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Set by Denis Ashurst

Hon. Secretary
Mrs S. Broomfield, 8 Woodview Crescent, Hildenborough, Tonbridge TN11 9HD

Hon. Editor
D. W. Crossley, Division of Adult Continuing Education, The University, Sheffield S10 2TN

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Field Notes

compiled by J. S. Hodgkinson

Medieval bloomery slag at Crawley, Sussex

A watching brief on building work at the rear of 101 High Street, Crawley, has noted a small amount of bloomery slag together with three sherds of late-medieval pottery in the fill of a pit (TQ 26837 36785). The building known as the Old Punch Bowl, behind which the pit lay, dates from the early 15th century. Other sites of medieval ironworking have been noted in the High Street area.[1] This latest discovery, notified to the Group by John Mills, Assistant County Archaeologist for West Sussex, fuels speculation that late-medieval Crawley was a centre for small-scale, quasi-domestic iron trades.

A possible medieval bloomery at Southwater, Sussex

Investigation by the Chichester District Archaeological Unit has revealed ditches, pits and post holes containing pottery of probable 14th century date, possibly associated with a medieval smallholding, on the south side of Southwater Street, Southwater (TQ 1606 2724). A number of features contained bloomery slag, both tap slag and forging slag, including at least one forging hearth bottom. This site, again reported by John Mills, is from an area in which no other such sites are known.

A bloomery at Lyminge, Kent

Archaeologists from Liverpool University have discovered a bloomery extending over an area of 200 metres on Greatfield Farm, Stelling Minnis (TR 129454). The site, close to the Roman Stane Street, the ancient route from Lympne to Canterbury, lies on the chalk and appears to have drawn its ore from the iron-rich sandstone beds overlying the chalk. Other sites in the same area, TR 134430 and TR 167476, point to an outlier of the industry possibly

associated with the ports at Lympne or Dover. We are grateful to David Higgins for notification of this site.

Great Cansiron Romano-British ironworks, Forest Row, Sussex

This site (TQ 448382) was described by Tebbutt, who noted the abundance of pottery and evidence of buildings.[2] The Field Group revisited the site in October 1993. Very wet weather preceded the visit, and it was noticed that the stream, which lies along the northern boundary of Far Blacklands field, had overflowed and a second stream had come into existence further to the south, running in an approximately straight line from TQ 4474 3834 to TQ 4494 3827. It was observed that slag did not occur to the north of this new stream, suggesting that, in Roman times, the stream may have followed this more southerly course, silting up possibly occurring when the area was part of the tail of Cansiron Forge pond. Pottery of the Roman period, including four pieces of Samian ware and several sherds of *mortaria*, together with fragments from later periods were found in the northern parts of fields immediately to the south and south west of the site. A scattering of bloomery slag was also found in the same part of the field to the south west. With the consent of English Heritage a resistivity survey was commenced and will be continued.

A bloomery in Hartfield, Sussex

A bloomery has been discovered in a small ghyll south of the settlement at Cabbagestalk in the Parrock area of Hartfield parish (TQ 460338). The site lies on Ashdown Sand, south of the faulted boundary with the Wadhurst Clay, in an area with inferred industrial use in the medieval period.[3] Scattered with the slag were several large pieces of Cyrena limestone.

North west of the above site, in Paradise Wood, there is sub-surface slag at TQ 4575 3395, about 3 metres west of the easterly of two streams. The finding of a large bloomery furnace bottom at TQ 4575 3390 supports the possibility that a bloomery may have been situated nearby. Tebbutt noted a bloomery in the field to the west.

Ponds in the wood may have been ore pits.

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The Ordnance Recommended to Arm the Defensive Earthworks Proposed for the Sussex Coast in 1587

Pam Combes

In 1870 Mark Anthony Lower published a copy of a survey of the coast of Sussex the original manuscript of which was, at that time, owned by a Lewes solicitor, Wynne E Baxter. The manuscript was purchased in 1971 by the British Museum and is now British Library Add ms 57494. The manuscript is entitled, 'A survey made by Sir Thomas Palmere knight and Mr Walter Couverte esquire Deputie Lieutennts of her Maties Countie of Sussex, of all the places of descente alongst the sea coast of the said shire'. The map is coloured and on vellum and the text is on paper. The survey is signed and dated Nicholas Reynolds, London, May 1587.[1]

The title given to the document is somewhat deceptive since not only are the vulnerable areas of coast identified but proposals are made concerning defensive works to be undertaken and the ordnance with which the works should be armed. It is of note that a Sir Walter Convert (Covert) was owner in 1583 of a furnace and forge at Cuckfield. He

was still associated with ironworks in 1589 when furnace owners were reprimanded for their failure to supply returns of their output and customers to the privy council. The omission of the knighthood in the description of the Walter Couvert named in the survey makes it difficult to be certain that they were the same person, but it is possible that they were.[2]

The survey begins at the west of the county by the entrance to Chichester harbour and finishes at Rye. The text of the printed edition, not the original document, has been used for this note.[3] The spelling of place-names and types of guns have been modernised.

