WARWICKSHIRE Industrial Archaeology Society

WIAS

NEWSLETTER

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FROM THE CHAIRMAN

A new season is upon us and the programme of meetings for 2019-2020 is listed below. The programme seeks to satisfy the wide range of interests that exist within the society, and is fairly liberal in its interpretation of 'industrial heritage'.

As the Chairman's report to the AGM will reveal we continue to have well-attended meetings – well in excess of those achieved by similar societies – and we hope that we can continue this into the coming season. The February meeting provides an opportunity for members to make their own short presentations - always an enjoyable evening with an often surprising range of interests revealed.

One such presentation from past Members' evenings was by Peter Stanworth on the water tower in his garden. The tower was constructed in the 1930s, but had not been used for about 70 years, and problems over falling pieces of concrete persuaded Peter that he needed to take remedial action. Not many societies will have members with such a garden feature, and, faced with a demolition cost of at least £40,000, Peter decided to convert the water tower to a holiday let. Under the headline 'The Quirkier the Better for Britain's Staycationers', The Daily Telegraph of Saturday 29 June 2019 featured this conversion. I must admit that when I first heard of his plans, my reaction was one of rather cautious optimism, but, after a few false starts, a really imaginative design by local architect Martin Smith has seen the project come to fruition. The result is stunning and a wonderful example of adaptive re-use of an industrial building.

Fortunately, the possibilities raised by adaptive re-use seem to be higher on the agenda for developers than in earlier decades where the wrecker's ball held sway. Adaptive re-use seems to have become the focus of much of the current effort in the preservation of the industrial heritage. So few sites/buildings can survive as industrial museums (with a commercial viability) and the alternative can easily lie with adaptive re-use. The Association for Industrial Archaeology is very much at the forefront of this movement, and has an annual award for the best adaptive re-use building in the UK. The 2019 award went to The Engine Shed, University of Northampton Students' Union. It is a Grade II listed building and had been unused for over 15 years. The Midland Railway operated the building as a running shed to service steam locomotives on the Northampton to Bedford Line, later used by the LMS, and then by British Rail Engineering, as a workshop. It closed in 1998 and remained empty and vandalised until bought by the University in 2014. The project has ensured a viable, and productive use, for the Engine Shed as the new Students' Union, an iconic element of the Waterside Campus site of the University of Northampton. Let's hope that at least some students – whilst they sip their coffee and mull over the post-Brexit world – might be inspired to investigate the heritage of the building and the associated railway system!

Both these projects are relatively small-scale. Larger sites often carry more problematic issues, not least in terms of cost. Historic England has been much involved exploring the issues raised by the adaptation of old industrial buildings, including the Lancashire textile industry. It commissioned Oxford Archaeology North to carry out a survey - 'The Textile Mills of Lancashire: the Legacy' - and this can be downloaded from the Historic England website https://historicengland.org.uk. There are a number of other publications on this website that will be of interest as well. One of the mills considered is Holmes Mill in Clitheroe which has been converted into hotel, bistro, brewery and food hall – with a cinema to come – but with the retention of some of the redundant textile machinery. I had the pleasure of staying at the hotel recently, and sipping local Bowland craft beer surrounded by a Clayton and Goodfellow Cross-Compound Engine of 1910-1911!

Moreover, adaptive re-use is not simply a UK feature – a quick browse on the internet reveals examples throughout the world of adaptive re-use planned or enacted. It would be good to hear from members of any buildings they come across – at home or abroad - that have demonstrated how an industrial building might be adapted for an alternative use.

PROGRAMME

12 September 2019:
AGM and Chairman's Lecture.
10 October 2019: Peter Coulls and Alan Jennings
The Warwick and Leamington Tramways.
14 November 2019: Brian Ellis
The Geological Background to Warwickshire's Industrial Activity.
12 December 2019: Ian Pogson
The Life and Engineering Achievements of Dr. Frederick Lanchester.
9 January 2020: David Skillen
Giants in the Sky - the Zeppelin in WW1.
13 February 2020: Members' Evening
Twenty's Plenty.
12 March 2020: Ian Whittle
The Life and Work of Sir Frank Whittle.
9 April 2020: Paul Rabbitts
Bandstands - History, Decline and Revival.
14 May 2020: Mike Bunn
Fetch the Engines: a History of the Warwickshire Fire Service.
11 June 2020: Peter Hoath
A View of Computing History - 2,000 Years in 60 Minutes.

