Romano-British iron production in the Sussex and Kent Weald: a review of current data

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Abstract

A succession of studies over the past sixty years has shown that iron making was well-developed in the Weald in the Romano-British period. Distribution maps showing the extent of the industry in the region have not, hitherto, attempted to indicate a measure of output for individual sites. This revision of data provides such an opportunity.

Founded upon a small number of native British production sites, exploitation of the clay ironstones in the Cretaceous, Hastings Beds expanded during the first century of the Roman occupation. Output from the region was given considerable impetus by the development of large-scale sites in its south-east part, of which a few have been connected with the *Classis Britannica*.

Interpretation of the importance of the iron industry in the Weald in the Roman period has depended largely on the identification and dating of production sites, and the database has grown over the last sixty years, from the nine recorded by Straker (1931, 214-468) and the 33 included by Cleere (1974, 190-9), to the 76 listed by Cleere and Crossley (1995, 295-305 and 380-1). Further sites have been, and continue to be, identified by the Wealden Iron Research Group. Other authors have made use of the distribution maps accompanying these lists but, to date, these have only included the locations of sites and have not attempted to show comparative data on their size or output. In one local study Cattell (1970, 19) attempted a simple classification of the sites he recorded in the upper Rother valley of Sussex, grouping them according to their linear extent parallel to the valley side.

Based on evidence available at the time, Cleere (1975, 238-43) attempted to quantify the output of the largest sites in the Weald by estimating the volume of the slag and then applying a simple formula to convert this figure into a measurement of the ore that yielded the slag, and from that an estimate of the mass of iron produced. Estimates of the volume of slag heaps at iron production sites are possible if their area and average depth are known. However, conversion of the slag volume into volumes of ore and metal, resulting in an estimated mass of iron produced at a site, is fraught with problems. Firstly, there is the difficulty of quantifying the actual slag in the waste heaps at sites to the exclusion of furnace debris etc. Estimates of the percentage yield of ore reduced to slag and to metallic iron can be similarly contentious, and will vary with the quality of ore used and the efficiency of the smelting process.

The quantity of slag remaining at an ironworking site is a measure of two principal factors: the scale and duration of operations at the site. Estimation of this quantity will be tempered by the possibility - sometimes known and quantifiable - that a proportion of the slag has been removed since operations ceased. In the Weald, it is known that the Romans used iron slag as road metalling, and the subsequent discovery of some of the larger sites of that period was a result of the slag being carted away to surface local turnpikes in the 19th century. In the Forest of Dean, the re-use of slags from earlier working in blast furnaces of the post-medieval period is documented. On a smaller scale, the casual removal of slag from such heaps, for local use as hard core, will have been common. Thus, measurement of the volume of slag heaps in estimating the output and/or operating life of sites is likely to be inexact. In the case of the Weald early descriptions of some of the larger sites have given estimates of the extent of heaps before removal of the slag took place in the 19th century. Quantifying the removal of slag by the Romans themselves can only be assessed globally by attempting some measure of the slag used on the Roman roads in the region. Many of the Roman roads and trackways in the Weald, identified by Margary (1965), were metalled using compacted iron slag. Although it is not possible to state a total mileage of such roads, some idea of the amount of slag used in such circumstances can be estimated. Of the Roman road that runs north from Lewes, Sussex, across Ashdown Forest, towards Edenbridge, Kent, as much as 30km may be surfaced with slag. Assuming for such a road an average slag width of 3.6m and depth of 0.15m, there might be 540m^3 of slag metalling per kilometre. The construction of the Lewes-Edenbridge section of road, therefore, could have consumed over 16,000m^3 of slag; equivalent to all the waste from one of the larger ironworking sites in the region.