The largest gun recommended was a demi-culverin. The smallest guns recorded were probably the bases, with sakers, minions, falcons, falconets and robinets in descending order of size between the two extremes. Quarter slings were also recorded, a demi-cannon and a curtall cannon, the latter a cannon with a short barrel. The purpose of the small shot is not clear; it could be either for small arms or to arm smaller pieces brought to those sites if and when they were required.

Cakeham Stone, the east point of Dell mouth (the channel up to Dell Quay) was to be fortified for the planting of one demi-culverin and two sakers. The same fortifications were recommended to be placed between the beacons[4] and the church at Selsey and also at Pagham point. The need for trenches or flankers for small shot was also noted.

Littlehampton, the entry to Arundel, was to be fortified for the planting of two demi-culverins and two sakers. Some entrenching was recommended, but only where there were stades (beaches where vessels could be run aground) or beacons.

Shoreham was to be fortified for the planting of one demi-culverin and two sakers. Goring beacons and Kingston stade were to be flanked and trenched.

From Goring to Heene mill there was water between the beach and the stade, forming a defence in itself; between Heene and Worthing beacons was an existing small trench in ‘cheverne’ (chevron?) form which could be strengthened by trenching and flanking. At Lancing

beacons a small trench flanked for small shot was proposed.

Between Brighton and Shoreham the landings were good and it was considered necessary that two demi-culverins and two sakers should be kept in some good house 'to be readie at sudden'. In various other places there were to be trenches with sunken flankers for small shot.

Brighton itself was already supplied with ordnance but this was still considered insufficient; sunken flankers for small shot were recommended in addition to the demi-culverin, three sakers, and the minion and falcon which were already mounted and furnished with shot. Powder was lacking. Trenches with flankers for small shot were recommended for Saltdean and Moordale, both of which lie on the coast between Brighton and Newhaven.

At Newhaven the existing ordnance was unmounted and considered of little worth. A bulwark of earth was recommended for the planting of one demi-culverin and two sakers. To the east at Blatchington Hill two rampiers (defensive ramparts) of earth were to be made with one demi-culverin and one saker in each. At Blatchington town they had one saker and at Alfriston church two pieces already mounted and furnished. Bishopstone Hill was also to be trenched with flankers for small shot.

At Seaford a falcon and two falconets were already mounted and furnished but trenches and flankers for small shot were recommended. At Chinting farm there was a saker, but the rampier and the carriage and wheels were utterly decayed. Two demi-culverins were recommended for the cliff.

Cuckmere Haven had a saker, minion and robinet, all furnished; a rampier was to be made. Birling Gap was to be fortified or rammed up.

Existing earth bulwarks and rampiers at Eastbourne were to be mended and strengthened with 'apt' flankers. There were already a demi-culverin, two sakers, three robinets and three bases with their chambers but no powder or shot. The marshland and cliffs from there to Fairlight were considered a reasonable deterrent to penetration inland from the coast but despite this the haven mouth was to be heavily armoured.

Two rampiers were to be provided with provision for a demi-culverin and two sakers on each; in addition it was needful for the Captain there to have six pieces aptly mounted for the field. The smallest piece was to be a saker. At Cooden beacon some entrenchments and flankers were recommended.

Pevensey Castle was to be 're-edified or utterly raised'. There were two demi-culverins there, of small value. (At the time that Lower wrote two demi-culverins were still at Pevensey and it is possible that the surviving Pevensey demi-culverin is one of these guns).

At Bulverhythe point a rampier was to be constructed for a demi-culverin and a saker. Hastings was bristling with ordnance and was, after Rye, the best defended town on the coast with a mixture of brass and iron ordnance. There were three Portugal bases of brass with four chambers of brass for each of them, one iron culverin unmounted, two sakers, two minions, one robinet mounted and three quarter slings stocked. There was sufficient powder and shot.

Winchelsea was considered a threat should the enemy take the town so a demi-culverin and two sacres at least were recommended.

Only three people were living at Camber Castle which was in good repair and well furnished with ordnance and munitions, a cannon, two curtall cannons, one demi-cannon, a culverin, two demi-culverins and two sakers.

Rye was furnished with great ordnance and munitions both of the Queen's and of their own. The individual guns were not identified but there were no fewer than thirteen brass and ten iron pieces.

The potential benefit of such a project to the Wealden ironworks would have been substantial. If only a small number of the seventeen demi-culverins, twenty three sakers and six other pieces together with the shot required were supplied the order would have provided employment for a substantial workforce in the Weald and profits for the ironmasters. Did this proposed renewal of the coastal defences ever take place? Can any of our members who live along the coast identify where the defences were and do any of the guns survive in the vicinity?

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Cinderhill, Leigh, Kent

B. K. Herbert

The last of the 1993/4 forays took place in April with a second visit to Cinderhill bloomery furnace site at Leigh in Kent, TQ 5330 4588. This is recorded in Straker's book, *Wealden Iron*, but is of unknown date, and in the Spring of 1993, WIRG had failed to find any dating pottery in two small excavations. The location is unusual in that it is over a quarter of a mile from any significant stream. A house to the NE of the site is called The Bloomery, the owners being well aware of this with their garden full of slag.

