floor was finishing and the outworkers' waiting room and on the second floor, often with roof lighting, was clicking and closing. Power came from steam or oil engines, with all the attendant fire risks.

Fortunately, a large number of these buildings remain, or have been recorded, and plenty of examples were shown, together with a nostalgic roster of manufacturers. Not only the exteriors but many examples of working practices were also shown.

As might be expected, there is a long list of allied industries: tanning, insoles, stiffeners, lasts, tacks and cardboard boxes to name but a few.

The growing fashion for sports and leisure meant people turned against welted leather footwear in favour of leisure designs. Such shoes had more complex constructions with subsequently higher costs which drove production to low labour cost countries such as Portugal and especially China. Despite attempts in the UK to automate design and production the competition from imports continued and no amount of technology could stop the decline of the UK industry.

Paradoxically, the failure to use new technology and new machinery has turned to Northamptonshire's advantage. Men's welted footwear is difficult to produce and people are prepared to pay a premium for it. So today exports are increasing! Church's Shoes announced earlier this year they are taking over a former tram and bus depot to give additional production capacity. So, in contrast to some other industries there does seem to be a future for traditional footwear manufacture in Northamptonshire using machinery and techniques that the Victorian shoemakers would recognise.

Finally, to the issues of heritage and conservation. An English Heritage survey identified over 450 buildings associated with shoe trade (excluding garden workshops). Some are still in industrial use and internally remain relatively unchanged. Many of the 3-storey factories have been converted into apartments, where radical change has taken place internally. In 2011 a conservation area was created north and east of the town centre called the boot & shoe quarter. It contains over 100 former shoe factories and 3 or 4 are still in operation. The aim is to conserve the Victorian streetscape and try to preserve the factory buildings whilst ensuring their ongoing use. Northampton Museum is known worldwide for its enormous collection of shoes - not just Northamptonshire and machinery and a new, expanded museum is to be built.

June 2014: Members' Evening

25 Years of WIAS. 1989 - 2014.

A perfect June evening and the excellent facilities of the Bridge House Theatre provided the best possible setting for members, wives and friends to celebrate the first 25 years of WIAS.

Welcoming drinks and canapés, plus a magnificent Anniversary 'Gas Works' Cake by Jan Coulls served in the interval, were enjoyed by everyone.

After moving into the theatre Martin Green opened the proceedings with a moving tribute to the late Toby Cave and his contribution to the success of WIAS since its inception.

Peter Coulls then reviewed the Industrial Heritage of Warwick which was liberally illustrated by pictures from the collection of Derek Billings. Thanks to such pictures we can see the wide variety of local manufacturers and their products, often in settings that remain in existence today. Vehicles of many types and applications jostled with buildings, canals and railways. Warwick has been much more than a quiet Market Town in the Midlands.

Peter, together with Alain Foote and John Willock has been spending many hours in the County Record Office helping in the huge task of organising the archive of Rugby-based Willans & Robinson, a leading steam engine builder at the turn of the twentieth century (see Newsletter No. 38 on the website for more details), that had been handed over to the Record Office. This significant archive, consisting of photographs, glass plate negatives, engine index books, drawings, commercial documents, Board minutes, company publications and much more - invaluable primary sources for historians and industrial archaeologists alike - is now being preserved.

To further help this work WIAS has made a donation to The Record Office of £250 and a cheque was handed over to Sam Collenette, the Archive and Historic Environment Manager. She briefly described the work of the 80 year old Record Office and especially the full scope of the W & R Archive. There are 90,000 negatives, many of which are glass. John and Peter have so far catalogued 17,000 of them and Alan and John have also catalogued 1,000 plans. A part-time conservator has also been employed thanks to grants and a contribution from the I.Mech.E.

Martin Green then reviewed the Society's activities, especially in relation to museums, world heritage sites and other organisations such as English Heritage. In particular he considered the place of Industrial Archaeology within the study of economic and social history. As would be expected from someone with his academic background, and his commitment to the preservation of our industrial heritage, his views were both pertinent and timely.

Martin was followed by the personal recollections of three longstanding members.

Roger Cragg reminded us of the remarkable structure of the Marton Bridge close to Leamington. When built this was the longest wrought iron truss bridge in the world. However, its designers soon developed doubts as to its load carrying capability and gave it a supporting structure that

remains to this day.

John Selby, another founder member recalled a walk with Peter Chater on the Oxford canal near to the abandoned Fenny Compton brick kiln. This visit inspired a sustained piece of research into the brickworks and a resultant paper. Amongst John's illustrations was one of contractors at work on the site in 1837.

Peter Chater, also a founder member, has the unique distinction of never having missed a meeting save the one when the Leam broke its banks totally disrupting traffic. Peter has organised many summer walks, notably, along the local canals and produced accompanying leaflets. He gave us some reminiscences of his lifetime's work on the railways.

Roger Cragg made a presentation on behalf of the Society to Martin and Judy Green in recognition of the immense contribution that Martin has made over 25 years as founder, secretary, programme organiser and chairman and the support that Judy has provided. The Society is much indebted to them.

After a break Martin looked at the future of the Society. Of particular importance, both because it will provide information to visitors to the area and be a record of Warwickshire's industrial heritage as it exists today, is the development of our database.

Martin illustrated this with 25 examples representing the 25 years of the Society and covering the County from the Mancetter Quarry to Wellesbourne water mill via Coventry top shops. The Nelson Club at Stockton to Chesterton windmill. Bridges at Compton Verney, Walton Hall and Hampton Lucy. Hatton locks to Stratford's canal basin and warehouses. Cash's, Courtaulds, Toye Kenning & Spencer and Atherstone Hats. Alcester needle making and de Normanville's roof for Leamington's swimming pool.

Warwickshire has a rich industrial heritage. Much no longer exists but much remains to be recorded. It is to be hoped the WIAS through its members will be instrumental in that regard.



Presenting the Society's cheque to support the work of the Warwick County Record Office.

From l to r: Martin Green, Alain Foote, Peter Coulls, Sam Collenette and John Willock.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

Setting the limits

With the Society successfully launching the WIAS database during 2014, it is perhaps an occasion to examine some of the challenges of that task and to give some direction to the next stage. Acting as a contributor has been a very interesting experience, and, on more than one occasion, has really tested the interpretation of the nature and limits of industrial archaeology.

This is not another navel-gazing session about 'what is industrial archaeology?', but some practical thoughts on whether certain sites should or should not be included. The fundamental basis of the survey of sites was to focus on what actually remains today, and there has never been a more effective way of reminding oneself of what has disappeared!

This is most evident in the disappearance of huge chunks of industrial heritage of some of the industries of Coventry. So often, in the place of these once proud manufacturing sites we discover the occasional plaque or isolated building, with the majority given over to housing or retail-park. Interestingly, one of the lasting features is often the company Sports and Social Club building, and the sports field associated with them, albeit a shadow of their former glory. Interesting features, but are they industrial archaeology?

The industrial archaeology of the motor industry is difficult to record, but there are even more issues to discuss over the impact of the motor car upon our landscape, and whether these merit inclusion. Ring roads, car parks, motorway service stations and the country garage are familiar ingredients to us all, but are they industrial archaeology?

