WARWICKSHIRE Industrial Archaeology Society

WIAS

NEWSLETTER

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FROM THE CHAIRMAN

Throughout the time that WIAS has been in operation, the monthly meeting has been at the heart of the activities of the Society. Each meeting, of course, often brings a flurry of interest and contributions from members and others who have something to add to the topic covered in the meeting. This was my own experience after the June 2023 meeting on NCJoseph and The Aluminium Works, Stratford upon Avon.

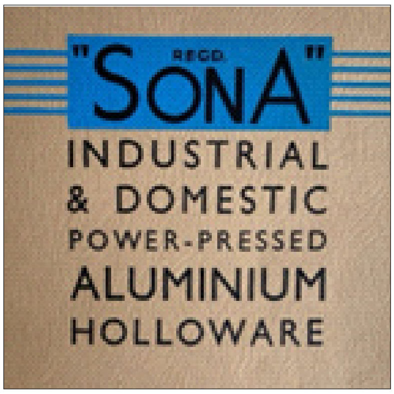
The project had a strong Joseph family interest and there was much talk of whether we should try and produce a publication on the subject for the benefit of the family (and others). Given that so much family information was unearthed, Brian Joseph (grandson of Barney Joseph, one of the founders of the company) decided to progress this idea and took the initiative to produce a book for private circulation.

Coincidentally, an article appeared in the Stratford Herald suggesting a possible re-union of former Joseph employees, an initiative led by Peter Vale-Humphreys. Contacts were made and a re-union was organised and over 40 former employees attended, including 95-year old Ray Handy who had joined the company in 1942. After outlining to the meeting some of the material that Brian and I had discovered about the company, there was an opportunity for individuals to tell their own stories, led by Ray Handy. Several brought along memorabilia, including catalogues and a wonderful collection of photographs of the works in action.

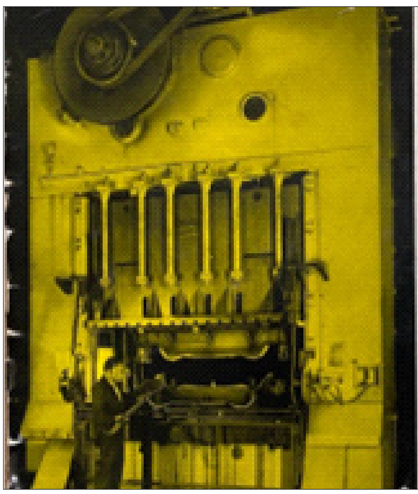
It was a memorable occasion and the camaraderie that had developed via many years of working at Josephs was a pleasure to witness. This inevitably led to a desire to record some of these stories and so we are embarking on an oral history project to try and give a fuller description of the experience of working at the company, and, perhaps – one day – a book for wider distribution may be produced.

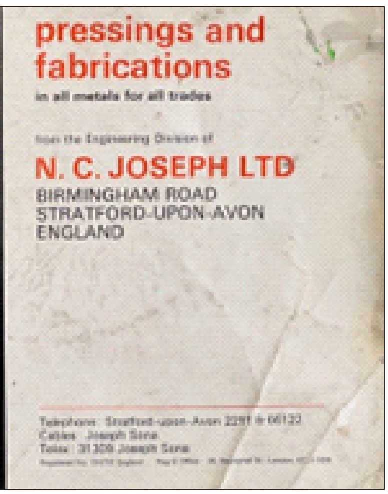
This was followed a fortnight later by a talk given to Stratford Rotary Club and it came as quite a surprise to me that very few of those present had any knowledge of the Joseph firm and its importance to the industrial history of the town. All the premises are now demolished, so no industrial archaeology remains as such, but the industrial heritage is embodied in the products made, the surviving photographs, the memorabilia collected and the personal memories of those who worked there. It is an important story that needed to be told.

So if there is anything in a WIAS meeting that particularly arouses your interest, or is something to which you could add your own knowledge and/or experience, please get in touch. There are probably members of WIAS out there who will share your interest and might even wish to embark on some research together. You never know where it might lead ...