Two 1.5m by 1.5m cuttings were started where the metal detector indicated slag, although probing suggested that there was very little. Unfortunately, the probe was correct and, although a shallow ditch filled with slag was found at subsoil level, there was no pottery.

At this point it was decided to probe in line with this ditch. At about 18 inches depth, the probe went through a thin crunchy layer. Small test holes were dug, to reveal that the crunchy layer was in fact roasted ore fines, the sieved waste after the roasting process. This also accounted for the lack of charcoal in the excavations, as ore is roasted with wood as a fuel, and the resulting ash would have dissolved away.

Notes on Early-18th Century Memoranda on the Making of Iron

J. S. Hodgkinson

The expenditure accounts for Beech and Robertsbridge Furnaces and Robertsbridge Forge, between 1726 and 1735, have received little attention.[1] They are worthy of interest, however, for a series of memoranda preceding the accounts, which add to our knowledge of the detail of charcoal ironmaking in the Weald and elsewhere. There are several published descriptions of aspects of the practice of iron making, the most familiar examples from the Weald being those of John Ray and John Fuller; the latter a most comprehensive description.[2] The memoranda transcribed below (in italics) do not provide a full description of either the smelting or forging process. Rather they supplement the better known accounts. The memoranda appear to constitute a series of notes, perhaps made by the clerk of the ironworks for his successor, for the guidance of someone either new to the iron business, or to the Weald, or both.

[1] *Calculate of charges of wages &c. at a Furnace when she goes on Sand work viz.*

s	
Master Founder per week of 7 days	*14.0*
under Founder	*9.4*
Upper Filler	*12.0*
under filler	*10.0*
	£2. 5. 4

when on plates for ladling per Ton 6s. 8d. over and above the weekly wages.

For making ye hearth *£1: 10. 0*

Leathering the bellows 4s. & ye old leathers

House rent and firing. & 1s. per week for looking after the moyne & coals

& keeping acco. of the carryers bringing em in.
Casting hammers and anvills 1s. each over & above the weekly wages.

The detail above helps to clarify the varied information on skilled labour charges which is available from other sources.[3] Payments for ladling iron, casting hammers and anvils etc. were regarded as extra to the normal wage, whereas in the Ashburnham Furnace accounts, for example, the wages paid to the founder, borer, moulder etc. are itemised and, in many cases, grouped together with other sums for additional work carried out.[4] For example, in the long campaign of 1763-4 (referred to as Blast AL), which lasted 45 weeks, Thomas Johnson, the founder at Ashburnham, was paid £125 16s 9d for blowing the furnace, which averages £2 16s a week. No mention is made in the account of a separate payment to a filler, nor to an under-founder or -filler, so it could be assumed that his responsibilities were shared with subordinates, and his wage shared in proportion. However, included in the sum for the campaign, which is comparable to the payments in the Beech/Robertsbridge account, is payment for 'breaking the hole twice & the dam once' and 'casting 30 plates in sand', so the figure is distorted to an unknown degree. If the Ashburnham and Beech/Robertsbridge figures are comparable, little if any inflation in labour costs had occurred in the intervening forty years.

The efficient and reliable performance of the two pairs of bellows which provided the blast for the furnace was essential, particularly if guns were being cast, for control of the blast was crucial to the reduction process, and to the state of the metal in the hearth. In March 1748 John Fuller observed to Samuel Remnant that one of his bellows had 'been ill of an Astma this month', and was particular that ox hides, rather than bull or stag hides, be used as replacements. By June the bellows had not been repaired and were looking 'like a ship with Jury Masts after a storm'.[5] Payment for work on bellows differed between Ashburnham and Beech/Robertsbridge. At the former, separate payments were made for currying hides and then

sewing them; the hides, which were bull hides, and the oil to soften and preserve them, being purchased separately. The total payment when the bellows were repaired in about 1765 was £6, of which the sewing accounted for 10s 6d. At the latter furnace we have no information about the supply of raw materials, merely that the repairer was given the old hides, though what use they could be turned to in their worn state is difficult to imagine. In terms of sewing the hides, labour costs at the two sites are roughly comparable.

[2] *NB about 3 loads of coal do make a Tun of Gun mettle, & to exceed that little or not at all.*

This ratio compares very favourably with the figures quoted for the production of pig iron at other furnaces at about the same period, assuming that there is consistency in the definition of a load.[6]

NB to have all underwood cut between ye end of Octobr. and Candlemass if possible.

