WARWICKSHIRE Industrial Archaeology Society

WIAS

NEWSLETTER

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FROM THE CHAIRMAN

An invitation to speak at the Warwick Society at the start of the year focussed my mind on the particular features that might characterise the industrial history and industrial archaeology of Warwick. Certainly, very few of the visitors to the town will have these themes at the forefront of their minds, but Warwick does have some unexpected features and offers potential for further study. It still has an industrial presence e.g. Dennis Eagle on the Heathcote estate and Kigass Aero Components on Montague Road, but also it has, indeed, lost some important manufacturers in the town such as Benfords and Pottertons.

The county town of Warwick, the administrative and legal centre for the county, has the castle at its heart, and both these ingredients have an important influence on the economic and social development of the town. Within the castle there is an important site – the Castle Mill - with a fascinating collection of water power, gas engine and electricity features that merit more than the cursory glance given by the vast number of visitors that pass through the castle gates. Those brave enough the scale the ramparts will benefit from magnificent views of the Mill, the Weir and the old Castle Bridge, with its successor in the distance. Further upstream, Guy's Cliffe (Saxon) Mill is another popular venue with some remnants of the mill's former activity in evidence.

As might be expected, the town carries many examples of street furniture, often bearing the names of local ironfounders (particularly Roberts and Glover), plus the notable Victorian postboxes at East and Westgates, and the unusual telegraph cable markers dotted around the town (researched by one of our members, John Brace). The market square still holds a weekly market, with the old Market Hall now converted for museum uses.

Warwick has always been attractive to visitors, and facilities have been developed to match, such as transport services and hotel provision. Could early developments to serve the tourist industry ever be included in a definition of 'industrial archaeology' – I suspect not.

The coming of the canal (in two sections - Warwick & Birmingham and Warwick & Napton 1800) and the railway (Great Western Railway 1852) impacted significantly on the development of Warwick, with a considerable influence on industrial location. The Saltisford Arm must have been a scene of much activity, but this has now been submerged beneath retail, commercial and residential facilities. I have often speculated over what might have happened had that development been proposed in more recent times – could Warwick ever have had a canal basin (with a scale of development to match) which would have enabled visitors by boat to reach the heart of the town?

One feature, of course, is still standing proudly in situ in the Saltisford. This is the last remaining building of the 1822 Warwick Gasworks, recently refurbished, and the adopted emblem of the Warwickshire Industrial Archaeology Society.

The canal sweeps to the north of the town, and then swings to the south of Leamington en route to Napton and beyond. As in many locations throughout the country, the canal was an attractive site for industrial premises, with the carriage of coal and heavy materials considerably eased. One such site is the Cape area in Warwick. This has long been a location for industrial activity, and still maintains an industrial presence, although, of course, the canalside is no longer relevant. Slightly further eastwards we have, of course, the most notable example of industrial archaeology in the town – the remaining buildings of the George Nelson Dale Gelatine works, together with evidence of the 'Nelson Village'.

There is a triangular area bordered by Cape Road, Millers Road and the canal that has seen much industrial activity over time, although, inevitably, many changes have taken place in recent years. Few of the buildings have architectural merit, often utilitarian in design, but they have contributed much to the industrial history of the town. This area strikes me as one that would merit research. What firms operated there? What did they make? Do any physical remains exist? Once again, we are faced with the 'premises, products, processes' dilemma – the shell of a building may exist, there may be evidence of some of the products that emerged, but knowledge of the processes of manufacture may be difficult to discover. Perhaps the best known example is the original Healey works in Lock Lane, now re-born as a site for renovation of Austin Healey cars.

I am reminded of one of the excellent books written by Robin Leach on Kenilworth. In his *'Kenilworth's Engineering Age'* he has researched areas of the town that are little known by visitors, but made up much of Kenilworth's manufacturing activity. A similar volume for Warwick would add much to our knowledge of the industrial history of the county town.

PROGRAMME

February 11 2016
Dr Barrie Trinder:
Industry in Banbury: an Overview 1700-1960.
March 10 2016
Mike Gould:
Rover - the Marque Doomed to Die.
April 14 2016
Peter Lee:
Nuneaton's Mills and Factories.
May 12 2016
Anthony Coulls:
The London Water and Steam Museum.
June 9 2016
Members' Evening.

