

# Wealden Iron



Second Series  
No.1 1981

Bulletin of the  
Wealden Iron  
Research Group



# WEALDEN IRON RESEARCH GROUP

## Bulletin No 1 Second Series

1981

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# Scheduled Ancient Monuments

Mr. E. W. Holden, D.o.E. correspondent, informs us of the following sites newly scheduled after recommendation by WIRG:

- |         |                              |
|---------|------------------------------|
| No. 469 | Crowborough Forge, Withyham  |
| No. 470 | Woolbridge Furnace, Mayfield |



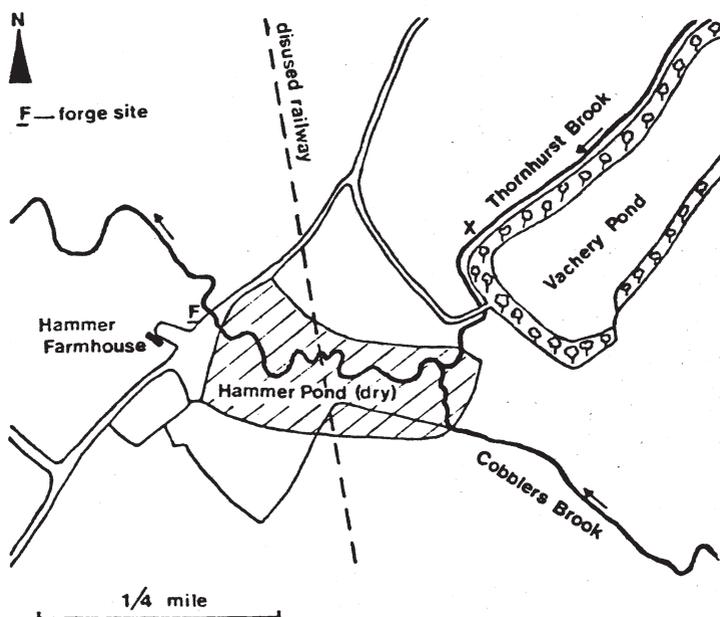
## The Vachery Ironworks

*Stanley Smith*

Ernest Straker set out an account of the Hammer Pond and Forge in great detail in *Surrey Archeological Collections* 47 (1941). Hammer Farmhouse (TQ062369) still stands, and was the probable home of the ironmaster.

An intriguing sentence reads: “This being a forge only, its pig iron was probably obtained from Vachery”. This led to an effort to find the site of a furnace and a furnace pond nearby (Fig 1). As can be seen, much disturbance has been caused first by the Vachery Pond (about 50 acres) constructed in 1813, and second by the railway which was laid down about 1860.

In our researches we discovered in the Thornhurst Brook (marked X) a platform some 40 paces long and about 6 feet wide, made of small black slag 3-4 inches across, fused together to make a flat hard surface. At the upstream end is a brick pier 12 feet high. The purpose of this platform is impossible to judge. The platform is about 3 feet higher than the bed of the stream. At this point of Thornhurst Brook are large quantities of cinders and some blast furnace slag. Mr and Mrs. Tebbutt are certain that this man-made platform has nothing to do with the old furnace, and any suggestions as to its purpose will be gladly explored. Nevertheless, we have some hard evidence that Straker’s reference to a possible furnace at Vachery is a correct assumption.



*Fig 1: Site of Vachery ironworks*

In the Muniment Room at Guildford is an Indenture made the 28th of August 1587, between Lady Jane Bray and John Lambert, the latter described as a forgerman. This granted a 21-year lease of the Vachery Pond together with ten acres to the south and sixteen acres to the north and all houses and buildings thereon. The sentence “and the use of the water of the furnace pond” appears twice, and equally important is the sentence “doth lease and grant ... the carriage of his sowes cole and other carriages through the Vachery Park as the ways lie through the same park”. The former implies that water from the furnace pond fed the hammer pond, and the latter that the pig iron was transported from a furnace through Vachery Park. This is a typical layout of the

complementary workings for a furnace and forge, and their respective water power.

In conclusion, the original Thornhurst Brook probably ran through the present Vachery Pond, and the furnace and bay are under the water level. The present Thornhurst Brook is an artificial course constructed to flow round the NW perimeter of the Vachery Pond.

We are obliged to the Surrey Archaeological Society for permission to use their map on which the sketch plan is based.

Note from C. F. Tebbutt:

In reference to Mr. Smith's 'man made platform' which he kindly showed me, I would prefer to suspend judgement as to its origin until it has been seen by a geologist. I have been deceived too many times before by iron pan to make a definitive identification.

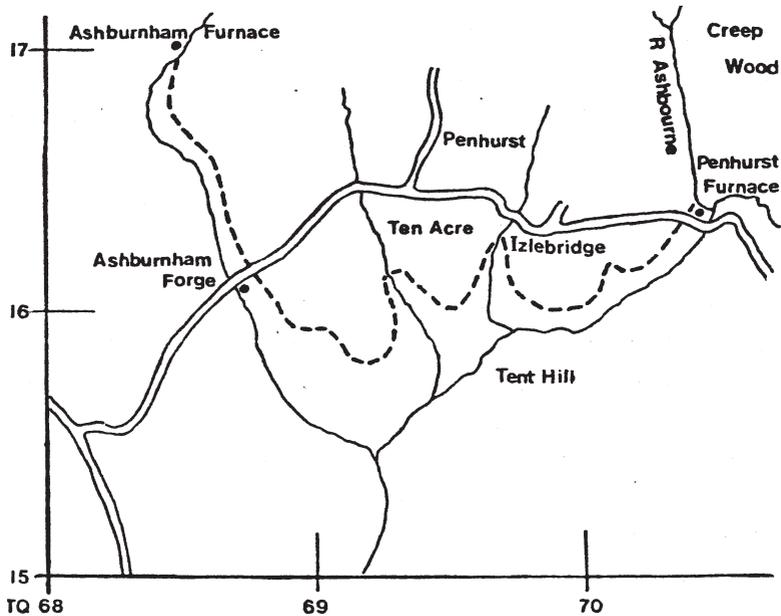


## **The Penhurst–Ashburnham Leat (Aqueduct channel)**

*W. R. Beswick and C. C. Ennever*

It has always been known locally that a leat existed between the Ash Bourne stream at Penhurst and the Ashburnham Furnace site.<sup>1</sup> Any relevant documents appear to have been lost, so it is expedient to record this unique feat of engineering.

