

Fordley North Park: Coke smelting in the Weald?

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Abstract

The identification of an early coke-smelting iron furnace with one of two sites in western Sussex suggests the possible experimental use of coke in an area hitherto known only to have used charcoal. Neither documentary sources nor analysis of slag confirm this identification, which remains inconclusive.

Philip Riden's recent gazetteer of unsuccessful early coke blast furnaces included the name of Fordley North Park, for which no location was offered¹. The name appears at the end of a short list of coke furnaces which apparently were closed by 1788; part of a longer list which included charcoal furnaces². Riden tentatively suggests a possible association with Funtley, near Fareham, Hampshire. The site is not named in the similar lists of ironworks in the Weale Manuscripts³.

Of the charcoal blast furnaces operating in the Weald in the second half of the 18th century, all but one are included in the list quoted by Riden. The omission from the known sites of the period is North Park furnace, otherwise known as Fernhurst furnace, near Midhurst in western Sussex (SU 878283)⁴. The site has a documented history which extends back to the early 17th century⁵. In 1769 a seven-year lease of the site, together with Pophole Hammer, near Haslemere, was granted by Lord Montague to Joseph Wright and Thomas Prickett of Southwark, gunfounders⁶. The previous tenant had been John Butler of Bramshott, who had operated the furnace for some years. Following their lease of North Park, Wright & Prickett began to cast guns for the Board of Ordnance, but they surrendered their lease in 1774, possibly because of the Board's intention only to accept guns bored from the solid from the following year. The furnace was then leased to James Goodyer, a Guildford ironmonger, for an annual rent of £100⁷. Under the terms of the lease, Goodyer was to take 400 loads of mine at 12d. a load from the lands of Lord Montague, or pay £20 a year if the mine was not taken. Although there was no specific requirement in the lease for underwood to be purchased from the Cowdray estate, the option to buy at current prices was included. The lease was for 21 years with options for early surrender after three, seven and fourteen years. Goodyer must have given up after three years as the two sites were advertised for sale in January 1777⁸. In October of the same year

Goodyer was declared bankrupt, and it may be of some significance that one of the assignees of Goodyer's bankruptcy was Richard Crawshay, later of Cyfarthfa but then a London iron merchant⁹. It is not known if the two works were subsequently re-let.

The name, Fordley, is not directly associated with the North Park site. However it is the 18th century form of Verdley, which lies about 3 km ESE of North Park, and is the site of a blast furnace for which no documented history has been traced hitherto (SU 906265)¹⁰. The close proximity of the two sites suggests that they could have been operated together, however it is also possible that the name refers to one site only. The absence of surface evidence of the use of coke at North Park, which has recently undergone limited excavation and survey work, may suggest that the reference is solely to the furnace at Verdley¹¹.

The use of coke for smelting iron has previously not been associated with the iron industry in the Weald because of the distance which supplies of mineral coal or coke would have had to have been transported from the coalfields in the Midlands or north of England, and because of the abundance of coppice wood for charcoal in the Weald, for which there is no evidence of a shortage in the second half of the 18th century. The Kent coalfield was not exploited until the early 20th century.

Quite why an ironmaster in the Weald should wish to experiment with coke smelting is difficult to understand, given the geographical constraints. It is known that bar iron from the forges at Pophole and Thursley was transported by wagon to the River Wey at Godalming, and thence by barge, probably to London¹². It is less certain whether carriers of ordnance from North Park used the same route, as to do so the steep escarpment of the Greensand ridge south of Haslemere would have had to have been ascended. The alternative was to carry them to the River Rother or River Arun for transportation to Littlehampton and thence by coastal vessel. Coke, or coal, for it is not known whether there were any means of coking available, could have been brought to the works at North Park and Verdley by either route, but at considerable cost. The successful financing of such an operation is therefore hard to contemplate, and may explain the bankruptcy of James Goodyer, who had been in business in the iron trade for at least twenty years, although there is, at present, no evidence to connect his occupation of North Park with any use of coke¹³. Nor is there any evidence, it must be

said, linking him with the furnace at Verdley.

It might reasonably be expected that the use of coke would be revealed in the composition of the waste products of the smelting process, and particularly in the amount of sulphur derived from the coke. The use of charcoal as a fuel for Wealden iron furnaces meant that such slags typically had a very low sulphur content. Accordingly, samples of blast furnace slag from Verdley and North Park, together with samples from Lurgashall, a nearby furnace which would have used a similar source of ore, were submitted for analysis to Chris Salter, of the Research Laboratory for Archaeology and the History of Art at Oxford University. The composition of the samples is shown in Table 1. These analyses can be compared with those of coke-fired slags from elsewhere in Britain which are given in Table 2.

