

**BROSELEY
LOCAL HISTORY
SOCIETY**



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EDITORIAL

Broseley Local History Society

The Society was originally formed as the Wilkinson Society in 1972 and was renamed in 1997 to reflect its main purpose:

‘the research, preservation and promotion of Broseley’s unique heritage’.

Meetings are held on the first Wednesday of each month beginning at 7.30 pm, at Broseley Social Club; and annual events include a summer outing, an autumn walk and a winter dinner. Members receive a quarterly newsletter and an annual journal. The Society’s collection of artefacts is at present stored at the IGMT Tile Museum at Jackfield.

The Society has a web site which contains information about Broseley, copies of the newsletter and articles from previous journals. This can be found at www.broseley.org.uk

The Journal

In this issue we present three articles with a Broseley area background, a fourth based on the annual Wilkinson lecture, and a comprehensive 30 year index. The articles represent ongoing researches and reminiscences of the members of our Society and others, and we are grateful to the individual contributors. Our thanks to Steve Dewhirst for designing and typesetting this issue.

Contributions for the next issue of the Journal would be welcome and should be sent by 31 August 2004 to the Editor, Neil Clarke, Cranleigh, Wellington Road, Little Wenlock, TF6 5BH.

The Unfortunate Barge Builder

by Richard Barker

A freak accident in the library catalogue found a tract by Robert Barker, entitled “The Unfortunate Shipwright: or, cruel captain. Being a faithful narrative of the unparalleled sufferings of Robert Barker, late carpenter on board the *Thetis* snow of Bristol, in a voyage to the coast of Guinea and Antigua”, published in London in 1758. This was not the *Thetis* I was looking for (an unlucky name for a ship, if ever there was one), and who would have guessed that it opens with:-

“I was born near the borough of Wiggan in the county of Lancaster, and registered in that parish church on the 12th day of January 1729, and was brought up in the said parish, or near thereunto, till the age of fourteen, then bound apprentice unto Thomas Holland of Liverpool, shipwright, and served my time in the aforesaid county; which being expired I worked awhile with Edward Nash, barge builder at Broasely in the county of Salop, and afterwards a considerable time with John Harrod, barge builder at Shrewsbury, from whence I went to Bristol, and there entered on board the *Tryal*, captain Abraham Sanders, in a voyage to the coast of Guinea, St Christopher’s [West Indies] and Virginia, and back to Bristol, which we completed in the year 1751. After such voyage I returned to Lancashire, and worked at Tarlaton, near Preston, on the river Douglas, in the employment of Mr Alexander Lee of Wiggan, chief proprietor of that navigation, where I remained till July 1754, then went to Bristol again, and then fell into work under Mr Osborn in the Limekiln dock on the *Thetis* snow [a two-masted brig with the distinction of a gaff sail set on a jack-spar behind the mainmast] whereof Fitzherbert was commander, the said Robert Wabshutt chief mate, and the said John Roberts doctor, bound on a voyage to Andony on the coast of Guinea for slaves, and from thence to Antigua, and back to Bristol; which began my misfortune. [Robinson Crusoe also came to grief on a slaving trip, of course, though from Brazil; he too became a boatbuilder, though with a disaster to his credit, perhaps confirming that in Defoe’s time launching of ships was more conspicuously problematic than we see in glossy images today; besides eventually suffering a plague of cats]

The snow being finished, I agreed with Mr William Blake, who was purser and part owner, to proceed the voyage in her as carpenter, at the

rate of 4*l.* per month, with the privilege of an hogshead of sugar or a punshion of rum from the West Indies.”

Our shipwright joined the snow, of something less than 100 tons, at Pill, and found that she was laden down to within two feet eight inches of the gunwale: “this staggered me much” as he puts it. Things began to go seriously awry in Andony, and our hero became the victim of one Richardson, being obliged to “strip into buff”, while Richardson issued a command to “... cut one of the cables, slip the other, loose the topsails and hoist Jolly Roger”. To cut a long story short, he obviously survived the voyage, with a yarn to tell.

This gives us three names for barge builders in Shropshire, but the striking feature is the employment of a fully-fledged maritime shipwright in Broseley and Shrewsbury, recruited from so far away. Was there perhaps a family connection, or how was he recruited ? And which yard was it in “Broasely” - Jackfield, or more loosely the other recorded sites at Bower Yard, Benthall or Coalport ? (Broseley is the recorded building place for three vessels 1790-1825, Jackfield for three in the 1860s). We might also note that the records, such as they are, do not start to record carvel construction in Shropshire before the nineteenth century - 1810 is the earliest explicit reference I have seen, and carvel would certainly have been the form used for ocean-going ships in Bristol about 1750. Even if Robert Barker had learned clench-building in Liverpool, it would have been markedly different from the Shropshire form, developed for the shallow river, with a flat carvel floor and some very strange planking transitions, as finally revealed in the Lydney trow.

The extant official and other records that had come to my hand identified by name only a hundred Shropshire-built barges, and only a couple of dozen local owners. The bargebuilders fared even worse: a mere seven, of whom one was a resident of Tewkesbury and may actually have been the first owner rather than the builder. Thus

1790	John Jones, at Broseley (later a barge-owner)
1797	Edward Broadfield, at Bridgnorth
1810	Francis Stoad (possibly Stodd ?), at Benthall
1817	Humphrey Brown (of Tewkesbury), at Bridgnorth
1819	F. S. Gother, at Bower Yard
1823, 1824	Francis Oakes, at Bridgnorth
1839	James Williams, at Ironbridge



View from the Severn Warehouse (Anon.), showing a boat yard at Bower Yard (IGMT Collection)

Of the two new local names, John Harrod may possibly be a corruption of Harwood, on the basis that Hulbert, *The history and description of the County of Shropshire*, 1837, records James and Thomas Harwood as barge owners in Shrewsbury.