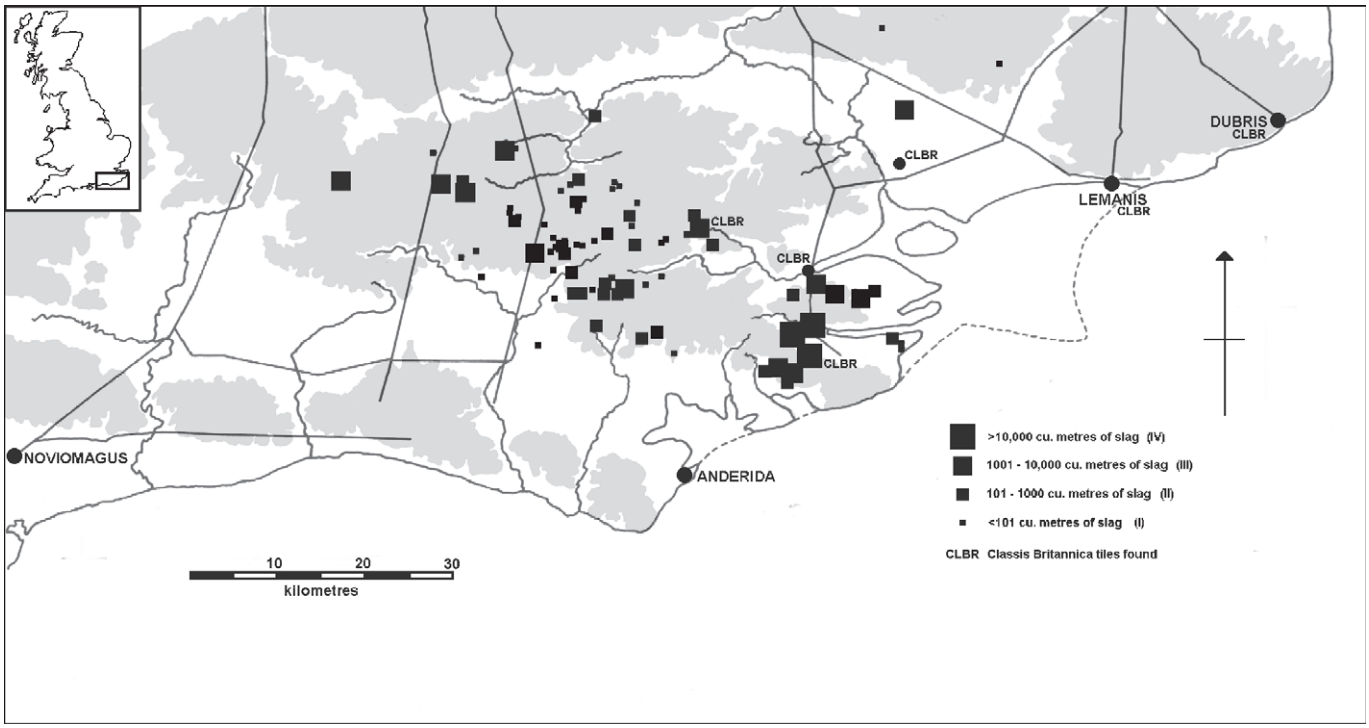

Figure 1: Romano-British iron-working sites in the Weald

Despite the misgivings indicated above, some attempt to measure the relative importance of sites is useful if maps of their distribution are to be meaningful. To this end, Figure 1 shows the distribution of Wealden iron-working sites of the Roman period but with each site classified according to the estimated quantity of slag and furnace waste present, or formerly said to have been so. The classification is on a logarithmic scale, as this allows the most convenient symbolic representation. Use of proportional symbols would necessitate the largest being as much as 3000 times larger than the smallest, which would have a profoundly detrimental effect on the clarity of the map. The data available on the area or depth of slag at Wealden sites is very variable, so the volume estimated for sites is, in several instances, arbitrary because of insufficient information. Nevertheless, it is possible to appreciate from the map some notion of the scale of iron making in different parts of the Weald, with the proviso that a distribution map which is known to be incomplete must inevitably reflect the extent of fieldwork as much as the distribution it sets out to explore. Such fieldwork, undertaken over a period of more than a century, unavoidably includes a selectivity in the sites for which an approximate date has been ascertained. In the absence of a systematic programme of excavation, sites have been chosen for a variety of criteria, such as perceived importance, likelihood of finding datable material, accessibility, and amenability of landowner. This has resulted in a greater proportion of larger sites being dated. Small sites, which were worked for a shorter period and which probably occupied a smaller labour force, are less likely to yield pottery sherds, which are the most easily recoverable dating material. It is likely, therefore, that such sites will tend to be the least well-represented. The map shown in Figure 1 is, therefore, incomplete and inaccurate in many respects but, nevertheless, represents the best currently available information.