Ray Handy, Brian Joseph & Peter Vale-Humphries at the re-union.





PROGRAMME

14 March (live/hybrid): Terry Merrygold
Sir William Lyons: The Great Opportunist.

11 April (live/hybrid): Mark Davies
The Work of the Chance Heritage Trust.

9 May (live/hybrid): David Daniel
Guns and Cars - BSA's Motoring History.

13 June (live/hybrid):
Celebratory Event for 35 Years of WIAS.

All meetings are on the second Thursday of the month and start at 7.30 pm.

Live/hybrid meetings meetings are held in the **Warwick Prep School Hall CV34 6PL** with a simultaneous delivery online via zoom.

Meeting Reports

December 2023 (zoom): Alan Hill
Milestones in Marine Steam Technology.

For our December meeting, the first of this season's zoom only meetings, we had a fact packed account of the evolution of marine steam power.

Alan began by stating how the advent of steam ships brought continents closer, noting that in 1800 a sailing ship could cross the Atlantic in four to eight weeks whereas by 1850 a steam ship could reliably make the voyage in just two.

The first practical steam powered boat was the *Charlotte Dundas*, designed by William Symington, built in 1803 and powered by a modification of a beam engine. Four years later Robert Fulton built the *Clermont* which is considered the first successful commercial steam powered vessel. With an engine by Boulton and Watt and paddle wheels on each side she operated on the Hudson River in New York.

In 1812 Henry Bell built the *Comet* to operate on the Clyde which she did successfully but all these vessels were operated on canals or calm waters and needed fresh water to feed their boilers. Nevertheless, the potential advantages of steam were clear and several ships were built exploring the new technology. The American built *PS Savannah* crossed the Atlantic in 1819 in 27 1/2 days, using her engines for 85 hours.

It needed the imagination and drive of Brunel to take the next big step. The *SS Great Britain*, at the time the largest ship ever built, was originally planned to have paddle wheels either side but Brunel was persuaded by observing the *SS Archimedes* to abandon the paddle wheel and fit a screw propellor. The engine which was intended to drive the paddle wheels was too slow for a propellor and to gear it up Brunel devised a 3 to 1 giant chain drive which also brought the shaft down to an appropriate level for a propellor.

Early experiments with propellors had shown that, contrary to expectations, a full turn or more of the screw (based on the Archimedes screw pump) was less efficient than simple blades like a windmill. However, early propellors were unreliable with cast iron breaking and fabricated versions shedding blades before the modern phosphor bronze propeller was developed. Wisely most ships still had masts and sails to use when the wind was fair or the engine inoperable.

Alan described how the British Navy took some time to be convinced of the superiority of the screw propellor. In 1845, they set up a trial between two similar ships the *Rattler* and the *Alecto*, the former with a propellor and the *Alecto* with paddle wheels. The *Rattler* won convincingly, towing the *Alecto* backwards at walking pace.

Furthermore, in rough seas with the ship rolling there was a great strain on the shafting as one wheel or the other lifted out of the water and a paddle provided a perfect target for enemy fire. Paddle ships were not entirely superseded as they were very manouverable and continued to be favoured for such as harbour tugs.

Although the steam engine was clearly an important development and represented the future, sailing ships were also developing during the nineteenth century. By the 1870s the tea clippers could achieve 20 knots whereas it wasn't until the 1890s that the average steam ship could do the same.

Not only did the engines and boilers of steam ships take up much of the potential cargo space but storing the coal took even more. The great rivers and lakes of North America provided a better opportunity for development than the open and stormy oceans.

Nevertheless, new forms of engines were designed to keep the centre of gravity as low as possible. One of the most successful was the side lever engine which can be described as an upside-down beam engine. Working pressures were increasing from just 15 to 30 psi which was the limit for the box type boiler and the introduction of more efficient compound engines from the 1850s with high and low pressure cylinders necessitated cylindrical boilers with pressures up to 60 psi. These, of which the archetype was known as the Scotch boiler, were lighter and cheaper than the box type with their plethora of internal stays.