The sulphur content of the Wealden slags is calculated as SO₃, which gives a higher figure than the elemental sulphur quoted for the analyses in Table 2. The Wealden mean of 0.08±0.03% SO₃ is still well below the 0.7% sulphur content of the slag produced using low-sulphur coal at Ebbw Vale, and the 1.37% of that from the coal-fired furnace at Bradley, while the content of each of the three slags from coke-fired furnaces is over 2%. The conclusion must be that none of the slags from the Wealden furnaces suggests the use of coal or coke.

It is conceivable that the experimental use of coke at either North Park or Verdley was short-lived, and that any slag thus produced may lie concealed under other, charcoal-derived slag scattered about the sites. For the present, however, in the absence of any corroborative evidence, the use of coke to smelt iron in the Weald must be regarded with some scepticism.

	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	P ₂ O ₅	SO ₃	K ₂ O	CaO	MnO	FeO
Lurgashall 1	0.33	2.09	18.81	57.30	0.05	0.10	3.22	3.15	5.93	9.02
Lurgashall 3	0.30	4.12	18.15	58.23	0.02	0.14	3.54	7.14	7.19	1.17
Lurgashall 4	0.27	1.98	15.69	51.22	0.15	0.07	2.54	3.07	5.54	19.48
Lurgashall 6	0.33	3.52	19.67	58.73	0.02	0.12	3.35	6.75	5.68	1.88
Lurgashall 7	0.26	2.02	15.73	50.87	0.16	0.04	2.49	3.00	5.68	19.75
North Park 1	0.32	4.15	20.29	56.19	0.01	0.05	3.32	9.07	6.02	0.58
North Park 2	0.29	3.92	19.07	53.05	0.06	0.11	3.19	7.13	6.94	5.80
North Park 3	0.32	4.11	21.58	55.68	0.02	0.10	3.44	7.64	5.49	1.64
Verdley 1	0.35	3.61	19.42	57.07	0.02	0.06	3.22	6.62	6.38	3.25
Verdley 2	0.32	3.51	18.59	55.57	0.03	0.06	3.20	6.63	6.38	5.71
Verdley 3	0.29	3.43	19.16	53.46	0.02	0.08	2.85	5.72	4.92	10.07
Verdley 4	0.31	4.49	19.96	54.85	0.02	0.09	3.28	9.42	6.98	0.59
Verdley 5	0.32	3.30	18.38	56.19	0.02	0.04	3.10	6.25	5.98	6.42

Table 1: Analyses of Wealden slags

	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	P ₂ O ₅	S	K ₂ O	CaO	MnO	FeO
Bradley*	-	2.50	11.20	38.10	0.05	1.37	-	41.10	1.90	1.45
Dale Abbey	0.20	4.90	18.30	37.30	0.50	2.30	0.60	31.30	1.80	0.30
Parker's	-	6.50	17.20	38.00	0.01	2.10	-	34.00	1.30	0.40
Tipton	-	3.50	15.10	39.50	-	2.20	-	32.50	2.90	2.00
Ebbw Vale*	-	1.10	20.40	43.60	0.40	0.70	-	28.90	0.30	3.70
*coal-fired										

Table 2: Analyses of selected coke-fired slags¹⁴

Acknowledgement

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Notes and References

- 1 P Riden, 'Some unsuccessful blast furnaces of the early coke era', *Historical Metallurgy* 26 (1992), 36-44.
- 2 Birmingham Reference Library, Boulton & Watt Collection MII/5/10.
- 3 Science Museum Library Ms.371/1.
- 4 H Cleere and D Crossley, *The iron industry of the Weald* (Leicester 1985), 331.
- 5 *The Archaeology of Chichester & District 1989* (Chichester 1990), 33-5.
- 6 West Sussex Record Office, Chichester (WSRO), Cowdray 1443, 1444.
- 7 WSRO, Cowdray 1445.
- 8 *Sussex Weekly Advertiser* 13th January 1777.
- 9 Public Record Office, London, B4/21/228. Guildford Muniment Room (GMR), 1503/4.
- 10 Cleere and Crossley 1985, 362-3.
- 11 *The Archaeology of Chichester & District 1989* (1990), 30-5; *The Archaeology of Chichester & District 1992* (1993), 41-4. J.Magilton, pers comm.
- 12 Both Pophole and Thursley forges are marked on Rocque's map of Surrey (1762), and were noted as working in 1767 during the campaign for the repositioning of the tollgate on the Guildford-Liphook Turnpike, when the iron used was brought by water to Godalming and from thence by road. GMR LM1064.
- 13 Goodyer occupied Abinger Hammer, Surrey, from at least 1756. Surrey Record Office PI/6/1.
- 14 Data from D Cranstone, *The Moira Furnace, a Napoleonic blast furnace in Leicestershire* (1985), 106.

The author

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