Colin Green (*Severn Traders*, 1999, p170) records many more builders, drawing partly on Grahame Farr's materials. For the Gorge: Francis, Samuel and Edward Gother; Robert, John and Edward Jones; Thomas and Francis Stodd; John Easthope, John Orwell, John Madelin, Thomas Lloyd, Thomas Beard, Peter Grice, William Davis,

For earlier articles and correspondence on Severn barges and boat building in the Ironbridge Gorge, see pp27-32. Ed.

Today Broseley - Tomorrow the World

by David Lake

[In this edited version of the 2003 Annual Wilkinson lecture, David draws on the Janet Butler archive at Coalbrookdale to illustrate the character of John Wilkinson, his relatives and associates]

This obituary appeared in Aris's Birmingham Gazette of July 18th 1808: "Thursday, at his works at Bradley, in the County of Staffordshire, at the advanced age of eighty years, John Wilkinson Esq. Few men are more entitled to the praise and gratitude of his country, for unwearied and successful exertions in raising that important branch of our national production, the iron trade, to a height unknown until that period that constituted the zenith of his useful powers. Frugal, though not parsimonious, he acquired an immense fortune, presenting to society the satisfactory testimony that, in this free and happy country, industry and prosperity go hand in hand. The loss of such a man must be great indeed..."

Early Life

John Wilkinson was born on the cart on which his mother was going to Workington Fair - a portent perhaps of that extraordinary mobility that was a characteristic of his life. The family lived at Little Clifton, where his father Isaac combined farming with work at the local blast furnace. In 1740 when John was twelve they moved to Backbarrow, where Isaac worked at the substantial Backbarrow Furnace, commenting "They paid me 12s, I was content. They raised me to 14s, I did not ask them for it; they went on to 16s and to 18s, I never asked them for the advance. They next gave me a guinea a week and I said to myself, if I am worth a guinea a week to you I am worth more to myself. So I left them." Isaac seems to have been clever but unpredictable. The Backbarrow Company was dismayed - "...Wilkinson has served the Company and got above £2000 in their Service and is now as fully employed as ever he has been; but notwithstanding this he has contracted for several shares in a new Work which is setting up in Opposition to Backbarrow Furnace and it is presumed that He intends to make the same kind of Wares there, and to serve the Backbarrow Company also, altho' the Articles were intended to restrain him from Working for any other Company but they were drawn by a man not well skilled in business of that kind..." Young John must have had plenty to think about, technically and commercially. He was a pupil at Kendal Academy, a Dissenting

Academy where the progressive curriculum included natural science and modern languages.

When John was nineteen in 1747 his father took over the furnace at Lindale and experimented with the local peat as fuel. It did not work, and perhaps consequentially in the following year John took himself to Shropshire, where Abraham Darby I had pioneered the more successful smelting of iron with coke. In 1752 Willey Estate records show a John Wilkinson as buying their coal. Meanwhile in 1751 court records list Isaac's suing against counterfeiting of the box irons he manufactured and claimed to have invented; he seems to have been rather inclined to resort to litigation.

Bersham, Willey and Bradley

Ford and Goldney of Coalbrookdale importance had leased the Bersham Furnace for 21 years from 1733, again working with coke. On the expiry of their lease Isaac moved again and took over Bersham, living at Plas Grono, a substantial house, birthplace of Elihu Yale of later American fame. John married the heiress Ann Maudsley but was distraught when in 1756 she died in childbirth. It was at this time that he was first described as "Ironmaster", and he provided the technical expertise in a partnership with Ferriday and Blakeway which got the Old Willey furnace back into blast. Isaac meanwhile took out Patent Number 713 for iron cylinder bellows for producing blast. His inventiveness continued with his Patent 723 for the foundry use of moulding boxes – "...the said Isaac Wilkinson, representing that I had by great study, trouble, industry and repeated and expensive experiments, found out and invented a new Method of invention for casting of pieces of cannon, fire engines, cylinders, pipes and sugar rolls and other such-like instruments in dried sand in iron boxes made for that purpose whereby the said pieces of cannon, fire engines, cylinders, pipes and sugar rolls or other such-like instruments will be made and cast..." John was perhaps less of an enthusiast for the patent process, remarking "There is more difficulty in practice than in drawing up a specification."

Sadly, despite his ability to produce such important innovations, Isaac went bankrupt at Bersham in 1761 and moved away to Bristol, but success eluded him. "I, Isaac Wilkinson of the Parish of St James in the City of Bristol, Ironmaster in consequence of the agreement of 31st January 1776 between Thomas Guest of Dowlais Furnace, Thomas Whitehouse, and Isaac Wilkinson... refer to the advertisement of June 26th 1776 that the partnership between Thomas Guest, Isaac Wilkinson and Thomas Whitehouse for the making and casting of pig iron at Boyd River Furnace in the County of Gloucester stood absolutely dissolved,

to which advertisement the names of Thomas Whitehouse and Isaac Wilkinson appeared to be subscribed. And this deponent hereby testifies that the said advertisements have been inserted without the knowledge or consent of this deponent..." John's understanding of managerial methods must have been broadened by his closeness to Isaac's misfortunes.

John and his brother William took over and successfully ran Bersham, galling perhaps to their father, though his daughter Mary's marriage to Dr Joseph Priestley must have been gratifying. At Bersham William had a junior role, which would not have been inappropriate as he was ten years his brother's junior and had little of his experience and little of his genius; but this could have been the start of William's embitterment. "William Wilkinson's complaint about John Wilkinson and Bersham - J. Wilkinson did apply and proposed to him to become a partner with him in the said Ironworks, the Capital to consist of £4211-6-9d, W. Wilkinson to have 1/8th, contributing £526-8-4d, J. Wilkinson to have 7/8th, contributing £3684-18-5d J.W transacted a certain part of the business of the partnership from 1774 down to this time, 1795, and received for his trouble £100p.a. W.W. who employed the whole of his time transacting the business of the partnership received a salary of £50p.a. W.W. went abroad in 1777, ceasing to manage Bersham. J.W. kept the accounts in such a way as to diminish the share W.W. was entitled to in the profit of the partnership."