The route of the leat (Fig 2) has been found from those parts which are still visible, time and agricultural needs having taken their toll. Its rediscovery was assisted by the fact that it follows the 100ft contour line between its origin at Penhurst and its termination at Ashburnham, a distance of approximately 5000 yards. The leat would have been dug out of mainly clay soil to an approximate depth of 4ft 6in., with a variable top width of up to 8ft, probably less in many places.



*Fig 2: The Ashburnham leat*

The Ash Bourne stream receives its water from two small gills whose source is the south foot of Darwell Hill and which combine at The Waterings (TQ 703172) to produce a southerly flow along the western side of Creep Wood. It was then dammed at TQ 705165; here there is a low bank across the stream, now broken through, which would have back-flooded the shallow valley gorge and so created a shallow pond which could have covered as much as two acres. The leat is first seen at the south west corner suggesting that it tapped the pond water here and it can be plainly seen running due south for 100 yards before it disappears under the Stevens Crouch – Ashburnham Forge road.

The Ash Bourne stream continues its flow south on the east side of the valley and 200 yards down from the pond is the recently rediscovered Penhurst Furnace site.<sup>2</sup> Large quantities of slag were

uncovered here during construction of the Eastbourne Water Works pumping station. The furnace had its own pond of about one acre immediately to the south of the other. Over half of the furnace bay can still be seen.

The leat continues south from the road and along the west edge of the Ash Bourne valley, round a small drain at TQ 702161. It then draws away to the west, crossing a field until it reaches Izlebridge Wood Gill. It runs north, parallel to the gill, for 200 yards before turning west to cross it by an earth bridge constructed at least 15 feet above the stream. The centre of the bridge has been washed away. It circles south, south west and then to the north west to Ten Acre Gill which it crosses as at Izlebridge. At TQ 692161 a clear portion 20 yards long appears little damaged. Here the general measurements were taken.

The leat then apparently takes another crescent path across a ploughed field to where it is next seen clearly, in Peens Wood. It can be followed north for nearly half a mile until it leaves the wood at TQ 688162 to re-cross the Stevens Crouch road  $\frac{1}{4}$  mile east of Ashburnham Forge. The leat runs parallel to but higher than the track to Ashburnham Furnace and in a contrary flow to Giffords Gill in the valley below. It rounds a small indenture in the land caused by the flow from a spring, and 300 yards further north switches to the left or west side of the track. Here the leat and track cross a deep coombe between Alfrees and Malthouse Woods; it is probable that this bridge was originally constructed to carry the leat, for to the right is an ancient trackway sheering away to the east to join the old Penhurst-Ashburnham Furnace road. This suggests that there was no crossing here until the leat bridge was built.

The channel now takes a curve to the west, and after 250 yards crosses the track, now the modern cutting through the fields. It now lies north above the track for 400 yards before ending at the dam bank of Ashburnham Furnace (TQ 686171). Between the track and the furnace is a short tunnel through the sandstone believed to be 25 yards long. This would prevent landslip, as the rocky ground would have precluded construction of an open channel.

It is not clear whether the leat terminated behind (north) of the furnace bank to add more water to what must have been a very large furnace pond, 20 to 30 acres, or whether it terminated immediately in front (south) of the dam bank for a secondary purpose at the furnace. As an all-year operation the furnace would have needed water in summer drought, the storage of water would be a necessity to work the water wheels at the furnace.

The authors wish to thank the various landowners for their assistance in uncovering the aqueduct channel and for their permission to walk over their lands.

### References

1. *Recologia Papers* No.4 (1976)
2. WIRG, *Wealden Iron*, 1st series XI (1977), p.8.



## Sources for the History of the Wealden Iron Industry in the Public Record Office, Part 2

*Sybil M. Jack*

### Ironworks in lawsuits

Lawsuits are the most likely source of information on the private ownership and use of property in the 16th and 17th centuries, although they are tricky to use except where the judgement can be recovered and matched to the pleadings. The formal proceedings at common law, kept in Latin and according to rules designed for lawyers rather than laymen, may yield valuable material, but they are hard of access, as the contemporary indexes are designed to identify people, not causes.

After such suits the sheriff of the county might be ordered to extend

the property of a contumacious defendant, or peremptorily give possession to the plaintiff. Such writs will occasionally survive amongst the various, mainly disturbed and broken, series of writs and returns, but the shrieval records, even if they do survive, will give no information on the property.<sup>1</sup>

More accessible are English bill equitable proceedings, which enabled suitors to bring into court cases for which for one reason or another there was no remedy at common law. Such disputes concerned partnership agreements, the law merchant, and instruments such as bonds.

The court with the longest run of such records is Chancery. The decree rolls start only in Henry VIII's time, but the bills and answers begin well back in the fifteenth century. These cases can cast light on the circumstances in which mills were operated. For example, towards the end of Henry VIII's reign, Joan Weishe, widow, went to the court of Chancery to plead an equity case against Robert Tyrwhitt over the forge and iron mill in Etchingam and the furnace in Darvell Wood. Her late husband, Thomas Weishe had held the property by a lease from the late Thomas Oxenbridge, esquire, made 16 May 1540. Thomas Wriothesley's decree assured Joan of a pension of £24 for thirteen years but awarded the tenure of the mills to Tyrwhitt and his wife Elizabeth, who were to pay a reasonable price. This was to be decided by an indifferent assessor from Etchingam and was also to cover the wood ready cut, cord wood, coals ready made and ore 'dydded'.<sup>2</sup>

Another favourite court for cases which could be deemed to include some threat to the monarch's law and order was Star Chamber. Here however the historian is handicapped by the absence of the decree rolls which would have set out the Court's decisions. In 1543, a widow, Dionyse Bowyer was a suitor before the Star Chamber against William Saunders of Ewell in Surrey, gentleman, over a furnace and forge in Hartfield, Sussex. Some forty acres of land upon which the forge and furnace stood were in dispute and Saunders was riotously attempting to stop the mill working, if Dionyse Bowyer was to be believed. The

elements of the story, which are not in dispute, cast some light on the operation of the works. When Saunders arrived at the forge with his son-in-law and servants he found four or five persons working. These men appear to have been anxious only to avoid trouble, and on assurance that their wages would be paid and that they might finish working the iron that was already hot, they agreed to leave quietly enough. At the furnace, ‘an arrow shot distant’ the trouble started. Saunders met Dionyse’s son John *en route* and his presence may have strengthened the workmens’ resolve, or they may have foreseen greater loss by the untimely blowing out of the furnace. They were engaged in the melting of iron when Saunders arrived. When Saunders’ men attempted to stop the wheel the chief workman attacked Saunders himself with an iron bar. The latter ordered them to stop and returned to the hammer mill, leaving two servants on the bridge between the two works to keep a look out for the reinforcements which John Bowyer had gone to seek. The hammer mill was by this time deserted but for a boy, and Saunders ordered his servants to load certain dishes and three pairs of bellows on to a waggon brought for the purpose. Interrupted in this activity a fight ensued; Saunders, having the upper hand, eventually achieved his purpose, breaking in the process the frame on which the bellows stood. The workmen named were Christopher Trendall, John Walter, Henry Heywood and Robert Glover.<sup>3</sup>