Meeting Reports

November 2015: Dr Stephen Parissien
English Railway Stations.

Report by Colin Brookes

The Pyne Room was filled to capacity with a hundred members and friends expecting a treat for those of us of a certain age, and we certainly were not disappointed but enthralled by a first class presentation by an eminent speaker at the top of his game. Dr Steven Parissien is perhaps better known for his sterling work at Compton Verney where he has been Director since 2009. Railway history is just another string to his bow which covers very wide interests indeed. He has written ten books to date, the latest of which is on the subject in question.

We were invited to look at 'lots of British Stations' illustrated by pictures of the development of the Railway Station from 1825. Beginning with Stockton Station on the Stockton and Darlington, the first public railway, which originally was just a private house where you purchased your ticket.

In 1830 the Liverpool and Manchester railway opened with a grand station in Manchester, which survives today. It had no platforms as freight was more important to the railway, people travelled in wagons. Nowadays at the nearby museum you can take a ride in historic wagon carriages in authentic conditions.

We moved on to another survivor closer to home, that of Birmingham's second railway station Curzon Street, built for the London and Birmingham Railway in 1838. Stephen used the superb illustrations by Bourne (1837) of Curzon Street Station designed by Phillip Hardwick, who was also responsible for the Euston Arch at the London end. Sadly the Arch, and much of the station, including the great hall which had the largest unsupported ceiling in the country, was demolished in 1961 despite a huge campaign at the time to save it.

Then to the south-west and Bristol Temple Meads Station built for the Great Western Railway. Interestingly, Bristol Temple Meads was built by Wyatt and again survives, but only just, it has to be said. The Great Western Hotel at Temple Meads showed that Phillip Hardwick was still trying to perpetuate the 'Arch' theme as he had at Euston. Hardwick contended that 'The Doric arch was well adapted to the national character, which it dutifully served'. Brunel was, we learned, his own boss who liked to do everything himself rather than delegate. He was also responsible for Paddington Station in 1852.

Staying in London, we looked at Cubbitt's design for Kings Cross Station. Originally the roof structure was in laminated wood to save weight; it was later replaced by iron and steel. Continuing with the arch/gateway theme, we hopped across the pond to see Pennsylvania Grand Station, built as an impressive gateway into America and a monumental entrance to the country. Much as the Brandenburg Gate in Berlin did for Germany. Indeed the Railway was here to stay!

Back to London where we moved on to St Pancras Station built by the Midland Railway in 1868 in stunning Victorian Gothic by Gilbert Scott and incorporating the hotel in 1873. Again, a survivor which was almost lost to the world but was thankfully saved through the efforts of, amongst many others, John Betjeman. Scott was a disciple of John Ruskin. All the materials came from the Midlands, especially the Skidmore Ironwork, whilst the vaults were made exactly to the inch to accommodate Burton Beer Barrels. Yet another innovation at St Pancras was the Clock Tower. The photographs of the restored staircases illustrated how much has been achieved and, whilst there is little doubt that everyone admired the results and appreciated how wonderful it all now is, perhaps few of us could afford to stay there!

It was good to see what most would say was an expert audience being carried along with the whole experience. As one picture followed another in rapid fashion, on every occasion when the audience was asked to name the location of the station, not once did anybody fail to answer immediately and correctly!

We recognised, almost in chorus, the Royal waiting rooms at Windsor Station, its neighbouring Slough Station (1880 rebuild) followed by Leamington Station (GWR 1939) which produced a huge round of applause! Then back to Birmingham and GWR Snow Hill, which unfortunately was demolished in 1969, followed by the Hotel, and Shed in 1979, but at least the Station is now back in use again.

Another trip across the pond to Cincinnati introduced us to its Grand Central Station (1934) and then back to London for Waterloo Station including an excellent illustration of the War Memorial.

The list came thick and fast and it was a struggle to keep up with them. Indeed, it might be an underestimate that some 120 to 150 separate railway stations had a mention, and more importantly with at least one, sometimes more, pictures in a feast of excellent photography.