At one stage Coventry had the highest proportion of its workforce engaged in manufacturing of any city in the UK, but the service sector now dominates. Retailing is one of those service industries and, despite the decline of high street

shopping, many fine examples of historic buildings devoted to retail still exist in the county, often with architectural merit. Several interesting buildings of the Nuneaton Co-operative Society remain in the Nuneaton and Bedworth area, but are they industrial archaeology?

There are also buildings with important structural features that merit investigation by the industrial archaeologist. Alpha House in Coventry, a residential tower block, built in 1962, was one of the first examples of 'jackblock' construction in the UK, with each floor constructed at ground level and then jacked up to the full storey height. It is one of the last remaining examples of such a system in the UK. An interesting building, but is it industrial archaeology?

Architectural merit plus the use of particular (often local) constructional materials represents a powerful case for inclusion. Examples are to be found throughout the county. The Old Bank in Stratford upon Avon is a fine example of Victorian Gothic architecture, built in 1883 for the Birmingham Banking Co to the design of Harris, Martin and Harris of Birmingham. With the town's Shakespearian connections, the bank commissioned a fine Byzantine-style mosaic of Shakespeare over the main entrance, and the set of 15 terracotta panels at first-floor level depicting scenes from Shakespeare's plays. The sculptor was Samuel Barfield of Leicester. An interesting building, but is it industrial archaeology?

The Temperance Hotel and Coffee Tavern in Warwick provides an even stronger case for inclusion. It is a fine red brick building built in 1880, with terracotta panels depicting flowers in the Arts and Crafts style, together with COFFEE TAVERN lettering. It was commissioned by Dale of George Nelson, Dale & Co, gelatine manufacturers of Warwick. The architect was Frederick H Moore of Warwick, who also designed the Nelson Club for the company. Is this industrial

connection firm enough to merit the Coffee Tavern's inclusion?

A similar case might be made for the residences of Warwickshire's industrialists. Success in business was often marked by the purchase – or the building – of a house of substance to reflect that success. George Singer's Coundon Court in Coventry might be a case in point – but is the industrial link too tenuous? This, of course, is very different from the situation where a company might provide housing for its workers. The inclusion of housing by Kaye & Co., cement manufacturers, at the Model Village, Southam certainly does merit a listing on the database.

Decisions on these - and other examples – must rest with the database committee. Given the paucity of sites remaining in many industries, the argument for inclusion can be strong. In these circumstances, any contribution will be positively assessed by the committee, and, where possible, will enter the database. As always - if in doubt - please present the site.

PROGRAMME

December 11 2014

Jeff Burgess:
Leamington's Water Supply.

January 8 2015

Richard Thomasson:
The BAE 146: the last UK-designed civil aircraft.

February 12 2015

Christiaan van Schaardenburgh:
Coventry Shadow Factories.

March 12 2015

Martin Green:
Nooks & Crannies of Warwickshire's Industrial Heritage.

April 9 2015

Jim Andrew:
Housing the Great Exhibition - The Crystal Palace of 1851.

May 14 2015

Sue Tungate:
Matthew Boulton and the Soho Mint: Copper to Customer.

June 11 2015

Members' Evening:
Industrial Archaeology and Agriculture - Strange Bedfellows?

NEWSLETTER

Meeting Reports

September 2014

AGM, AIA Cheshire Conference Report and Members' Evening

In the absence of Martin Green, Peter Coulls chaired the AGM of the Society and gave Martin's report for 2013/14, the 25th anniversary year.

In a year marked by the death of Toby Cave, whose memory will be honoured on a permanent basis, much had been accomplished. Well attended monthly meetings with a wide variety of speakers, the establishment of a database of IA sites in Warwickshire, a comprehensive and well used web-site and plenty of opportunities to develop further are at the heart of the Society.

The treasurer, Victor Lobb, presented a strong financial position with good stewardship arrangements in place. He also outlined the position, following the Society being recognised by HMRC as having Charitable Status, for members to use Gift Aid which would increase the value of their subscriptions to the Society.

A number of topics were discussed, including donations to save the Wedgwood Collection (members to act individually), the use of 'social media' to enhance the appeal of the Society and the possible change of the Society's logo in view of the redevelopment of the old gas works site.

After the formal meeting four members made presentations that again demonstrated the breadth of interests and expertise that are within WIAS.

Brian Redknapp, formerly Senior Engineer in the Coventry City Engineering Department and the first engineer to tackle the city's inner ring road design, celebrated its 40th anniversary with an old promotional video that showed its origins and especially featured Peter Galliford. His eponymous construction company, then a small local business and minute compared to the national contractors, won an increasing number of tenders on the project and was set on its course to become the great concern it is today.

Brian defended the decision to use grade separation rather than roundabouts as brave, and a daunting risk at the time, which had been justified by the low accident rate that has ensued. He also explained that the present work around the access to Coventry Station had been anticipated long ago; the inexorable rise in traffic volumes would require changes to the road layout and at the same time the unpopular pedestrian subways leading to the city centre will be replaced by a more user-friendly bridge.

Chris Barney, hot-foot from the AIA Conference in Chester, gave a whistle stop tour of a selection of the industrial sites laid on for the delegates to visit. Starting, appropriately, at the mainline station and the hotel (for first class passengers, others down the street) still advertising its coaching inn heritage and thence to the Steam Mill (powered by the 8th engine from Boulton & Watt) alongside the Shropshire Union Canal which then flowed 50 feet below the Roman Walls to Taylor's Dockyard still maintaining narrow boats.

Further afield, North Cheshire has major chemical process plants and many notable bridges and viaducts. Site work has begun on a new £600 million Mersey Gateway Project to connect Widness and Runcorn. Fiddlers Ferry power station was visited, it consumes 800 tons of coal an hour at full output with supplies now coming from Russia, Indonesia and several other non UK sources. The rebuilt Anderton Boat Lift linking the River Weaver and the Trent and Mersey Canal has substituted 70 foot hydraulic rams

at £1million each for the original cable and counterweight system to raise and lower the caissons.

Older industries were represented by copper mining on the Derbyshire border and silk mills in Macclesfield. Paradise Mill was closed in 1981 but its hand operated jacquard looms have been preserved and the Mill plus nearby Museum are recommended for a visit. Finally, Cheshire's very active salt industry's origins were explored via Murgatroyd's Brine Pump and the Lion Salt Works (the last traditional producer, closed in 1986) with its planned visitor centre.

Martin Woolston, resplendent in a Rolls-Royce Heritage Trust uniform, outlined the work of the team of volunteers at Anstey in restoring the engines and ancillary equipment belonging to the Trust. Other teams undertake similar work at Derby and elsewhere to ensure that the rich engineering heritage of Rolls-Royce and others is not lost for future generations.

His current project is the restoration of a Rotax starter motor used on aircraft gas turbines such as the Armstrong Siddeley Mamba and Sapphire. This motor used a cordite explosive charge to drive a small turbine which in turn span the main engine up to a speed that allowed the compressor to operate and the engine to fire up.

Early jet engines had a propensity to flame out and, possibly to allow a restart in flight, this particular starter had two chambers for explosive charges. Alternatively, perhaps both were needed for the initial start-up. This dilemma illustrates the difficulties faced by the restorers in the absence of drawings, manuals or other information for the equipment. Clearly, from the component parts on display, this starter motor was a complex piece of engineering and when finished will add to our knowledge of the early days of the jet engine.