Suitors were less likely to try and proceed in the Court of Requests, which was supposed to be the poor man’s court, although some actions were brought. In 1597, for example, Thomas Johnson of Brenchley, the Queen’s Gunfounder, brought a case there.<sup>4</sup>

The Exchequer was not a court open to all comers, but on technicalities some cases of a private nature could be brought there, and one curious case over wood seems worth mentioning. John Porter of Lamberhurst had in 1603 paid Antony Viscount Montague £320 for a lease of Bayham Forge and Tollesley Forge and all their buildings and equipment from 1605 for twenty-one years. The rent of £133 6s 8d included the right to

take a total of 16,800 cords of wood for coals from the demesne woods, a modest 800 cords a year. He could also build coaling pits, waggon ways and other necessary works. Since there was doubt as to whether the demesne woods would be adequate to meet this demand for wood of twelve years growth, he was also given the right, in case of default, to take 800 cords a year in Snape Wood after the dowager, who held it for life, had died. Any deficit in supply was to be deducted from the rent at 4s 4d a cord. Montague then sold Bayham to Stephen Barneham but kept Snape Wood, and problems arose over who should receive the rent for the woods if Porter had to fell in Snape Wood. He did so in about 1612 and took 659 cords which after a dispute was paid to Montague. He had in 1624 done so again and Barneham's heirs were claiming the money.<sup>5</sup>

There were other ways in which cases involving ironworks might come before the Exchequer, for the court was responsible for enforcing the statutes of the realm. Despite continued controversy over the effectiveness with which this was done it would be a mistake to assume that it was not at least attempted, and the better informed (or better placed) obtained licences from the crown to ignore the provisions of restrictive statutes. After the act in Elizabeth's first parliament restricting the area in which wood could be taken for coaling for iron manufacture, various people obtained exemption. They included William Lord Paget, Thomas Ellyng (for woods in Abinger Worth and Abynger Capell), George Darrell, for life and two years after his death (for iron works now built in Newdigate and Leigh in the Surrey Weald, for trees in Capell, Ockley, Wotton and Oakington).<sup>6</sup>

Action under the statutes was generally initiated by informations laid by that unpopular figure the common informer. The cases can be found in two places – amongst the books of Decrees and Orders where the barons' actions were noted from day to day (thus in 1583 Cheney and Frankwell were in trouble for spoil of woods in Brightling),<sup>7</sup> and on the memoranda rolls, principally the Kings Remembrancer rolls. A typical entry is in 1596, when information was laid against Thomas Browne

of Chiddingstone, Kent, yeoman, for converting into charcoal 9000 cartloads of oak, elm and beech wood in Sevenoaks wood and Whetche wood and others within the parish within the forbidden distance from London and the Thames, which represents 5000 trees and parts of trees more that 1 foot square. 5000 oaks of that dimension were estimated to be worth 40s each. Browne appeared and denied the charge, but Edward Coke, as attorney general asked for an inquisition. Browne may have escaped, as he took over the role of Queen's Gunfounder shortly thereafter, but not all were so lucky.<sup>8</sup>

### References

- 1 See PRO C239 for one series including such writs.
- 2 PRO C78/1 no 57. This incidentally confirms the very early furnace noted in WIRG, *Wealden Iron*, 1st series **VII**, p.27.
- 3 PRO C3/Edw.VI/8/38.
- 4 PRO Req.2/228/13.
- 5 PRO E112/127/249.
- 6 *CPR* 1558-60, pp.96, 326, 340; *CPR* 1560-63, pp.342, 478.
- 7 PRO E123/9/45.
- 8 PRO E159/408 easter 37 Eliz. rot. 286.



## A Metallurgical Site near Kings Standing Farm, Ashdown Forest

*C. F. Tebbutt*

At the end of July 1980 the course of pipe laying by the Mid-Sussex Water Company was being watched, the section concerned being that running from the SE side of the B2188 road (S of the new Blackhill reservoir) to a point just E of Kings Standing Farm buildings. At the time when this was being examined only the shallow preliminary 'top soiling' trench had been completed. This operation consists of removing the top soil over a 4in-wide strip leaving, in this case, the yellow clay subsoil exposed.

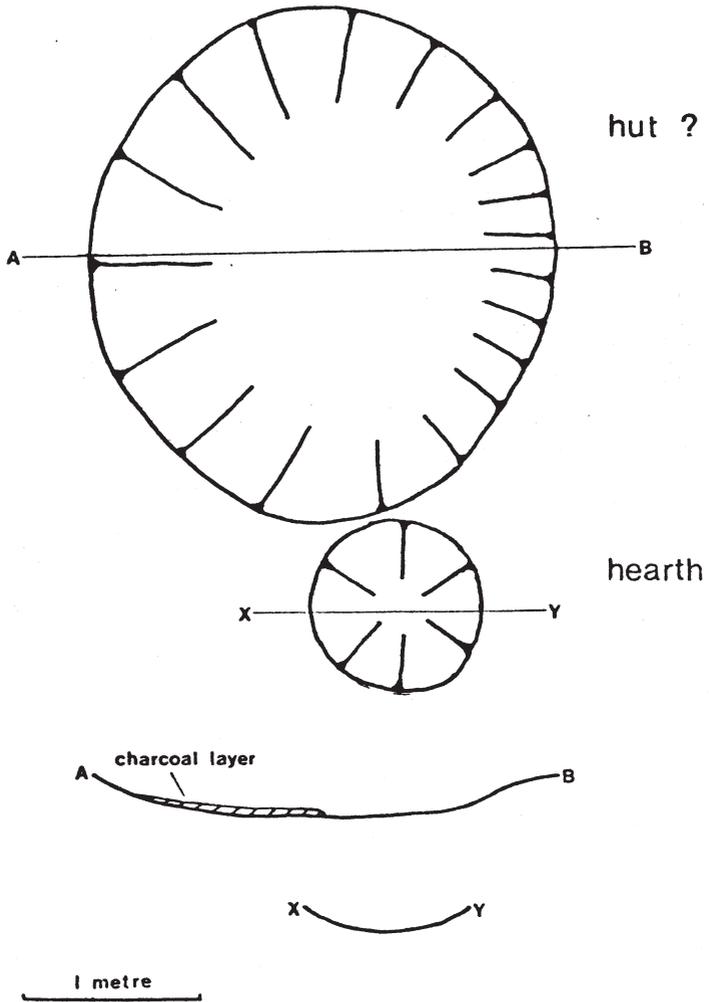
At a point about 115m. N of Kings Standing Farm (TQ 476205) a circular area of burnt clay was noticed, and next to it an oval area of dark loam contrasting with the surrounding yellow subsoil. As it was expected that pipe distribution and laying, involving further trenching, would probably take place over the following few days, an emergency rescue excavation was organised by WIRG field group members.

