A Note on the Decline of the Wealden Iron Industry

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The decline and eventual extinction of the charcoal-based iron industry of Britain has been traditionally associated with decreasing timber supplies. This has especially been the case in the iron industry of South-East England. A detailed investigation into the decline of a part of the Wealden iron industry, namely the area of Central Surrey bounded by the River Mole, the River Wey, the North Downs and the Sussex border, casts doubt upon this analysis, and suggests alternative explanations.

The exact chronology of the industry's decline is somewhat uncertain, but definitely extended over a long period. Schubert[1] writing of the Weald as a whole, places the beginning of the decline at around 1600. Norden[2] writing in the *Surveyors Dialogue* of 1607 notes indications of shrinking demand at that time. Other authorities, including Jessup[3] in his study of the Kentish section of the industry, contend that the industry far from declining in the early seventeenth century did not reach its peak until the 1660's. While there are individual examples of an early decline, such as the closure of Ewood works in 1604, a general decline cannot be traced for such an early date, and contrary evidence of a considerable boom in production during the Civil War, which is only to be expected in a munitions industry, can be found. The 1653 official list recorded the existence in the three counties of 35 furnaces and 45 forges. In 1660 29 furnaces were still in existence in the Weald (no forge figures were collected). By 1717 there were 14 furnaces (11 in Sussex, 1 in Kent and 3 in Surrey).

A distinction must be drawn between the rates of decline of the furnace and the forge, the former being more vulnerable and less adept at conversion to new uses. In Central Surrey the first half of the eighteenth century can be taken as the critical period, although the Cranleigh forge was closed at least 100 years before this period, but only because it was within the prohibited 14 miles from London.[4] Charlwood forge ceased sometime between 1737 and 1750. Some sites appear to have lasted longer than others, although subject to a general reduction in trade. Manning in 1804 stated that Abinger Hammer was in operation 'until late years'[5], and Stevenson[6] writing in 1809 recorded that no sites were still in operation in Central Surrey, although he made a mention of recently extinct sites in West Surrey. The last certain site in operation in Surrey was the Thursley forge in West Surrey, which struggled on until 1805.

In the Weald as a whole only three furnaces were still in existence in 1790, all of which were in Sussex. The Kentish part of the industry suffered a similar decline with only four works remaining in 1740. The heart of the Wealden iron industry, the Rother-Brede area of East Sussex, survived

longer than the more marginal area of Central Surrey, but here again a decline can be traced from the beginning of the eighteenth century, and as in Surrey the forges lasted longer than the furnaces. The last three forges to cease production were Brede in 1805, Robertsbridge in 1808, and Ashburnham in 1828. The extinction of Ashburnham marked the end of Wealden iron.

Many reasons were advanced at the time to explain the cause of the decline, many of which were associated with timber consumption. Spasmodic timber scarcities were felt, especially during the seventeenth and early eighteenth centuries, and were readily blamed by contemporaries upon the iron works, whose large consumption of timber was well known. Such complaints as that of the citizens of Kingston in 1562 were definite as to the cause of the timber shortage and the consequent high prices demanded in the markets 'at Dorking or thereabouts'.[7] Much of the restrictive, and often punitive, legislation in the sixteenth century that was directed at the iron masters was intended to preserve the woodlands as much as to protect the state of the roads. Definite cases of deforestation caused by the iron works are, however, hard to find. The only certain reference to this in Central Surrey is in Charlwood parish[8], where the clearing of Norwood Hill is recorded in the Court Roll of 1635, and attributed to the cutting of timber for the iron works of Leigh, Ewood, and Charlwood. This charge against the iron works has been greatly overemphasised by both contemporary and later commentators. Furnace and forge timber was carefully managed by skilled men who harvested a crop from deciduous coppices, rather than ruthlessly exploited the nearest wood. In addition there was a close link between the iron works and the timber source, which were often under joint ownership. The 'vertical integration' was of benefit both to the iron works, which were thus assured of a steady supply of fuel, and to the woods, which were carefully tended. Place-name evidence of such a link is found in examples such as 'Millpond Copse' (TQ125460), 'Smithwood Common' (TQ050415), and 'Mill Copse' (TQ120420). The Act of 1581 which was concerned with timber preservation was careful to praise the timber management of Leigh furnace and exempt it, as a reward, from the provisions of the Act. Further evidence of this integration is found in the 1560 licence granted to Abinger forge to cut wood within the confines of Abinger, Wotton and Ockley parishes. The location of these parishes, all being contiguous, suggests the importance of the immediate locality in timber supply.