Finally, John Barclay gave a glimpse of wartime Lancaster bomber production in Warwickshire with 'the Shirley Secret' that lay behind Ernö Goldfinger's 1955 headquarters building for Carrs Paper Works.

Using a wealth of contemporary photographs we first explored the work being undertaken 10 miles away at the Longbridge shadow factory. Here largely female labour was producing various sub-assemblies for the bomber; front turrets, bomb-aimer positions, cockpits and fuselage centre sections. Conspicuously absent were any rear fuselage assemblies.

These were being produced at Carrs Paper Works in Shirley. A unique collection of photographs taken from a one-off retirement presentation album showed, (again mainly women) producing the rear fuselage complete with rear and mid-upper turrets. The completed sub-assemblies were transported by road to Elmdon for final assembly and testing before delivery to squadrons.

Much recent attention has been given to the visit to the UK of the Canadian Lancaster which has been flying in company with that of the Battle of Britain Memorial Flight. The Lincolnshire Aviation Heritage Centre at East Kirkby has a third surviving Lancaster that has running engines and does taxi runs (air has been seen under the tail wheel on occasions). There is the mouth-watering prospect of this ex-French Air Force machine becoming airworthy and a trio of Lancasters in the air.

There are poor records and details of many of the wartime shadow factories but our knowledge should be increased at the February 2015 meeting when Coventry's shadow factories will feature.

Members' Contributions

Peter Chater:

Hatton Bank and Bank Engine. Memories of the 1940s



Hatton Bank is situated between Warwick and Hatton on the former GWR main line. The distance between the two stations is four miles. Over this distance the track rises about 140 feet. A lot of this gradient is at one in one hundred.

With banking assistance from Warwick, freight or mineral trains can be loaded about one half heavier all the way from London to Birmingham.

The 61xx locomotive shown above would be similar to the engines that were used as the Warwick bank engine.

The engines mostly used were the 41xxs, 51xxs and 81xxs of 2 6 2 wheel formation with driving wheels of 5' 8" diameter.

These engines were built for mixed traffic purposes and quite suitable for this work. They were classified D. They carried 1900 gallons of water and about three and half tons of coal.

Normally the engine was available 24 hours a day. It was brought off Leamington Loco Shed at 5.45 am. and returned at noon for coal and the relief of enginemen. Returning again at 9.00 pm. for same purpose. It was returned to its shed when the fresh loco arrived at Warwick.

At Warwick a water column and ash pit were located at the Bay platform for servicing purposes.

Method of working

A train would run through Warwick station and the driver would stop clear of the Down Bay points.

The signalman would set the road for the bank engine to buffer up to the rear of the standing train. It was not coupled up.

The guard would hand the bank engine driver the tally of his train and then return to his van. The bank engine driver would whistle up two crows and one (a crow is one long, then three short and one long whistle). This could be heard all over Warwick. The train driver on hearing this would reply in the same manner and both engines would start off together.

The bank engine driver would look out for signals. If the train was going towards Birmingham the banker would propel it through to Hatton North Signal Box. If towards Stratford on Avon, it would be stopped at the South Box.

The banker was returned to Warwick to do the same again.

Members' Contributions

John Willock:

Willans & Robinson at War; An Update on the Archive in the County Record Office.



As Alain Foote, Peter Coulls and I have started to delve more deeply into the Willans and Robinson (W&R) archive we have become aware of the diversity of its products, particularly during the First World War. Military contracts show widely differing requirements for war *matériel*, from shrapnel shells to aero engines, tank tracks to submarine conning towers.

Of particular interest were instructions for W&R to machine cast iron cylinder liners and cylinder heads for the French designed 80 and 110 hp Le Rhône rotary aero-engines used in many allied aircraft, especially fighters and scouts, including the renowned Sopwith Pup and Camel, Nieuport 11 and Avro 504K. W.H. Allen & Co of Bedford was the British licensee for Le Rhône and it is possible that W&R supplied finished parts to them directly. The Rhône was noted for its particularly smooth running qualities, due mainly to its unusual use of slipper-ended connecting rods and thrust blocks, retained in a series of concentric annular tracks. This obviated imbalance arising from piston acceleration that occurred between cylinders when conventional master and articulated rod type assemblies were used, as was the case in all other types of rotary aero-engines.

Other contracts relate to the complete manufacture by W&R of the French /Swiss Salmson (Canton-Unne System) radial; as well as the supply of components and special tools.

W&R had considerable experience in the manufacture of the water-cooled Salmson under licence from the British agents, Dudbridge Iron Works of Stroud. In fact W&R was the primary producer in this country, holding the sole British Empire manufacturing rights for this rather complicated engine. The ability to machine precision components for the Salmson engine undoubtedly helped with the Rhône contracts. Unlike the Rhône, the Salmson was not a premier power plant, being far too cumbersome with its cooling radiators, for lighter aircraft use. It, nevertheless, powered at least fourteen different types of production and prototype allied aircraft. Only one example of a Salmson engine exists in the UK, a W&R manufactured Model M9, exhibited in the Science Museum.

We have also examined a large number of wartime orders from the Admiralty, for the supply of winch engines, parts and castings, including the provision of the necessary jigs, fixtures and tools for their manufacture. These particular contracts, occasionally marked "Urgent", were split between a number of companies, including Napier, Belliss and Morcom, Mirrlees Watson & Co and Armstrong Whitworth. Initially, it was thought that the winch engines were required for ship-borne use, possibly for minesweeping. However, a number of them seem to have been selected for truck mounting, posing something of a puzzle. Although uncertain, it is

possible that the truck-mounted winch engines were for use with observation balloons, possibly on the Western Front. We have been unable to locate any drawings and specifications for these engines and associated winches. Until more evidence becomes available we cannot be sure of their exact form and intended use.

Observation balloons were used by both sides in the conflict and were vital in the artillery battles, spotting and reporting the fall of shot, as well as providing general battlefield intelligence. Filled with hydrogen, observation balloons were prime targets and highly vulnerable to attack from marauding aircraft using incendiary ammunition.

If threatened it was necessary to winch the balloon down very quickly. This could be accomplished in minute or so. Even so, the average life expectancy of a balloon on the Western Front in 1918 was only about two weeks. All too frequently they were shot down in flames, with the observer having to resort to his fairly unreliable parachute to descend to earth! Thus the high speed winch and its associated engine was a vital piece of war equipment.

W&R were also requested, via the Ministry of Munitions, Department of Mechanical Warfare, to manufacture large quantities of what are called "Tractor Links" in the contracts. Although not actually specified as such, these almost certainly refer to caterpillar track links for the revolutionary new weapon, the tank. The contracts involved the production of thousands of link stampings, their associated ferrules and the assembly of same.