The site (Fig 3) was found to consist of a shallow oval pit, c.2.90m by 2.60m, the sides sloping to a flat bottom c.22cm from the top of the subsoil level. The main fill of the pit was a dark, almost stoneless loam with a thin layer of grey material, possibly wood ash, separating the loam from the yellow clay subsoil. Over the W half of the pit a thin layer of black charcoal dust occurred just above the grey. The S end of the pit, next to the hearth, was somewhat different. Here there were indications that the pit had originally been deeper and had been partly filled with debris originating from the hearth. This debris consisted of material which, on a bloomery site, would have been described as 'furnace lining'. That is, heavily burnt clay with one side glazed, an effect which could only have been produced with the aid of bellows. With this were scattered a very few small pieces of roasted ore including cyrena limestone, and tap slag.

The hearth was a separate but closely adjoining feature. It consisted of a flat base of burnt clay c.90cm in diameter; in section it was a shallow saucer-like depression in the subsoil with a maximum depth of 15cm. At one side there were indications that there had originally been a raised edge of unknown height, but it was not like any bloomery smelting furnace which we have seen.

Unfortunately no dateable artefact was found, but in the opinion of the writer it seems unlikely that medieval ironworking would have been allowed in the area, which was within the pre-1696 deer park pale.

The purpose of the hearth must remain a matter of surmise. From the almost total absence of slag, ore or charcoal either on the site or in



*Fig 3. Features excavated near Kings Standing Farm*

its immediate surroundings (excavated by the pipe line operators) it is difficult to believe that its purpose was iron smelting, but undoubtedly it was connected with the industry. Much tap slag occurs in the wood 120m to the NE, a large lump was found in the ditch between the site and Kings Standing Farm, and roads in the farmyard contain slag. The general opinion of those taking part in the excavation was that some form of forging had taken place.

The purpose of the shallow, oval flat-bottomed pit is also a mystery. Personally I believe it to have been the site of a hut or shelter with slightly sunken floor and walls of turf. The collapse of such walls would account for the deep layer of stoneless loam filling the pit.

All these theoretical conclusions are unsatisfactory, but the record may perhaps be paralleled in the future on a site where the date and purpose are more certain.

We have to thank the Mid-Sussex Water Company for their usual helpful co-operation.



## **The Sussex Weekly Advertiser – Some Extracts**

*Jeremy Hodgkinson*

The following items of interest were noted during a continuing search through copies of the *Sussex Weekly Advertiser*, or *Lewes Journal*, at Brighton Reference Library.

## 1. Monday January 6th. 1772

To the Smiths in General

Benjamin Molineux begs leave to acquaint them that he hath taken Maresfield Forge, Where they may be supplied with any Quantity of BAR IRON; likewise may be served by him with Bar, Rod, Hoop and Sheet, Steel and Horse Shoe Moulds at Mrs. Molineaux's shop in Lewes.<sup>1</sup>

LEWES Jan 7 1772

## 2. Monday April 26th. 1773

To the Smiths in General

To be Sold

at Maresfield Forge

Bar Iron of all sorts, share moulds etc. of all sizes; in a word, everything that Blacksmiths require for their use of Good Iron for nineteen pounds per ton.

by Elias Standen

## 3. Monday July 11th. 1774

The following persons being prisoners for debt in Horsham Gaol give notice they intend to take the benefit of the Act of Parliament passed in the present 14th Year of King George III

First Notice

(inter alia) William Summers formerly of Lamberhurst, late of Wadhurst, both in the same county, Furnaceman.

## 4. Monday November 21st. 1774

A poor man had the misfortune to have his hand shattered in a terrible manner, on Thursday morning, by the discharge of a cannon at Maresfield.

## 5. Monday January 23rd. 1775

To be sold (inter alia)

At Hawkesden Forge, Mayfield, Sussex.

TEN TON of exceeding good BAR IRON at a cheap rate. For

particulars enquire at the FORGE HOUSE.

6. Monday March 27th. 1775

This is to acquaint the PUBLIC

That the IRONMONGERY BUSINESS is carried on in all its branches, by ANN MOLINEUX and co., at their shop near the White Hart Inn, Lewes, who sell wholesale and Retail, on the lowest terms; likewise all sorts of Bar Iron, Rods, Hoops, Sheet Iron etc. Also Brazieri, and Tin Ware.

All orders will be duly attended to punctually obey'd and gratefully acknowledg'd by

Their most obediant, humble servants

ANN MOLINEUX & Co.

#### Reference

1. Mrs Molineux appears to have been the widow of Joseph Molineux, ironmonger, whose death was reported in earlier issues of the paper.



## Catsfield Furnace: A New Discovery

*John Upton*

A 'Furnace Field' is mentioned in a Bexhill Manor document of 1567.<sup>1</sup> The site (TQ 732114) lies on the same stream as, and almost halfway between, Potman's and Buckholt Forges.

Subsequent use of the area was the erection of a corn watermill at TQ 734115.

Wm. Gardner's map of Sussex 1795 shows the watermill pond in water, with the pond covering the furnace site. Remnants of a bay are still visible behind and to the side of the watermill building. Budgen's Map of 1724 shows no sign of either a pond or a mill, whilst the Ordnance map of 1813 again shows no sign of a pond. These map references seem to provide evidence of the dates of the watermill.

In the north bank of the stream at TQ 732114 circa 1.5m below present ground surface level there are timbers protruding into the stream. Immediately downstream at circa 1.3m below present ground level there is evidence of a floor, as a line of pebbles exist for several metres in both banks. Also at this level the soil is heavily contaminated with charcoal and rust deposits whilst blast furnace slag may be seen *in situ*.

A roughly shaped piece of iron approx. 15in x 4in x 2in, rounded underneath as though cast as a small pig, and weighing approx. 15 lbs was found recently in the stream at the site by the farmer. (This is at present in the author's possession at Battle).