Defoe, writing in 1724, saw little deforestation,

> I must own that I found the complaints [i.e. about wood shortage] perfectly groundless, the three counties [i.e. Surrey, Kent and Sussex] being one inexhaustible store house of timber.[9]

Drayton[10], writing in 1612, was prepared to state that coppicing as practised by the iron works actually aided the growth and regeneration of woodland, while the petition in 1664 recorded a total of 200,000 acres of land under

coppice in the three counties of the Weald. A more expert opinion is found in Yarranton who, writing in 1677, stated

> The next thing is that iron works destroy the woods and timber. I affirm the contrary; and that iron works are so far from destroying woods and timber, that they are the occasion of the increase there.[11]

Even Evelyn, whose great concern was the preservation of woodland, could not in fairness accuse the iron masters of causing deforestation.

> But yet to prove what it is to manage woods discreetly; I read of one Mr Christopher Darrell, a Surrey gentleman of Newdigate, that had a particular indulgence for the outlay of his woods at pleasure, though a great iron-master; because he so ordered his works, that they were a means of preserving even his woods. I suppose by increasing the industry of planting and care.[12]

It cannot even be claimed that the iron works were a danger to national security by consuming timber needed for shipbuilding, as coppice timber, not oak standards, were used for making charcoal, although of course some competition for available planting land could have occurred. The situation in the Rother Valley of Sussex was very similar. Complaints were made by the citizens of Hastings that the iron works were causing a serious timber shortage. A similar use of coppice timber is found, and a similar link between furnace and wood can be traced.

While it can thus be advanced that the iron works did not of themselves cause deforestation, it is certain that timber shortages did occur and that competition for available planting land between different uses existed, as Wrigley has suggested.[13] Edwards[14] has estimated that a shortage of Wealden timber occurred in the eighteenth century, especially of oak suitable for ship-building, and bases this assertion on the writings of William Marshall in 1798.[15] The spread of hop cultivation into Surrey from Sussex, where it had been introduced in 1525, created a demand for suitable hop-frame timbers, especially in the Farnham and Chilworth areas. In the broader view also the growth of London and of the county's population in the middle and late eighteenth century must have increased pressure upon the woodland, especially in the areas adjacent to the metropolis.

It has sometimes been advanced, therefore, that timber exhaustion, whether due to the iron works themselves or not, was a major cause of the demise of this industry in South East England. This argument has an added credibility when it is remembered that timber was an important locating factor for many of the furnace and forge sites. Many counter arguments can be advanced against this thesis. The careful management of the woods by the works has already been mentioned. Most of the works were in areas where no serious deforestation has been traced, and which are often well wooded to-day. The chronology of the closing of the works, spread over 150 years in the Weald as a whole, does not show a sequence of closure which bears

any relationship to the presence of woodland. In addition no contemporary commentator can be found who attributes the demise of a forge or furnace to this cause. Local scarcities did occur from time to time, and rising timber prices could have been a contributing factor in some cases, but the prime cause of the decline of the industry must be sought elsewhere.

Iron ore exhaustion is also an unlikely explanation, sufficient quantities still being found in the strata commonly exploited at the time[16], although local shortages of easily accessible sources could have raised costs, and contributed to the problems of the industry.

