

THE ORIGINS OF THE CINDERFORD COKE IRON FURNACE

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It is often said that the first coke burning iron furnace in the Forest of Dean was erected in 1795 to the north of Cinderford Bridge. Occasionally it is even said that the furnace was in blow in that year. It is seen as ushering in a new era for the iron manufacturing industry in the Forest, when a change was made from charcoal to coke for the smelting of iron ore. As Mr. I. Standing has pointed out, little is known of the origins of the first Cinderford coke blast furnace. (1) The majority of our information is taken from the Rev. H.G. Nicholl's book on iron making in the Forest of Dean, where it is stated that the date 1795 was preserved on an inscription stone in No. 1 furnace, then standing Oct 1865. (2) Nicholls then quotes a personal communication from a Mr. Bishop which makes it clear that at the time of the description the Cinderford Furnace was fired by coke. (3)

"from the rude and insufficient character of their arrangements they failed commercially as a speculation, the quantity produced (of pig iron) not reaching twenty tons per week. The cokes were brought from Broadmoor in boats, by a small canal, the embankment of which may be seen to the present day. The ore was carried down to the furnaces on mules' backs, from Edge Hill and other mines."

Research for a Ph.D. in the Public Records Office led me to a set of documents referring to the erection of the Cinderford furnace. (4) The remainder of this article will be a discussion of these documents which are letters from Thomas Blunt, Deputy Surveyor to Miles Hartland, Surveyor of His Majesty's Woods South of the Trent. The information is particularly important as it shows the secrecy and misunderstanding with which this first introduction of coke iron smelting was surrounded, and also furnishes a plan and description of the furnace during its construction.

The first reference to the site is contained in a letter dated 14 May 1796. The building being erected was located 400 to 500 yards upstream from Cinderford Bridge. The date and location confirm that the site being referred to is that of the above-mentioned coke iron furnace. (5) It would appear that there was a deliberate attempt made to conceal the purpose of the buildings being erected.

"... the intent of this building is kept secret, as well as the name or names of the real proprietors, the workmen are paid by one Tho' Teague, a collier, formerly clerk to David Tanner, Esq., Ironmaster, it is I understand said by him, the intent of the building is to erect a water engine for the purpose of draining some coalworks for the doing of which, the colliers seem to claim a right, but having this morning had a conversation with Mr Thom (a mason who is employed in erecting the building) he tells me that if the building shall be in part applied to the purpose of the coal works, he is sure the principle object is the making of iron, for that he has received directions from Mr. Teague to build a furnace for the melting of iron ore on the same plan, but of much larger dimensions than Sr. Tho' Crowley's furnace at Flaxley Abbey".

Two main points are brought out in this letter, firstly, in order to build on Crown land it was necessary to have an excuse, the only acceptable reason for a substantial building which would not be regarded as an encroachment and therefore liable to removal, was a connection with mining. The miners were allowed, by traditional rights, to erect a pumping engine, hence that was the cover for the erection of the furnace. Secondly, there is no mention of the furnace being coke fuelled, which may seem strange, as it would have been the first of its kind in the Forest of Dean and therefore surely noteworthy. However, Thom may not have had access to that information, the employers keeping, what can be seen as a relatively radical step, secret from their employees.

It is obvious that Blunt did not appreciate that the furnace was going to be coke fired, for on July 4th, he sent a plan of the furnace to Hartland, indicating that it would be fuelled with charcoal. It is unlikely that the furnace was initially intended to be fuelled by charcoal because of its size. Early coke furnaces were similar in appearance to charcoal ones; the furnace at Flaxley, on which the plan was supposedly based, was a charcoal blast furnace that ceased working around 1802. (6) Coke furnaces were, however, much larger. G.R. Morton (7) points out that the greater quantity of heat carried through the furnace by ascending gasses, particularly the greater volume of inert nitrogen, led to efforts to reclaim heat which necessitated taller furnaces. Previously, around 20' - 30' in height, they increased to 30' - 40'. The Cinderford furnace stack in July 1796 was 40' tall. Indeed, its dimensions of 40' square by 40' high were similar to those at Whitecliff, (8) the construction of which began in 1798.