Meeting Reports

March 2019: Anthony Coulls

A String of Pearls - The Legacy of the Stockton and Darlington Railway.

A talk by Anthony Coulls always contains some gems and 'a string of pearls' was no exception. The Stockton and Darlington Railway is part of the DNA of Industrial Archaeologists and this review of the present evidence for its existence 190 years on added to our knowledge.

In 1825 the history of wheeled vehicles running on rails was some 220 years old. However, the S & D R was a seminal moment in that it combined all the former elements with the game changing introduction of the steam powered locomotive.

The S & D R was born out of the South West Durham coalfield around Bishop Auckland. Traditionally, pack horses with panniers had carried the coal to the ports of Teesside but after the journey often only rubble and dust remained much reducing its value.

Elsewhere in the country canals had resolved the bulk transportation problem but although proposals, including one by John Rennie, had been put forward for South West Durham, none were pursued. Welsh engineer George Overton advised using a tramway and surveyed a route from the Etherley and Witton collieries to Shildon and thence north of Darlington to Stockton. The proposal was supported by the Quaker Edward Pease and well backed but failed due to opposition from land-owners.

There were plenty of short tramways operational in England but following the failed proposal Pease and his moneyed friends in Darlington, notably Jonathon Backhouse, thought a steam locomotive should be considered and sought the advice of George Stephenson. Stephenson and his son Robert surveyed a route, in part following Overton, in six weeks with a view to using steam power. Thus, the S & D R would be the first public railway designed from the outset to use steam.

Whilst the route from Shildon via Darlington to Stockton is mainly level, the Witton Park colliery is located in hilly country. Stephenson's plans for this part of the route used inclined rope-worked tramways, locomotives were never envisaged. Shildon would be the junction of the two systems.

There is, surprisingly, considerable remaining evidence of the tramway but very little of the collieries which were worked out by 1853 when the tramways were abandoned. Today, Witton Park Farm lies in peaceful, rolling hills but nearby can be found evidence of the track and infrastructure.

At the bottom of the descent from Witton is Phoenix Row a run of cottages on the gable end of which are the witness marks of a tallyman's hut.

Beyond Phoenix Row the substantial earthwork of the Everley incline can be followed up to the site of the engine house which was demolished in 1975. The engineman from 1825 was Thomas Greener, who was acquainted with George Stephenson. When Stephenson was made chief engineer he brought Greener with him to lay the rails. Greener commenced his work at Stockton in May 1822 and then moved to Etherley. Once the line was opened for traffic, Greener was appointed engineer in charge of the engine at Etherley. Accomplished in arts and crafts, he made a model of the tramway and engine which is still in working order.

He was replaced at Etherley by his brother John in 1826. John was prominent amongst the local Methodists and often spoke on the Bishop Auckland circuit. He also taught several working men to read. He accidentally fell under one of the beams of the engine when it was in motion in 1843. The engine house soon ceased working. Perhaps Greener's death was a factor in its closure. The engineman's house survived until the 1980s, remaining in use and belonging to the S & D R, with its distinctive number plaque H5.

The track leads to the site of the important bridge over the River Gaunless. Only the abutments remain of what was the earliest iron railway bridge in the world. Fortunately, the bridge itself can now be seen in the National Railway Museum in York.

Beyond the Gaunless comes the Brusselton incline, now a scheduled ancient monument and much restored by an active community group. The stone sleeper blocks for much of the incline have been exposed, rising to the remains of the engine house and the few pit houses remaining after the removal of the village in the 1950s under Schedule D authority. Thence the tramway drops to near Shildon where it meets the railway proper and a simple obelisk carries the brief inscription*: 'Near this site the Stockton and Darlington Railway Company on the 27th September 1825 ran the first passenger train drawn by a steam engine'.*

Shildon was the first 'railway town' and a template for those that followed such as Swindon. It is a fitting site for the present Railway Museum.