A bank c.50cm high runs northwards across the adjacent field following the line of a feeding stream. It is not clear whether this is a bay for a pond or soil from clearing out the stream. The former is at least a possibility, for it is doubtful whether the pond at Potmans, upstream, could have served this furnace. The watermill pond may well be responsible for the depth of silt covering the slag and timbers.

For ease of identification I suggest calling the site 'Catsfield Furnace'.

No mention of the site is made by Straker.

#### Reference

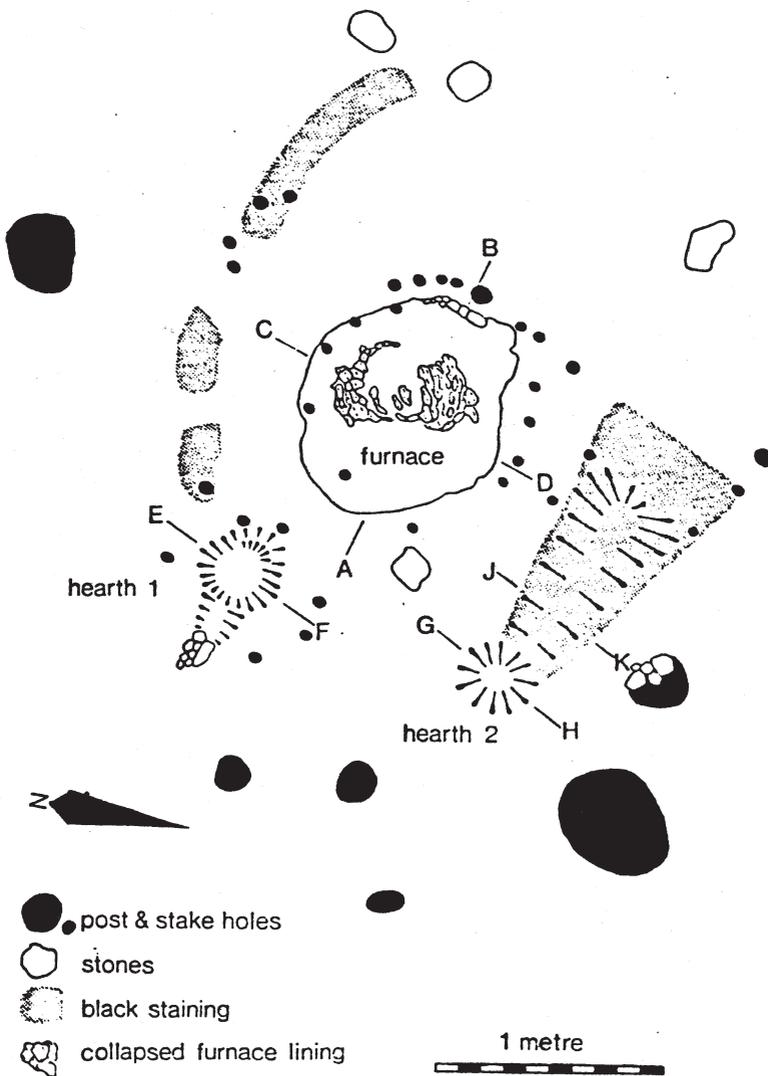
1. ESRO Accession No.2631 (photocopy) Bexhill Manor Documents. I am indebted to Mr David Martin who discovered the reference, and to Mr Fred Tebbutt who passed the information on to me and also for looking at the site.

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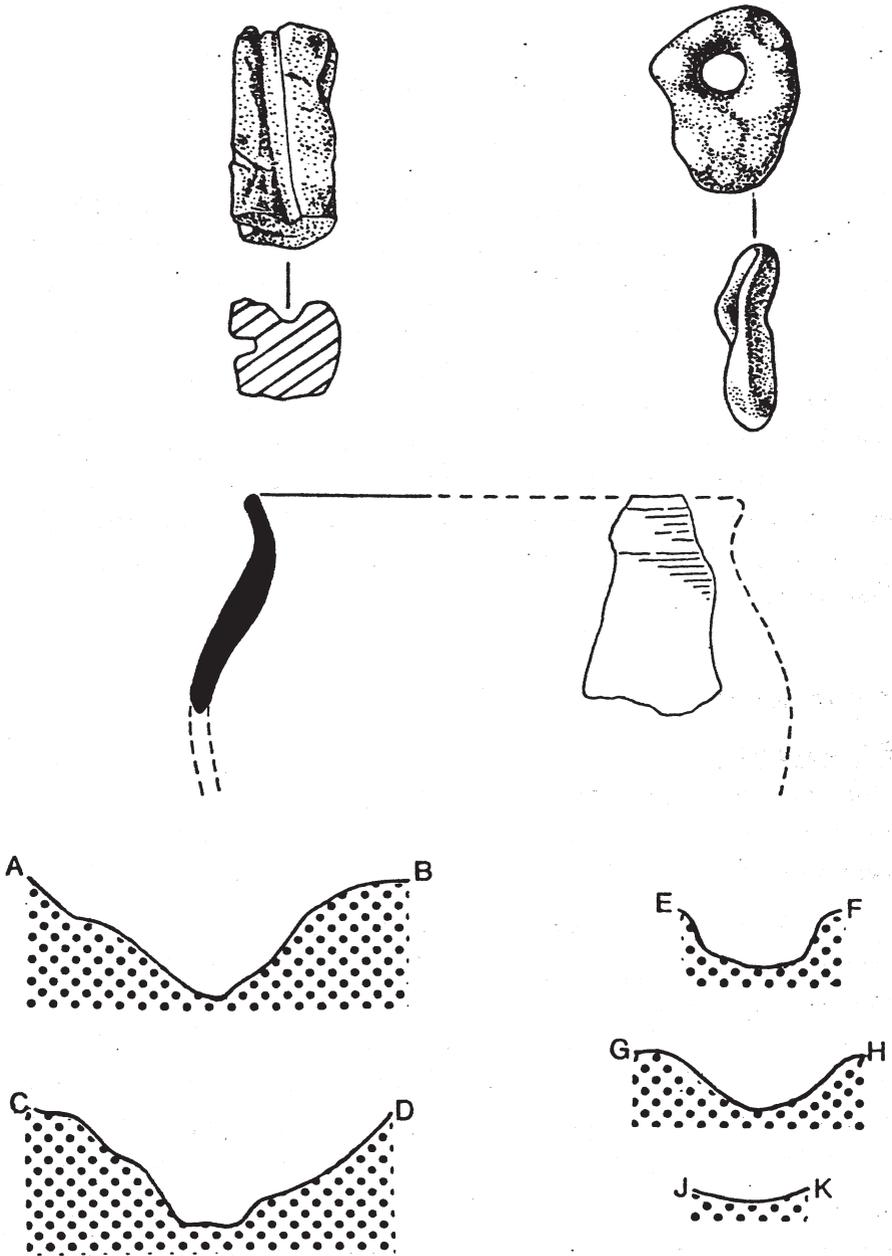
## Ashdown Forest (Millbrook) Saxon Bloomery

*C. F. Tebbutt*

Reference to this important find was made in Bulletin (WIRG *Wealden Iron*, 1st Series) **XVII** (1980), p.15, and again in *Newsletter* 1, p.3, where the archaeomagnetic date of ninth century AD was given. It has now been decided to give it the name 'Millbrook', that being the nearest feature on Ashdown Forest named on Ordnance Survey maps.