There are 538 known bloomery sites in the Weald, of which 133 (25%) have been dated. The proportions of those sites by period are shown in Figure 2, from which it will be seen that the 81 sites of the Romano-British period, (Table 1), are approximately 61% of the total dated.

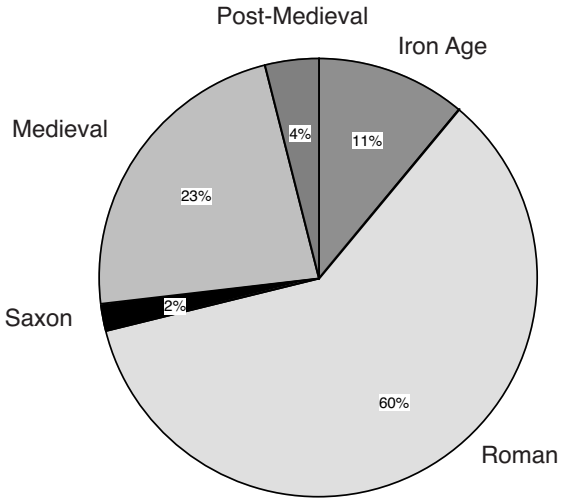

Figure 2: Wealden bloomery sites: distribution by period for 133 of 538 known sites

Table 1: Romano-British ironworking sites in the Weald

Site name	Parish	NGR	Slag volume	Accuracy*	Reference
Grade IV					
Beauport Park	Battle /Westfield	TQ 7860 1460	30000	2	Cleere 1976
Oaklands Park	Westfield	TQ 7850 1750	20000	1	Cleere 1976
Footlands	Sedlescombe	TQ 7720 1780	15000	2	Cleere 1976
Grade III					
Chitcombe	Brede	TQ 8140 2110	10000	2	Cleere 1976
Crowhurst Park	Crowhurst	TQ 7750 1270	10000	3	Cleere 1976
Great Cansiron	Forest Row	TQ 4480 3830	7000	2	*SAC* 110, 1972
Oldlands	Maresfield	TQ 4750 2670	7000	3	Straker 1931
Ridge Hill	East Grinstead	TQ 3690 3550	6000	3	Straker 1931
Burnthouse Wood	Beckley	TQ 8480 2060	5000	3	*SAC* 111, 1973
Forewood	Crowhurst	TQ 7520 1305	4500	3	*BWIRG* 12, 1992; 13, 1993
Bardown	Ticehurst	TQ 6630 2930	4500	3	Cleere 1976
Crawlsdown Wood	Heathfield	TQ 5735 2250	3000	2	*BWIRG* 17, 1997
Romden	Smarden	TQ 8985 4220	3000	3	*BWIRG* 16, 1996
Broadfield	Crawley	TQ 2580 3530	2000	2	*SAC* 130, 1992
Colliers Green	Ewhurst	TQ 7930 2310	2000	2	*Recologea Papers* 7, 4, 1981
Walesbeech	Forest Row	TQ 3950 3450	2000	0	*BWIRG* VI, 1973
Grade II					
Ralph Wood	Waldron	TQ 5468 1757	1000	3	*BWIRG* 20, 2000 (forthcoming)
Oaky Wood	Buxted	TQ 5070 2720	1000	1	*BWIRG* XIII, 1978
Morphews	Buxted	TQ 5090 2560	1000	2	*BWIRG* VI, 1973
Oakenden Farm	Chiddingstone	TQ 5040 4280	1000	2	Cleere & Crossley 1995
Shoyswell Wood	Etchingham	TQ 6820 2790	1000	2	Cleere & Crossley 1995
Pounsley	Hadlow Down	TQ 5250 2220	1000	0	Cleere & Crossley 1995
Stilehouse Wood	Mayfield	TQ 5846 3030	1000	3	Cleere & Crossley 1995
Holbeanwood	Ticehurst	TQ 6630 3050	1000	0	Cleere & Crossley 1995
Bynes Farm	Crowhurst	TQ 7580 1100	1000	3	*SNQ* 13, 1950
Standen	East Grinstead	TQ 3920 3510	750	3	*SNQ* 7, 1939
Glossams Place	Beckley	TQ 8590 2160	700	2	Cleere & Crossley 1995
Tilsmore Wood 1	Waldron	TQ 5763 2174	600	0	*BWIRG* 19, 1999
Pepperingeye	Battle	TQ 7440 1310	500	1	Cleere & Crossley 1995
Cinderfield	Framfield	TQ 5290 2190	500	0	*BWIRG* V, 1973
Howbourne	Hadlow Down	TQ 5170 2490	500	0	*SAC* 111, 1973
Clappers Wood	Horam	TQ 5940 1680	500	1	Cleere & Crossley 1995
Flat Farm	Hadlow Down	TQ 5520 2200	300	2	Cleere & Crossley 1995
Minepit Wood	Rotherfield	TQ 5230 3380	250	3	Money 1974
Badland Wood	Ewhurst	TQ 7739 2134	200	3	*Recologea Papers* 7, 2, 1980
Scocus	Hadlow Down	TQ 5525 2312	200	1	*BWIRG* XIII, 1978
Old Place	Icklesham	TQ 8780 1650	200	3	*SNQ* 6, 1937
Brickhurst Wood	Mayfield	TQ 5900 2776	200	1	*BWIRG* 5, 1985
East Wood	Maresfield	TQ 4480 3010	200	2	Cleere & Crossley 1995