In 1915 Harry Ricardo formed "Engine Patents Ltd" and was requested by the Royal Naval Air Service to appraise and modify the Daimler sleeve valve engine, then being used in the first British tanks. The original engines were

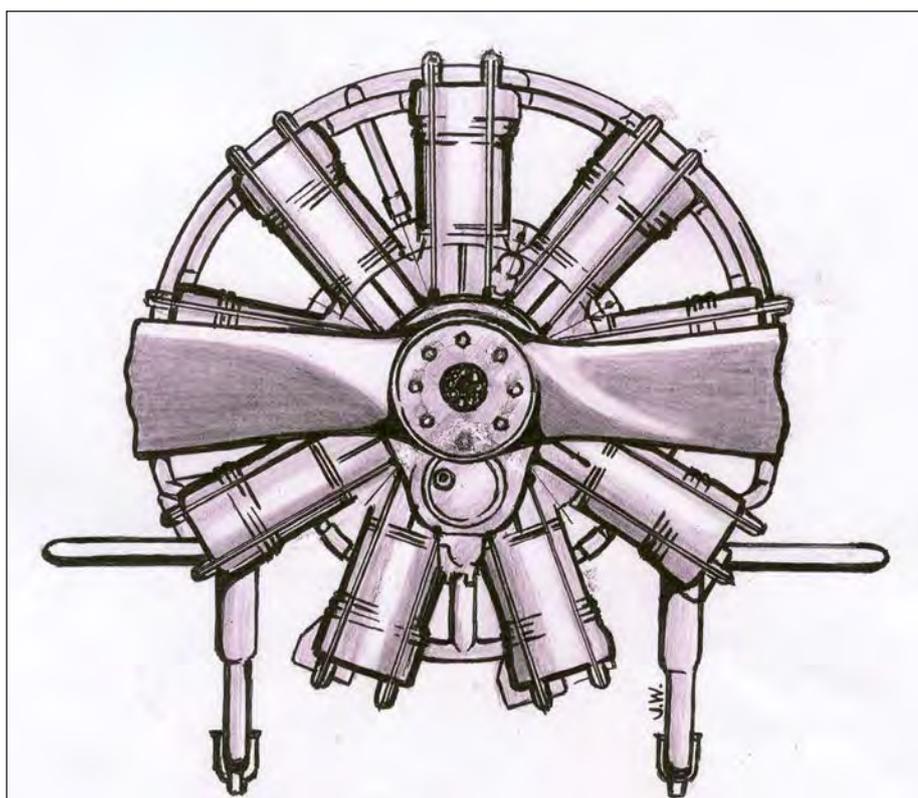
unreliable, underpowered and emitted large quantities of oily exhaust smoke, a good target marker. To overcome some of these limitations, Ricardo designed a totally new 150 hp engine which resulted in large orders for which W&R supplied patterns and castings.

A contract dating from 1917 yielded information on a stationary diesel engine supplied to the Agua Santa Nitrate Railway Company in Chile to supplement its power requirements for the mining and processing of nitrates. As nitrates are a constituent part of explosives, it can be reasonably surmised that the British military was interested in increasing the output of this vital war material from its South American source. Further research is required into this interesting piece of military history.

The company was also involved with the production of submarine conning towers, code named "Lighthouses". Other naval orders included boiler ash eppers, the erection of two sets of marine turbines with reduction gear for a destroyer being built in 1918 by Hawthorne Leslie & Co, Newcastle-upon-Tyne, and several diesel engines for the submarines service. Diesel engines for the Admiralty seem to have been ordered under the coded pseudonyms of "Oilers" and "Bearers" in order to disguise their intended purpose!

All the above examples illustrate the manufacturing expertise of Willans and Robinson on a complex and disparate range of military products during WW1. Quite an interesting departure from their rather better known line of Central Valve Engines, Steam Turbines and Condensers!

The writer would like to thank the Warwickshire County Record Office for their co-operation in the preparation of this article.



Members' Contributions

Alwyn Sparrow:

The Cape Road Goods Yard, Warwick.

Originally opened in 1892, it's now over fifty years since this site closed, with the petroleum depot lasting only a few more years. Very little remains.

I remember this yard in its latter days as a busy place, located off Cape Road adjacent to the road bridge. Apart from general freight, the main goods were domestic coke, coal & bulk petroleum. Parcel traffic was dealt with from the Leamington Goods yard.

The Regent Oil company had a depot within the yard serving road tankers. Warwick Gas Works was also accessed through the yard to their own siding on the other side of Cape road.

The yard access was controlled by a four lever ground frame housed in a small cabin which was electrically released from Warwick Station signal box.

I also remember the three wheel Scammell Mechanical Horse lorry working out of the yard with deliveries. There was a fixed crane for unloading the rail wagons which was listed as having a six ton lifting capacity.

The main activity I recall was the coal merchants who frequented the yard each working day. Arthur Hunt and Vic Dillow were a couple of well known merchants. They often had their own private wagons.

The Wagon Repairs Limited hanging wall map came from Arthur Hunt so he may well have owned his rail vehicles at some time.

I possess the weighbridge ticket book for the period 9th September 1940 to 4th October 1940, during which time two hundred tickets were issued for loads of coke & coal. Interestingly, some of which were destined for Budbrooke Barracks.

The site today & surviving artefacts

The yard today is an industrial site which was developed in the 1970s. Some images of items including the base of the crane, which survives to this day, are shown here.



The surviving crane base



The yard weighbridge invoice book



The ground frame name plate



Arthur Hunt's Wagon Repairs Limited wall map

Meeting Reports

October 2014: Peter Grenfell

The Ford Foundry, Leamington Spa

A large audience – including several former Ford employees – attended the October meeting to hear Peter Grenfell talk on his years at the Ford Foundry, Leamington Spa, 1974-1996. When Peter arrived at Ford it was a second-hand, Second World War foundry, and yet by the time he left it was one of the most up-to-date foundries in Europe, perhaps even the world.

From the outset, Peter made it clear that his focus would be on what actually happened inside the foundry, and this necessarily included a fair degree of technical detail. This report cannot possibly do justice to that detail, and we hope that – in time – the Society may be able to publish a fuller document that will satisfy both the interested enthusiast and the technical expert.

Peter divided his talk into several sections. Looking first at the nature of foundry working; then the history of the site prior to the arrival of Ford; followed by the state of the foundry on Peter's arrival in 1974. The latter part of his talk concentrated on the three key developments in the 20 plus years he had been there: the electric melt; the DISA flaskless mould lines; and the two major flaked lines.

Peter explained that the essential function of a foundry is simple - it takes scrap metal, heats it (to about 1500°C) so that it becomes liquid, pours this into moulds, which are subsequently allowed to cool and the product extracted. Iron is melted in cupolas. Steel was made by taking cupola melted base iron and passing it through Tropenas converters (similar to Bessemer's invention, except that the air is blown in the back and across the surface of the metal).

The mould lines were continuously moving iron pallets, with steel boxes ('flasks') in which the moulds were made. The task of making accurate moulds, to carefully pour metal into them, allow them to cool, and extract the castings on a continuous basis is very difficult indeed. The sand also needs to be re-used, so rubber conveyer belts added to the mayhem, ferrying the sand back to be mixed to the right consistency before returning to the moulding machines in a noisy, dusty operation.

In the fettling shop the castings have to be cleaned by shot blasting to remove all burnt sand. The edges are trimmed and the feeder stubs removed on a large grinding machine. In the core shop the moulds that had required cores would have these removed.

A particular feature of the Ford foundry was that it also had a machine shop, not ideally placed in the middle of the foundry, and which was later transferred to the Queensway estate.

With a background in electrical engineering, the move to Ford from a quiet electronics lab was quite a shock to the young engineer. The Plant Manager demonstrated the nimblest of footwork in showing Peter this gigantic, noisy, dusty plant with molten iron running around on the floor and sparks flying everywhere, with people seemingly sure of exactly what they had to do, usually with no protection at all. What a modern Health and Safety Inspector might have made of it defies belief!