John's manager at Bersham was Gilbert Gilpin, no doubt carefully chosen and with an easy relationship with John, but still given a closeness of control made possible by the power of John's memory. "John Wilkinson to Mr G Gilpin, Bersham. A demand is made on me for 10 Barrels Gunpowder - this I suppose is for that powder which lay so long unknown at the low crane. Who had it? and paid? and at what price? What account has paid it? or where am I to enquire for this demand being right? How did this powder answer? and which is best, this or Mr Wakefield's?... I shall want a gun or two bored in a similar manner from a nine foot leader, to fit a sphere or round ball, to do this from an old or waste gun.... it will require the bore enlarged in diameter to procure the curve wanted - I suppose Charles will find no difficulty in doing this - tho' he did in the wide parallel grooves.... For such guns new shot will be wanted made from gray metal - Hammered or round surface as in France or abroad.... J.W. N.B. the less taken out of the guns that are rebored in this way the better that it will not weaken them too much."

"John Wilkinson to Gilbert Gilpin - I note your intention of reform

among the Smiths - the attempt is proper and I hope you will succeed - the behaviour of the parents to the Welsh children in taking them almost by force is very unaccountable. They were some of them here on Sunday, and being asked what were their reasons they had none, but mentioned some letter that had made them all join in taking this step. I wish you would inform R. Burton that I wish he would be without three men who have returned in so scandalous a manner and have spent their time and money upon such an errand. Such fools to their children cannot be necessary in any of my concerns..."

"Gilbert Gilpin to J.Wilkinson, Castlehead. Sir, The pig iron off The Recovery for Tomlinson & Co was 41 tons short weight, we note the rest of your letter of 18th inst. The bar iron which we receive from Bradley is very bad. In screwing one of the bottoms onto the Pary's mine company's distills we broke twelve screws out of six and twenty which were made of that iron. The iron not being strong enough to screw these large distills tight together, our people say they are not able to make a good joint....I am Sir, Your humble servant, Gilbert Gilpin. - Sometime ago you promised me Ward's Algebra. I left it in the office at Castlehead, and my father can bring it."

In 1763 at thirty-five John married again, and again to a lady of some fortune - Mary Lee of Wroxeter, sister-in-law of Edward Blakeway of the Willey partnership. The partnership was moving on also, to the building of New Willey Furnace. Here John had his first opportunity to design his ironworks on a greenfield site, leased from the Willey Estate with the rather ahead-of-its-time condition that at the end of the lease the site was to be restored to a condition suitable for agriculture.

The mineral wealth in coal and ironstone of the area of Staffordshire around Bilston had long been recognised, but it lacked the waterpower needed to blow a blast furnace. John saw the possibility of using a Newcomen engine to recirculate water and thus indirectly blow a furnace. In 1766 he bought Bradley Manor and built the 'mother furnace' of what became the Black Country. W.A. Smith says "It is not without significance that J. W's first manager at Bradley, John Threlkeld, was recruited from a nearby glasshouse, then in decline... he thus had a manager who was conversant with the use of coke in a furnace, furnace procedure, and an acquaintance with the properties of slag. He would not however have been able to supply the blast required to smelt successfully with coke. This lack of blast was remedied by Wilkinson when he applied a Newcomen engine, known as Topsy-Turvey, to work iron bellows patented by his father in 1757. J.W. was producing coke-smelted pig iron, selling some to Bromford Forge - the

indications are that by this time J.W. had succeeded in reducing silicon to an acceptable level for the forge. The possibility is that he arrived by accident at an approximation to hot blast.” Birch, in ‘British Iron and Steel 1784-1870’, said “The iron made at Bradley is almost entirely made into ironware and plates, which seems to me the best proof of its quality. In August 1802 there are 20 reverberatory furnaces in the works of which 14 are puddling furnaces, 2 are reheating furnaces, 4 are balling furnaces.... Bradley is, in my opinion, the foremost works in England.”

On the 5th December 1766, while building at Bradley, John was thinking about selling his increasing output and writing to John Florry of Birmingham – “Sir... As I have not the pleasure of being acquainted with Mr Bolton my writing to him on the Business you have been so kind as to recommend me in would not in my opinion have that weight as your application on my behalf, for any Castings he may have application for. I should have a particular pleasure in doing business for a gentleman of such distinguished merit.”

With John’s increasing power, and probably also with the ageing of his partners at New Willey, in 1773 the following advertisement was published – “To be sold at The Crown at Broseley in the County of Salop on the 2nd day of June next at a meeting there to be held of all the proprietors of the said Works. All the property of The Willey Company in the Ironworks at New Willey in the County of Salop consisting of Fire Engines, Cylinders, Pipes, Cast Wares, Cast Iron, Wrought Iron and Utensils proper to Iron Manufacturing etc etc.” John bought “all the property of The Willey Company” and so had to control Bersham, Willey and Bradley - no mean task.

The development of the steam engine

In 1774 John patented his very difficult but successful method of boring cannon from the solid casting. His reservations about the patent process must have been reinforced when his patent was later overturned on the grounds that the power given by such a monopoly was against the public interest. It could be that problems in the field of armaments increased his concentration on steam engine work On the 17th August 1775 he wrote to James Watt at Soho, with strategic vision, determination, and humour ! – “I wish to do all in the best manner - and to start fair. Let us only succeed well in these first Engines, particularly in mine - and I will venture to promise You more Orders than will be executed in due time. Am glad you think the Cylinder for Ms Bentley & Co will do. I am preparing a Machine in the horizontal Way to finish them with greater truth - if that will not answer



*The site of the New Willey Ironworks (S. Dewhirst)
The building to the left may have housed the Watt blowing engine*

a perpendicular One shall be tryd. In short nothing shall be wanting that is in my way, which can promote and facilitate your Engine. Our time in this World (at best) is but short - & we must be busy if you intend that all the Engines in this Kingdom shall be put right in our Day. I have had some thoughts on this Matter, and am of Opinion that if you dare undertake the Drawings I will provide the Castings. Practice will make Us perfect - and a Score of Engines one Year hence will be dismissed with more Ease, than One at present."