NB Observe the woodcutters that they cut ye cordwood as close as possible & not leave the Tree too large which they are apt to do. NB In wood cutting it is good to avoid being late; begin as early as you can and agree to have yr. wood all cut by ye beginning of february if possible, and in order to it in yr. putting onto yr. wood to cut avoid putting it all out to collier, for if he takes it all heel be apt to keep the best part to himself, and by letting out the worst to others heel discourage all other wood cutters who will in consequence go to other woods to cut, it being the colliers steady view to make his cutting setting, coaling &c. last the year round. And when you begin wood cutting let the [?] *tree be made up if possible as the wood cutters go on, which will prevent the damage yr. woods will sustain by lugging & pulling the* [?] *tree about in the Spring late when the bud & shoot springs.*

The above three paragraphs suggest that the relationship between the ironmaster and the colliers was not always an easy one. The ironmaster would rent the woodland but the colliers would be given

what amounted to a free hand in the way they cut and coaled the coppice. The ironmaster was interested in the preservation of the woodland as a resource for the ironworks, whereas the colliers' interest was in deriving a living from the woods in the best way they could, a motive which would not necessarily coincide with that of the ironmaster. The desirability of having all the wood cut during the non-growing season, when incidentally the furnaces would be in blast, conflicted with the colliers' need to have a livelihood throughout the year. The ironmaster could protect his interest by employing his own wood cutters, but had to ensure that the itinerant colliers who coaled the wood did not discourage others by selfish exploitation of the woodland.

[3] *Observations about Moulders work when on Gun &* [?] *loam work of severall sorts.*
Moulding large and midling Guns £3. per week or £1 per Ton, the Moulder paying for boring cleaning & stopping & cutting off ye heads.
For very small Guns £4 per week
For making Cages 5s. per cage.
For cutting skantling boards for guns £1 [?] *each.*

The distinction between sand and loam work is evident from these memoranda, different skills being employed in each. Loam was generally used in the construction of gun moulds, and possibly for other castings where non-reusable moulds were employed, such as sugar or garden rollers. Sand would have been used for open-mould castings, such as sows and firebacks. Local sources of both sand and loam were known to founders and the positive identification of such sources would be of great interest.

Again there is a difference between Beech/Robertsbridge and Ashburnham. At the latter many of the responsibilities of the moulder were paid for separately, although it is apparent that at all three works the jobs may have been done by several people. The cages would be the frameworks of metal strapping which encased

the moulds of guns. Unlike the rest of the mould, this part would be reusable. The 'skantling boards', also known as strickle boards, were cut to shape from paper draughts and bore the exact longitudinal outline of the gun.

> *NB a very good method to allow the Smith 1s. per day for all work at the Furnace while on Guns which is what Mr Fuller constantly allows.*

A smithing hearth and anvil would have been a permanent feature of a gunfoundry, to make alterations to the cages, and to repair equipment such as boring bars.

[4] *NB In the beginning of a blast it is right to blow very softly for fear of the hearth; on the best calculation I can make I think not exceeding nine puffs in a minute for about four days is well and then to increase it to about twelve puffs or eleven in a minute will do well. At Beech when the furnace is in order we go about 24 or 25 charges in 24 hours & carry about two hundred 3^{qrs} of mine & 4 baskets of coals to a charge of which baskets 24 make a load of coals.*

No details of the rate at which the furnace bellows were pumped is included in John Fuller's description of furnace operation so the above passage is of considerable interest as calculations can be made about the amount of air being pumped into the furnace with each 'puff', and also about the volume of water which was required to sustain such a blast over a period of time.

At Chingley Furnace the remains of the axle tree which operated the bellows was excavated and surviving mortices indicated that each of two pairs of bellows was depressed three times for every rotation of the water wheel.[7] This would provide for six 'puffs' for every rotation and therefore, in the example quoted in this document, the normal operation of the bellows required two rotations of the water wheel in a minute. The average diameter of furnace water wheels excavated in the Weald is 10ft 6in (3.2m), which would give an average circumferential speed for such wheels of 1.1 ft/sec (0.33

m/sec) at two rotations a minute.[8] In the absence of more specific data, estimates of the power output of water wheels were made by Dr P Strange, who assumed a circumferential speed of 3ft/sec for the water wheels at Chingley, where the forge wheels were approximately 8ft in diameter and the furnace wheel 11ft.[9] The energy required to operate the wheel powering a forge hammer would have been considerably greater than that necessary for a furnace wheel, but the slower circumferential speed than the estimate made for Chingley indicates a smaller power output, and has implications for estimates of the amount of water needed. Incidentally, from this estimate of the speed of the water wheel, the effort required to 'tread the wheel', which had to be done at three furnaces in 1743, can be compared to briskly walking up a flight of steps.[10]

The size of charge at Heathfield Furnace cannot be easily compared with that at Beech/Robertsbridge. The number of baskets of charcoal is comparable, although it is not certain that the baskets used at Heathfield had the same capacity. At Heathfield the ore was measured in wooden or metal containers called boshes which held forty or fifty pounds of ore (these should not be confused with the part of the inside of the furnace which bore the same name). Fuller's description implies that furnaces could hold an average of about 1000lb of ore at any one time, but he is not specific about the amount of ore placed in the furnace with each charge.[11] At Beech the charge is stated to be 308lb of ore which, over a twenty-four hour period, amounts to an average of 7392lb (3.3 tons), and equates to the production of about 0.75 tons of cast iron (assuming an ore:pig ratio of 4.3:1), about half the expected output of a Wealden furnace in the period.[12]

> *NB In making the hearth when it is finished it is a very good method to strike it over with loam & hair w^{ch}on the first heating will contribute to the glazing of the hearth and consequently to the preserving it ye longer & makes it endure the blast both harder and longer.*

Fuller's description refers to the necessity of gradually warming the hearth and the furnace stack by burning timber in them and also describes the tendency of iron to stick to the walls of the furnace on blowing in, but offers no remedy for the latter.[13] To what extent the above method of glazing the hearth was more widely used is not known.