The earliest occupant of the rail-side site was the iron-founder Radclyffe & Co in 1881, subsequently joined by the Imperial Stove Company, and in 1902 the site came into the ownership of Flavel's, the well-known Leamington stove manufacturer. Their occupancy lasted until 1939,

and Ford purchased the site in 1940. They installed a steel making facility which consisted of two cupolas, three converters, an overhead crane, and an arc furnace with a mechanised mould line. They were then able to make Bren gun carrier track links in steel, and several other war-related components, including bomb casings.

With the return to peacetime production, emphasis shifted to agricultural machinery, before developing the ability to produce a large range of parts for Ford vehicles ranging from brake drums and discs and flywheels to lorry and tractor parts. It was generally recognised that any Ford car driving around would have at least five parts made in Leamington Spa!

The first of the significant developments was the new Electric Melt opened in 1975. It consisted of three furnaces each of 9MW electrical power and 30 tonnes capacity. They were mains frequency coreless induction furnaces (transformers, with the metal as a single turn secondary, for electrical engineers). Space does not permit a detailed explanation of these, but it represented a more efficient, cleaner and quieter method of heating the metal. A fourth melter was added in 1979, thereby ending cupola melting.

The second development was the introduction of the DISA plant in 1982. DISA Dansk is a firm near Copenhagen that developed moulding lines that did not use steel boxes but used only sand. The block of sand is created in a special chamber, with the two halves of the pattern plate on the outside. A mould was made every ten seconds, it took three seconds to move the line, so that left only seven seconds for the accurate pouring of the metal! The steady hand of man was replaced by auto-pourers. So, potentially, one could sit back and watch perfect moulds appear on their own. The whole plant was monitored by a computer (something of a novelty for 1984).

The last major project was the replacement of the old lines with new bigger conventional flaked lines, No.6 (1988) and No.7 (1989). The latter line made SG iron, iron with a small amount of magnesium added, which made it more ductile like steel (important for certain car components), but the addition of magnesium was a tricky process and Ford developed their own individual method, now widely used in the foundry industry.

Peter left Ford in 1996, and a new DISA machine was subsequently added, together with an updating of the fettling shop. However, rumours began to emerge of the potential closure of the foundry as it no longer fitted the Ford model for production facilities. Some blamed the unions, but closure began to seem inevitable, and the last pour took place on 13th July 2007.

Peter gave a fascinating account of the real world experience of life in a foundry, and quite clearly loved the demands of the job. He responded enthusiastically to a range of questions after the meeting, and it was good to share the knowledge with other former Ford employees in the room.

To end the evening, the Chairman showed some photographs of the derelict Ford site and its eventual demolition, together with a reference to the Foundry Wood Project which is keen to keep alive the heritage of the Ford Foundry and the associated railway.

November 2014: Bob Booth (Chairman of the Bournville Society)
Cadburys and Bournville

Bob Booth, chairman of the Bournville Society and a member for 28 years, entertained a large attendance, which included 18 visitors, with the history and development of Bournville by the Cadbury family into the forerunner for the 'Garden Cities' that were to come.

Over the years we have heard much about the Quaker contribution to the Industrial Revolution, but this has been largely biased towards the 'Industrial'. The social history aspects have not been so well covered. Bob amply redressed the balance with his wide-ranging review of Bournville, the estate and its services together with some insights into the employment practices and the amenities provided by an enlightened and paternalistic family ownership.

From the opening pictures of a group of the building staff in 1922 and the tallest Maypole in the country there was little doubt that those who lived and worked at Bournville could count themselves fortunate. Especially when compared with conditions only a few miles away.

Frequently in the presentation, illustrations from the early years of the 20th century were followed by a contemporary view of the same building or landscape. The passing years have not done many favours. The former sense of spaciousness and ease has been lost although it is still much better than in other nearby neighbourhoods.

The Quaker Cadburys chose Bournville as the site for their new enterprise because of its proximity to the canals and the developing rail network. Early buildings included housing for a fire brigade; cocoa beans can spontaneously combust! There has been a rumour that Leamington or Warwick were considered as possible locations but no evidence has been uncovered in support.

The Cadbury family name is first found in Devon, Somerset and Dorset in the 16th Century. In 1794 one Richard Cadbury was the first to settle in Birmingham as a draper. His son, John, was sent to Leeds to learn the tea retail business and in 1824 he began as a coffee and cocoa nibs roaster and dealer of tea, in Bull Street, Birmingham. An abstainer, he had interests in the temperance and abolition of slavery movements. In 1831 he took a warehouse in Crooked Lane Birmingham, married and had three sons Richard, George and Henry. In 1847 he moved to Bridge Street, Birmingham with a business selling cocoa as a pure health and homeopathic drink. A contemporary engraving of the Bridge Street factory shows a substantial operation.

At that time, as now, raw cocoa beans came in bulk from African growers. The early attempts to produce a palatable drink were not very successful and, apparently, tasted badly due to adulteration. Cadbury persisted and with the Quaker belief that quality spoke for itself developed a 'cocoa essence' that was widely advertised and sold well. The advertising material was notable for its early use of colour.

Simultaneously with the development of the Bournville factory the Cadbury Quaker paternalism blossomed with the creation of the Bournville Estate and its rapid development. Some 144 acres were rapidly filled with housing and recreational facilities. This development was vested in the Bournville Village Trust set up in 1900 and separate from the factory. Later on, the Trust developed other similar ventures.

From the outset, only half of the housing was set aside for Cadbury employees but stringent criteria were, and are,

applied to all applications for a tenancy. However, works transport was provided to supplement the local bus and train services.

Employment at Bournville peaked at around 10,000 of which some 8,000 were female. 'Girls', who never worked nights, left employment on marriage but with a bible as a parting gift.

Much of the character of Bournville, its houses, its amenities and not least its recreational spaces is due to the work of the architect William Harvey, who was much influenced by Voysey and thus created an 'arts and crafts' community. Notable buildings apart from the domestic housing include a 48 bell carillon (now with a visitor centre), the largest sports pavilion in the country in the midst of 90 acres of sports fields (now sadly reduced to 40 after more house building), schools, a Quaker Meeting House, Church of England, Roman Catholic and Serbian Orthodox churches.

Considerable attention was paid to landscaping and the creation of substantial pools for boating and fishing. A large outdoor Lido fed by natural springs is no longer in use but may well be rebuilt. Indoor swimming baths, separate ones for men and women, were also built and everyone had to learn to swim. The architectural historian Pevsner noted the girl's baths which sadly is now used as a storage facility.

A slight downside to the Quaker benevolence was the absence of a cinema, a chip shop and, unsurprisingly, a pub.

Amongst the illustrations were some watercolours by E. Wallcousins of various buildings that had been used as postcards. The dining block was particularly impressive and remains so today. Its basement provided changing rooms, youth club rooms, a library, doctors' and dentists' surgeries and a Concert Hall seating 1050. A fountain and statue was given by the workers in 1933 to commemorate the firm's centenary. It was also interesting to see some of the bomb damage suffered in the 1940s and how the buildings had been restored to their original designs.

Elsewhere on the estate can be found buildings built as convalescence homes and for holiday accommodation together with a number of Cadbury family homes now used for various community purposes including a residential Quaker Centre. Not to be forgotten were infant and junior schools, the School of Art and the Day Continuation School, originally intended for young Cadbury employees.