*Fig.4: Millbrook Bloomery. Plan of site*



*Fig. 5: Millbrook Bloomery. Finds – sandstone hone, flint ‘amulet’, pottery rim sherd (all at scale 1/2). Furnace and hearth sections.*

Specialist reports are still awaited before the site can be fully written up, and publication in a national or county journal will probably take up to two years. However, as Margaret Tebbutt has now completed her drawings of the site, and Anthony Streeten that of the pottery, it was thought that WIRG members should see these.

Members who heard Henry Cleere's lecture on February 7th last will recall that this is an example of the non-slag-tapping type of bloomery furnace pertaining to the eastern branch of European ironmaking technology. It was thus fundamentally different from the Celtic slag-tapping furnaces of the Roman period with which we are more familiar.

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## Field Group Reports

*C. F. Tebbutt*

### **Water Powered Sites**

A number of forays were made by members of the field group, mainly to clear up questions raised from documentary sources. The following results were achieved.

#### **Knole Park**

In an article 'A Northern Extension of the Wealden Iron Industry', (*Journal of the Iron and Steel Institute*, 1948) H. R. Schubert suggested the existence of a forge at Knole, Sevenoaks. A study of the map showed no stream of any size in the park. A visit to Knole, which included a walk over much of the park, confirmed that it comprised a number of completely dry valleys (Lower Greensand) with no apparent possibility of a water-powered forge being situated there.

#### **Ardingly Furnace**

TQ 337287 (Not included in Straker). There has always been speculation as to which furnace was served by Ardingly Forge. Now Charles Cattell has recorded the discovery in the grounds of Ardingly College, only 400m from the forge, of a furnace site with the pond still in water (*Sussex Archaeological Collections* **117** (1974), 161). The bay here is

75m. long and has a downstream height of 5.25m, with an existing spillway at the north end. In the working area there are earthworks probably indicating the loading platform, wheel pit and tail race, and also much glassy slag.

### Pashley Furnace, Ticehurst

TQ 710295 (Straker 298-9). This site had inadvertently been omitted from previous forays. It has an unbreached bay 80m long and 3m high both up and downstream, with the present stream passing round the west end at the probable site of the original spillway. Here there is a protective bank which could also have formed a loading platform, a probable furnace site with indications of a wheel pit and tail race, and glassy slag. The pond is dry but there are pen ponds upstream at TQ 711299 and 710297.

### Maynards Gate Forge, Rotherfield

TQ 540298 (Straker 254). In response to a suggested documentary reference to a forge at or near Maynards Gate (in addition to the furnace) the stream at the furnace site was re-examined. The probable site of a forge was found approximately 125m downstream of the furnace bay, where an artificially levelled area occurs on the north side of the stream. An apparent leat 90m long leads to this area from the direction of the bay, the 35m nearest to the bay having been destroyed by a landslide. This leat is at a high level, well above the present stream bed. From the levelled area a dry depression, perhaps a tail race, runs to the stream, and downstream from this point forge-type cinder occurs mixed with glassy slag from the furnace.

## **Newly-discovered bloomery sites**

### Ashdown Forest

TQ 462288. This site, reported by our member Derek Thorpe, has been exposed by the erosion of water running along a narrow path that follows the south-west side of a small valley leading out of an artificial pond near Pond car park. Fairly prolific quantities of tap slag are being washed out.

## Chiddingly

TQ 551161. A scatter of tap slag and cinder and a small furnace bottom were found on arable land overlooking the stream. The site is about 100m from the corner of a moat, with which one is tempted to associate it.

## Heathfield

TQ 595195. Just inside woodland bordering the stream is a thick scatter of cinder and tap slag, on level ground that quickly slopes down to the valley bottom. Possible mine pits occur nearby.

## Wilderness Wood, Hadlow Down

TQ 538237. Following information from the owner, Mr Chris Yarrow, the site was visited and tap slag and cinder were found being turned out by rabbits.

## **Explorations and brief notes**

### Chiddingly

Documentary reference to ‘Lower Chiddingly Furnace’ in 1597 seemed to presume two furnaces in this parish, whereas our records show only one, at Stream Mill (TQ 555155). This prompted a foray along the likely streams, and to accomplish this the stream from Hamly Bridge (TQ 557137) to Stream Mill was followed. North of Stream Mill the eastern course was explored as far as TQ 565180, close to Waldron Furnace. The western course was explored as far as TQ 544166. No evidence of any new water-powered furnace or forge was found, although a new bloomery site was noted (see above).

### Heathfield

Budgen’s map of 1724 marks ‘New Furnace’ at the site of Heathfield Furnace (TQ 599187), which raises the possibility of an older one nearby. To check this, a foray was arranged to explore the area of Twissells Mill, thought to be the most likely place. First the pond at TQ 591197 was visited, and then the actual mill site at TQ 594196. The stream was

then followed down as far as Heathfield Furnace. No sign of any other furnace was found, but a new bloomery was recorded (see above).

### Runham Farm, Lenham, Kent.

In Bulletin (WIRG, *Wealden Iron*, First series) IX (1976), pp.21-2, 'Two Outlying Ironwork Sites', reference was made to a scatter of bloomery slag thought possibly to be from a Roman road surface. In 1980 Viscount Monckton informed the writer that excavations were taking place near the former site and material of the Roman period being found. A brief visit found an excavation in progress by the Mid-Kent Training School, under Brian and Edna Philp, at TQ 872510. Tap slag was scattered over what appeared to be a domestic Roman site, dated by pottery to the second century AD. This seems to give even greater credence to the likelihood of smelting in the immediate neighbourhood. An interim report of the excavation appeared in *Kent Archaeological Review* Winter 1980, 28-29.