> *NB A cord of wood in Sussex is in measure as follows: 14 foot long 3 foot wide & 3 foot 2 inches high. ye 2 inches in heigth being allow'd for shrinking or settling.*

Cords of wood vary considerably. Cleere & Crossley quote cords of 126, 128 and 168 cubic feet, and the dimensions by which such figures were arrived at also differ widely.[14] Straker refers to similar variation.[15]

> *NB a black cinder is a sign of good grey Iron in ye hearth, & if you find y^r^ Iron too white on ye increasing y^r^ moyne, you must take off some weight of moyne & for a little while abate y^r^ blast two puffs in a minute or thereabouts, & if that doth not do it is then proper for a small time to increase a basket of Coals p^r^ charge, but if y^r^ hearth be extreamly much worn ye only way is to blow out for in that case you can't have neither good iron nor a good yeild.*

The production of grey cast iron was highly important in the manufacture of guns. Grey iron contains carbon in the form of graphite and, while having greater tensile strength than white cast iron, i.e. is less brittle, it is softer and more able to be cut and filed.[16] Without these qualities cast iron guns would be prone to bursting and it would be difficult, if not impossible, the remove the gunhead and any surface irregularities. White cast iron was suitable for manufactures which would not be subject to stresses, e.g. firebacks, round shot, or for conversion in forges where a lower proportion of silicon in the iron was required. The faster cooling rate of open-mould casting tended to lead to white iron being produced. Variation in the colour of slags may be a useful indication of the type of iron

produced at a furnace and consequently in distinguishing between possible ranges of products, e.g. sows for forging, or ordnance. Fuller described the relationship between the appearance of slags and the condition of the furnace, pointing to the colour as a guide to the need to increase or decrease the ore or the charcoal.[17]

[5] *NB it is best to keep a bright Twere when you are blowing for if y^{r} tweer is dark by the growing of sinder upon it, must be a great loss of ye wind from the bellows & weaken the blast.*

Fuller describes the 'Recrements which hang about the Tweier' being worked free with an iron pole called a ringer, presumably inserted through the casting arch; the same implement was used to extricate solidified slag from the hearth.[18]

NB be carefull how y^{r} Founders manage in the night season for if they don't sleep by turns & always one be in watch & work the bellows must often be liable to blow almost cold, for want of the tweer being kept clear & ye furnace must be check'd for want of lingering & in such case you'l find a going off in your yeild and to conceal such negleck they are apt when they awake to increase the blast with violence to fetch up ye lost time, in every instance this is very prejudiciall.

The need to balance carefully the three elements in the smelting process – air, ore and charcoal – so that the iron was of the correct quality for its purpose could not be done retrospectively, for once in the hearth its chemical constitution had been decided. The commitment of the skilled workforce clearly could not be relied upon, as witness the experience of Abel Walter, at Sowley Furnace in Hampshire, in 1758, where his reputation as a supplier of guns, and possibly the financial basis on which that supply was mounted, was destroyed by the carelessness of his founder, known as 'Drunken Bets'. Twenty three out of Walter's consignment of thirty seven guns failed the Ordnance Board proof.[19]

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5. D. W. Crossley & R.V. Saville, *The Fuller Letters* (Sussex Record Society volume 76, 1991), 244.
6. Cleere & Crossley, op. cit., 287.
7. D. W. Crossley, *The Bewl Valley Ironworks* (Royal Archaeological Institute monograph 1975), 32-35.
8. Cleere & Crossley, op. cit., 242.
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10. Crossley & Saville, op. cit., 187.
11. Saville, op. cit., 66-67.
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14. Cleere & Crossley, op. cit., 134-5.
15. Straker, op. cit., xii.
16. W. Rostoker & B. Bronson, *Pre-Industrial Iron*, (Archeomaterials Monograph 1, Philadelphia 1990),17-18.
17. Saville, op. cit., 69.
18. ibid, 72.
19. Public Record Office WO47/51 pp.205 & 523; WO47/52 p.80; L. J. Williams, 'A Carmarthenshire ironmaster and the Seven Years' War', *Business History* **II** (1959), 35.

A Fourth Foray on the London–Lewes Roman Road

B. K. Herbert

Work in February 1994 brings up to date four years of retracing the London–Lewes Roman Road[1,2,3] described by I. D. Margary in his book, *Roman Ways in the Weald*. Reference to places on the road are noted by letters in brackets and are marked on the maps, whilst an associated list of map references is given at the end of the article; places situated off these maps have numbers in brackets.