Apart from the architecture, a recently discovered illustrated booklet shines light on Cadbury's industrial activities and shows the company as being in the forefront of administrative technology, and with its apprentices being so well regarded that they were often poached by other employers such as the Austin Motor Company.

Moving to the present day, Bournville continues to develop and its new housing will include state-of-the-art eco features and by 2017 there will be purpose built retirement facilities.

Today's Cadbury employees, even under the new American ownership, continue to work in 'the factory in a garden'. And, it is, perhaps, no surprise that Ebenezer Howard took forward the Cadbury ideals into his own Garden Cities – 'neither town nor country but with the benefits of both'.

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

It was very encouraging to receive two responses to the questions raised in my last Chairman's Notes concerning the problems of setting the limits to industrial archaeology.

The first is from Brian Ellis, who, as well as being a supporter of and a speaker at, WIAS meetings, is much involved in the Warwickshire Geological Conservation Group, as well as a professional geographer with a long interest in landscape interpretation. The second was from Roger Cragg, a long serving committee member and regular speaker at WIAS, who explores the reasoning behind the inclusion of Alpha House, Coventry in the database.

Brian Ellis observes: 'I was interested to see that you had included two buildings in your Newsletter Notes, viz the Old Bank in Stratford and the Coffee Tavern in Warwick. Both are included in two (recently published) WGCG leaflets about Geology and Building Materials in those towns. They are included specifically because they reflect local mudstone geology being utilised in local industries, particularly in the production of terracotta used in the decorative work. One of the characteristics of archaeology is its dependence on the preservation of artefacts and these tiles are indeed artefact evidence of a vanished industry, but preserved, not in the ground, but in the building. And this justification is over and above any question of the architectural merit of the buildings in which they occur.

A similar argument could be made for buildings which contain local named bricks. In the case of Cherry Orchard Brickworks the only remaining artefact evidence of that industry is in the bricks in the buildings. So if you are looking for justification for inclusion in the database of such features as industrial archaeology I would argue that, as a means of identifying and preserving artefacts, these buildings and similar features merit inclusion. The case is particularly strong in the buildings you mention in Nuneaton where the link, local outcrop of Etruria Marl,

the related quarries, the consequent brick and tile works and the bricks and especially terracotta, is strong and documented.

The defunct industrial sites raise different issues about inclusion on the grounds of "is it industrial archaeology?". The case for a location's inclusion is a bit more attenuated. I think the key here is archaeology's concern with 'place' – evidence of past activity at a particular place. One justification for a database is that it records evidence of a past activity at a particular location. If an industrial archaeology database is the only (or principal) place where that evidence is preserved then there is a justification for inclusion. There is a reasonable record of the history of the car industry in Coventry but historians are not so concerned with specific locations, but rather with firms. The folk memory of there being a car factory at X will soon fade – my Coventry grandchildren are not aware of what preceded Sainsburys on the A45 (well they are now I have told them!). So there may be a 'social obligation' on Industrial Archaeologists to ensure that there is a record kept.

You may also need to broaden what counts as evidence. You cited the presence of firm's sports clubs and grounds. But you might consider place names as evidence – Dolomite Avenue, Herald Avenue on the site of the Standard/Triumph/Rover plant and Humber Road. A less obvious bit of evidence is the extent to which the footprint on the defunct use is reflected in the boundaries of the replacement use. This is very clearly the case in the Business and Retail park which has replaced the old Standard plant, and in the small housing estate which replaced the Renold Chain works in Coventry.'

Roger Cragg notes that: 'Alpha House (SP 352798) was the first multi-storey building in the world to be built by the 'jack block' system. It is a 17 storey residential tower block of 96 flats. There is a central core containing the lifts, stairs, refuse disposal chutes and other services.

The principle of the jack block

system is that the roof slab and the uppermost section of the core is cast at ground level. When the concrete has achieved sufficient strength, usually after about three days, the whole structure is jacked up by hydraulic jacks until it has reached one storey in height. For Alpha House 40 jacks each of 220 ton capacity were used. The next floor is then added below and the process repeated, thus the building slowly rises from the ground. It was possible to cast one floor every 9 days.

When the last (lowest) floor was being lifted into place the whole weight of the building, about 7,600 tons, had to be raised. Whilst the lower floors are still being cast, it is then possible for the finishing trades to be at work on the completed upper floors. The building was completed in 1963 and is still in full use today after 51 years.. The system was developed by Felix Adler of Richard Costain (Construction) Ltd. and the Coventry City Architect was Arthur Ling.

The Panel for Historical Engineering Works of the Institution of Civil Engineers considers a number of independent criteria when assessing the historical importance of an engineering structure. One of these criteria is to determine if the structure demonstrates a development in construction techniques or the use of new materials etc. I would suggest that from an engineering viewpoint the construction technique which was used for the first time at Alpha House clearly qualifies this building as having considerable historical engineering merit. Indeed, it has been registered as a Historical Engineering Work (no. 2652) by the Institution.'

PROGRAMME

April 9 2015

Jim Andrew:

Housing the Great Exhibition - The Crystal Palace of 1851.

May 14 2015

Sue Tungate:

Matthew Boulton and the Soho Mint: Copper to Customer.

June 11 2015

Members' Evening:

Industrial Archaeology and Agriculture - Strange Bedfellows?

NEWSLETTER

Meeting Reports

December 2014: Jeff Burgess

Leamington's Water Supply.

Thirty years involvement with the Water Industry was the background to Jeff Burgess's review of Leamington's Water Supply. Another large audience, including several visitors, learned many facts about 'the history beneath our feet' in a liberally illustrated talk.

Starting with the ironwork in our roads and pavements; stopcock boxes, sluice valve boxes and the like, we followed the development of the provision of water to the citizens of Leamington from private enterprise via municipal operations, nationalisation and full circle to the present utility companies.

The pavement ironwork illustrates the successive organisations which, over the years, have been responsible for the water supply. In the case of Leamington, we have represented in ironwork: Leamington Board of Health, Leamington Corporation Waterworks, South Warwickshire Water Board, Severn Trent Water Authority and Severn Trent Water Company.

Prior to 1831 there was no public water supply. Larger houses had their own wells, others may have relied upon a communal well or spring or a well in the garden; all too often located too near to the privy.

In the early 1800s, the farmer at Newbold Comyn Farm, situated at the end of Holly Walk, was one Thomas Oldham. He also was the proprietor of the mill on the River Leam after which The Mill Gardens are named. The Mill was located near to the junction of Mill Road and Leam Terrace, close to the 'Elephant Wash', protruding out into what is now the river bed. Traces of the foundations can be seen through the water from Mill Bridge.

In 1832 Oldham promoted his own water supply system and provided a number of houses in the old town with piped water. In 1833 he extended the mains into the new town north of the river. The source of Oldham's water is uncertain. Some reports give it as a spring at the mill, some as a spring half a mile upstream on the north side of the river, some as a culvert laid through the water meadows upstream of the mill. Whatever its source, water was pumped to a brick-lined, open, reservoir on Campion Hills for a gravity fed supply.