On July 5th Hartland forwarded the plan to the Treasury with a covering letter, pointing out that should the works be allowed to continue, he feared it would lead to a proliferation of iron-works within the bounds of the Forest.

"The natural consequence for such work, if permitted to be carried on, the interest of the Crown in that part of the Forest will be totally destroyed; and as the Forest abounds with iron ore and well watered by several large brooks, some of them easily made navigable to the Severn, you will, if this Building be permitted to stand, soon have furnaces and forges erected all over the Forest and thereby the interest of the Crown in the whole Forest will be totally annihilated."

It would seem that Hartland was particularly worried because he had been informed that the furnace would burn charcoal. However, even a coke furnace was an encroachment and as Blunt had early pointed out, (9) the erection of cottages for workers would be a further encroachment that could lead to harm to the Crown woodlands.

In the summer of 1796, a case was filed against the erection of the furnace and in the autumn of that year, Blunt gave notice to Thomas Teague, George Teague and Thomas Martin, to desist in their building operations. Following this, there is no further mention of the furnace, but it would seem that some arrangement was arrived at, for in 1801, a report on proposed railways noted there were two furnaces in Dean, one at Parkend and one at Cinderford. (10) It is not known when the furnace was blown in, but as there was no reference to the canal in 1796 and the incline was a long way from completion in July, it may be that the furnace was not blown in until the spring of 1797 at the very earliest. The beginning of the coke furnace era in Dean should then be dated to 1797 or 1798 rather than 1795 when the furnace erection was begun.

The furnace was still working in 1806 but probably closed soon after. (11) Bishop points out that it was a commercial failure because of its inadequate arrangements and the growth of iron manufacturing in South Wales and Staffordshire. The quantity of pig iron was said not to have reached 20 tons per week, which was the output at Flaxley charcoal furnace. The production of iron at less than the capacity of a charcoal furnace was unlikely to lead to commercial success. It is likely that Cinderford suffered from the same problems as did Whitecliff, as outlined by Ian Standing in his latest work on that furnace. (12) He has shown that until the active involvement of David Mushet, the Whitecliff enterprise suffered from a lack of technical expertise. The situation was, presumably, similar at Cinderford, where the collaborators were coal miners with no known previous involvement in the iron industry.

Little is known about the owners of the furnace. Thomas and George Teague and Thomas Martin were unlikely to have been the financial backers of the venture as the Teagues were known as colliers and Martin was a farmer at Ruardean Hill with a coal mine on his property, (13) none of them are likely to have raised the capital to meet the projected costs of £2,000. As Thomas Teague was formerly connected with David Tanner, who had engaged in a number of enterprises at Lydney and Redbrook, it may be he who advanced the capital; however, his interest must have been shortlived as he went bankrupt in 1798. (14)

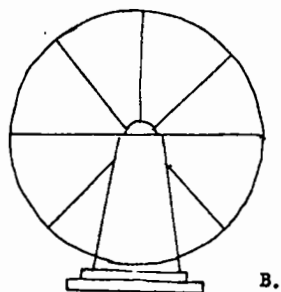
The introduction of coke furnace smelting into the Forest of Dean must have, in part, been a response to its success elsewhere. Its introduction at this time, however, appears to have owed much to the entrepreneurial attitudes of the coal owners. Members of the Teague family were involved in the setting up of enterprises at both Cinderford and Whitecliff. In both cases, they were primarily free miners before their involvement in the iron industry. It can be argued that these men sought to encourage the coke iron industry in order to create a market for their coal and thus stimulate the development of the coal industry. The early 19th century saw both the introduction of coke smelting into Dean and a rapid expansion of the coal industry. Whilst this expansion in the coal industry cannot be related directly to the introduction of coke furnaces, the demand of which was small until the third decade of the 19th century, but was a direct result of the introduction of more advanced technology, the development of both coke furnaces and coal mining was linked. The same people were investing in the development of both in the early 19th century. Coke furnaces must have been seen as a potential, if not immediately realisable, asset to the development of coal mining in Dean.

