WARWICKSHIRE Industrial Archaeology Society

WIAS

NEWSLETTER

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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?

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 from Coventry 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 productionising 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?'