The previous foray, which came from the north,[3] finished near Bassett's Manor (A), where the owner says much slag was found when a new silage pit was dug out (B). Close to this silage pit is an older water-filled pit (C) with the road almost touching the west end, and where pieces of Cyrena Limestone were found lying in a field close by. However, no sign of the road could be found between these two pits and the un-named river (D). On the north bank of the river an extensive chalybeate spring still runs (E), this is the "bog with rusty slime" noted by Margary. It should be realised that the exact course of the river crossing may never be found due to the river having changed its course over the years. The flood plain is some 30 yards wide here and the valley may well have silted up due to a weir (1), some 1500 yards downstream, where water was taken off into a head leat for Bolebrook Cornmill (2)

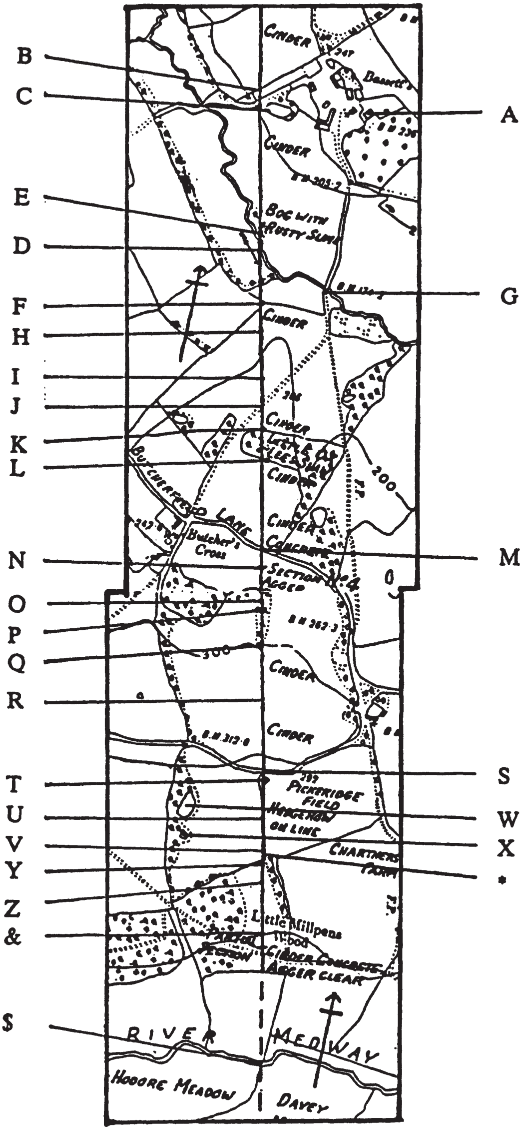
A few yards south of the river and two feet down under the bank of a ditch (F), the road surface was seen for the first time, along with some large tabular sandstone blocks similar to those under the road bridge (G). It is interesting that this ditch is on the course of the head leat to Bassett's blast furnace (3).[4] The course of the road up from the river passes between a small dry pit and the electricity

pole (H), with still no surface evidence; as the hill flattened out (I) a slagged surface could be probed and was followed to the drive-in (J) to Bassett's Manor.

The road is lost again beyond the drive until it enters a small copse (K to L) where it was probed and found to be slagged and in good repair just below the surface, whilst a ditch on the south side of the copse (L) cuts through the slagged road. Beyond the copse, all signs of it were lost again up to Butcherfield Lane (M). Beyond the lane the ground is raised to form a causeway (N) leading towards a modern pit with slag visible on the north edge (O). From the south side of the pit a hollow-way goes up a steep slope (P to O). Unfortunately, it is suspected that all three of these features are contemporary with one another and not related to the road, especially as it should be some 10 metres to the east at the top of the hollow-way (Q), near the field boundary. At this point, it is possible to view the southerly course of the road from the Holtye road.

No sign of the road was found up to the summit of the hill (R), nor down the other side to a road (S) leading to St Ives Farm (4). Beyond, in the next field, the road is not visible, although it was seen on the east side of the hedgerow (T); it is seen again half way down the field (U), where slag was found two feet down in the ditch. It then became obvious by probing and by using the metal detector that the road was passing under the hedgerow and ditch at a glancing angle, and this accounted for slag being found in the ditch for some 50 feet between (U) and (V) at a depth of two feet. Beyond the west side of this field two pits (W and X) were seen; these are discussed below.

In the next field, now within view of the river Medway, the road passes just to the west of the gate (Y), where pieces of slag were found on the bare ground, whilst slag was also probed intermittently further down the field (Z). To the east of the road, a north/south gill starts abruptly(*), not deepening gradually in the usual way. This geological feature is difficult to justify; maybe the start of the gill was filled in, from (U) to (*), to enable the road to remain on a straight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X
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CINDER
Butcher's Cross
SECTION AGGED
PICKERIDGE FIELD
HEDGEROW ON LINE
CHARTNERS FARM
Little Millpens Wood
AGGER CLEAR
RIVER MEDWAY
HOORE MEADOW
DAVEY

level course.

Dowsing experiments were carried out at this point, using two iron wire rods bent at right-angles held in ball-point pen holders: the road could be detected by two people; further experiments will be carried out to prove the usefulness of this technique, especially for finding side roads.