The main difficulty lay in salt water. Clearly ships could not carry sufficient fresh water so some form of condenser was needed to recycle the boiler feed. Very sophisticated condensers using seawater as a coolant were devised to overcome this. Tallow used for sealing and lubrication was another problem not really solved until mineral oils became available.

Other developments included white metal bearings and Siemens Martin steel in 1863 which was more consistent than Bessemer steel.

By 1875 there were 2000 vessels with compound engines and in the 1890s triple and even quadruple expansion engines were built necessitating superheaters and working at pressure up to 100 psi. Alan showed us pictures of truly massive engines.

Alan's next 'milestone' was Charles Parsons' invention of the steam turbine in 1884. Realising the potential for marine use Parsons had built the *Turbinia* which achieved 34 Knots in trials. It had three turbines each driving a shaft with three propellors. Parsons had problems with cavitation but nevertheless *Turbinia* stole the show at the 1897 Diamond Jubilee fleet review steaming at high speed up and down the ranks of anchored navy ships.

Initially the turbines were no more efficient but they took a lot less space compared to the massive compound engines and we were shown an impressive slide comparing a turbine set with a compound reciprocating engine of equivalent horsepower. Now rather than gearing up the engine output it was necessary to reduce the speed and massive sets of reduction gears became standard.

Coal as fuel had been normal since the first steam powered vessel. However, it required much work to take it aboard and store it as well as hard physical labour in stoking the boilers. Just cleaning down after bunkering as much as 6000 tons was a major undertaking. Once oil had been discovered ship owners were quick to see the advantages, smaller crews were needed and refueling was not only cleaner but much quicker. By the beginning of World War I the British navy had completely converted.

This account of the developments of marine steam development through the nineteenth and into the twentieth century largely by British engineers was illustrated by numerous splendid slides many portraying the huge and handsome engines to delight the audience.

January 2024 (zoom): Elizabeth Thomson
Brickmaking and the Development of Canals in the Black Country 1760 - 1870.

Elizabeth started by defining the Black Country as the four boroughs of Wolverhampton, Walsall, Sandwell and Dudley which by the late 18th century included some 90 miles of canals.

The canals are the best surviving evidence of industrial development of the two centuries since 1760 though some of the canals have been filled-in since the 1960s a great deal remains.

The first of these was Brindley's line from The Staffs and Worcester to the centre of Birmingham which needed 21 locks to climb up to Wolverhampton. Each lock called for 100 thousand bricks Thus with the bridges, canal walls and paving many millions of bricks and were required and there was a constant need to find suitable clay. A typical bridge took 25 thousand bricks and some 370 accommodation bridges were built, although only 17 original bridges remain today. It has been calculated that the canal walls for 80 miles of canal needed 47 million bricks. Altogether a prodigious number were wanted.

Although much of the Birmingham canal system went through clay soil not all of it was suitable for brickmaking or for puddling the bed of the canal. We were shown a quotation which illustrated this -- "Baker, the brickmaker then made several holes in the setting out but found no clay worth getting."

Elizabeth moved on to describe how the construction of the canals was organised with the engineer, Brindley, in the case of the Birmingham Canal, delegating responsibility to a Clerk of Works, or as they would be known later, the Resident Engineer, for the day to day organisation including appointing contractors for the actual construction. In addition, there were administrators working under the canal committee dealing with the necessary paperwork.

Contemporary sources which Elizabeth had used for her PhD included historic maps, canal company records, newspaper advertisements and particularly the extensive notebooks of John Green who was the Clerk of Works on the Staffs and Worcester Canal appointed by James Brindley to work under John Baker, a member of the canal company committee.

An example of a newspaper advertisement shown was for "a brickmaker that can make five hundred thousand, or a million bricks." Other contracts were for cutting and excavating the canal, puddling the bed, constructing the locks and making the gates. Although in the earlier phases of canal construction while the excavation and lining of the canal was by contract the construction of the locks and bridges was often by direct labour under the canal company itself.