This supply continued until the mill was demolished in 1889. It would appear that Oldham's waterworks had no legal standing; it was not a water undertaking in the proper sense. Nevertheless, Oldham continued to supply water and to extend his mains in the streets. Indeed the Commissioners for the town contracted to buy water from him for street watering purposes.

The Paving, Lighting and Improvement Commissioners were established by an Act of Parliament dated 1825. Some of their duties are evident from the title and others included sewerage and water supply. Street watering was important, particularly in the summer, to keep down the dust. In 1847 The Commissioners contracted with Oldham to supply street watering water at a cost of three shillings and three pence per thousand gallons; a very high price. Potable water supplies seem to have taken second place as far as The Commissioners were concerned, even though it was well known that many of the shallow wells, on which most people depended, were contaminated.

However, The Commissioners did seek the advice of Thomas Hawkesley, a notable civil engineer who had

built Nottingham's Trent Bridge Waterworks. His report recommended the sinking of a well into the sandstone at Emscote, but he did say that the river water would be perfectly satisfactory if properly treated, and would be cheaper.

The well at Emscote was never dug, but the Commissioners purchased the distribution pipes and reservoir from Oldham and contracted for the supply of water and steam power. Two guineas a day was agreed for the purchase of power, and one shilling per day for up to 300,000 gallons – a far cry from the three shillings and three pence per 1,000 gallons for street watering. The mains and reservoir were in the hands of The Commissioners by January 1851.

Amid continuing complaints about water quality in the town, in 1858 the Commissioners built two 500,000 gallon circular covered brick reservoirs on the Campion Hills which were in continuous use until 1976. Evocative pictures showed their cathedral like structure which still exists – any ideas for conversion?

The next character to appear was Alderman Henry Bright, whose memorial is the obelisk in Hamilton Terrace near to the Town Hall and which records 'to whose untiring exertions this town is indebted for its supply of pure water'.

Following medical advice, Bright abandoned the river as a water source and sank a 120 foot well at the junction of St Paul's Road and Campion Terrace which was brought into operation in 1879 producing 1.5 million gallons a day.

Two horizontal steam engines, named after members of the Committee, provided pumping power and a most atmospheric video clip evoked all the drama of such an engine house. So much so that an encore was demanded!

By 1885 a rising population and a reduction in the rest water level in the well required an additional supply. A steam driven pump was installed at the Pump Rooms to draw river water for street watering. Raw water mains were laid alongside the existing treated water ones and Leamington became one of the few towns in the country to have a dual system. Using untreated river water for street watering reduced the demand for potable water from the well.

Soon more drinking water was needed and a second deep well (dug with some difficulty when a seam of running sand was encountered) and service reservoir were built in Lillington at the junction of South View Road and Cubbington Road and came on stream in 1900. The original pump house was demolished in the 1990's and the service reservoir was taken out of service at the same time. Most of the site is now housing but the well is still in production.

Demand continued to outstrip supply, especially during WW2 but, thanks to the development of submersible electric pumps, additional small boreholes were drilled and the Leamington Brewery well was added to the town's water sources.

In 1957 a further 2 million gallon reservoir was added to the Campion Hills facility together with a water treatment plant. This was supplemented in 1960 with the Willes Meadow reservoir (21 million gallons) and pumping station. Today, these resources are now supplemented by the massive 5,000 million gallon reservoir at Draycote and much enlarged treatment facilities for river water.

It is clear that Leamington's water supplies are in good hands. It has been an interesting journey from Mr Oldham to Severn Trent. Full circle and still British owned.

January 2015: Richard Thomasson

The BAe146: The Last UK-designed Civil Aircraft.

Richard Thomasson again combined his deep technical knowledge with a gift for anecdote to bring the story of Britain's last airliner vividly to a large audience. He also spoke with the authority of one who had been closely involved with the aircraft over many years in a number of senior positions.

Liberally illustrated with many original photographs, the talk began by documenting the pedigree of the 146th design to come from the drawing offices of de Havilland and its successors. These included the Tiger Moth, on which thousands of RAF pilots first flew, through the inter-war years beauties like the stressed-skin, moulded plywood Albatross to the similarly constructed Mosquito, for four years WW2's fastest aeroplane, and the first operational single-seat jet fighter, the Vampire. Unforgettable, for both good and tragic reasons, was the Comet, the world's first jet airliner. Further military machines included the mighty Sea Vixen but more apposite were the first business jet, the 125, and the Trident airliner.

By now part of Hawker Siddeley, the HS 146 was born of a design concept for a V/STOL (vertical/short take-off and landing) aircraft to operate from city centre airports and small, remote third world airfields. It was not an easy birth, in fact nearly a still birth, with one photograph of a group of workers lobbying Parliament with a coffin bearing the legend 'Don't bury the 146'. A staunch supporter was Tony Benn and in 1971 the 146 was launched.

Richard's successive roles as Project Manager, Bids & Proposals Manager and Commercial Manager for the 146 provided him with a possibly unique collection of photographs ranging from a drawing office without a computer in sight (but plenty of draughtsmen's boards) to the extensive in-house facilities at Hatfield for foundry and press work used mainly for producing tooling. The Commercial Manager's office looked especially Spartan!

An excellent technical review of the 146 highlighted the innovative flying controls needed to meet its specification, the advanced chemical bonding processes that gave both great strength and anti-corrosion properties and duplicated electrical and hydraulic services driven by the four engines. The last was not fool proof – one pilot on landing cut the two inner engines which provided the main hydraulic pressure and on reaching the terminal found himself without brakes and was only stopped by hitting the air bridge!

One particularly striking slide showed the breakdown and sourcing of the major parts of the aircraft. Not only the five UK locations of the Hawker Siddeley Group were involved but also Shorts, SAAB and not least Avco Lycoming in the USA who provided the engines after Rolls Royce decided not to produce a suitable power plant.

Another interesting series of illustrations covering the production and erection of the first aircraft showed the high tail fins lost amongst the roof trusses of the assembly hall and the ingenious way an aircraft was tipped tail down to allow it to be moved out of the hall.

Three prototypes were built, now under the auspices of British Aerospace but still designated 146, and the first flight was made on 3 September 1981.

The first order came from Argentina and others followed from both the UK (DanAir, Air UK and Branson) and overseas (Air Wisconsin, Air Nova, Air Pac and Thai

Airways). The Royal Flight eventually operated three aircraft. Clearly the 146 had a niche market with the smaller, specialised operators offering feeder services to larger hubs.

It also soon gained a fine reputation as a pilot's aeroplane thanks to its excellent manoeuvrability and handling characteristics whilst maintenance crews praised its well thought through systems. For example, a fuel pump could be changed without draining down the whole system.

Various cabin configurations were offered around a basic six abreast, centre aisle plan. Initially limited to 100 seats, a lengthened 300 series increased this to 120 seats.

The original design concept had produced a singularly quiet aeroplane. Popularly known as the 'whisper jet' it was particularly useful for night operations and this soon led to the introduction of a freighter variant that was popular with parcel delivery operators such as TNT. The RAF used a few but the lack of a ramp limited its service suitability.

The development of London City Airport on the old King George V Docks site allowed the 146 to use all its capabilities to the full. Not least its very robust landing gear as demonstrated in a hair raising video clip of a cross wind landing which brought gasps from the audience.