We moved, finally, towards what should be termed successes; stations that were demolished but then rebuilt afterwards. Of course, that is where the lines were left open or newly re-laid. It is true to say that the railways are now being used to a greater extent that was previously the case. Pershore is a good example here, but France seems to be better at finding new uses for old stations. Bath Park Station is one instance and Manchester Central another, where the building is safe but the railway it served has long gone. Nearby, Kenilworth Station is also being rebuilt.

It is a shame that we lost so much. However, it can perhaps be regarded as part of our future, rather than part of our past. Hopefully, in England we are entering a new age.

Dr Parissien was warmly thanked and the audience, as always, enjoyed excellent refreshments. Speaking of which, do visit Compton Verney at an early opportunity, the refreshments there can be vouched for too!

Name this Warwickshire station. No prize, just the honour!

December 2015: Roger Cragg

Bringing Birmingham's Water: The Elan Valley Aqueduct.

Roger Cragg has spoken to the Society on a wide variety of civil engineering subjects and the story of the Elan Valley Aqueduct and the supply of clean water to Birmingham encompassed many of them. Moreover, it gave the audience an insight into one of Victorian England's great but unsung achievements.

Until the early 16th century Birmingham had a population of about 1,000 but then grew steadily to some 75,000 by 1800. Attempts to improve the supply of water made little progress until 1826 when Parliament granted powers setting up the 'Company of Proprietors of Birmingham Waterworks'. Subsequent Acts authorised the building of pumping stations, reservoirs and the sinking of deep wells but by 1891 it was obvious that the growth of the City was outstripping the supply of clean water.

In a previous report to the Corporation of Birmingham Robert Rawlinson had criticised the water supply to Birmingham. In 1871 he recommended the rivers Elan and Claerwen in central Wales as the best future sources of water for the City.

The Corporation consulted James Mansergh with a view to developing new sources and he concluded that it would not be possible to obtain the necessary increased supply from local sources and again recommended taking water from the Elan and Claerwen catchments. He also considered that it would be possible to convey the water to Birmingham by gravitation from the proposed reservoirs. Mansergh had been the Engineer for the Mid-Wales Railway and thus familiar with the terrain. The works would comprise the construction of a series of reservoirs, an aqueduct to convey the water to Birmingham and a filtration and distribution works at Frankley in south-west Birmingham.

Before examining the aqueduct Roger gave a quick overview of the Elan Valley reservoirs. Four dams were constructed, one normally submerged whose purpose is to maintain the water at the level necessary to ensure gravitational flow to Frankley and so avoid pumping. During the great drought of 1984 the reservoirs were practically empty and the submerged dam was exposed, a very rare event. The three main dams were the highest built in the country at that time. Later an additional reservoir was added.

Roger then turned to the design and construction of the aqueduct, initially considering the project as originally built. The aqueduct was designed for an ultimate flow of 75 million gallons per day and is 73 miles 658 yards long, giving a hydraulic gradient of 1 in 2,320. Following experience with the Vyrnwy Reservoir (which supplies Liverpool) it was decided to install screens and rough filters at the Elan Valley end to reduce the likelihood of silting in the very flat gradient of the aqueduct. In addition, the water was dosed with chalk to reduce its action on the lead used in some of the pipe joints.

The route of the aqueduct is an almost direct line between the reservoirs and Frankley in an approximately east-north-east direction. It passes through Radnorshire, Herefordshire and Worcestershire before entering West Midlands. The water takes 36 hours to travel from the reservoirs to Frankley.

The aqueduct is comprised of several main sections. Where the water level is at or above the hydraulic gradient the water flows in a closed channel at atmospheric pressure. Some of these sections are in cut and cover, others in tunnel. In sections where the water is below the hydraulic gradient it flows in pressure pipelines. At the lowest point of the aqueduct, the crossing of the River Severn just north of Bewdley, the pressure is 250 psi. There are numerous river crossings, six railway crossings and a crossing over the Staffordshire & Worcestershire Canal. The pressure pipe sections initially had two 42 inch diameter pipes with a provision for later pipes to be added as the demand increased. There are 36 miles 1,248 yards of conduit and 36 miles 1,170 yards of pressure pipeline.