Brickmaking was manual and always seasonal. The clay was dug or 'won' before the beginning of November, worked before the 1st of February. This involved softening the clay by treading it out in pits either by human feet or with animals and removing any stones or other rubbish. The bricks needed to be formed before March 1 and then they were allowed to be dry before being fired in kilns or clamps. It was illegal to fire bricks outside this period although this was commonly ignored. Building with the bricks needed to be between April and September as good weather was essential to allow the lime mortar to set. Of every 20 thousand bricks made some one thousand would be rejected as unsuitable and constant quality control was needed.

The whole process of canal construction was heavily dependent on the weather. Even transporting bricks to where they were needed was difficult on muddy tracks and if possible, this could be done by boat as soon as a length of canal was complete. A typical lock needed some 13 boatloads of bricks.

The canal acts gave the canal companies the right to enter and occupy "any land except parks, orchards and gardens." But they had to make good any land which had been used for brickmaking including leveling it off and removing all clamps and kilns.

Besides the great quantities of clay required for bricks and puddling, huge quantities of coal were needed to fire the bricks. Fortunately for most of the Birmingham canals coal could be mined close by and any section of the canal which was completed could be used to convey it to the brickworks which were often sited close to the canal line to make this convenient.

In addition to the canal structures there were many buildings to be constructed, also requiring bricks, for example, lock keepers' cottages and although many of these have been lost, we were shown a picture of a good example, listed Grade 2, on the Walsall Canal. Other contemporary examples of brick buildings we were shown were a fine bonded warehouse at Stourbridge and the butter and cheese warehouse at Wolverhampton.

From the 1850s blue bricks were made. These were produced from Etruria marl, fired to a much higher temperature than common bricks so that they vitrified. They were used in the Netherton tunnel and J R Walker, the engineer, required them to be tested. The crushing strength varied from 14 to 31 tons.

At about the same time brickmakers began to stamp their product with the name of the company and this encourages modern brick collectors. Later our chairman admitted that he was one!

Information about the brickmakers themselves was limited. The seasonal nature of the job made it attractive to itinerant workers. An early source was 'The London Tradesman' published in 1747. "The Brick-Makers Business is by some not reckoned a very reputable employment; especially to be Journeymen, if they can properly be so called."

From the 1840s factory inspectors' reports give some information. Often whole families would work at the trade with children as young as four being employed. We were shown a photograph of Nellie Coleman making a brick when she was 64. Conditions had barely changed between 1920 and the 1980s.

Elizabeth had been contacted by an individual whose grandmother, Sarah Jane Pratt, had been a brickmaker in Dudley at the Cricket Field Brickworks and we were shown a photograph of her. As part of the Forging Ahead development at the Black Country Living Museum, which Elizabeth was involved in, they were building a replica brickworks based on the Cricket Field brickworks and intended to use the example of Sarah Pratt to depict the work there.

The final slide showed a brick stamped 'Utopia', this had been made by the Aldridge Brick and Tile Co. these bricks can be found all over the West Midlands and were made after WWI when there was hope for a better world, a utopia.

February 2024 (zoom): David Skillen
Starfish, Stripes, Decoys and Dummies. Camouflage and Deception at War.

Camouflage and Deception from the Trojan Horse to Desert Storm was how David subtitled his talk. He started by challenging us to spot the sniper hidden in a rocky hole and I imagine that nobody watching his slide could do that until he focused in. He then showed us a Potoo bird looking exactly like a piece of tree and trompe l'oeil from Chatsworth of violin hanging on a door, a most convincing painting. The American magicians, Pen and Teller came next and David recommended that we seek out their well-known vanishing chicken trick. All this to emphasise that deception comes in many forms

David's first example from history was the Trojan Horse, around 1180 BC, which the Greeks used to fool the Trojans that they had abandoned their siege when they had done no such thing. A big jump took us to the American Civil War when the Confederate General John B Magruder with just 10 thousand troops fooled the Union General McClellan, with a force of 120 thousand, that he had many more by marching his troops in and out of view several times and lighting numerous camp fires. The cautious McClellan withdrew. The super tall hats of soldiers; shakoes and bearskins, were intended, and no doubt succeeded, in frightening their opponents that they were much bigger men than they were. On the other hand, did bright red uniforms make them easier targets?