From Shildon to Stockton the present railway follows the line of the original. Consequently, there is little or no evidence of the track but there are a number of 'Pearls' along the route.

The first is the house occupied by Timothy Hackworth. Hackworth, a devout Methodist, was the manager who made Stephenson's locomotives reliable and pioneered many subsequent railway practices. He notably introduced the spring-loaded safety valve that prevented abuse by press-on drivers.

Just outside the museum is the Soho Shed, a former ware-house built with a Roman-style hypocaust, subsequently bought by the railway and used as a paint-shop.

Heighington Station is now the Locomotion One public house. It was here that the engine 'Locomotion' was first put onto rails and run under its own power.

Further on we come to Darlington's North Road Station which now houses a Museum for the S & D R. Nearby are several other later buildings.

Also here are the Hopetown Carriage Works, used for the manufacture and maintenance of railway carriages; in the early days using techniques found in contemporary Stage Coaches. On the other side of the North Road lies the Goods Shed now used for the restoration of rolling stock by the S & D R Preservation Society. A substantial area of open grassland adjacent to the Carriage Works is heavily contaminated and so safe, for the time being, from development. Perhaps not so safe are other original buildings such as a run of lime cells, currently up for sale.

The last major feature before the Fighting Cocks Inn is the now restored bridge over the River Skerne built in in a Georgian classical architectural style.

At Stockton, alongside an old railway building, a slightly more elaborate memorial than at Shildon has a family group waving farewell whilst a 45-year-old panel for the Stockton Railway Heritage Trail marks the Tees-side wharf where the line ended.

Indeed, a string of pearls well worth remembering.

April 2019: Peter Bolton

Stanley Mills, Perthshire: Textile Milling in Good and Bad Times.

Peter Bolton's review of Stanley Mills in Perthshire (1784-7) added to the remarkable list of substantial manufacturing enterprises, already brought to our notice, which were initiated at the end of the 18th century and which flourished at a time of revolutions and international war. These manufactories were often located in previously rural locations but possessing a workforce, waterpower and the possibility of transport links to the outside world.

Similar textile operations include Arkwright's Cromford Mill (1783), Greg's Quarry Bank Mill (1784), Dale's New Lanark (1786) and Catrine (1787) Mills. Other more local examples are the Stone Pipe Company at Guiting Power and the Parkes, Crompton and Brookhouse worsted spinning mill in Warwick.

Stanley Mills, whose sheer scale still astounds the visitor, are located some 5 miles North of Perth in pastoral countryside on the banks of the River Tay. The river initially supplied both power and transport. The former later came from a gas engine but steam was never used at Stanley.

It is strange that a cotton mill was established in the relatively dry climate of eastern Scotland compared with one on the island of Arran which enjoyed five times the rainfall. Furthermore, the nearest east coast port, Glasgow, was at least a five-day journey for the mule trains bringing raw materials in the early days.

As with many other enterprises in the early days of the Industrial Revolution, Stanley Mills owed its existence to an aristocratic landowner seeking to improve the return on his capital. The Fourth Duke of Athol was such a man. One attempt at diversification, planting spruce trees, failed when the Napoleonic wars ended and with them the demand for such timber.

Another project involved the removal of the village of Old Blair which obstructed the 'tidying up' the landscape around the family castle. The inhabitants were offered land at Stanley where the factory was soon to be established. If the factory should fail, those thrown out of work would be dependant on the ratepayer funded poor law. Since the Duke was the principal rate payer there was an incentive for the project to succeed.

The Duke was not alone in the project. George Dempster, MP for the Perthshire boroughs, had taken the waters at Matlock Spa whilst returning from London and had met Richard Arkwright and visited his mill at Cromford. At the time Arkwright was having his patents challenged and Dempster persuaded him to come to Scotland in retaliation. There he met David Dale of New Lanark. Dempster's interest was not purely commercial; he was concerned at the social upheavals being caused by the highland clearances and sought some means of mitigating the damage.