So in April 1776 James Watt was able to tell J. Smeaton "Mr Wilkinson has improved the art of boring cylinders, so that I promise upon a 72" cylinder being not further distant from absolute truth than the thickness of a thin sixpence in the worst part." The first Boulton & Watt pumping engine was installed at Bloomfield Colliery in 1776. Coincidentally the first Newcomen engine had been built not far away at Coneycgre in 1712.

From John's letters to Boulton & Watt it would seem that he served as their development department. "Broseley. We have had our engine here all to pieces again. The pasteboard in the joints of the inner and outer

nozzles - at the joint under the Copper Bottom, as also the outer joint between Cylinder and Bottom was in some parts totally destroyed. We are now on again pretty well.”

”Re problems with the engine at Broseley.... we think our great fault now is want of proper Condensation. T.Vickers is almost sick of it. My ejaculations have been bordering often on a Curse! But I keep up the spirits by remarking what a fund of experience they get under these difficulties.”

“Re experiment on the Battering Ram or Devill. I am glad to find you have hit upon a good Method to open and shut the Regulator suitable to that kind of working in a reciprocating Engine - that Motion well regulated will open a large Field for small Engines.”

”I am convinced long condensers - whatever thickness the metal may be - will answer best, by the injection being as near as possible to the cylinder.”

“These last rains have filled Willey Pool and I expect we shall not want Water again this Year. Our new Engine on this Acct does not move so fast as intended - We follow it now as best suits other Matters.”

It must have been as a consequence of the role John was playing in the development of the new engine that Boulton & Watt wrote to him on 17th July 1777 with their proposals regarding his erection of engines for his own use “upon payment of one shilling yearly when demanded” - very different from Matthew Boulton's lucrative but unpopular premium levied upon other customers. The success of the new engine was part of a pattern of success for John. The platway from New Willey to Willey Wharf on the River Severn was completed, and John's Broseley residence was “The Lawns”, a big and beautiful house next door to “The Mint” which handled his own currency, proof indeed of his financial strength.

France and beyond

Unsurprisingly, French interest in our new technology was intense, and Marchand de la Houliere, reporting directly to Louis XVI, made an offer of a well-paid role in France to John, whose reply was that he had too much to do here, that he would not have entire confidence of actually being paid, but that his brother might feel able to accept a generous offer. This proved to be the case, with William's salary to be at the direct expense of Louis XVI. “Wilkinson to be paid 120,000 livre for two years, and paid 1000 livre a month for lodgings and subsistence. If Wilkinson wishes to carry on any business deals of his own he may follow them up, and if they require his absence he will choose a time when the shortest possible absence will do no harm to the

operations he is charged with; if that is done nothing will be taken off his expenses." So in 1777 William left Bersham for France, where the requirement was to raise the quality of French cannon to that achieved in England by John. After a time working at an existing ironworks at Indret, William was not able to achieve this and it was decided that a new ironworks based on English technology had to be built. The King's Royal Cannon Foundry was built to William's design at Le Creusot, while Ignace de Wendel was the King's man in charge of the project.

The French had probably thought that the name Wilkinson was a sufficient guarantee of success, but this proved to be optimistic. A Boulton & Watt engine was purchased to provide blast and Matthew and James visited Le Creusot to check that the installation would be successful. The blast proved more than adequate; the furnace lining specified by William melting as fast as the charge. Even after the rectification of such embarrassing problems the cannons still burst, and William's relationship with de Wendel deteriorated. The King had other problems as the French Revolution drew near. William returned to England but kept up an affable but self-justifying correspondence with friends at Le Creusot, where the blast cylinder, with "Wilkinson" cast in relief, still stands in the courtyard of what was the engineers' hotel.

Boulton & Watt's engine trade, with John's assistance, was now taking on a global dimension. Jenny Uglow, in 'Lunar Men', notes letters from Soho to Aix-en-Provence, Altona, Augsburg, Berlin, Bordeaux, Breslau, Cadiz, Dresden, Frankfurt, Geneva, Ghent, The Hague, Hamburg, Hanover, Iserlohn, Konigsberg, Leghorn, Leipzig, Liege, Lyons, Marseilles, Nancy, Naples, Nuremberg, Orleans, Riga, Rotterdam, Smyrna, Vienna and Wesel.

Expanding interests in England and Wales

With John's purchase in 1778 of land for a great house at Castlehead, a place of evidently happy boyhood memories, his empire became even more far-flung, and even his remarkable ability to manage and travel as though distance hardly existed must have been thoroughly tested. Jenny Uglow records the work of Erasmus Darwin and other contemporaries in speeding up and improving the comfort of coach travel, of which John, so close to the Lunar Society, would have taken advantage. Mary Wilkinson was installed as the mistress of Castlehead, and John was to a degree the family man – "Bersham 1st August 1779. John Wilkinson to James Stockdale. My daughter is now at Shrewsbury - has some thoughts of going to France if proper company offers - but there are now so many difficulties that it's much if she can get away this year. Mrs W is with me here for her Summer Jaunt !"

In 1780 John was building his new ironworks at Snedshill. He wrote to his fellow Shropshire ironmaster "John Wilkinson, Castlehead to R. Reynolds, Ketley. Aug 28th 1785.... this publication insinuates that I am able to make 10,000 tons annually, and at £ 11 per ton. I have replied that I have not an expectation in my day of making bars so low as to deliver them at Stourport for £14 - or that the quantity I may like to see made myself at my own Works will exceed 1/4 of such annual amount. Upon the subject of Coals which I understand is rated very low in his paper I give Mr Gibbons my opinion that those we use for coak upon an average cost us 5/- per ton rather than 2/6d, or double what is stated in fact to be our Rate.

