

# Brock Mill Forge

by Bob Blakeman

SOME of the best archival sources for information about British industry in the eighteenth century are surprisingly in Sweden. This is because it was not in the interests of British industrialists, who worked independently of the government, to publicise details of their manufacturing processes, and thereby make their information available to competitors. In Sweden, however, the government oversaw industrial affairs and made efforts to maintain and improve the health of Swedish industry. To this end, it is sometimes sent, at government expense, travellers with knowledge of industrial matters, to various countries within Western Europe, to act as industrial spies, and to write reports on what they found. These reports were preserved for posterity.

Several of these spies visited Britain. The Swedish government was particularly interested in the British iron industry because Sweden was the main exporter of bar iron to this country.

The most useful of these industrial spies to the Swedish government (and to modern historians) was R.R. Angerstein. Angerstein's family originated in Germany, but had moved to Sweden to set up an ironworks there. As well as being knowledgeable about the iron industry, Angerstein was a keen observer, a painstaking writer and a capable artist: the perfect man for the job. He visited several countries, including Britain, and his reports, in 8 volumes, containing 150,000 words and 360 pages of sketches, are in the archives of the Swedish Steel Producers Association. Two of the volumes, which relate to Britain, have been translated into English and published as one volume (1) They provide a fascinating picture of England in the middle of the eighteenth century; not just its industry, but its agricultural and social life as well.

Angerstein arrived at Harwich on 16th September 1753, and stayed in the country until the end of 1755. On his arrival he made contact with Swedish merchants living in London. They helped him to plan his journeys and wrote letters of introduction to their business acquaintances for him.

Angerstein passed through Wigan on his travels, and in his report on this district he describes his visit to Brock Mill, a watermill situated in the narrow valley of the River Douglas, to the North of the town. (The site is now occupied by a small housing estate called Woodland Park).

Some idea of the importance of watermills before the introduction of steam power can be gained from the number of such mills on the upper reaches of the River Douglas. William Yates' Map of Lancashire, published in 1786, shows seven watermills between Wigan and Worthington. Although not named on the map, they were almost certainly Scholes Mill, at the bottom of Millgate, Wigan; Sutton Mill, at Bottling Wood; Haigh Mill, where the drive from the Plantation Gates crosses the river; Leyland Mill, in Leyland Mill Lane; Brock Mill, in Wingates Road; Jolly Mill, near Fairclough Wood off Chorley Road; and Worthington Mill, near the junction of Rectory Lane and Chorley Road.

At the time of Angerstein's visit Brock Mill contained several forges at which tools were made from scrap iron. (These forges were, in 1788, to be combined with a foundry at Leyland Mill to form the embryonic Haigh Ironworks). A mill race ran alongside the River Douglas to a point near Samuel's Fold in Pendlebury Lane. Water in the race

turned the waterwheel at the mill which worked the bellows which blew onto the hearths. Angerstein writes:

*Brock mill has a wind furnace for melting down scrap, some of which is purchased in London, and some from foundries in the neighbourhood that specialise in the casting of pots. The latter consists of castings that have become malleable iron during remelting. The former kind of iron, melted down from scrap is the best, and is used for making hoes, shovels and sugar-cane knives. The latter, on the other hand is used for the core of forge anvils and for other heavy forgings.*

*In the smithy there are five hearths, where ten people are occupied making hoes and other goods, all of which are sold in Liverpool for the West India trade.*

*For hoes, two pieces of iron are selected, 4 inches or 5 inches long, depending on the size of the finished article; and in between them, at one end, a piece of steel is placed, whereupon the sandwich is welded together. One end, destined to become the socket, is forged down thin and cut. It is then bent, and formed into a socket over an anvil. Finally the hoe is trimmed even with a shear, and hardened and ground. Two hands can forge two dozen hoes a day and, if they have been partly fabricated beforehand with the socket etc, they can make three dozen.*

*The wages are 9, 10 to 12 pence per dozen, according to size. Sugar knives, which are called 'sucherbis', cost 10 pence per dozen for one kind and 12 pence per dozen for another type. Anvils for smithies are sold for 6 pence a pound, but the work is carried out at day rates.*



Brock Mill Cottages (now demolished) stood at the bottom of Brock Mill Lane and housed workers at the mill when it was part of Haigh Hall Ironworks.