Investment criteria in the 18th century were very different from today and as described by Peter was gambling with the odds stacked against you, perhaps, not so very different to investing on the stockmarket today. The results were often similarly unfortunate. At Stanley the money ran out by 1800 and the mill was sold off in instalments. Dempster built other mills and one in Sutherland burnt down. In 1813 Dale was bankrupt with debts of £40,000. The post Napoleonic wars years were difficult ones with many business failures and bankruptcies. Richard Arkwright was one of the lucky ones and always managed to get out in time but in those less protected times bankruptcy was accepted as a fact of life.

Returning to the Stanley Mill, the initial workforce was mainly highlanders from Old Blair. Ex agricultural workers with no experience of industry or factory life and their totally different ethos. The training programme was unusual, to say the least. The new workers marched, in highland dress and accompanied by bagpipes, to Arkwright's Cromford Mill for training. Echoes of Bonnie Prince Charlie came to the surprised Cromford workers.

Arkwright was setting new standards for factory organisation and management with separate departments, the head of each selected his own people who in turn had a say in who was to be head. The result: a team that could work together.

The mill workforce was predominantly female and juvenile. The 1834 Factory Act specified a minimum age of nine. There were school facilities, but a 14-hour day left little energy for education. The men took the supervisory roles or those requiring strength and any spare time was occupied with small holdings to help support their families.

Turning to the details of the mill and its location on the river Tay, the fastest flowing river in the UK. Water scarcity never stopped the mill although a rise of only three feet did flood the wheel pits; up to fifty days in a bad year.

A series of pictures showed the present state of the wheel pits and interiors. The buildings had been well laid out with large windows giving good lighting. Iron framing was used but the structure was not fireproof; the original candle lighting must have been a potential hazard until gas lighting was installed. An interesting heating system fed warm air throughout the buildings.

A series of business initiatives and investors kept Stanley Mills afloat when others failed. It was an unlikely survivor, not least as it was never steam-powered. A number of niche markets were developed. Notably webbing for drive belts that were becoming widely adopted as industrialisation spread. Another outlet was for military webbing. Although the demand fluctuated, the British army was active in many parts of the world throughout the Victorian years.

Perhaps the most successful product was the endless, two cm wide tape used in the production of cigarettes.

Indian independence and heavy duties led to a collapse in demand and other new products were needed. These included brake linings and outer casings for hoses. However, nothing could prevent the arrival of man-made fibres and the acrylic revolution was a disaster with production moving out of the UK to Italy, Switzerland and Germany.

In 1989 the Mill finally closed and in 1990 it was subject to vandalism and declared structurally dangerous. However, it has been saved by Scottish Heritage and its restoration has included a variety of domestic accommodation and a museum. An oral history project is an important piece of work being undertaken and former worker's case histories feature in the current displays.

In the last years of the mill's working life many workers came from Poland and Germany and were housed in hostels built nearby.

Stanley Mills deserve to be better known as part of our industrial heritage. Being north of the border is a poor excuse.

May 2019: Alain Foote

Metropolitan Vickers and Trafford Park.

Following a late cancellation by the expected speaker, Alain Foote stepped in with another of his immaculately researched and illustrated reports. This time on the Metropolitan Vickers operations at Trafford Park, Manchester.

The story begins with an American, George Westinghouse, who at the age of 23 took out his first patent for railway air brakes, the foundation of his fame and fortune, and set up the Westinghouse Air Brake Company quickly followed by the Westinghouse Machine Co. and the Westinghouse Electric and Manufacturing Co. where he developed the transformer to the point of commercial use.

In 1889 he set up the Westinghouse Electric Co. Ltd. of London with the substantial capital of £1,500,000 to sell and install Westinghouse products in Great Britain. In 1899, Westinghouse bought 130 acres of land that was part of what was to become the Trafford Park Industrial Estate, the first industrial estate in the world.

The works were planned on a colossal scale and a complete factory laid out for the manufacture of steam and gas engines, steam turbines and every product of electrical engineering. Work started slowly in mid-1900. Westinghouse was dissatisfied with the progress of the British contractors and engaged a Canadian contractor to complete the work in a shorter timescale. Mechanisation and improved practices increased, for example, a bricklayer's output from 500 to 1,500 bricks a day.

The scale of the huge machine shop was well illustrated in a photograph showing a train delivering material inside and dwarfed by its surroundings. Manufacture started in 1902 with over 3,000 employed by the year end.