I do not like these publications - I had much rather spend my time in making of Iron, than in writing about it. We are misrepresented to the Public, and the different Puffs upon our imaginary profits will I doubt injure the Cause with the Administration.

However, as the Irish propositions appear to be at an end, it is to be hoped that Matters will rest where they are and that every Man will be permitted to pursue his Business without further Regulations on the part of the Government. If they do take it in hand to make any I fear it will be for the worse. My wish is - that they may let us alone .

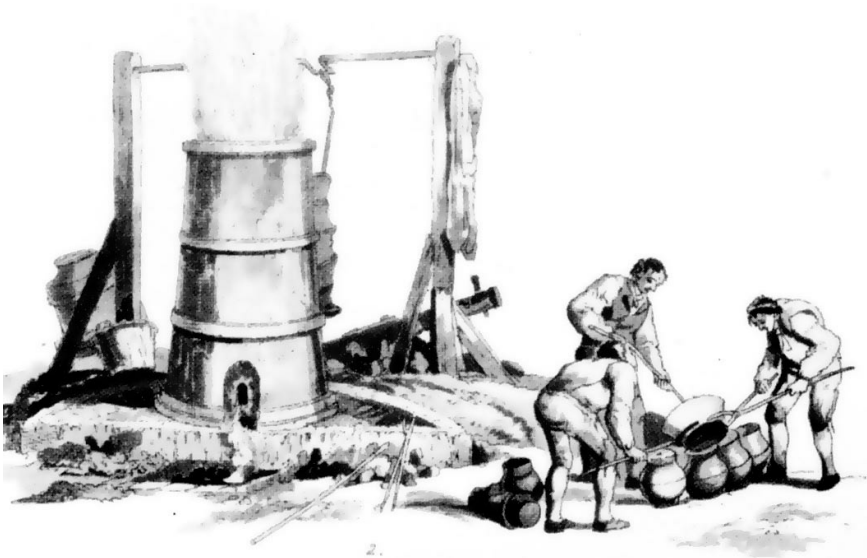
(Hope to be in Shropshire in first week in October) Yours, John Wilkinson."

The usually very cautious James Watt incautiously mentioned to John the possibility of adapting the reciprocating steam engine to provide rotary power. John saw immediately the importance of such a development and pestered James unmercifully until he had the first rotary B&W engine installed at Bradley. Matthew Boulton was writing on 8 June 1786 – "We have never erected an Engine for Slitting and Rolling Iron, but our friend Mr Wilkinson has by licence from us annexed a slitting or rolling mill to one of our engines." John Randall in "The Wilkinsons" quotes Matthew Boulton as writing in 1791 "They are all frozen up, and were it not for Wilkinson's steam mill the poor nailers must have perished; but his mill goes on rolling and slitting ten tons of iron a day, and thus the employment and assistance of these poor people is secured."

The versatility of John's mind was again apparent in his patent 1694 of 30th July 1789 for the rifling of gun barrels. "An improvement in the Method of making Cannon or any other piece of Ordnance made of Metal, together with its Shot, Shell or Arrow, so contrived as to give a more certain Direction to the Mark intended than any other that has been hitherto in use, which he believes will be of great Public Utility,

that he is the first and true inventor thereof, and that the same hath not been made or practised by any other persons whatsoever to the best of his Knowledge or Belief. Any gun or piece of ordnance, after being bored in the usual method, hath cut therein two spiral grooves which run the whole length of the bore. These grooves according to their curvature will give a circular motion to the shot during its flight. The grooves may be varied in their form, size or curvature as may be more convenient for practical engineers. The shot for the above ordnance are formed with a belt or wings that fit the grooves of the ordnance for which they are made and from this connection acquire a circular motion from the action of the gunpowder; the form of these shot may be varied at pleasure..."

In 1790 John built a new ironworks at Brymbo, not far from Bersham where matters had ultimately been bedeviled by his brother's embitterment. William was not invited into any participation with Brymbo. According to W.A.Smith, John's instructions to his executors included – "Respecting Brymbo, Manganese ore is intended to be used at this furnace for a better pig iron." In those early days of modern chemistry he had an awareness of the effects of alloying elements that perhaps owed something to his relationship with Joseph Priestley . John's interests in copper and lead were not of course as great as his



Casting Cannon Balls from a Cupola
(Pyne's Microcosm, 1803)

iron smelting but still considerable. In 1792 he built a new lead smelter at Caello.

His Patent Number 1993 for the Cupola Furnace was taken out in 1794 when John was 66, but evidently of undimmed imagination, this type of furnace being subsequently built in uncountable numbers throughout the world. He had been slow to accept Cort's puddling process for wrought iron production, possibly because Broseley loyalty made him a supporter of Peter Onion's similar system, but after Cort's patent lapsed in 1789 he was more enthusiastic. Joshua Gilpin wrote in 1796 – "New Mode of making Bar Iron at Bradley....The Iron broken as above is put into ovens heated by air furnaces so that the flame passes over the Iron - the bottom of the ovens is covered with sand - so soon as it melts a person watches it and keeps continually stirring it so that it is broken up in abt an hour and a half formed by the stirring into round lumps or masses of abt 1/2 to 3/4 cwt. In Wilkinson's furnace the lumps are carried directly from the Puddling to the large heavy round rollers which work backward and forward. Here one groove being larger and another smaller it is worked to and fro into a round rough bloomery of about 2 feet long and 2 1/2" diam and abt 1/2 cwt - this is again heated and rolled in square or flat grooved rollers into bars of the necessary size."

Conclusion

John died in 1808, and his interment was also a matter of surprising mobility! Crouzet gives an overview of his reputation in 'Industrialist', 1985. "John Wilkinson.... often gets into the textbooks for the more bizarre or startling aspects of his activities - iron boats, pulpits, monuments or coffins rather than the originality of his technology or any careful estimate of the size or efficiency of his business empire. It has been his fate to be often seen through the eyes of enemies and critics, for instance his pirating of the Watt engine has been seen very much from the point of view of the engine partnership because the B&W papers survive.... while the fruitful and cooperative relationship between the ironmaster and the steam engine partners over many years has been obscured. His very good relations with the copper magnate Thomas Williams and with his fellow ironmaster Richard Crawshaw are less profusely documented and less well-known - as businessmen they were however in a higher league than Boulton & Watt."