### Iron Graveslabs with Incised Lettering.

A well known direct product of the Wealden blast furnaces is the cast iron grave slab. These occur in small numbers in many Wealden churches, most being at Wadhurst. It seems always to be assumed that the lettering and other ornament on the slab is impressed in the sand mould and cast with the slab. This is indeed usual but is not so in every case, and there are examples where inscriptions are incised in the cast iron. At Wadhurst a few incised examples may be found which appear to have been added to the cast inscription at a later date.

I am not familiar with all the existing Sussex cast grave slabs, but only at Mayfield Church have I noted a complete inscription in incised lettering. It follows below a cast coat of arms and commemorates

'THOMAS SANDS CIUZEN AND WINE COOPER OF LONDON 1708'

In considering the economics of cast or incised lettering I can only assume that the availability of steel of suitable quality to cut into grey cast iron must have been a decisive factor. Was this a bid by the stonemason to regain his traditional trade?

# The Fullers and Carron

*David Butler*

After reading a number of articles concerning the Fullers and their ironmaking activities, a visit was made to the East Sussex Record Office to examine the Fuller Letter Book in their keeping.<sup>1</sup>

The purpose of the visit was to find if any additional information was contained in the letters, also to ascertain what had occurred during the last years of gunfounding at Heathfield. Among the letters written by Dr. Rose Fuller in 1773 some references were found relating to the Carron Company of Scotland and to the likelihood of new contracts between the Sussex gunfounders and the Board of Ordnance.

The letters cover the period from 10th July to 4th August 1773 and read as follows:

Rosehill 10<sup>th</sup> July 1773

My Dear Lord

In walking round the Gun wharf at Woolwich on the 13<sup>th</sup> or 14<sup>th</sup> of last month, I was informed that an Experiment had been lately made between five Cannon cast in Sussex at five different Founderies and five of those made at Carron, and the event was, that all the cannon made at the latter burst before they had been fired ten times and some of them before they had been fired five, and that all the former had been fired forty five times, and that not one of them burst. Upon this intelligence I wrote to M<sup>r</sup> Charles Frederick, which brought on a correspondence, a copy of which I send you inclosed. I presume you have received a Letter of the same purport with Mr Baddingtons to me, of the 3<sup>rd</sup> instant. Whether your Lordship hath or not is what I want to know, and shall be obliged to your Lordship to inform me.

As we in my opinion shall have the Cannon trade restored, I shall not be rash in offering the terms upon which I shall deliver then, but I will take all the care I can that they shall be reasonable in respect to Government and the Founders

themselves; which they were not before, otherwise all the Founders in this and the two neighbouring Counties except your Lordship and myself would not have been ruined, I most earnestly wish to see you in order to have your assistance in a matter of so much importance to the publick in general, to our country and ourselves.

I am my Lord Your most Obed<sup>t</sup>

& most Hum<sup>ble</sup> Ser<sup>t</sup>

Rose Fuller

P.S. I and my Brother Stephen have just heard that your Lordship is at Ashburnham, – therefore we will do ourselves the pleasure of calling upon you at eleven o’Clock on monday morning

Rosehill July 15<sup>th</sup> 1773

Dear Sir

I have received a Letter from the Board of Ordnance signifying that they are ready to receive proposals from me or any other Gunfounders for Casting Iron Ordnance in this County; It is my opinion they will never receive any more made att Carron in Scotland or elsewhere of charred pitcoal, and that this County will have as they formerly had, the sole trade of furnishing government with that necessary commodity, Because, I believe they have lately discovered that those made in other places are not to be depended upon, When I see you I will communicate to you some matters which have passed, whereby, I am certain you will be convinced I have been a great instrument in bringing this happy event about; I will tell you more of this business when I have the pleasure of seeing you – As the foregoing is very good news for the proprietors and occupiers of lands in and all the inhabitants of the Eastern part of this County, I would have you communicate it to your brethren and other Gentlemen met att the Sessions but not give a copy of this Letter to anyone

I am S<sup>r</sup> Your most Obed<sup>t</sup> Ser<sup>t</sup> R.F.

John Fuller Esq

Rosehill August 4<sup>th</sup> 1773

You will please to inform the Board that upon maturely considering the questions proposed to me by their order in your Letter of the 3<sup>rd</sup> of last month, to wit that I would mention the price and time I would engage to deliver any quantity of Iron Ordnance I have not been able to make a calculation with any sort of exactness of the price upon account of the rigor of the search and proof much greater than formerly and not directed governed or limited by any rules or at least such as are known to the founders but dependant upon the particular ideas of the officers appointed to judge of their goodness. It is certainly reasonable that the founder should know the precise rules upon which their guns will be received or rejected; In knowing these they will have no other advantage than what is common to all other manufacturers although they will thereby be enabled to judge themselves which to send for proof and which to retain at home, and by which they will save the carriage and freight of those that are defective for bad guns are worth at least as much in the yard at the Furnace as refused ones are in the Garden att woolwich and the laying down these rules can be little or no trouble to the Board for the officers who have the function allotted to them of judging of the goodness and reception of Guns, if they act equitably impartially and at all times alike must have in their own minds some certain rules for their guidance – I hope therefore the Board will be pleased to form such rules to which they will adhere and communicate them to the Founders that they may consider and agree to them or propose others if they dislike them – There is another material obstruction to the making a Calculation on this subject and that is the delay of payment sometimes for years without Interest This is unprecedented in any other Trade and was one great cause of the ruin of most of the Gunfounders during the last War – As I cannot conceive that any possible reason can be given why commodities and particulary Ordnance purchased by the

Board of Ordnance should not be in as favourable a situation as to payment as if Bought by the Navy Board I cannot but think it highly reasonable they should be upon the same footing in that respect I hope therefore the Board will agree that their Debentures shall be on the same footing in all respects and particularly as to Interest and course of payment with Navy Debentures – If it shall be the pleasure of the Board to comply with the two foregoing requests I shall then acquaint them att what price I can serve them with Ordnance which at present I cannot with safety doe.

Your most Obed<sup>t</sup> Ser<sup>t</sup> Rose Fuller

John Baddington Esq

The contents of the letters raise a number of interesting questions. What was the matter with the Carron guns? Did Rose Fuller have the correct information? Were any orders subsequently placed with the Sussex founders by the Board of Ordnance?

A study of the early history of the Carron Company gives some idea of the events which led Rose Fuller to write as he did.