No further sign of the road was found down to the Medway ($), where the flood plain is 100 yards wide. Unfortunately, here the foray had to stop and the investigation of some sandstone blocks on the flood plain is covered in Part 5.

The bare ground beside the gate (Y) and a cattle trough (&) make excellent line-of-sight markers for the final foray from the Medway to Gallypot Street (5).

The opportunity was taken to investigate features in the vicinity of Chartner's Farm (6). Here the track ran between two pits (7) and (8), but was probably one pit originally. The east pit was water-filled and typical of many in the Weald but the other had a 30-foot high face on the north side; much higher than usual. These pits and others (9) and (10) near St Ives Farm (4), are on a faulted junction of the Wadhurst Clay and Ashdown Sand. It may be that the fault has not caused the iron ore to be buried too far down, and that the ancient miners discovered this source of ore.

References

1. WIRG, *Wealden Iron*, 2nd series **12** (1992), 2-8.
2. WIRG, *Wealden Iron*, 2nd series **13** (1993), 14-20
3. WIRG, *Wealden Iron*, 2nd series **14** (1994), 5-12
4. WIRG, *Wealden Iron*, 2nd series **3** (1983), 36-42

Map references

The 1:25000 O.S. map, 1965 ed. shows the Roman road 20 metres west of the course surveyed by the group.

A	TQ 4670 3775	Bassett's Manor
B	TQ 4652 3777	Silage pit
C	TQ 4653 3773	Water-filled pit
D	TQ 4657 3751	The river
E	TQ 4657 3752	Chalybeate spring
F	TQ 4660 3739	Blast furnace head leat
G	TQ 4670 3740	Drive-in bridge over river
H	TQ 4662 3735	Between pit and electricity pole
I	TQ 4663 3735	Before Bassett's drive
J	TQ 4664 3721	Road across Bassett's drive
K	TQ 4666 3718	North side of copse
L	TQ 4667 3713	South side of copse and ditch
M	TQ 4670 3698	Butcherfield Lane
N	TQ 4672 3694	Middle of causeway
O	TQ 4672 3691	Modern pit
P	TQ 4672 3690	North end of hollow-way
Q	TQ 4674 3683	South end of hollow-way
R	TQ 4677 3671	Summit
S	TQ 4679 3660	Road to St. Ives Farm
T	TQ 4680 3658	Roman road just to east of hedgerow
U	TQ 4681 3653	Start of Roman road in ditch
V	TQ 4682 3647	End of Roman road in ditch
W	TQ 4668 3652	Pit west side of field
X	TQ 4669 3646	Pit west side of field
Y	TQ 4683 3644	Bare ground to west of gate
Z	TQ 4684 3641	Field beyond gate
*	TQ 4684 3645	Head of gill
&	TQ 4687 3627	Cattle trough on old field boundary
$	TQ 4691 3611	River Medway

Places off the map:

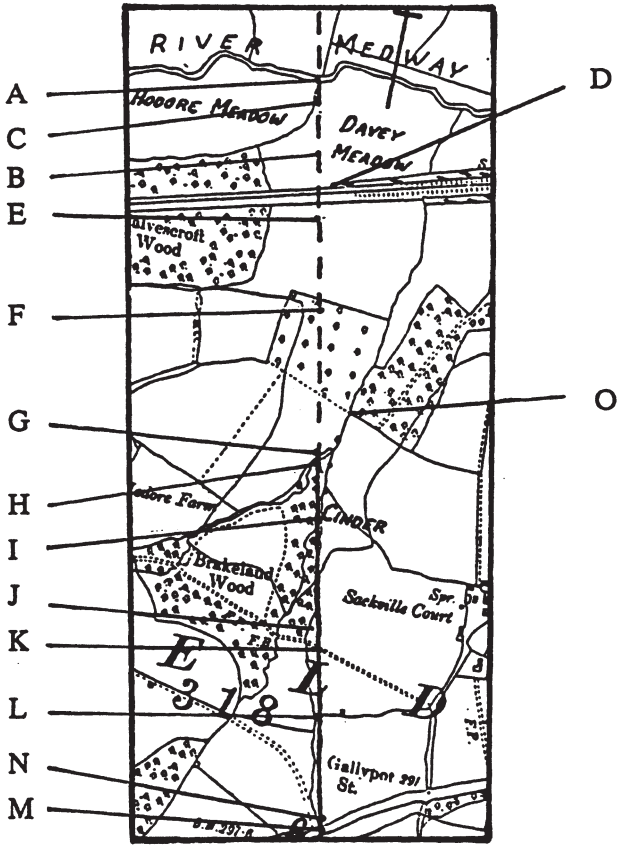
1	TQ 4716 3735	Head leat weir for Bolebrook Mill
2	TQ 4815 3736	Bolebrook Mill
3	TQ 4683 3738	Bassett's blast furnace
4	TQ 4600 3649	St. Ives Farm
5	TQ 4716 3511	Gallypot Street
6	TQ 4729 3658	Chartner's Farm
7	TQ 4732 3650	Pit east side of track
8	TQ 4726 3645	Pit west side of track
9	TQ 4677 3660	Two pits west of St. Ives Farm (fishing)
10	TQ 4644 3651	Pit east of St. Ives Farm (being filled in)

The Fifth and Final Foray on the London–Lewes Roman Road

B. K. Herbert

The March 1994 survey brings to a close the project to re-trace part of the London-Lewes Roman road from south of Edenbridge to Gallypot Street, near Hartfield; the previous forays are listed below.[1, 2, 3, 4] As before, points of interest are noted by letters in brackets and marked on maps copied from Margary's book *Roman Ways in the Weald*, whilst an associated list of map references is given at the end of the article; places situated off the map have numbers in brackets.