Angerstein's account of Brock Mill is particularly interesting because of a number of recent inventions that were in use there. These inventions were the work of an "expert mechanic" named Merlin, the previous owner of Brock Mill who, "*made himself poor*

*through experimenting, and now lives a few miles away in a little town called Holland'* (i.e. Upholland).

One of these inventions was a peculiar kind of tuyere or nozzle through which air is injected into a furnace. Angerstein waited in vain to have its mechanism explained to him, for it was the firm's policy to keep such information secret. He noticed, however that it seemed to have a cooling system built into it; a useful adaptation for equipment that was used at very high temperatures,

Angerstein also mentions "*a contrivance to drive five pairs of bellows from one waterwheel by means of flat rods. The workmen at each hearth could stop the bellows as often as they wished by pulling up a weight, and start them again as soon as the weight was released*". As this mechanism was open to view, he was able to provide a detailed description of it, together with a sketch of a Heath-Robinson contraption.

But the invention that Angerstein most wanted to see was an invention for making screws, and that was kept locked in a cellar. He writes:

*In the absence of Mr 'Thornis', to whom the works belong, I tried to bribe the workers to show me the machine, but they told me that it was locked in, and that they had sworn to keep the invention secret, so that not even a 100 guineas could induce them to reveal it. Subsequently Angerstein went to Upholland and tricked the inventor into giving away details of the machine by pretending that he had already seen it.*

Another invention of Merlin's that interested Angerstein was a windmill with eight sails (instead of the usual four). It was equipped with a regulator which kept the sails turning at a uniform speed in both strong and moderate winds. Sir Roger Bradshaigh 4th Baronet, Angerstein informs us, had used one there for several years for pumping water from one of his coal mines.

Angerstein has more to say about the Wigan district than his visit to Brock Mill. He gives a brief description of the town, its industries and one or two of the people living there who struck him as noteworthy. He describes the local coal industry and notes the geological strata that he observed as he descended the mines, together with his theories on their origin.

Angerstein's observations of Brock Mill are typical of the notes he made on all the places he visited. His complete records provide a fascinating collection of vignettes of England on the eve of the Industrial Revolution. His translators, T. Berg and P. Berg, are to be congratulated for rendering his journals into English, from the little known Swedish, and thus making them accessible to a much wider readership.

[Footnote] (1) Angerstein, R.R. (2001) R.R. Angerstein's illustrated travel diary 1753-1755. Trans. T Berg and P. Berg. London. Science Museum.

Re: Brook Mill Forge

Hi Bob,

Really enjoyed reading your article in last month's Past Forward. Here is a letter I have sent to the magazine in response (I'm sending to you just in case it doesn't get published).

Reading Bob Blakeman's account of the industrial activity at the Brook Mill Forge in the middle of the 18th century was absolutely fascinating. I was particularly intrigued by the account of the secret screw cutting machine invented by 'Merlin'. As an engineer myself I know that the development of automatic screw cutting has a long history. In fact when I looked into it I found that the first patent was recorded by the brothers Joss and William Wyatt in 1760, but it was ten years later before Jesse Ramsden built the first satisfactory screw cutting machine. The machine at Brook Mill was obviously a very successful device, enough at least to attract the attentions of a foreign spy. The fact that this was at least five years before the Wyatt patent and a good 15 years before Jesse Ramsden's machine, suggests that maybe we need to re-write the history books with regard to screw cutting technology and put industrial Wigan at its heart (yet another first for the town).

Hope you are well, we haven't seen you for a while and were wonder how you are getting on and (I apologise for keep ask this) are you up to doing a talk?

All the best for the New Year,

Best regards

Bill Aldridge

Dear Bill,

Thank you for your interesting letter. Actually ... Angerstein wasn't very good at writing English surnames, and some of them are difficult to identify. However, he didn't write 'Merlin' :- this was typing error unfortunately. The name he wrote was "Melin" – this might be Mellin or Mallin; names I have not come across before.

Best regards,

Bob Blakeman

Hi Bob,

Glad you liked the letter, I got the information from company called Bolt Science, an international screw and bolt consultancy (based in Chorley of all places). Bill Eccles who runs the company was fascinated to hear about Wigan's early involvement (I've sent him a copy of the article). He tells me that he often goes to Sweden to give courses and mentions Manchester when relating early technical developments, but now he says he is glad to be able to mention somewhere even closer to home.

Best regards

Bill Aldridge