From near misses to real accidents is sometimes uncomfortably close. Mercifully, the 146 has an excellent safety record and the first total loss was not due to any mechanical failure but to a former employee gaining access to the flight deck and killing the pilots. In contrast, the three engine ferry capability of the aircraft was demonstrated when an inboard engine went bang and after its removal at a remote airstrip the aircraft was flown safely back to its US base, not without some caustic comments from the authorities. One pilot ran out of runway, ending up on a beach whilst another, as mentioned earlier, ran out of brakes and hit the terminal air bridge.

In the late 1980s the flight deck was given an upgrade and makeover with new avionics and in the early 1990s production was moved to Manchester. At the same time, a number of design studies were undertaken for versions with larger wings and twin engines, but nothing came of them.

Richard's final association with the aircraft was unusual to say the least. Project 'Water Bomber' was the request from a Canadian owner who wanted to install a 3,000 gallon tank for firefighting fluid that needed to be emptied in some ten seconds and refilled in an eleven minute turn around. A small but specialised team successfully engineered the conversion and some spectacular video shots showed the water bomber in action.

There are around half of the 400 146s built still flying, including the prototype, now converted into a special purpose meteorological aircraft. The 146 is a popular aircraft for luxurious interior conversions for corporate transport where its attributes of low noise and small airfield requirements can be used to advantage.

In a wide ranging discussion session, the issue of preservation of examples of Britain's commercial aviation past was highlighted. Examples left in the Mojave Desert were deemed no substitute for accessible ones in the UK but sadly there seems to be no solution in the short term.

As the last slide said: 'BAe 146 Britain's Best Airliner?' After this review it has to be a contender.

February 2015: Christiaan van Schaardenburgh

Coventry Shadow Factories.

Another large attendance of 105 including 19 visitors learnt much during the evening from the speaker's depth of knowledge of Britain's Shadow Factory Scheme and its contribution to the country's survival in the early years of WW2.

Chris van Schaardenburgh has been the Curator of Vehicles at the Coventry Transport Museum but is about to move to the Tank Museum. He has an engineering background and has worked at the National Space Museum in Washington, DC. He had curated a recent exhibition at the Transport Museum on 'The Shadow Scheme' or 'What did the Motor Industry do in the War' and this formed the basis for his talk which was liberally illustrated with scenes of contemporary activities.

The Shadow Scheme was a fundamental component of the UK's rearmament programme from 1936 onwards. Shadow did not mean secret, indeed the programme was well known and German visitors were by no means uncommon. The programme was designed to expand production capacity principally for aircraft and aero engines, vehicles and ordnance. It was based initially on the resources of the motor industry given its experience and skills in high volume production methods. Shadow meant following the practices of the parent company. The majority of the shadow factories built were government funded and owned. An early protagonist of the programme was Roy Fedden of Bristol following visits he made to Germany and thus becoming aware of the scale of Germany's rearmament programme, coupled to his contacts with the Rootes Group in Coventry.

Whilst dispersal of manufacturing facilities was one consideration, proximity to the parent also brought benefits. A number of the Coventry shadow plants were close to their parents i.e. Humber and Daimler, whilst Rootes were responsible for a plant at Speke on Merseyside.

One of the largest shadow plants was at Castle Bromwich for Spitfire production. Originally operated by Nuffield it was an initial failure until Lord Beaverbrook (Minister for Aircraft Production) called Lord Nuffield's bluff and assumed Ministerial responsibility for the operation. In Coventry, the Rootes plant at Ryton was built to produce Bristol aero engines, Banner Lane and Anstey for Standard Motors, the latter to assemble the Mosquito fighter/bomber and nearby Lode Lane for Rover for Bristol engines.

One interesting illustration was a poster created for the CTM Exhibition that showed the great spread of the shadow factories operated by the motor industry in Coventry, Birmingham, Luton, Leyland, London and Oxford.

One particular aspect of the shadow programme caused considerable anguish to the Trades Unions and the traditions of a skilled labour force. In order to meet the greatly increased demands for output, many of the shadow factories' operations were de-skilled and were organised around an un- or semi-skilled workforce. This required a new approach to both machinery and working practices that needed understanding by all parties. Furthermore, an increasing proportion of the workforce was female bringing other issues into play.

Some plants were fully vertically integrated from raw material input to finished product with foundry and press shop facilities whilst others were sub-contract component specialists.

In retrospect, the organisational efforts from both government and industry must have been immense but the growing realisation of the threats being posed to the country surely provided a most potent incentive to succeed.

The volume of matériel produced from the Coventry

factories was stupendous and made up much of the output of the British Motor Industry. Between September 1939 and October 1945 this totalled:

Tank Transporters 1,317, Trucks 153,036,
Ambulances 14,543, Heavy Cars 46,689,
Tractors 36,820, Light Cars and Vans 93,419,
Motorcycles 421,039, Trailers 151,070.

Plus over 7,500 armoured carriers and cars, scout cars and armoured command vehicles.

Perhaps even more impressive were the figures for aircraft delivered through the shadow factory scheme:

Fairy Battle 1,029, Hawker Hurricane 300,
Short Stirling 620, Avro Lancaster 330,
Handley Page Halifax 1,780, Airspeed Horsa 365,
Bristol Blenheim 3,422, Bristol Beaufighter 260,
Airspeed Oxford 750, DH Mosquito 1,066,
DH Tiger Moth 3,432.

Plus thousands of Bristol and Rolls-Royce aero engines and many other aircraft sub-assemblies and components.

The Castle Bromwich factory produced 11,553 Spitfires and 300 Lancasters as well as operating a large repair facility for both planes and vehicles.

The Rover Company was involved in the early stages of production of the new Whittle jet engine before the project was passed to Rolls-Royce for completion. This work had a post-war spin-off in the Rover 'Jet' car when there was much interest on both sides of the Atlantic in developing small turbine engines for road use although nothing reached commercial realisation.

Another interesting diversion from vehicles and planes was the production at Carbodies of midget submarines although their numbers and deployment was not disclosed. Amongst the many illustrations were some of Whitley bombers made in Coventry being refurbished at the SS (Jaguar) plant and a production line of women welding jerry cans with not an overall in sight and bare legs with elegant shoes showing under the bench. Also highlighted were lightweight jeeps and inflatable decoy lorries.

Family life with 4 ½ million in the services and 4 million involved in war work clearly suffered. There were many movement, relocation and accommodation issues to be resolved as well as labour relations. A 55 hour week was the norm with good pay at around £8 a week. Many hostels with good canteen facilities were built in Coventry together with welfare services, nurseries and crèches. Music while you work and ENSA provided entertainment in the factories.

An important part of the preparation for the CMT exhibition had been an oral history project, the results of which those members who bought the DVD will have enjoyed. Clearly morale was excellent and helped by VIP visitors who included the Queen, Churchill and Bevin.

The Coventry Blitz and other air raids had a surprisingly small effect on production. Much disruption certainly but, as in Germany, it was found that machine tools are difficult to destroy and buildings can be made useable surprisingly quickly.

What was the post war legacy of the shadow scheme? Some extensive factories became available to the Motor and Aircraft Industries but there were few new designs for cars nor commercial aircraft despite the potential demand, especially for the former. Errors in government policy for post war expansion led to regional dispersal policies falsely based on the success of the shadow schemes.

This talk made much clearer the very intricate links between the many manufacturers involved and that the story of Coventry's Shadow Factories could well be entitled 'Who made What Where?'