The foray started on the south bank of the Medway (A), whilst the last known probing of the road was some 300 yards north of the river, marked Z in the previous report.[4] As there was nothing to be seen in either river bank, other possible locations for a river crossing were considered, but without result. With a 100-yard-wide flood plain, the river might well have moved laterally, destroying all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MEDWAY
Hoobre Meadow
Davey Meadow
Silvencroft Wood
Brakeland Wood
Sackville Court
Spr.
Gallypot
St.
E 318 I D

signs of a crossing. After a great deal of probing well away from the river, a slag base was eventually found about one foot down (B); at this point some slag and large pieces of sandstone were seen on the surface. After probing back towards the river, the slag base ran out 27 yards from the river bank (C); at this point it was two feet down in the silt. Whether this was the edge of the river at the time could not be ascertained, although a simple excavation would be of interest.

Field names on this part of the river, at Little Millpens Wood (1), suggest that there was a corn mill in the vicinity, perhaps with pen ponds, although it has not yet been pin-pointed. As it would be impossible to operate a water mill on the flood plain of the Medway, the author suggests that it would have operated using the 'head leat' principle, allowing the mill building to be situated just off the flood plain. It is interesting to note that there is a water course, now dry, from (D) to (2), beside the railway. The sandstone blocks that were found in the field (B), and which are on the flood plain, could be the remains of a weir (within a bay) controlling water to this head leat.

By probing, the road was found to be intermittent just south of where the railway line crosses the line of the road (E). Beyond this point nothing was detected until the brow of the hill (F) where a recently installed pipe has brought a scatter of slag to the surface; however, no slagged road surface could be probed here. No further sign of the road could be found across this field to the boundary (G).

Beyond the field boundary (G) the land drops steeply some six feet down to a stream (H) over a distance of about 15 feet. A slag surface was seen under the south bank (H), therefore the road must originally have run in a hollow-way to drop to a ford at stream level. Beyond this stream the road runs up a valley, where at one point another stream probably flows on the course of the road, before passing to the east bank; the last visible slagged surface was seen in this stream at (I). The land gets rough from here as the road is bounded by woodland to the east and a boundary bank on the west side. A small amount of slag was found beyond the boundary

bank, but well off the course of the road (J); although it probably originated from it. There was no sign of the road in the next field (K) to (L). The final field before the Forest Row to Hartfield Road (L) to (M) at Gallypot Street showed little sign of slag until just prior to the Hartfield Road (N), where a wide scatter of slag was found, making it difficult to pin-point the line.

The opportunity was taken to search the stream flowing north from where the road crosses it (H). Nothing was found until what seemed to be black bloomery slag was noted in the bed on the stream (O). This turned out to be a conglomerate, a natural geological material which causes no response from a metal detector.

This series of five forays covers 5½ miles of the London-Lewes Roman Road. In all this length there are only about ten places where a convincing surface or section was seen, or a surface probed; one of these places has been mistaken, in the past, for a bloomery furnace site.

The author would like to thank all members of the WIRG field-walking team for their contributions. WIRG would like to thank the eleven land owners for showing so much interest in our findings and allowing us to walk so freely over their property.

References

1. WIRG, *Wealden Iron*, 2nd series **12** (1992), 2-8.
2. WIRG, *Wealden Iron*, 2nd series **13** (1993), 14-20
3. WIRG, *Wealden Iron*, 2nd series **14** (1994), 5-12
4. WIRG, *Wealden Iron*, 2nd series **15** (1995), 18-23

Map references

The 1:25000 O.S. map, 1965 ed., shows the Roman road 20 metres west of the course surveyed by the Group.

A	TQ 4691 3611	River Medway
B	TQ 4693 3605	Slag and sandstone
C	TQ 4692 3609	First probing of road south of river
D	TQ 4697 3598	Start of head leat, west end?

E	TQ 4696 3592	Just south of railway
F	TQ 4600 3577	Brow of hill
G	TQ 4703 3561	Field boundary
H	TQ 4703 3560	Stream crossing
I	TQ 4704 3555	Last sighting of road in stream
J	TQ 4706 3535	Slag off course of road
K	TQ 4710 3534	Boundary, wood to field
L	TQ 4712 3526	Boundary, field to field
M	TQ 4716 3511	Forest Row to Hartfield road
N	TQ 4715 3512	Well scattered slag in field
O	TQ 4705 3567	Conglomerate, not slag

Map references off the map

1	TQ 4720 3605	End of dry head leat, east end?
2	TQ 4688 3732	Little Millpens Wood