Trafford Park at that time was open countryside and lacked any housing or amenities. Trafford Park Dwellings was established to build a 'village' for the workforce near to the factory and 700 houses were built by 1904. A unique community was created with its own shops, churches, library, working men's club, police station, clinic, hotel, schools and wash house. In 1914, a works school, the first in the country was established and by 1916 this was attended by 330 apprentices.

By the end of 1914 one third of BW's workforce had enlisted. The armaments produced included shells, bombs, fuses, mine-sweeping paravanes and aircraft magnetos. A Bosch magneto had been salvaged from a crashed Zeppelin and sent to the works where a production line was set up to manufacture these in large numbers. By May 1917 the number of workers had increased to 8000, of whom nearly a third were women. By the end of the war, 3519 men had joined up with 304 losing their lives.

In 1917 a British holding company was formed to buy out the American shareholdings. Finance was provided by the Metropolitan Carriage, Wagon and Finance. However, in 1919 that company, including British Westinghouse, was acquired by Vickers and the British Westinghouse Company became known as the Metropolitan-Vickers Electrical Company.

An example of diversification was the experimental radio station in the research department that became the first Manchester station of the nascent BBC – call sign 2ZY.

The post WW1 decade saw a huge expansion of the facilities at Trafford Park and the beginnings of the consolidation of the electrical industry in Great Britain. The control of M-V passed from Vickers to the International General Electric Company, then Associated Electrical Industries (AEI) was formed, M-V continued to trade as Metropolitan-Vickers but with financial control vested in AEI. A new arrangement for exchange of patent rights and manufacturing information with GE of America was put into place.

The decade also saw plenty of technical and commercial innovation; a 500 kW thermionic valve for the Rugby Radio Station, the first electron microscope and a technical agreement with Russia for turbines (interrupted by a show trial in that paranoid time). Employment at Trafford Park also continued to grow.

The rearmament programme saw a huge new factory built for the new Avro Manchester bomber. Powered by two RR Vulture engines (which proved unsuccessful) the Manchester evolved into the famous Lancaster of which over 1,000 were produced at Trafford Park.

Early in 1937, arising from a Government request for high power valves, M-V made the first radar transmitters for the chain of stations around the coast of Great Britain. Much of equipment, based on these early radar developments, was made in Trafford Park as was a wide variety of other war matériel.

Post war recovery led to much reorganisation, especially for steam turbines and large electrical machinery. The list of activities in the 1950s includes: Automation, Control Gear, Gas & Steam Turbines, Generating Plant, Guided Defence Weapons, Instrumentation, Motors, Nuclear Power, Radio & Electronics, Scientific Apparatus, Switchgear, Traction Equipment and Transformers.

The final part of Alain's presentation was liberally illustrated and full of detailed descriptions of the ground-breaking developments in steam and gas turbine powered electrical generating plant that had been made by M-V.

The company was also involved in the development of aircraft jet engines, especially of the axial flow configuration. Such engines first flew in a Gloster Meteor in November 1943. An M-V Beryl engine was chosen by Donald Campbell for his Bluebird record attempt in 1955. M-V continued turbojet development with the last flight engine design being the F9 Sapphire, the design of which was handed to Armstrong Siddeley in 1947. M-V then concentrated on gas turbines for power and naval propulsion applications. An M-V gas turbine of 1948 was the first ever gas turbine generating set to run in parallel with the British National Grid System. It was installed in the Trafford Park Works Power Station to smooth out peak demands on the local supply.

M-V was also involved with the development of computers and built the first commercial computer to use transistors. It also developed rail traction equipment for diesel electric locomotives, building on its earlier pioneering work in the field.

Transformers, switchgear and scientific instruments continued to be important product lines but, over-optimistic projections by the CEGB in the 1960s led to the eventual consolidation of the UK's electrical industry and the rationalisation of production.

This process continued so that by the turn of the century all activity at Trafford Park had been transferred to other sites with substantial loss of local employment. The iconic main office block was demolished in 2002.

Today, little remains. Only the Trafford Park Hotel, St Antony's Church, some shops and a Heritage Centre where the original foundation stone, two Westinghouse War Memorials and sundry other artefacts serve to remind visitors of former glories.