WARWICKSHIRE WIAS

Industrial Archaeology Society

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NEWSLETTER

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 launch-pad 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.

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 Pontyscyllte 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, Thyratron 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 Larne, 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 Alsthom of France to form GEC Alsthom 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.

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