The Carron Company started to make ordnance in 1761 and about this time they took on two or more teams of moulders from Sussex.<sup>2</sup> Despite this, a lack of skilled labour led to an unreasonable number of reject guns and late in 1762 Carron ceased to make guns. They started again in 1764, when a gunfounder from Hampshire was employed.

In June 1764 they offered the Board of Ordnance guns at £14 a ton, even though the Company considered they would make a loss by selling at £16 a ton. John Fuller was asking about £16 a ton in 1754.<sup>3</sup>

The Board of Ordnance then asked their other suppliers of guns to match Carron's price but only the Crowleys and the Churchills agreed; the others refused. At the end of April 1765 the Carron guns ordered by the Board underwent proof and 8 out of 24 were rejected. This rate of rejection was considerably higher than for other gunfounders.

In May 1765, some of the Sussex men unexpectedly left, having been enticed south. In August 1765, 32 out of 86 Carron guns failed proof. In December 1765 two out of 11 guns were rejected, but Carron kept trying.

In April 1766 only 10 out of 63 failed proof and the Board ordered 66 more guns from Carron ranging from 9 pounders to 32 pounders. In May 1767, 63 out of 100 guns failed proof. Carron offered abject excuses, as apparently they were suffering from a lack of skilled moulders and borers. Sussex men were preferred but Carron were unable to entice skilled borers from Sussex.

One Sussex gunfounder (name unknown) did agree to come. The Board ordered more guns, new labour from Sussex was employed, and work continued during 1768. In 1769, despite Carron guns having a higher rate of failure than those of other makers, the Board gave Carron an order for 497 guns – the largest it placed that year.

Carron put every effort into completing this order. For a time all went well, but in March 1771 the Board complained that a large number of Carron guns had burst. In the middle of 1770, the Royal Navy had complained that cannon had burst whilst being used for training and these were almost invariably Carron guns.

In November 1772, the Board undertook more exhaustive tests of the Scottish ordnance and the results were bad. Carron were now in trouble with the Board and in February 1773 offered the excuse that one of their servants had lost his senses. They also sent the Board a large number of guns which they hoped would pass proof. In May 1773, at two proofs, 36 out of 133 guns failed. In June, the Verbruggens – of the Royal Brass Foundry – were called upon to assay metal from two Carron 12 pounders which had burst in proof on 1st and 5th May 1773. The Board received their report on 28th June 1773 and all Carron guns laid down for proof on 1st, 5th and 26th May 1773 were rejected. Subsequently all Carron guns were held in store, and those with the Navy were called in.<sup>4</sup>

Despite this setback Carron persevered. They enlisted the help of Smeaton and started to bore guns from the solid. They eventually produced the famous Carronade and soon Carron guns were in great demand – except by the Board of Ordnance. It took an order from the king, in May 1779, to make the Board try Carron guns again. The trial

was a success and Carron subsequently became a major supplier of ordnance. They finally stopped gunfounding in 1852.

It would appear that the information gathered by Rose Fuller on his visit to Woolwich in June 1773 could well be correct. In November 1772 and June 1773 the Board had ordered special tests and it is reasonable to suppose that one such test would be a comparison of Carron and Sussex guns.

The letters also confirm that the Board was in contact with its old suppliers. Whether any more guns were ordered from the Sussex founders is not clear. The letter book contains no other letters concerning gunfounding after one sent to the Harrisons on 4th August 1773.

Rose Fuller apparently had every justification for thinking that the gun trade would be restored to Sussex, but he was wrong to assume that the Board would never again receive guns made “of charred pitcoal”. The subsequent actions of the Board certainly indicated they were well aware of the cost and quantity advantages of coke-smelted iron, because they continued to investigate the merits of the old and new techniques. For this purpose the Board awarded a contract to Anthony Bacon, in July 1773, for the supply of three 18-pounder iron guns and these were duly supplied, together with a fourth gun. This fourth gun was of iron bored from the solid, and it received much attention from the Board. Bacon estimated that such guns could be supplied at a cost of £20 a ton.

At this time it is possible that Bacon may have been working in conjunction with the Wilkinsons who had an iron works near Wrexham. John Wilkinson patented an iron boring mill in 1774. About 1775 it appears that Bacon set up a large iron works and gun foundry at Merthyr Tydfil.<sup>5</sup> The Board conducted extended trials with the gun bored from the solid and again the help of the Verbruggens was enlisted. One request was for them to estimate the cost of casting and boring from the solid. The Verbruggens reported that the metal of the solid guns was more compact compared with those cast on a newal bar

(i.e. cast on a core) but they were unable to estimate the cost increase.

In view of the attention given by the Board to the gun bored from the solid it would appear that this technique – as applied to iron guns – was new to them. If so it suggests that the Wealden guns and others were not bored from the solid.

The results of the trial must have impressed the Board for in August 1776 it was made clear that in future they would only accept guns bored from the solid. They also awarded Bacon a contract for 300 tons at £18 a ton. It appears that Bacon could make good quality guns and a profit at this price. In this respect it seems reasonable to suppose that he used techniques similar to the Wilkinsons.<sup>6</sup>

The latter remelted raw iron from the coke blast furnace in an air or reverberatory furnace, thereby obtaining a clean iron of good quality. Such furnaces were fired with cheap raw coal; they could also be used for melting scrap, e.g. broken cannon – a process not possible with the blast furnace.

The Wealden founders were not in a position to compete with this process.

Names mentioned in the letters are listed below, together with some meagre information acquired.

|                          |   |
|--------------------------|---|
| Mr. Charles Frederick    | Secretary to the Board of Ordnance.   |
| Mr. John Baddington      | With the Board of Ordnance?   |
| Messrs. A. & I. Harrison | Fuller's agents. The Harrisons had cast guns at Hamsell Furnace in the 1740s. |

## References

- 1 East Sussex Record Office RAF/F/6/l. I am grateful to Mr. Alan Fuller and to the East Sussex Record Office for allowing these items to be reproduced.
- 2 R. H. Campbell, *Carron Company* (Edinburgh 1961), 82 ff.
- 3 H. Blackman, 'Gun Founding at Heathfield in the XVIII Century', *Sussex Archaeological Collections* **67** (1926), 52.
- 4 M. H. Jackson and C. de Beer, *Eighteenth Century Gunfounding* (Newton Abbot 1973), 50.
- 5 H. Scrivener, *History of the Iron Trade* (1854, reprinted 1968), 122.
- 6 W. H. Chaloner, 'Smelting Iron Ore with Coke and Casting Naval Cannon in the year 1775', *Edgar Allen News* Vol.27, No.318 (Dec. 1948), 194-215.