* The accuracy of the slag volume given for each site is indicated by a number from 0 to 3 - the number of known dimensions of the slag heap. Missing dimensions have been inferred from other information known about the site. Where no dimensions have been recorded, personal knowledge or informed guesses have been used.

Table 1 (continued)

Site name	Parish	NGR	Slag volume	Accuracy*	Reference
Grade II (cont)					
Castle Hill	Rotherfield	TQ 5597 2803	200	1	Cleere & Crossley 1995
Hodges Wood	Rotherfield	TQ 5270 3256	200	1	*BWIRG* XV, 1979
Blackman's Farm	Warbleton	TQ 6140 1720	200	2	Cleere & Crossley 1995
Grade I					
Brook House	Buxted	TQ 5060 2730	100	0	*SNQ* 14, 1957
Front Wood	Buxted	TQ 4899 2460	100	2	*BWIRG* XV, 1979
Greystones Farm	Buxted	TQ 4950 2710	100	0	Cleere & Crossley 1995
Newnham Park	Buxted	TQ 4940 2840	100	1	Cleere & Crossley 1995
Steel Cross	Crowborough	TQ 5290 3180	100	0	Straker, 1931
Crump Corner	Framfield	TQ 4750 1650	100	0	*BWIRG* 2, 1982
Hempstead Wood	Framfield	TQ 4900 2160	100	1	Cleere & Crossley 1995
Cow Park	Hartfield	TQ 4520 3090	100	3	*SAC* 117, 1979
Garden Hill	Hartfield	TQ 4440 3190	100	2	*BWIRG* XV, 1979
Markly Wood	Heathfield	TQ 5802 2316	100	1	*BWIRG* 17, 1997
Little Inwoods	Mayfield	TQ 5620 2397	100	1	Cleere & Crossley 1995
Pannel Farm	Pett	TQ 8820 1470	100	0	Cleere & Crossley 1995
Carter's Farm	Pett	TQ 8920 1450	100	0	Cleere & Crossley 1995
Coalpit Wood	Wadhurst	TQ 6530 2850	100	2	Cleere & Crossley 1995
Bingles Farm	Withyham	TQ 5070 3400	100	1	*BWIRG* XV, 1979
Dooze's Farm	Mayfield	TQ 6250 2740	60	3	Cleere 1974
Runhams Farm	Harrietsham / Lenham	TQ 8720 5100	50	0	Philp 1994
Crabtree Farm	Buxted	TQ 4845 2983	50	1	*BWIRG* XIII, 1978
Eastwell Park	Eastwell	TR 0010 4790	50	0	CKA Record Cards
Coleham	Fletching	TQ 4070 2410	50	0	Cleere & Crossley 1995
Eridge Old Park 1	Frant	TQ 5770 3430	50	0	Cleere & Crossley 1995
Eridge Old Park 2	Frant	TQ 5776 3452	50	0	Cleere & Crossley 1995
Eridge Old Park 3	Frant	TQ 5750 3400	50	0	Cleere & Crossley 1995
Trolliloes Bridge	Herstmonceux	TQ 6320 1520	50	0	Cleere & Crossley 1995
Bosmere Farm	Hadlow Down	TQ 5450 2220	50	1	Cleere & Crossley 1995
Knowle Farm	Heathfield	TQ 6234 2414	50	2	*SNQ* 17, 1969
Magreed Farm	Heathfield	TQ 6005 2292	50	1	Cleere & Crossley 1995
Stumletts Pit Wood	Rotherfield	TQ 5290 2770	50	0	Cleere & Crossley 1995