Coal - The Vital Resource at Caughley

by John Willock

When examining our treasured Caughley pieces and considering the finer aspects of form, pattern and function, it is very easy to set aside the fact that these beautiful creations of man are actually the products of the earth's natural resources. In the case of Caughley Porcelain: soapstone rock (steatite), fire-clay and coal.

Upon visiting the Caughley factory site one is immediately aware, in this century of mass communication, of its relative remoteness. The site is only accessible even today by indifferent roads, and the river Severn is not particularly near. Why then did Thomas Turner select this isolated spot for his new Porcelain Manufactory? Was it a desire for secrecy, to protect his new business venture from prying eyes, or some far more practical consideration?

It is generally accepted that a pottery existed at Caughley a number of years prior to Turner's occupation of the site. Undoubtedly the reasons for locating a pottery in that part of East Shropshire were not totally dissimilar to those of the subsequent porcelain works. The pottery would have been able to draw almost exclusively upon locally available materials, including suitable clays for potting, and refractory material for kiln linings and the manufacture of saggars. However, the most important factor in determining the location of the pottery, and the subsequent porcelain works, was the abundant reserves of coal which, according to John Randall, "...could be obtained within twenty feet of the surface...."

Informed opinion indicates that approximately ten tons of coal are required to fire one ton of pottery. This ratio could no doubt be increased for porcelain, due to the higher firing temperatures. In this simple statistic, therefore, we have the precise reason for the factory site being positioned at Caughley. Very large fuel requirements, and the immediate availability of coal, requiring minimal transportation, dictated the manufacturing location. Whilst transportation was an important consideration in any eighteenth century industrial enterprise, the movement of other raw materials such as soapstone from the Lizard peninsula, and the despatch of finished products away to markets, were not, in this particular case, the deciding factors in site selection.

The illustration, which is entitled "The Mouth of a Coal Pit near Broseley," by George Robertson, was engraved by Francis Chesham,



The Mouth of a Coal Pit near Broseley after G. Robertson.
(IGMT Collection)

and published in 1788. The Caughley colliery would have been very similar to this scene. On the right of the picture, the tall brick chimney, with a furnace at its base, would have been used to create a forced draught for mine ventilation. The two horses attached to the winding equipment, or 'gin', imply a fairly deep shaft. Both of these features indicate a productive mine with extensive underground workings. The use of an early railway, or footrid, and the two packhorses with panniers, are particularly interesting and well observed features. Could it be deduced that certain items of porcelain are about to be loaded into those panniers ?

Several theories have been advanced as to why Thomas Turner discontinued porcelain manufacture at Caughley, after only some twenty-five years of production. These theories have speculated upon Turner's "ill-health," disaffection between himself and Chamberlains at Worcester, increasing competition from other factories, changes in artistic taste, and downright sharp practice by his old apprentice and new business rival, John Rose. Michael Messenger, in his book, 'Coalport 1795-1926', quoting Jewitt, cites another possibility. These writers hypothesise that existing coal measures were running out at Caughley, and that further capital investment in new pits was required

to keep the business viable. This is a reasonably plausible argument and, when taken into consideration with other factors, may provide some additional supporting evidence about Thomas Turner's decision to sell The Salopian Porcelain Manufactory in 1799.

However, Jewitt's assertions must be treated with a degree of caution and, whilst not wishing to dispute that some of his comments may have validity, it should be stated that the coal measures at Caughley were certainly not exhausted during Turner's tenure. The Caughley colliery was a prominent and presumably still valuable asset (Part of Lot 2) in the auction of leases of the Coalport and Caughley China Works in September 1803; the sale being precipitated by the bankruptcy of the new lessees Edward Blakeway, John Rose. and Robert Winter. In addition, the writer of this article can positively state, from information conveyed to him personally by individuals now long deceased who were in a position to know, that coal continued to be extracted well into the twentieth century, more than one hundred years after Turner had vacated the site.

The actual scale of subsequent mining operations is not precisely known to the author of this paper, and whilst probably not very large, was certainly sufficient to supply the needs of nearby clay industries in latter years. In this regard the mining business cannot have been too depressed, as the writer's maternal great grandfather, whose many and diverse business interests included, inter alia, the operation of the Caughley colliery, was sufficiently prosperous to own the first motor-car in Broseley at the turn of the twentieth century!

In or about 1900, some very old mine workings were discovered at Caughley, and from them the writer's great grandfather recovered what is now generally believed to be the earliest, substantially intact, flanged wooden railway wheel extant. Earlier wheels may have been found, but they now no longer survive. Writing in 1970, M.J.T. Lewis stated in his book 'Early Wooden Railways' that carbon-14 tests were insufficiently accurate to give a precise date for the wheel (and of others found elsewhere in Shropshire and subsequently lost), but tentatively ascribed to it a date of pre-1729, and possibly even seventeenth century. The wheel, although split and subsequently repaired, shows little sign of use and was probably discarded quite early in



Flanged wooden wheel found at Caughley (B. C. Roberts)

its life. In 1729 the Coalbrookdale Company started to produce cast-iron railway wheels, which probably supplanted wooden ones quite rapidly. The very early date attributed to this item tends to suggest that coal mining operations had been carried out at Caughley for many years prior to the Gallimore-Turner era. It is believed that the wheel is now in the care of the Ironbridge Gorge Museum Trust.

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Oral information imparted to the author by the late Mr. B.C. Roberts and the late Mr. J. Roberts of Broseley.
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Opencast Mining at Caughley in the 21st Century (S. Dewhirst)

Wartime and After: part 3 of my Autobiography

by Jack Owen

I decided to leave Maws and went looking for work in Rugby. This was well before the war and jobs were scarce. My first place was at BTH, British Thompson-Houston, as a turner. It was piecework, but if you didn't turn out enough you not only didn't make much on piecework, they knocked your money down as well to encourage you to do more! BTH was said to stand for Better Than Hell but not by much. Every Friday the foreman would walk between the machines and say "You, you, and you, pack up your stuff, you're finishing at 5". The terms were one hour's notice either way.