Concentration upon the critical decades of the eighteenth century, in the marginal and thus especially sensitive area of Central Surrey, reveals other factors, of which the most obvious is technological change. The Darby experiments at the Coalbrookdale works, in which iron was smelted with coke rather than charcoal, were conducted in the first decade of the eighteenth century. The effects of this advance can be expected to have an influence upon South-East England during the first half of the century, and in addition would have been felt early in Central Surrey due to the area's close relationship with London. Ultimately this technological advance, and the reduction in material costs it allowed, encouraged concentration, or in Wrigley's terms[17] a 'punctal', rather than 'areal', production, in order to reap the economies of scale that were the whole *raison d'être* of the industrial revolution. This alone would have destroyed the iron industry of the Weald, without the aid of any other contributory factor.

An investigation of a few other factors that may be significant, on at least a local level, is of interest in determining the finer points of the chronology of the decline. Labour costs rose in the early eighteenth century and would have added to costs. Again, Central Surrey, with its range of industry and employment, as well as its nearness to London, would have been especially affected by this. Contemporary commentators listed labour costs as a factor in the decline of the Charlwood forge.[18] Chalkin, however, in his study of the Kentish iron industry[19] suggests that only seven men, on an average, would be employed at each site and labour costs would therefore be only a small percentage of total costs.

A shortage of water, caused by an abnormally low rainfall over a period of years, would make operations difficult, causing low reservoirs and a slackening of the water pressure, and would have added greatly to the problems of the iron-masters. Records for the Charlwood site suggest such a shortage, due to the low rainfall between 1737 and 1750, and on a wider plane records exist that point to an unusually dry period in the first half of the eighteenth century, which was particularly severe in the south of the country[20]. Although neither shortage of water nor rising labour costs would, in themselves, have caused the demise of the industry, they can be considered as additional and accelerating factors.

The marginal nature of Central Surrey, as a northern outlier of the main centres of the industry, having been brought into existence by especially

heavy demand in the sixteenth century, had the effect of making this area more liable to economic fluctuations, than were the producing areas deeper in the Weald. This would account for its comparatively rapid decline. Similarly, the area's position on the economic margin greatly aided its flexibility, as it was not deeply committed to a single industry, but had the ability to change to other pursuits.

NOTES

1. Schubert H. R., *The History of the British Iron and Steel Industry* (1957), 157-75.
2. Norden J., *The Surveyors Dialogue* (1607).
3. Jessup F. W., *A History of Kent* (1958), 106.
4. Straker E., *Wealden Iron* (1931), 446.
5. Manning O. and Bray W., *History and Antiquities of Surrey* (1804-14).
6. Stevenson W., *A General View of the Agriculture of the County of Surrey* (Board of Agriculture, 1809), 260 *et seq.*
7. Loseley MSS. 1562. Hist. MSS. Com. Rep. VII App 616.
8. Sewill R. and Lane E., *Free Men of Charlwood* (1951), 86.
9. Defoe D., *A Tour through the whole Island of Great Britain* (1724-6) (Everyman ed. (1935)), I, 125.
10. Drayton M., *Polyolbion* (1612). Quoted in Straker E., *op. cit.*, 130
11. Yarranton A., *England's Improvements by Sea and Land* (1677), 149.
12. Evelyn J., *Sylva* (1776), V, Bk ii, 148.
13. Wrigley E., 'The supply of raw materials in the Industrial Revolution', *Economic History Review*, XV (1962), 3.
14. Edwards T., *Trees in the English Landscape* (1954), 125.
15. Marshall W., *The Rural Economy of the Southern Counties* (1798).
16. Straker E., *Wealden Iron* (1931), 7 and 104, and Lower M., 'Historical and Archaeological Notices of the Iron Works of the County of Sussex,' *Sussex Archaeological Collections*, II (1849), 169.
17. Wrigley E.:'The supply of raw materials in the Industrial Revolution', *Economic History Review*, XV (1962), 3.
18. Sewill R. and Lane E., *Free Men of Charlwood* (1951), 93.
19. Chalkin C. W., *Seventeenth Century Kent* (1965), 134.
20. Manley G., *Climate and the British Scene* (1952), 245.