Frankham, Mark Cross	Wadhurst	TQ 5900 3230	50	0	Cleere & Crossley 1995
Limney Farm	Rotherfield	TQ 5400 2710	50	0	Cleere & Crossley 1995
Walnut Tree Field	Rotherfield	TQ 5320 3320	50	0	Cleere & Crossley 1995
Long Gill	Mayfield	TQ 5887 2949	50	1	Cattell 1970
Tilgate	Buxted	TQ 4912 2604	15	3	*BWIRG* 20, 2000 (forthcoming)
Pippingford Park	Hartfield	TQ 4460 3130	12	3	*SAC* 111, 1973
Heaven Farm	Danehill	TQ 4044 2616	10	0	Cleere & Crossley 1995
Little Cansiron	Hartfield	TQ 4560 3840	10	0	Cleere & Crossley 1995
Freshfield Brickworks	Horsted Keynes	TQ 3850 2620	10	0	*SAC* 78, 1937
Rocks Wood	Withyham	TQ 5230 3490	10	1	*SAC* 125, 1987
Smythford	Worth	TQ 3590 3890	10	3	*BWIRG* 5, 1985

Notes: *BWIRG: Wealden Iron*, Bulletin of the Wealden Iron Research Group; volume numbers in roman numerals refer to first series, arabic numerals to the second; CKA: Council of Kentish Archaeology; *Recologea Papers*: J of Robertsbridge and District Archaeological Soc; *SAC*: *Sussex Archaeological Collections*; *SNQ*: *Sussex Notes and Queries*.

These statistics can be compared with those resulting from an earlier survey of an area of the central Weald, in which 246 sites were noted (Tebbutt 1981, 59). Then, it was possible to put a date to 40 sites (16%), of which 33 (83%) dated from the Romano-British period. Subsequently, 14 sites more sites have been dated, so out of 248 bloomery sites now recorded in the same area, 37 (69%) are of the Romano-British period.

It is not the purpose of this short paper to reconsider the organisation of the iron industry in the Weald in the Roman period; however, it is perhaps worth noting that the distribution of sites shown on Figure 1 throws into sharper relief the separation, proposed by Cleere (1974, 177-8), of the sites into two distinct groupings - an eastern, coastal group of larger sites, and a more dispersed group in the central High Weald. The presence of the *Classis Britannica*, evidenced by finds of stamped tiles at a small number of sites in, and adjacent to, the Weald, and notably at Beauport Park, has already been considered by Cleere, but it remains to be seen whether any further finds of tiles at other sites will confirm the presumption that its control extended over the eastern group.

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