I went to try for a job at the Mazda Lamp Works. The foreman there said "Nothing doing". I went back to my digs and told my landlady. She said "I know him - and where he lives. Go to see him there and mention my name". So I did. He grabbed the doorknob and pulled the door shut so his wife wouldn't hear. "Write me a letter and I'll see what I can do", he said. I got a job.

At Mazda three of us were responsible for the lamp-making machines. Each machine had a woman operator and if she had any problem she came and fetched one of us. As I got more experienced at this I was able to modify some of the machines to work better. On the machine there were four plates with slots in them and the girl would put a lamp element in each slot. I realised that they needed spring-operated ratchets to work better. After one of us three had had a bad day with everything going wrong, I made up what I thought it needed. After my modification our output of around 700 lamps an hour went up considerably. The foreman brought the top brass along to see what I had done, and they gave instructions to have all the machines modified. Then we were told to set up a machine to assemble 150 Watt lamps that we hadn't done before. A man called Les Lines was supposed to be developing the machines for new and better work but he wasn't much good at it. We asked for an increase for our improvements but we didn't get one, though Les Lines got a rise to 3 shillings an hour. So I moved on again.

The War Effort

If you had left BTH you found yourself on a blacklist and it was hard to get another job; so I went to Coventry, to Standard Aero. The



F9/40 prototype Gloster Meteor, the first jet fighter to see service with the Royal Air Force (R.A.F. Museum)

money was better at around £7 a week. The Claudel-Hobson aero-engine carburettors we were making were in two halves, top and bottom. Sammy Wright was the foreman of our line, making the bottom halves. The float chamber had to be capable of a flow rate of one gallon in 40 seconds. It had a needle seat made out of hexagonal brass, with 5mm holes for the petrol. There was a problem because some of them would not pass enough fuel. Sammy Wright and some of the high-ups called me over and said “The next one that fails we'll send to you.” I checked it and realised that they were wasting their time worrying about the petrol orifices. I calculated the needle travel we needed to get a flow area equal to that of the petrol orifices. They had not realised that the problem was inadequate needle travel. Sammy had no brains but he was crafty and took most of the credit for this. We had a production target for the Claudel-Hobson carburettors of 50 a week. When war started to look likely this went up to 150 a week.

Later I worked on the prototype of the Gloster Meteor, our first jet aircraft. At that time it had no name: it was the F940 and top secret. The work was done in a secret village near Birdlip Hill. We had the Whittle jet engines ready to go in the F940, and we had to modify the wings to take the engines; all top secret and very fascinating work. We were well looked after; Ethel was back in Broseley and they laid on transport so you could get home at weekends. Our foreman was a tall fellow we called Dipstick; he used to take us to the top of Birdlip for a break and to see the marvelous view, and we'd go to the Air Balloon for a drink. Now the Meteor prototype is at Cosford with a

plaque on it. I spoke to them there and I was able to show them the work I'd done fifty years ago, and I recorded an audio tape for them about it.

Post-war Ironbridge

I had opened my cycle and electrical shop in Ironbridge in 1947, after a time when I worked at Chilcotts at Jackfield, toolmaking. They made silencers and fuel tanks for vehicles, and so they needed lots of new tools. We made stuff for Harley-Davidson. I mentioned this to another customer who said "That must be the only thing that's right with them!" For a while I was running the shop part-time, with Ethel, and working part-time at Chilcotts, but this didn't work too well and I went to full-time at the shop. Cyclists would come from Shrewsbury, Ludlow, Wellington and the Black Country; Ironbridge was a favourite stop for them and they would come and see me. I sold special parts and wheels - I was good at building wheels. We were agents for Wearwell. Ethel would look after the customers in the front shop; then there was a step down to the workshop where I usually was.

We sold batteries for the radios of the day, accumulators that we would recharge and the high tension and grid bias batteries. There were no televisions in Ironbridge until then, but Alan Jones, whose father was pretty well off, bought one from me - an RGD for which I had the agency. They were made in Coalport. But on Tontine Hill there was the MEB place where you paid your electricity bills and they started selling in competition with us. I kicked up about it but didn't get anywhere.

There was not a lot of money about in Ironbridge in those days. Other folk set up little shops, selling sandwiches and so on. There was a cake shop run by two wealthy elderly ladies who lived up Church Hill on the left above the church. Stan Poole sold and processed milk, making ice cream. He also had the picture house, The Central, near the drill hall. It was fourpence to go in. I used to do his maintenance; everything was acetylene, the house lights as well as the projectors. I understood it well from my cycling experience

There were very few visitors to the actual Iron Bridge then. 1/2d was payable at the tollhouse by pedestrians. It was still open for vehicles when I was a boy. Cyclists were allowed over as pedestrians. When the Free Bridge had been built some of the men working on it stayed

with my Auntie Mary and Uncle Jim, a few yards upstream from the Robin Hood, where Ted Owen the landlord was first cousin to my granddad, Charles Owen of Benthall. "Now that Robin Hood is dead, have a drink with Little Ted" was the slogan. My eldest brother Albert remembered the building of the bridge.

Explosion!

One day, when I had my cycle and electrical shop in Ironbridge, Ethel and I had decided to go for a ride from Ironbridge to Buildwas. We had just closed the shop door, I was on my bike and waiting for Ethel. All of a sudden there was a terrific explosion, and then a column of black smoke rising in the air. Ethel was scared. I said "It's Frankel's metal works". Mr Frankel was reclaiming aluminium foil, turning it into aluminium ingots. In the process there were often small fires, sometimes from spillages of the molten metal. He was a fine man, a great friend and I used to do electrical work for him. He had emigrated to this country before the war. He had no time for Germany and did a lot for us. The first electrical work I ever did for him was when he had a place at Dale End. He had trouble with his main switch; the contacts had welded up. I fixed it for him, and ever after that he came to me for all his electrical work. In the metal works the furnace was a rotating tube, mounted at an angle and oil fired.