Roger then looked in detail at the various forms of construction and at some of the more notable structures on the route.

The general form of the conduit sections in which the water flows at atmospheric pressure is a trapezoidal section with curved sides, floor and roof. Generally the conduits have internal dimensions 7 ft 2 in base, 8 ft 2 in top, and sides 6 ft 6 in high. The sections were built with brick invert and side walls and a concrete roof. The whole was then surrounded with concrete.

There are 15 tunnels with a total length of 12 miles 1,556 yards with a ruling gradient of 1:3000. Many difficulties were encountered, not least where the depth of the tunnel raised the water pressure requiring considerable reinforcement.

There are 11 syphon sections in which the water pressure varies from 25 to 250 psi. Cast-iron pipes 42 inches diameter and 1 to 1½ inches thick were used for pressures up to 175 psi and welded steel pipes for higher pressures and some river and railway crossings.

There are 26 river crossings of varying designs where the flow is in syphon. Normally the pipes span between masonry abutments but in the case of 5 river crossings and one railway crossing bridges were used to carry the pipelines. For three river crossings the pipes were laid under the river bed. There were six railway crossings, in all but one the aqueduct was laid under the railway tracks. Some of the more visible structures on the aqueduct were reviewed in an extensive series of illustrations that highlighted the salient points of design and construction.

The aqueduct terminates on the west side of Frankley Reservoir. On the east side are sand filter beds and after treatment the water passes into a covered pure water tank before being distributed to the supply area. Nearly all the supply is by gravity but steam driven pumping equipment raised water into supply reservoirs at Warley and Northfield.

The construction of the aqueduct and reservoirs started in 1893 and the aqueduct first carried water on the 21 July 1904.

Six main Contractors were involved in the construction of the reservoirs, the aqueduct and the Frankley works and the costs totalled £4,428,565. Royally opened by King Edward VII and Queen Alexandra on 21 July 1904, the project was officially handed over in October 1906.

Today, the water supply is under the management of Severn Trent Water whilst the Elan Valley reservoirs are owned by Welsh Water.

There are some significant proposed works associated with the aqueduct to alleviate maintenance problems. The reservoir at Frankley contains about 5 day's supply of water and if the aqueduct is shut down it takes one day to drain and a further day to re-fill leaving only three days for maintenance. To allow greater flexibility it is proposed to tap new sources of supply which should allow more down time for the aqueduct, possibly up to 50 days per year. The Birmingham Resilience Project will cost £242m.

The Elan Valley scheme was a prodigious undertaking and a far sighted decision by the Birmingham authorities. It still remains, after 110 years of operation, the major supply of water to Birmingham.

January 2016: Gary Collins & Donata Santorini:
The Willans Project - What Did It Achieve?

Willans & Robinson is a familiar name to many members after several presentations and contributions (see Newsletters 38, 45, 52 and 53). However, Gary Collins and Donata Santorini, using the perspective of the professional archivist and conservator, substantially extended our knowledge which was further developed in a vigorous discussion session.

The Warwickshire County Record Office is well aware of the importance of the Willans & Robinson archive for which they now have responsibility. And of its value for promoting their activities to the public as demonstrated by the display banners for 'Boaters and Bright Sparks; images from the Willans Works engineering collection' shown alongside a few samples of the archive material.

Gary Collins, the Project Cataloguing Archivist, began with a review of the two year project to catalogue and conserve the engineering records of W & R and the principle sources of funding; the National Cataloguing Grant Scheme and the National Manuscripts Conservation Trust. Not forgetting our own contribution in June 2014.

Whilst Gary's presentation covered some familiar ground it was notable for the use of many new photographs which gave a greater insight into the W & R product range, its customers and its works activities. For example, the steam launch *Sprite*, originally built in 1884 for the military campaign to lift the siege of Khartoum, but actually used as a works launch at Thames Ditton. Robinson also used it during Queen Victoria's Diamond Jubilee review on the Solent in 1897.

Briefly tracing the company's history after the move to Rugby and the succession of mergers and takeovers leading to Centenary celebrations in 1997, we moved to considering the types of records held in the archive. These covered the period from the 1880s to the early 21st Century and give the background to the development of the business, and not least the difficulties it encountered.