The Cinderford furnace was the first coke furnace in the Forest of Dean. It was surrounded in secrecy during its construction and probably came into blast in mid-1797 or perhaps as late as 1798. As with many new introductions it was historically important, but was a commercial failure. Later ironworks presumably learnt from the mistakes made at Cinderford. Much research still needs to be done on this site and hopefully further information will be discovered.

REFERENCES

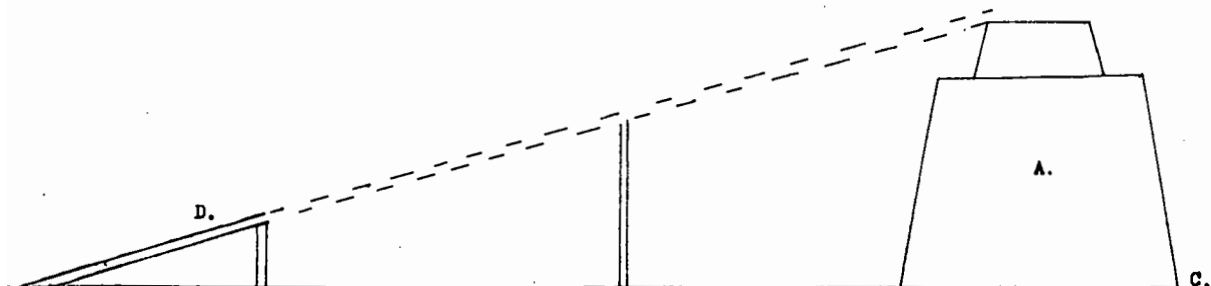
- (1) I.J. Standing: "The Whitecliff Ironworks in the Forest of Dean, 1798-1800." Journal of the Gloucestershire Society for Industrial Archaeology, 1980.
- (2) H.G. Nicholls: Iron Making in Olden Times as instanced in the Ancient Mines, Forges, Furnaces of the Forest of Dean. 1866, 55.
- (3) Nicholls, op. cit. 56.
- (4) Public Records Office F3/1046.
- (5) The location of this site is given on a map of 1825 where it is marked as 'old furnace' GRO Q/Rum 106. It was in the late 1820s incorporated into the Cinderford Ironworks. By 1835 a second furnace had been built to the south of the bridge at O.S.651,121 (Sopwith's Map of the Forest of Dean, reprinted 1981) The location and plans of the two sites are clearly given on John Atkinson's map of railways in the Cinderford valley in 1840s. PRO F17/100.
- (6) C. Hart: The Industrial History of the Forest of Dean, 1971, 81.
- (7) G.R. Morton: "The Early Coke Era", H.M.G. Bulletin, 1966, & quoted in Hart, Ind. Hist. 120.
- (8) I.G. Standing op. cit.
- (9) PRO F3/1046: letter of 14th May 1796.
- (10) Hart: op. cit. 153.
- (11) Hart: op. cit. 121.
- (12) Personal communication from Ian Standing.
- (13) PRO F3/1046.
- (14) Hart: op. cit. 98.

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EXPLANATION OF THE PLAN

- A. North view: 40 ft. square x 40 ft. high.
- B. Water wheel, 40 ft. diameter.
- C. East side at the bottom of which was an aperture to let out the melted ore.
- D. Incline to carry iron ore and charcoal up to the furnace mouth. Solid line depicts finished length, dotted line the proposed section.



PLAN of the CINDERFORD COKE IRON FURNACE
as taken by Thomas Blunt 5 July 1796