*Mr Frankel's metal works (centre) - an old
maltings located behind the Methodist Chapel*

The foil came down into the rotating furnace, feeding itself in constantly and automatically. The furnace was around two feet in diameter. Only the evening before the explosion he had called me in to repair a motor.

On my bike I was up from the shop to his place, on the left up Madeley Bank, just before the Methodist Chapel, in a matter of seconds, so I was first on the scene. The ground sloped up above the works, so I went up above the works and lifted a roof tile to try to get in, but flames shot out and the lathes were burning. The explosion was a terrible thing; Mr Frankel and a lady working for him were killed. There was a steel sheet above the furnace, to contain the heat, and it had fallen on them. The explosion had happened after the fire brigade had arrived, and three firemen were buried under the rubble. The oil tank that fed the furnace had come down, and oil was running towards the buried firemen. Denis Maiden, a local man who worked with his father in their painting and decorating business, arrived to help and we started to try to dig the firemen out with our bare hands. Another friend of mine arrived who was a linesman for the MEB; he had with him his legirons for climbing up posts so he was able to go up and cut off the electricity. Ladies from further up the road were bringing buckets and bowls of water. One of the buried fireman shouted "Do something for us lads, my feet are burning". We were tipping the water on them as it arrived, and between us we were able to get them clear of the burning oil. By now the main roof above us was burning. A local police constable arrived, and nurses from The Beeches hospital. As we freed the firemen we put them on stretchers and they were taken to The Beeches.

It was said afterwards that Mr Frankel had told the firemen to spray the furnace. This could not have been so because he was always very concerned about the risk of explosion - so much so that he would not allow his workers to have even drinking water in the works; they had to stand their bottles on the window ledges outside. He had the expertise to develop and manage a process not previously known here.

I sold the shop around 1949 to a Wellington man who continued it. I went to work away - mainly electrical installation. Our daughter Margaret had been born and we needed a more certain income.

The Power Station

The Ironbridge power station had been built but was not commissioned into service until about 1933. This was Ironbridge A,



*Capacity Engineering in the 1990s after
it had been sold by Jack (S. Dewhirst)*

with its four steel chimneys, so that it was nicknamed The Queen Mary. It could produce vast quantities of black smoke which could fill the whole valley. The generators were built by BTH of Rugby, as later on were the generators of Ironbridge B.

Cables in Broseley were installed first of all in King Street, underground, not overhead as was then more common. The cables were drawn off their drums by Oakley's horses and laid in their trenches. Then a lot of jointing work had to be done - lead jointing, a skilled job. Over the years the power stations have provided a lot of work for Broseley people, especially for ex-naval personnel who were experienced in boiler operation and maintenance

Ironbridge used to complain about the smoke, especially the ash content which came down on the town, but complaints used to come in from as far away as Wellington, depending on the wind of the day. There was a link between Ironbridge A and the similar station downriver at Stourport.

Capacity Engineering

When I took over Capacity it was with my friend Ralph Docherty, another cyclist. Capacity was known as Capacity Engineering; they

had done warwork in World War I. We bought the works off Eric Lloyd. One day when in the works I'd said "What's that for, Eric ?" There was a length of angle iron fixed above us, sloping down to over the driving belt to a machine. He said "It's because the flat belts get dry and start slipping. That's where some rain comes through the roof, so the angle iron drips it onto the balata belt and tightens it up !" The machinery was old and crude but usable. I put in some new machines, including a centreless grinder, a planer and an internal grinder with which we could rebores car cylinder blocks - a useful trade.

We got work for Coalbrookdale Ironworks, pattern dowel pins and bushes. One pin would be round, fitting a round bush. The other pin would have a flat on it, needing a bush with a corresponding hole that had to be broached out. We used to make the broaches. We did some heat treatment, some we put out to specialists, stuff in High Speed Steel for example. Gradually we started making pins and bushes for firms in the Birmingham area like Beans; we were noted for our accurate work. At one time we had twelve working there, which was large compared with previously; we were bringing work into Broseley as I had always wanted to do. The work built up as we improved our accuracy, so we were making gauges to tolerances of ten thousandths of an inch. The more accurate you could get, the more people came for even more accurate work. Later on we got into gear-cutting. We opened another place in Madeley, in part of the old barn near the church. Coventry Gauge and Tool shared the building with us, having gone there during World War II to get away from the bombing of Coventry. When they got work that was too tricky for them they gave it to us ! We did cutters for them.

When I sold Capacity, the business was increasing, especially in gauge making - plug and gap gauges. We had designed our bungalow and had it built behind Capacity about 1965. Tommy Pooler of Madeley was the builder. You had to keep an eye on things as with all small builders, but it ended up a good job

JOURNAL INDEX, 1973-2002

To mark the 30th anniversary of its launch, we are publishing in this issue an index of all the items (articles, notes, reviews and correspondence, but not Society administrative details) which have appeared in the Journal up to No. 24 (2002).

The Journal began under my editorship in 1973, and I continued in post until 1987 (No. 15). Maurice Hawes filled the breach in 1988 (No. 16), changing the format from A4 to A5, and, after a six year gap, Rex Key revived publication in 1995 (No. 17). I resumed the editorship in 1996 with No. 18.

Complete sets of the Journal are available for reference at Shropshire Archives, Castlegates, Shrewsbury and at the Ironbridge Gorge Museum Library, Coalbrookdale. Local libraries have some issues.

We are grateful to Vin Callcut for his work in providing this index. In addition, Vin is in the process of producing a CD-ROM of Journal items and other material on Broseley and John Wilkinson, incorporating the work of the late Peter Cooper and of Steve Dewhirst.

NJC

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