In World War I fake dead trees were used to hide observers when placed in 'no man's land'; one must shudder at the terror of an observer hidden inside. On a lighter note, we had a slide of a fake cactus tree being used to hide a phone mast, very effectively.

Returning to WWI there were examples of deceptive paint used to make aircraft less visible. Q-ships were devised to counter U-boats. These were small merchant ships with hidden guns. U-boats would not think they were worth using an expensive torpedo to destroy but would surface and expect to sink them with gunfire. The Q-ship would drop its disguise and use its own heavier guns to destroy the U-boat. They were quite successful but expensive.

The artist Norman Wilkinson devised a system of 'dazzle painting' which was extensively used to confuse a U boat commander as to which way a ship was heading and its speed in the same way as a zebra uses its stripes to confuse a predator. Today, prototype cars are often painted with complicated black and white patterns to confuse their shape to interested competitors.

Some of the pillboxes built to resist invasion in 1940 were camouflaged by making them look like innocent buildings. One slide showed a most convincing derelict Scottish bothy with fake stone walls , a chimney and a black panel to represent a doorway. The actual entrance was on the other side. Efforts were made to disguise airfields by painting fake winding roads on the runways. In the neighbourhood of possible and vulnerable targets extensive decoys were created using lights to confuse incoming raiders and artificial fires which could be lit at very short notice to represent bomb damage and mislead enemy bombers. Whole artificial buildings were constructed and painted to mislead.

Before the decisive Battle of Alamein in 1942 all sorts of fake distractions were made. Tents were created to cover field guns and make them look like lorries and canvas covered folding frames fitted over tanks which again made them appear to be lorries. It was realised that the best colour for reconnaissance aircraft which did their best work early in the morning and at dusk, when the shadows were long, was pink! Night flying aircraft were best in light grey not black.

Perhaps the most famous of all the distractions was 'The man who never was' codenamed 'Operation Mincemeat' The body of a drowned man was released where he would be washed up on a Spanish beach. He had been given a totally false but convincing identity as Captain William Martin RM and was carrying a brief case with fake papers that indicated that the Allied forces intended to invade Greece when they were actually going to invade Sicily. German officials in Spain, which was nominally neutral, were fooled by this and several German divisions were transferred to Greece reducing the garrison in Sicily.

Next David turned to what was perhaps the most important and effective deception of the whole war, which emphasised his point that it was vital to know what the enemy are thinking. Hitler was well aware that the allies would be invading across the Channel. However, he was sure that they would be landing near Calais, opposite Kent, whereas in fact they were planning to land on the Normandy beaches, 150 miles further West. To maintain the German's belief a fake army was created in Kent with artificial tanks assembled, not forgetting artificial tank tracks in the fields. They even made full size rubber tanks that could be inflated. Large numbers of fake radio message were transmitted, knowing that the Germans would be able to break the code. A double agent known as Garbo who had built up a convincing story of forces assembling in Kent told the Germans, as the landings began in Normandy, that they were just a diversion and that the real invasion would be in the Pas de Calais. So, convinced of this, the Germans kept their 15th army ready for an assault near Calais for a fortnight after the actual landings rather than reinforcing their 7th army in Normandy.

In Vietnam the Americans added a fake nose to their superior fighters which made them look like and behave like bombers which the North Vietnamese attacked, a mistake that lost them half their own planes in a few minutes. In Iraq the trick of dressing tanks to make them look like lorries was used again.

Needless to say, the art of deception continues and David gave many examples. In the natural world there are fish that appear to be swimming backwards and fish, particularly sharks, are shaded from dark to light to help conceal them. Spy planes are designed to be invisible to radar. Manchester United tried a grey strip to distract their opponents and house agents use slightly smaller furniture to make rooms look bigger.

David gave us much food for thought. From the Trojan Horse to Desert Storm the world of camouflage is much larger than we had realised.