The records include files of minutes and correspondence plus other material involving: shareholder communications; details of patents and contracts; workforce matters, apprentices, social, welfare, staff magazines; property information, deeds and plans; production drawings; and public relations, publications, events and visits.

We also learned more about the impact on the local community of one of Rugby's major employers. The housing it built (both permanent and temporary) with streets named after senior managers and the acquisitions of local mansions for various purposes.

Recreational facilities and social events were important contributions made to employee welfare that belong to the past, as were extensive apprenticeship schemes.

The archive also holds records relating to other products made within the English Electric Group. Products as diverse as fridges and the Canberra jet bomber, also railway locomotives, industrial motors, diesel engines, measuring instruments, marine turbines, mine hoists, transformers, trolleybus equipment and televisions.

There was an active in-house photographic department and an important part of the archive is the collection of glass plate and film negatives. Identifying and classifying these has occupied the WIAS members who are helping in the preservation work for many hours. The work of these and the other volunteers has been and is greatly appreciated. The final catalogue and the numbering of documents was due to be completed in August 2015 but this was delayed until early 2016, mostly because Alstom made two further donations of material during the course of the project and this material needed to be integrated, during the life of the project, with the two original donations made in 2006 and 2007. There are about 80 metres of shelving for the Willans Works collection and the boxes, files etc. would take up about 160 metres if laid out end to end.

Another important aspect of the project has been outreach, taking the story to a wider audience and answering enquiries. Typical activities include: a talk to the Willans Retirement Association, a blog, writing articles for other publications and providing material for the 'Our Warwickshire' website.

Links have also been made with other projects and organisations holding related material e.g. the National Railway Museum (GEC Traction), the Bodleian Library at Oxford (Marconi) and Museum of Science & Industry in Manchester (British Westinghouse/Metropolitan Vickers) and Lincolnshire Archives (Ruston Engineering works).

Further liaison with Rugby Art Gallery & Museum is ongoing and one particular project will be an oral history. If any member has a suitable contact or wants to be involved then the Record Office would love to hear from them.

Donata Santorini, a conservation expert who had earlier worked on the Soho Foundry archive, took up the story with an eye-opening description of the painstaking and time consuming work needed to preserve many of the items in the archive. She concentrated on the early architectural plans and engineering drawings as well as the photographic negatives.

Amongst the challenges presented was the sheer scale of the collection, over a thousand drawings and tracings, 5,000 glass plate and 6,000 film negatives. The condition of much of the material, especially the drawings, caused great concern. Paper tightly rolled and stored in tubes can be tricky and drawings packed into boxes smaller than themselves have damaging folds. Discolouration and distortion were common but fortunately mould was not often found.

Prioritising the work was essential. It can take 4 days to conserve a single drawing and the available facilities can only deal with one sheet at a time. Out of 292 drawings, 89 were graded high priority and 173 secondary. Priority being given to material of significant historical value.

The conservation treatment could involve up to six stages; dry cleaning (80%), flattening (45%), encapsulating (40%), repair (35%) and finally rolling with a support tube (5%).

Conserving a typical paper drawing meant mechanically removing any textile backing, wet treatment to remove a paper backing and to reduce acidity and discolouration then new lining with Japanese paper. Sometimes it was also necessary to remove pressure sensitive tape and reduce the discolouration and tackiness by the use of acetone.

A series of before and after illustrations showed the remarkable results that have been achieved. Equally important were the examples of how carefully the restored material has been repacked to ensure its future viability. Equally time-consuming has been the work on the photographic archive, the jigsaw of a broken glass plate negative would daunt many a restorer. The task of identifying, cataloguing and repackaging the negatives in special sleeves has largely been done by the WIAS volunteers, Peter Coulls, John Willock and Alain Foote.

Topics in a lively discussion session included the future accessibility of today's digital records (probably it will be impossible – needs urgent action), the value of industrial as compared to general archaeology, ideal storage conditions (WCRO has such facilities) and the value of the Willans archive to future historians.

Perhaps the last word should come from a Spanish professor who has called the Willans material 'a World Class Archive'.